DAIRY ASIA:
TOWARDS SUSTAINABILITY
From Concept to Action

Proceedings of the Regional Multi-
stakeholder Meeting held in Anand, India
March 23-26 2015
<table>
<thead>
<tr>
<th>Abbreviation</th>
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<tr>
<td>ADB</td>
<td>Asian Development Bank</td>
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<tr>
<td>APHCA</td>
<td>Animal Production and Health Commission for Asia and the Pacific</td>
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<td>CARE</td>
<td>Cooperative for Assistance and Relief Everywhere</td>
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<td>CCAC</td>
<td>Climate and Clean Air Coalition</td>
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<td>CGIAR</td>
<td>Consultative Group for International Agricultural Research</td>
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<td>DEDS</td>
<td>Dairy Enterprise Development Scheme</td>
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<td>DoL</td>
<td>Department of Livestock</td>
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<td>DLS</td>
<td>Dept. of Livestock services</td>
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<td>DPO</td>
<td>Dairy Farming Promotion Organization of Thailand</td>
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<td>EIA</td>
<td>End Implementing Agencies</td>
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<td>FAO</td>
<td>Food and Agriculture Organization of the United Nations</td>
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<td>FAORAP</td>
<td>FAO Regional Office for Asia and the Pacific</td>
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<td>FMD</td>
<td>Foot and Mouth Disease</td>
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<td>GASL</td>
<td>Global Agenda for Sustainable Livestock</td>
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<td>GDP</td>
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<td>GMP</td>
<td>Good Manufacturing Practices</td>
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<td>ICAR</td>
<td>Indian Council of Agricultural Research</td>
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<td>ICIMOD</td>
<td>International Centre for Integrated Mountain Development</td>
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<td>IDF</td>
<td>International Dairy Forum</td>
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<td>Integrated Dairy Schemes</td>
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<td>IFCN</td>
<td>International Farm Comparison Network</td>
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<td>IFPRI</td>
<td>International Food Policy Research Institute</td>
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<td>International Livestock Research Institute</td>
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<td>JICA</td>
<td>Japan International Cooperation Agency</td>
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<td>LBVD</td>
<td>Livestock Breeding and Veterinary Department</td>
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<td>LEAP</td>
<td>Livestock Environment Analysis Partnership</td>
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<td>MDA</td>
<td>Myanmar Dairy Association</td>
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<td>MDG</td>
<td>Millennium Development Goal</td>
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<td>MLFRD</td>
<td>Ministry of Livestock, Fisheries and Rural Development</td>
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<td>MOU</td>
<td>Memorandum of Understanding</td>
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<td>MT</td>
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<td>NDBD</td>
<td>National Dairy Development Board</td>
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<td>National Dairy Development Centre</td>
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<td>National Dairy Plan</td>
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<td>National Dairy Research Institute</td>
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<td>NGO</td>
<td>Non-Government Organization</td>
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<td>NLM</td>
<td>National Livestock Mission</td>
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<td>NPBBDD</td>
<td>National Project on Bovine Breeding and Dairy Development</td>
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<td>PS</td>
<td>Pedigree Selection</td>
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<td>PT</td>
<td>Progeny Testing</td>
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<td>RDTC</td>
<td>Regional Dairy Training Centre</td>
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<td>RKVV</td>
<td>Rashtriya Krishi Vikas Yojana</td>
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<td>SAPLPPP</td>
<td>South Asia Pro Poor Livestock Policy Program</td>
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<td>SDG</td>
<td>Sustainable Development Goal</td>
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<td>SEI</td>
<td>Stockholm Environment Institute</td>
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<td>SHG</td>
<td>Self Help Groups</td>
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<td>SIA</td>
<td>Social Impact Assessment</td>
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<td>Technical Assistance</td>
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<td>TWG</td>
<td>Thematic Working Groups</td>
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<td>USD</td>
<td>United States Dollar</td>
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<td>UVS</td>
<td>University of Veterinary Science</td>
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Background and Summary

Asia has seen a remarkable growth in the production and consumption of milk and milk products over the past decades and has now overtaken the Europe as the world’s largest milk producer. However, although domestic production has responded to growing demand, it continues to fall short of aggregate demand and most countries in Asia are confronted with increasing dairy import bills. According to recent OECD-FAO Agricultural Outlook estimates the demand for milk and milk products in the region will reach almost 320 million tonnes by the year 2021, which means the region will need to increase milk availability by another 50 million tonnes within this decade.

Two more characteristics of Asia Pacific region are of specific relevance in the context of growing demand for milk and milk products.

1. First, the region is home to two thirds of the world’s poor and undernourished people. Given that milk is a good source of energy, protein, vitamins and minerals, a daily glass of milk for Asian children can significantly boost their nutritional levels.

2. Second, over 80 percent of dairy animals in the region are raised by small-scale farmers who are a critical and unique ingredient in the region’s dairy landscape.

The existence of a vibrant smallholder-managed dairy sector combined with a favourable medium term market outlook is good news since the poor generally tend to be much more important in smallholder dairy production than in crop production. Furthermore, animals are typically more equitability distributed than land in many of these areas and dairying is also more labour intensive than crop production and provides a remunerative outlet for family labour. These characteristics imply that growth in smallholder dairy can have a more direct and greater impact in poverty reduction than the same increase in crop production. Thus, if production can match the growth in demand, dairying can emerge as an engine of poverty alleviating growth with all other nutrition related benefits.

At the same time, there are growing concerns about resource scarcity, growing pressure on feed / natural resources, climate change and the need for more equitable development. Farmers worldwide face the challenge of producing more food with fewer resources while also addressing climate change and impacts on ecosystems. The agriculture sector in general is under pressure to increase the efficiency of natural resource use to meet society’s growing food and environmental needs. For the dairy sub-sector, this means that the economic agents along the entire dairy value chain must adopt technologies and management practices that can facilitate integration of environmental health, economic profitability and social and economic equity goals.

Recognizing the tremendous role of dairy sector in promoting equitable economic development and the need for stakeholders to find common ground, the FAO Regional Office for Asia and the Pacific (FAORAP) together with the Animal Production and Health Division (AGA) of FAO, the Animal Production and Health Commission for Asia and the Pacific (APHCA), the Global Agenda for Sustainable Livestock (GASL) have initiated a multi-stakeholder dialogue process under the broad narrative umbrella “Dairy Asia: Towards Sustainability”. The first meeting under this banner was held in Bangkok on 21-23 May 2014. The meeting was attended by about 90 participants from over 20 countries
comprising stakeholders from governments, national and international research agencies, civil society organizations, multilateral institutions, think tanks, private sector and regional and global networks.

The meeting recognized the growing importance of Asia in the global production and consumption of milk and the changing landscape of dairy sector. In order to guide the dairy sector development in the region and to capitalize on the knowledge and experiences from different countries, the meeting recommended development of a Dairy Development Strategy Framework paper and the establishment of a multi-stakeholder platform to facilitate regional cooperation and collaboration. There was consensus that such a platform would add substantial value towards promoting ground level action in pursuit of sustainability objectives.

Following the Bangkok meeting, a multi-stakeholder drafting group prepared the draft strategic framework paper. The paper was peer reviewed and shared with Dairy Asia meeting participants for comments. Following the first revision, an open e-consultation was held during 15-25 October 2014 to invite further comments from the stakeholders at large.

The second multi-stakeholder meeting was held on NDDB Campus in Anand, India on 21-23 May 2015. Hosted by NDDB and supported by FAORAP, APHCA, and the GASL, the meeting reviewed the strategy paper titled “Elements of a Regional Strategy for Sustainable Dairy Development in Asia” and discussed the potential organizational architecture of the Dairy Asia Platform. A number of participants made official country/stakeholder statements, unanimously endorsed and adopted the Strategic Framework paper and issued a joint communique in support of the principles outlined in the paper (see Annex 1 for the Joint Communiqué and Annex 2 for all the country/stakeholder statements). The participants also worked together to identify the basic structure and the core functions of the Dairy Asia Platform and reached a consensus on the key elements.

Opening and keynote addresses

The inaugural and keynote addresses highlighted the trends, opportunities and challenges of dairy development in the Asia Pacific region. These addresses also acknowledged tremendous role played by institutions such as NDDB and the dairy cooperatives in spearheading the inclusive, equitable and socially relevant dairy development in the region and reaffirmed the need for strong national and regional institutions and leadership. In his opening remarks, Dr. Vinod Ahuja said that Dairy Asia Platform is an idea whose time has come. But how that idea is converted into something more tangible is our shared responsibility. He expressed hope that the meeting will offer a roadmap towards discovery of Dairy Asia platform.

Mr. Nanda Kumar, Chairman NDDB, shared the glimpses of the journey of India’s dairy development through small and marginal farmers that started in a small town—Anand—in 1946 and grew to become a national movement and a source of constant inspiration. He shared the history, the guiding philosophy and the core value of NDDB and highlighted the importance of milk in the socio-economic fabric of India. Our growth model is based on environmental sustainability and of continuous and sustainable improvement in the livelihoods of dairy farmers, said Mr. Nanda Kumar.

At the regional level, Mr. Kumar recalled and endorsed the Chiang Mai declaration which identifies strategic interventions under four mutually reinforcing pillars: (i) human resource development and
knowledge management; (ii) improving the productivity and competitiveness of smallholder milk producers; and (iii) Strengthening the linkages between farmers and consumers to offer a quality product at a fair price and four enhancing and enabling environment. Further, recalling his message from the Bangkok meeting, he said Dairy Asia is the right platform for collaborative action, knowledge sharing and innovation. But the problems that confront Asia are in some ways different from those faced by other parts of world and a one size fits all solution may not work in Asian regions. He expressed hope that the Dairy Asia platform would emerge as a catalyst in discovering the common but differentiated solutions for countries in this region.

Vili Fuavao, FAO Deputy Regional representative for Asia and the Pacific, emphasized on the need to pay attention to resource stress, food and nutrition security and inclusion of marginal farmers and women in the development of dairy sector. He said that this is a complex challenge and cannot be addressed by individual players. We must work closely in dealing with these challenges. The government, the industry, the farmer's organization, national and international organizations should all come together to ensure economic, social and environmental sustainability of food system. He reaffirmed FAO's commitment to work with all stakeholders and hope that together we can make a visible contribution toward improving livelihood and nutrition.

Dr S Honnappagol, Animal Husbandry Commissioner, Government of India, delivered the first keynote address and highlighted the diversity of dairy genetic and other resources in India and the challenges of enhancing productivity of such a diverse genetic resource base. He also discussed the key programs in the country for dairy development such as progeny testing, pedigree selection and National Dairy Plan phase 1. He further remarked on the role of ration balancing and feed supplementation in enhancing net dairy income. He supported the idea of Dairy Asia platform to facilitate mutual sharing of experiences among countries and hoped that India’s concern and priorities will be reflected in its vision and guiding principles.

Henning Steinfeld, Chief, Livestock Information and Policy branch, FAO, elaborated the sustainability principles, the role of FAO in sustainable development and the efficiency of livestock systems in terms of human edible protein output and input. He mentioned that intensive grain based livestock production systems generally make negative net contribution if we measure inputs and outputs in terms of protein availability. This further accentuates the food and feed competition as these systems use edible materials for feed. On the other hand, in a number of developing countries, South Asia in particular, the dairy production system is based on crop residues and other forages that cannot be consumed directly by humans. In India, for example, the ratio of edible protein output to input ratio for dairy is about 4.3 times resulting in the production of additional 3 million MT equivalent protein. At 60 grams/person/day, this can meet the need of about 150 million people annually without imposing additional pressure on natural resources. So the livestock sector in India makes a net contribution equivalent to protein needs of 150 million humans. This is a huge contribution and need to be highlighted at highest levels of policy and politics. Still however, the number of livestock keepers is large and South Asia stands out with the largest number of people below poverty line that also keep livestock. For them livestock is the tool for supplementary income and livelihood support. More importantly, it is the only asset the poor people have that can be mobilized and made profitable. All together the estimate is 421 million livestock keeping people who live below 1.25 dollars a day and 750 million people live below 2 dollar threshold.
Taking a broader view of the Asian and global food economy, Prof. Margaret Gill recounted the impressive achievements in food availability and access over the last 50 years but also reminded that this progress has come at a considerable cost and this is now being recognised by sustainable development goals. Further, despite the impressive achievements, there are still over 800 million hungry on regular basis and over one billion suffering from micronutrient deficiencies. The nutrition has become important topic for many governments in world and there is now positive evidence of contribution of animal source food in human nutrition.

In terms of production systems, however, we have to deal with trade-offs as we can’t have win-win situation always. If we feed more fibre to animals there would be more methane emissions. If we feed them more grains there will be higher productivity and less methane emission over the life cycle but that will accentuate food-feed competition. So we need to think innovatively in terms of animal feed. Alternate resources need to be explored such as by products, algae and insects. The key message is that we need to continuously monitoring key changes and lateral thinking/innovation in all parts of the dairy industry could be the key to success.

**Technical Presentations**

Selected technical presentations covered specific aspects of dairy productions with important implications for sustainability. The presentations highlighted aspects of animal nutrition, genetics, manure management, program and project organization, policy and strategy guiding framework and so on. The first presentation by Vinod Ahuja presented the elements of strategic framework for sustainable dairy development in Asia elaborating both the process and the strategic objectives. Following the presentation of the strategic framework, a draft joint communiqué was presented for the consideration of the participants and finalization and adoption on the last day of the meeting.

The second presentation by Harinder Makkar discussed about importance of animal nutrition in production. Feeding is the single largest cost in dairy production and accounts for 70 percent of total farm expenditure. Feed may have negative impacts on livestock production by contamination with microbes, toxicity in form of metal poisoning or aflatoxins and metabolic diseases. There is also increasing food feed competition which could be a threat to human food security.

Feeding practices have impact on methane and other greenhouse gas emission. The efficiency of different systems of livestock rearing depends on the method of calculation.

The key message in the presentation was that we need to optimize production and not necessarily maximize. For this, we need to improve our understanding of trade-offs and synergies from interactions between animal nutrition and other components of biophysical and socioeconomic systems. Providing solutions through identifying and implementing proper technology solutions, policy options and institutional support mechanisms is the key to building future sustainability agenda.

Donald Nkrumah, from Bill and Melinda gates foundation made a presentation on genetic improvement for sustainable increase in production highlighting the importance of genetics and modern genomic tools in improving the productivity of dairy animals and reducing carbon foot-print of dairy sector. He elaborated on a number of technologies that can help improve productivity in a range of biophysical
environments and can be adapted to smallholder production systems. However, the successful adoption a national genetics system to deal with all aspects of genetic improvement including breeding services, biotechnology, quantitative genetics and so on.

The core idea of the next presentation by Theun Vellinga was to position manure as a resource instead of environment pollutant, as if often done. Acknowledging that manure can be a problem in a number of situations and inefficient manure handling practices can have serious negative consequences, he highlighted opportunities in turning this ‘waste’ into a resource. He also discussed barriers to smallholders in adopting efficient manure management strategies and the need to stimulate investments in on farm hardware and in developing the enabling environment towards a more efficient and balanced manure management regime.

Dr Dilip Kumar Rath made a presentation on national Dairy Plan phase 1 on behalf of NDDB. He discussed briefly the objectives of national dairy plan, the funding structure and different partners in implementing the plan. Different activities and sub activities to be covered under national dairy plan and their impact on dairy production in India were also discussed. The major activities are animal breeding, animal nutrition and improving milk procurement system in country. The presentation was followed by discussions and clarifications about different activities by the participants.

Mr R S Sodhi, Managing Director of Gujarat Cooperative Milk Marketing Federation (GCMMF), shared the story of AMUL—a story of triumphant collective action against all adversity—that continues to inspire millions around the world. Branded as the ‘Taste of India’, AMUL is currently the largest selling brand of milk and milk products in India. Recounting the significance of milk and dairy products in Indian culture and tradition, however, Mr. Sodhi characterized AMUL not just as a brand but a vehicle for economic and social transformation. He shared the AMUL vision, the guiding philosophy, details of coordination along the value chain, the infrastructure, service delivery models and the achievements. One of the many factors of AMUL’s success, in his assessment, has been its farmer and livelihood centric approach combined with commercial orientation in the market. AMUL not only has the largest share of India’s dairy market, it also ensures high returns for the farmers. Currently, AMUL pays the farmer 71 percent of the liquid milk retail price—the highest in the world.

Breakout sessions

Different breakout sessions analysed the existing situation of dairy production, consumption and marketing in the respective countries, discussed the expectations from and structure of the Dairy Asia platform.

The first breakout session was to analyse existing situation of dairy development, challenges in dairy development and expectations and contribution to platform. All representatives discussed and made brief presentation about their country. The next session focused on the most common challenges across countries and expectations from the platform. The participants identified policy and strategy development, genetic improvement, feeding management, human resource development and marketing of milk as the common challenges. The participants also agreed that the Dairy Asia platform would add substantial value towards addressing these problems via facilitation of technical assistance, institutional support and knowledge and information sharing.
The next session was to identify the focus areas at the regional level with potential to add substantial value within the next 2 years or so. Here the participants identified genetic improvement, institutional building, policy and advocacy, market access, database development and productivity enhancement initiatives with most promise.

The discussion then moved on towards developing a structure and functions of Dairy Asia platform. All teams come up with different structure but at the end of the session the structure was finalised. The emphasis was to keep the structure flexible so that necessary changes can be made for facilitating the work of the platform. There was common agreement that the structure should facilitate and not hamper the work of platform. Among the thematic working groups, the participants identified three areas with maximum promise. These are (i) institutional development, (ii) policy and strategy development, and (iii) technology transfer. Finally, it was agreed that a small group of participants would meet in near future to develop a more coherent narrative towards investment in dairy development and a clearer value proposition that Dairy Asia platform would offer. This would then be discussed with potential investors and stakeholders.
OPENING AND KEYNOTE ADDRESSES
Opening remarks

Vinod Ahuja
Livestock Policy Officer
FAO Regional Office for Asia and the Pacific

Ladies and Gentleman,

A very good afternoon and a warm welcome to this meeting. At the outset I wish to express my most sincere thanks for the hospitality, the partnership and leadership of NDDB in organizing this meeting.

I have had the opportunity to work closely with the organizing committee and I know how meticulously and sincerely they have been working. I want to thank them all for their hard work and the support that they have provided. I also wish to thank all the delegates and guest for accepting our invitation to join this meeting. A very warm welcome on behalf of FAO and on my personal behalf.

As I stand here today my mind goes back more than 10 years, November 2003 to be precise, when we inaugurated a similar international meeting in this very auditorium. I spoke from this very podium. And even one of our invited speakers—Dr. Henning Steinfeld—who delivered a Keynote Address in that meeting is with us today and will deliver another Keynote Address. That meeting titled—“Livestock and Livelihoods – Challenges and Opportunity for Asia in the Emerging Market Environment” was organised in partnership with another global project that FAO was implementing at the time. It was called Pro-poor Livestock Policy Initiative. What came out of that meeting is now known as South Asia Pro Poor Livestock Policy Program (SAPPLPP). Similar initiatives were started in other regions as well—in Southeast Asia, Latin America, and the horn of Africa. As far as I know SAPPLPP is the only program that has sustained and is making vibrant and significant contributions.

Part of the credit for its sustainability goes to strong foundation that NDDB provided to that program. And I would like to acknowledge that at this moment. But the other big lesson for us was that the program emerged out of recognition from stakeholders, that a program like this is needed, that it was built with local institutions and local leadership not just in terms of shaping the program but also in terms of putting resources into it. It was not one of those programs which was designed with donors and delivered with external money. And I think as we come together in this meeting for Dairy Asia, looking for ways to galvanize collective action for more sustainable and more equitable dairy development, that is one of the lessons we must take into account. Over the last few years, I have had the opportunity to work with a range of stakeholders in the region and at a personal level I am convinced that Dairy Asia is an idea whose time has come. But how do we convert this idea into something which is more tangible is really our shared responsibility. I know that in any such process there is always a process of discovery. We don’t have all the answers coming to this meeting and we may not have all the answer going out of meeting. But my hope is that we would have a roadmap as to how we are going to convert this idea into something more tangible and something which can add value to all the stakeholders.

Finally, I would once again like to acknowledge the partnership that NDDB has provided for taking this process forward.
Thank you very much and welcome to Anand.

**Welcome Address**

**Dr T. Nand Kumar**  
Chairman  
National Dairy Development Board

Ladies and Gentleman,

On behalf of Government of India and on behalf of NDDB, I welcome you all to this Regional Meeting on Sustainable Dairy Development in Asia. For me the two most important words in the title of this meeting are “Concept to Action”.

The small town of Anand is known all over the world for the immensely successful experiment in sustainable dairy development through small and marginal farmers. A journey that started in small town in 1946 was scaled up as a national program in 1965 when NDDB was established. If 1946 was the beginning of hope and determination 1965 was the leap of faith. Dr Kurian famously remarked “We have traversed a path few have dared to. We are continuing on a path still fewer have the courage to follow. We must pursue the path that even fewer can dream to pursue. Yet, we must, because we hold in trust the aims and aspirations of millions of our countrymen”.

This is what drives NDDB in whatever it is doing then and now. For the uninitiated NDDB is a body created by an act of parliament so if I were to borrow a phrase from British civil services, it is a Non-Departmental public body. And it works on its own in many ways with its own resources but in the service of millions of dairy farmers. We have completed 50 years of committed services and innovative support to small dairy farmers in India.

In fact it is probably more than a coincidence that this conference which intends to draw a roadmap for the journey from concept to action is being held here in Anand, a place where action and continuous innovation has happened in the dairy sector. These actions over the last 50 years have made India the largest producer of milk in the world. But more importantly it has changed life of millions of small dairy farmers particularly women in rural India.

We at NDDB believe that dairy development is not about a commodity called milk but about social and economic transformation of rural households in India. We also believe that dairy development has to be based primarily on the promise that sustainable development is possible only if natural resources particularly water, energy and agricultural residue are used in a long term sustainable perspective. Our growth model therefore is based on environmental sustainability and of continuous and sustainable improvement in the livelihoods of dairy farmers.

In the previous dairy summit in Bangkok last year the concept of dairy Asia was born. Points were made about the growing demand of milk in Asia and there was an estimate that Asian milk demand would be around 320 million tons by 2021. Which meant the region would need to increase milk availability by 50 million tons by the end of this decade. It was also recognised that this increase has to come at a time when climate change is likely to put pressure on water, feed resources and ecosystem as a whole. Considering that 80% of milk in the region is produced by the smallholders,
improving smallholder organizations capabilities to give them a better bargaining power at the market was noted as a necessary intervention.

Making efforts to increase awareness about nutritional aspects of milk was highlighted and also as necessary input. Last but not the least the economic and social empowerment of women through dairy was underlined in the conference.

At this point, let me recall the Chiang Mai declaration which identifies strategic interventions under four mutually reinforcing pillars: One human resource development and knowledge management; two improving the productivity and competitiveness of smallholder milk producers; three Strengthening the linkages between farmers and consumers to offer a quality product at a fair price and four enhancing and enabling environment.

We, NDDB and I personally, endorse the strategic interventions fully and I believe these hold good for all Asian countries. We in India have been following these four pillars from last 50 years. We have however over time fine tuned and refined these interventions to suit our conditions and aspirations of our people.

I mentioned earlier about the projected demand of 320 million tons of milk in Asia. I believe this assessment is based on current consumption levels, projected population and economic growth. However I would argue that this estimate is on the lower side. Many countries in Asia are trying to cope with hunger and malnutrition. During the last 10-15 years, many of them have made significant progress in reducing hunger. But the efforts to reduce under-nutrition have not yet paid perceptive dividends. I am sure that next decade would see a spurt in demand from people in the lower economic strata who will demand nutrition as a matter of right and as a matter of choice. Wen this demand hits market some of these numbers may change significantly.

In addition concerns of food safety may significantly impact the demand for more processed milk and milk products. I would therefore suggest that we plan for a bigger demand that we have estimated earlier. There exist multiple paths to reach this goal. We in India believe that we have to choose a path albeit difficult that enables our small and marginal farmers to produce required quantity of milk within the country and to get their legitimate share of India’s economic growth.

Of course each society and each country has to choose a path it thinks appropriate based on its natural endowments and economic philosophy. What we in NDDB can offer you are our lessons learnt in difficult journey in case you decide to choose this path.

We in Asia have many things in common and as a region we are growing faster than many parts of the world. We are witnessing a very high degree of urbanization. We are concerned about the imperative to reduce hunger and under-nutrition. Our agriculture continues to be dominated by a number of small farmers for whom it remains the only livelihood option. In many Asian countries the contribution of agriculture to Gross Domestic Product (GDP) is coming down but number of people employed remains high. Given these conditions smallholder dairy continues to remain an effective instrument of intervention for increasing rural prosperity in this region. Therefore the Asian model for growth is likely to remain different from those of some other countries in the world.

In May 2014 meeting in Bangkok I said and I repeat “Dairy Asia is the right platform for collaborative action, knowledge sharing and innovation. But the problems that confront Asia are in
some ways different from problems faced by other parts of world. Therefore a one size fits all solutions may not work in Asian regions. We need a common but differentiated approach for this region. We are willing to share both knowledge and experience in arriving at common but differentiated solutions for countries in this region. We believe that deliberations in this workshop will lead to what it is supposed to do. That is to arrive at a roadmap from Concept to Action.

I once again welcome you to this town of Anand to our campus and welcome you to this conference. I hope that you will have a very fruitful workshop and we will at the end of this conference have a clear roadmap on where we intend to go.

Thank you very much.
Welcome Address

Vili Fuavao
Deputy Regional Representative
FAO Regional Office for Asia and the Pacific

Ladies and Gentleman,

On behalf of FAO Assistant Director-General and Regional Representative for Asia and the Pacific, Mr. Hiroyuki Konuma, and on my own behalf, I have great pleasure in welcoming you to this multi-Stakeholder meeting on Asian dairying.

This meeting, co-organised by the National Dairy Development Board (NDDB), FAO Regional Office for Asia and the Pacific (FAORAP), the Global Agenda for Sustainable Livestock and the Animal Production and Health Commission for Asia and the Pacific (APHCA), follows from another consultative multi-stakeholder meeting held in Bangkok, Thailand in May 2014. The delegates in that meeting had requested to develop a framework paper for sustainable dairy development in Asia and to explore the potential for setting up a Dairy Asia platform.

The consultative process continued in different forms after that meeting and now we are here in Anand. And perhaps, there could not have been a better place to meet than Anand—the epicentre of smallholder dairy development. The place where massive numbers of poor women have been directly lifted out of poverty into lives of hope for themselves and their children. The base from which Dr. Verghese Kurien won the World Food Prize for his seminal contribution, to solving the worlds problem of hunger and poverty through large scale development of smallholder dairy. And I am grateful to the National Dairy Development Board for having enabled this opportunity.

The world has witnessed remarkable progress during the last five to six decades in augmenting food supplies and reducing poverty. But future challenges remain equally daunting. While the number of hungry in the developing world fell by 26 million during the first half of the 1990s, it rose by 25 million between 1995–1997 and 2005–2007. According to FAO estimates, the number of undernourished people stood at 842 million in 2013, and almost 60 percent of these in Asia. Considering that in 2050 there will be additional 2.3 billion people more than today to feed, the current situation, in absence of decisive collective action, could only worsen.

At the same time, the growing middle class is demanding safer, higher quality, and more resource intensive food items. This phenomenon is here to stay for some time as, in addition to growth in numbers, people move from villages to cities and acquire higher disposable incomes. So far the overall supply has managed to keep up with this demand growth by introduction of new technologies and new ways of organizing production. But the manner of supply growth has also has imposed considerable social and ecological costs. Signs of resource stress are now becoming visible and raising new challenges for food and nutrition security of the poor in developing countries.
Small producers often get left out of the train resulting in missed opportunities. Technology development gets driven by the needs of large scale production systems to the exclusion of those that may be suited for smallholders. Similarly, research on the impact of these developments on the environment or public health does not always get adequate attention.

I will not dwell on the technicalities of these issues, not only for want of time, but also because there are so many experts present in this meeting. But, as we go into the deliberations in this meeting, I do wish to take a few minutes just to recap the key messages that emerged from the Bangkok meeting.

**First**, we must become more and more cognizant of the concerns about resource scarcity, growing pressure on feed resources, climate change and the need for more equitable development. There are growing pressures on farmers everywhere to produce more with less while also addressing climate change and impacts on ecosystems. It would therefore not be possible to meeting future challenges without substantial improvement in efficiency of resource use.

**Second**, and this is especially true for dairy, considering that nearly 80 percent of the milk in the region is produced by smallholders, improving their organization to give them better bargaining power in the market place must remain a core element of our work. Although there is an emerging debate on the ability of smallholders in responding to the complexity of modern marketplace, there is plenty of evidence from around the world, including the self-evident truths that surround us in this location, that with social and political commitment and appropriate organizational support, smallholders can meet any challenges. Private sector also has huge role to play in this but we must consciously work towards creating synergies and guiding investment in a manner that it does not marginalize smallholder producers.

**Third**, as you are well aware, women continue to be key actors in dairy sector, specially in poor agrarian societies. Dairying provides women with a regular daily income, vital to household food security and family well-being. Women are not only involved in milk production, but also in collection, processing and marketing of dairy products, roles which were often overlooked by development programmes. As we make recommendations for new policies, new projects, new programs, we must ensure that the participation of women in dairy sector is enhanced and this participation must be such that the women not only contribute their labour but also become an active participant in strategic decision making.

Thus, our true challenge is ensure a path of development that is economically viable, environmentally sound and socially responsible – now and for future generations.

This is a complex challenge and cannot be addressed by individual players. We must work closely together in dealing with this challenge—the governments, the industry, the farmer organizations, national and international organizations must come together to ensure economic, social and environmental sustainability of food systems. FAO remains committed to working with all stakeholders and I hope together we can make visible contributions towards improving livelihoods and nutrition.

Sincere thanks once again to NDDB and the Government of India for their gracious hospitality and partnership and I wish everyone productive and exciting deliberations.
Thank you.
Keynote Address: India’s dairy experience and challenges

Dr Suresh S. Honnappagol
Animal Husbandry Commissioner
Government of India

Namaste and good evening to all the distinguished delegates assembled in this Regional Meeting on Sustainable Dairy Development in Asia – from Concept to Action. Two previous speakers have made it amply clear how important this particular sector is and how much responsibility rest on all of us to march forward. We are the largest democracy in the world with 1.2 billion human population and 73 percent of them are below 40 years of age. So that’s why we always refer it to as young India as future days to come.

India has the largest bovine population in the world with 190.9 million of cattle that constitute around 14 percent of world population and 108.7 million buffalo population that constitute to the tune of 56 percent of world population. Out of total bovine population 63.7 percent is cattle (within that 13.26 percent is crossbred), 50.47 is indigenous and 36.28 percent is buffalo population.

India is one of the largest and fastest growing economies of the world competing with some of the most developed economies to become second largest economy if not the number one. Unlike western world our livestock sector is very unique. More specifically dairying in particular is integral part of rural India and it is a system of production by masses but not the mass production. About 80 percent of milk producers are small and marginal holders with an average herd size ranging between 1-3 animals and production average with less than 4 kg milk per day mainly utilizing crop residue.

Unlike major developed countries, milk production in India provides employment generation opportunity, asset creation, as a means of coping mechanism against crop failure, the social and financial security to the farmers and also provides gender equation. More than 75 percent of farm women are engaged in one or other way with reference to livestock or dairy production. The livestock sector has been instrumental to economic changes to a great extent and also for the change in quality of human life, including that to the nutrition and contribution to the tune of 67% of production volume.

The farm-gate value of milk at current prices was about 35,000 billion rupees (approximately USD 64 billion) which is more than the combined total value of output from wheat and rice in the country. This is the immense contribution what we get out of the dairy production. With the success of operation flood program, again it was spearheaded by NDDB and the active participation of all stakeholders during 1970 – 1996, India has emerged as the largest milk producer of the world from 22 million MT to almost around 140 million MT in the last year with very steady growth rate of 4.40% which is almost double than the world growth. As a result the per capita availability of milk has risen from 111 grams in 1970 to almost 307 grams in 2013-14.

Indian has around 39 breeds of indigenous cattle and 13 breeds of buffalos with various specific characters with reference to adaption and disease resistance. The biggest challenge has been increasing productivity of each breed through scientific feeding, breeding and management practices.
India being a tropical country the milk collection, storage and processing is also a challenge like in many Asian countries.

Even though our growth in milk production about 5 million MT/ annum is quite good, we need to further strengthen our efforts to improve productivity and sustain production in order to meet the rapidly growing demand for milk and milk products. To address we need a carefully thought out strategy which is scientific, sustainable and based on locally relevant approach.

Along those lines some selected organizations are carrying out progeny testing and pedigree selection programs to produce indigenous bulls across the country. More specifically the breeds of Rathi, Sahiwal, Gir, Kankrej, Tharparkar and Hariana for cattle and Mehsana, Murrah, Jaffarabadi and Pandharupuri for buffaloes. The government is also committed to breed conservation and development activities through programs like Rashtriya Gokul Mission and establishment of national Kamdhenu breeding centres which will become a national repository of indigenous breeds of cattle. These native breeds can compete well if not better than crossbred animals under harsh and humid conditions.

Balancing the ration out of available feed resources and area specific mineral mixture supplementation can considerably increase the net dairy income with increased milk fat and reduction in cost if production. This has been proven very well by NDDB. This also can reduce the chances of metabolic diseases like milk fever, ketosis and mastitis etc. that affect the milk output and reduce the methane emission which is the key concern to all of us.

Apart from these programs the government of India has launched National Dairy Plan (NDP). We are in phase 1 and again the lead implementing agency is the NDDB. Total outlay of NDP is around 255 million USD and it is focused on increasing the productivity through improved breeding, feeding and health programs. We expect that India’s concern and priorities will be reflected in the vision statement and strategic objective articulated in the framework paper of Dairy Asia.

We do hope that Dairy Asia would facilitate mutual sharing of experiences and lessons learnt among the participating countries including India. To end let me quote late Mahatma Gandhi, the father of our nation—“the greatness of a nation can be judged by the ways its animals are treated”. So let us pledge today and contribute all our strength to the prosperity and humanity in the Asian region I wish the delegation all the success and thank the organizers for having given me some time to share my experience with this august gathering.

Jai Hind!
Keynote Address: Sustainability - from Concept to Action

Henning Steinfeld
Chief
Livestock Information and Policy branch, FAO, Rome

Good afternoon, distinguished delegates, friends and colleagues,

Let me begin my presentation by referring to the Millennium Development Goals (MDGs) that were established following the Millennium Summit of the United Nations in 2000 covering a period through 2000 to 2015 and coming to an end this year. The different MDGs are to (i) eradicate extreme poverty and hunger, (ii) achieve universal primary education, (iii) promote gender equality and empower women, (iv) reduce child mortality, (v) improve maternal health, (vi) combat HIV/AIDS, malaria and other diseases, (vii) ensure environmental sustainability and (viii) develop a global partnership for development. The term sustainability here only appears in environmental context. But that is changing now.

Sustainability is a much broader concept, and it is not limited to environment. If we look at the record very briefly there has been steady progress, sometimes impressive progress, on poverty, hunger, health, education and gender. For example poverty rates have fallen to half in Asia. The number of food secure people have gone up quite substantially—more than 40 percent in Asia along with significant improvements in health, education and gender. Asia is the region that has shown the most striking progress with regard to MDGs.

Africa is unfortunately lagging behind even though picking up in the last about 6-7 years. But on goal number 7, environmental sustainability there has been a failure. With climate change, carbon dioxide levels continuing to rise, resource scarcity is becoming more pronounced. Here in India, we face water scarcity, land scarcity, nutrient scarcity. There has been a fair bit of environment destruction, biodiversity being one example.

At a conference in 2012 in Rio de Janeiro—20 years after the first conference on environmental sustainability—a process was put in place to focus on the sustainable development goals (SDGs), to replace MDGs in post 2015 development agenda. I will not go through all the 17 SDGs. Those would be discussed and ratified in United Nation General Assembly meeting in September 2015. But here are the big principles, the big orientation about SDGs.

One principle is really to eradicate poverty, leave no one behind, include everyone in development process and ensure basic economic opportunities and human rights. This is very much people centred approach. Sustainable development is the core and it is actually integrating social, economic and environmental dimensions. So really SDGs look at sustainability as integrated concept. Transform economies for job and inclusive growth; that also refers to gender opportunities. It particularly looks at rural, urban unemployment, at people living at margins of society. Build peace, effective, open and accountable institutions for all and forge a New Global Partnership, a new spirit
of solidarity, cooperation, and mutual accountability. These are lofty noble goals, but nonetheless these will guide global development discussion between now and year 2030.

What does this mean for dairy in Asia? Looking at livestock very broadly, the question is how much edible human protein do we put into the livestock sector as opposed to how much do we get out of it. As you can see in the picture below, in western countries this balance is very negative. That intensifies the food and feed competition because we are using edible materials for feed. As a result there is negative net contribution of livestock sector if we measure it in terms of protein availability.

In India, on the other hand, you get 4.3 times more edible protein out of the livestock than you put in. This translates to the net additional production of more than 3 million MT animal protein which is equivalent to the protein needs of 150 million people at 60 g/day/person. So the net contribution that livestock sector makes in India is huge. The reason for that is because the dairy in South Asia is based on use of crop residue and other forages that are not human edible and proportion of grains is very small. And when you look at countries like Sudan, Nigeria, Mongolia, Ethiopia, Kenya which are rangeland countries with vast grazing resources, they have even have more favorable protein balance.

The number of livestock keepers is South Asia is however still large. The region stands out with largest number of people below poverty line that also keep livestock. For them livestock obviously is the tool for livelihood support and additional supplementary income. East Asia has lower number and Africa has smaller number compared to South Asia. All together the estimate is 421 million livestock keeping people who live below 1.25 dollars a day and 750 million people live below 2 dollar threshold.

In terms of differences between South and East Asia, in South Asia dairying is mainly small scale traditional and more focused towards buffalos. They are self-sufficient in dairy and focus mainly on export. In East Asia, they focus on medium to large scale modern cattle based dairying. These countries have large imports of dairy products which are growing. This is an opportunity for Australia, New Zealand and Europe as they are exporting more of dairy products to these countries.

The opportunity set in dairy development can be characterized through four main elements—people, practices, markets and policies. People are opportunity because they know the importance of livestock. So we must work on the philosophy ‘start with what you have’. If livestock is what you have and the skill levels are not good for getting a decent job or if there are barriers to accessing
capital to start a business, then start with what you have. Livestock is the only asset most of rural people have. We should start with baby steps to come out of poverty. NDDB is best example of collective action. People have better bargaining power when it comes to processing and marketing.

Practices, many of the technologies are very basic and tried in many places. The performance can be raised by simple measures. Increasing productivity also results to emission intensity decreases and provides opportunity for food security, productivity increase and addressing climate change. While using technologies we should be scale neutral and not penalize those who are not able to achieve economy of scale. The efficiency is very unevenly distributed and if you try to bring efficiency of majority of producers to some of the best producers, these can cover significant efficiency in production and emission gap. For example when we move from 1200 kg per cow (which is standard figure for India) to 2400 kg, we reduce emission to half. This can be an opportunity to get dairy sector into carbon offset schemes and payments from reduced emission. North America, Australia, Europe has very less emission intensity, Asia is doing less well but it is better than parts of Africa. But still huge gap is to be closed.

Markets—India is growing at 4 %, China at 6 % in dairy development, and South Asia is also growing very rapidly. We need to have differentiated approaches for livelihood oriented and market oriented producers. We need to look at income generation and employment in dairy value chains. The number of jobs produced in dairy in India is stunning. According to some estimates, for every 20 liter of milk in India there is a job created. So dairy not only supports small scale producers but also people seeking jobs in off farm sector.

It is really about competitiveness at different levels. Policies should focus on competitiveness at different levels—smallholders, large producers, domestic and international markets. There should be targeted policies related to access to resources, access to markets and services; technologies; market information, credit and insurance, infrastructure, institutional development and partnerships.

FAO is currently working on concept of sustainability and we see it as an interface between natural and human systems. Humans use natural resources and environmental services to get agricultural products, economic and social services. Natural resources like land, water, genetic resources, forests, fish, nutrients and energy are used to produce food, feed, fibre and fuel. The environmental services are also used in form of climate, nutrient cycling, biodiversity conservation, water cycles and environment health. We also want agriculture to grow, employment generation, health, equality and landscape management.

The sustainability principles include conservation, protection and enhancement of natural resources so that they remain intact for future generation. This implies increasing productivity through resource
use efficiency—land, water, nutrients, improving equity, fair markets, responsible consumption, resilience and governance. We also need to protect resources by reducing food-feed competition, limit livestock’s expansion into valuable eco-systems, integrated land use management (in particular in fragile eco-systems), protect water resources. These require incentives, regulations and continuous innovation.

Increase resilience by using livestock as a tool of adaptation and improve coping capacity with shocks. Improve governance of global commons (e.g. climate), of local commons (e.g. communal grazing, water), incentive schemes (payment for environmental services, carbon markets).

FAO can contribute knowledge: best practices, assessment and analysis, technologies in feeds, genetics, and health. Policy dialogue: intergovernmental, multi-stakeholder partnerships and develop policy options: integrated analysis, trade-offs and tools.

Thank you.
Keynote address (via skype): Opportunities and issues associated with the contribution of dairying to meeting the Zero Hunger Challenge, with a particular focus on Asia

Professor Margaret Gill  
Chair, Integrated Land Use  
University of Aberdeen

People have depended on animals long before recorded history and they still do. Livestock is important to global economy and demand for livestock products is growing. In this presentation I will talk about agricultural growth and its consequences, growth in milk supply, rapid change and potential consequences, and planning for the future.

Agriculture has grown at a phenomenal rate over the last 50 years but this has come at a cost. The cost is now being recognised by sustainable development goals (SDGs).

The benefits of food production growth were low food prices. The food prices were highest in 1970s but declined through the 80s and 90s. During that time we also had food surplus particularly in Europe. Success in 70s was seen as increase in quantity of food and keeping prices low. This was success but at a cost. The Sustainable Development Goals attempt to build on the lesson that we can't take for granted the use of so many resources just to keep the prices down. Success came with a combination of science, policy and investments. The science contributed through crop breeding, animal breeding, growth of chemical industries e.g. fertilisers and pesticides, growth of pharmaceutical industries e.g. vaccines and antibiotics, crop and animal husbandry and increasing precision of mechanisation.

Despite successes however still there are over 800 million hungry on regular basis and over one billion suffering from micronutrient deficiency. We have success in terms of food production but we have serious problems in uniform distribution of food. The nutrition has become important topic for many governments in world. There is now evidence of positive evidence of animal source feeds and their benefits on nutrition.

FAO data shows milk, rice and meat have very high contribution to nutrition. The world average supply of milk and meat in terms of energy per capita per day is increasing over a period of time. People are consuming meat more often on regular basis than milk. Milk supply in Europe remains more uniform but increasing in India, Brazil and China.

Traditionally the contribution of science in dairy is in breeding for higher yield and composition of milk, dairy cow nutrition for yield and composition of milk – total solids, vaccines and antibiotics to treat dairy cows, design of milking parlours. But there are changes in trends which lead to change in contribution of science. The current and future contributions will be in genomics to match cross-bred to farming systems, breeding and diet to manipulate milk fat to be healthier, supplements to reduce intensity of methane emissions and decrease environmental impact of dairying.

Looking into the recent trends, there are some very rapid changes in system whose consequences are difficult to predict like climate change (and uncertainties associated with it), political change (the rise
of the BRICs, for example), social change and the ‘nutrition transition’, economic change, interconnectedness and uncertainty and access to information – increasingly informed public who want a voice. The global economies are also changing and there might be shift of positions among major economies like United States, China and India. There are even speculations that global power will shift to countries producing Soybean.

In a paper by Rockstrom et al (2009) they have identified 9 interplanetary boundaries which are; Climate change, Ocean acidification, Stratospheric ozone depletion, Disruption of nitrogen cycle (Disruption of phosphorus cycle), Global freshwater use, Change in land use, Biodiversity loss, Atmospheric aerosol loading and Chemical pollution. The dairy is responsible for climate change, disruption of nitrogen cycle and biodiversity loss.

The planning for future, the movement of feed stuff is increasing very rapidly. Majority of global feed tonnage is going for pig and poultry, the amount for ruminant feed is less than half. By 2050, 550million MT additional feed grains will be required for livestock sector. The Soy bean meal requirements will be huge.

The key questions about huge feed requirement in future are, can this be met? And should this be met? What if the world needs to shift from fossil fuel based economy to biomass based economy—58 percent of global biomass in 2011 was used to feed animals. Europe and a lot of other countries have bio-economy strategy, but what will be the impact when this strategy will be implemented? Lateral thinking or out of box approach for solving problems will be helpful.

For this we have to deal with trade-offs as we can’t have win-win situation always. If we feed more fibre the emission of methane will be more, but if we feed more grains there will be more productivity and less methane emission over the life cycle.

We need to think innovatively in terms of animal feed and alternate resources need to be explored like by products, algae and insects. The key message from the presentation is ‘Monitoring key changes and lateral thinking/innovation in all parts of the dairy industry could be key to success’.

Thank you.
TECHNICAL PRESENTATIONS
Elements of a regional strategy for sustainable dairy development in dairy Asia

Vinod Ahuja
Livestock Policy Officer
FAO Regional Office for Asia and the Pacific

Rising income levels and progressive urbanization have spurred a shift in dietary patterns – from traditional carbohydrate based diets to diets richer in proteins and micronutrients. As a result, consumption of milk and milk products has risen rapidly in the region. Estimates are that the demand for milk and milk products in Asia will reach almost 320 million tonnes by 2021. This means the region will need to increase milk availability, either by production gains and/or imports, by another 50 million tonnes within this decade.

Within these strong production and consumption trends there is wide variety in production and consumption patterns as well as socio-economic and cultural contexts. While South Asia has a longer tradition of milk production, and dairying in South Asia has been and continues to be an important livelihood support activity, recent growth in milk production in East and Southeast Asia has largely been led by large-scale private sector investment.

Despite these trends, traditional smallholder production systems remain dominant in Asia and contribute a substantial proportion of national and regional milk production. These systems rely on farm-produced and low-cost feed rations, family labour and remain a source of food security, nutrition, livelihood support and risk mitigation for millions of rural households.

Asia is home to two-thirds of the world’s poor and undernourished people and in some countries the proportion of undernourished children exceeds 40 percent of the total child population. Given that milk is a good source of energy, protein, vitamins and minerals, a daily glass of milk for Asian children can significantly boost their nutritional levels during these important development stages of life. At the same time, many people in the region now consume excessive amounts of sugar and fats leading to obesity and poor health. Rapid growth in demand for dairy products needs to be placed in the context of undernourishment, micronutrient deficiencies and overweight/obesity.

There are also growing concerns about resource scarcity, climate change and the need for equitable economic development. The agriculture sector in general is under pressure to increase the efficiency of natural resource use to meet society’s growing food and environmental needs. Investing in sustainable dairy is no longer a question of choice. It is the only option.

Transition to a more sustainable path must however consider sustainability in its full complexity encompassing all three of its pillars—economic, ecological, and social. Partial solutions will not produce the desired results. For example, any efforts towards natural resource conservation that ignore the need for economic development, food security and productive livelihoods are unlikely to succeed. Conversely, socio-economic development will not be sustainable if it does not maintain the ability of the ecosystem and society to adapt to short- and long-term changes. This complexity necessitates consideration of sustainability as a societal issue and requires integrated efforts by a wide range of stakeholders to capitalize on the strength of dairy production systems in Asia and to minimize the potential negative impacts of rapid growth in the production of milk and milk products in the region. It is also imperative that such efforts be realistic, equitable and aware of the region’s ecological, socio-economic and cultural dimensions.
The strategic framework paper attempts to articulate what may be described as the ‘Elements of a Dairy Strategy for Asia’. Such an approach recognizes that a single regional dairy strategy cannot capture the diversity that exists in dairy production systems and policy priorities across countries in the region. However, an articulation of various elements in what may be described as a ‘common framework’ can provide some strategic guidelines to national governments and other stakeholders to help them develop/adjust their own strategies and programmes in the light of broader trends and specific national priorities. The paper articulates the strategic vision of the Asian dairy sector as follows:

‘A socially and environmentally responsible Asian Dairy Sector that enhances rural livelihoods, improves nutrition, and contributes to economic prosperity’.

The vision seeks to foster multistakeholder collaboration to achieve sustainable growth in the dairy sector through market-based solutions while at the same time positioning the sector as a positive driver of food security, environmental sustainability and equitable economic growth in the region.

The strategic objectives of the regional strategy, as identified by the stakeholders, are:

1. Increase farm profitability and milk productivity sustainably to meet the increasing demand for dairy products.
2. Promote fair and efficient markets, including institutional structures to integrate small-scale producers in the modern value chain.
3. Improve dairy food quality and safety.
4. Enhance consumer education to enable more informed choices, including emphasis on publicly-supported school milk programmes linked to local dairy operations.
5. Strengthen stakeholder capacity to cope with production and market risks and for greater innovation.
6. Minimize the environmental footprint of the dairy sector and improve mitigation/adaptation measures of the dairy sector to climate changes.

Following the presentation of the overview of the draft strategy paper, the country representatives and other stakeholders affirmed their interest and commitment and support of the dairy Asia platform. Representatives from India, Nepal, Bangladesh, Myanmar, Thailand, Afghanistan, Sri Lanka, Viet Nam, Indonesia, Bhutan, and Fonterra made their statements and these are presented in Annex 1. The stakeholder representatives also endorsed a Joint Communiqué as presented in Annex 2.
Animal nutrition in a 360 degree view and sustainability of Asian dairying

Harinder Makkar  
Animal Production Officer  
Animal Production and Health Division, FAO, Rome

The evidence of importance of animal nutrition can be traced back into ancient Indian scriptures like Vedas and Gita. The actual development of the science of animal nutrition started in early 19th century when methods for animal feeding experiments were developed. The main objective of animal nutrition till 20th century was to maximize production.

Animal nutrition interacts with different components of bio-physical and socio-economic systems around us. These components include—Planet, People, Profits and Ethics.

Feeding of livestock has direct and indirect environmental impacts. These includes greenhouse gases (GHG) emissions (global GHG emission from livestock value chains is 14.5 %), water use (livestock uses 15 % of global agriculture water use and more than 90 % of it is used to produce feed), change in land use, water pollution, disruption of global nitrogen cycle and threat to biodiversity.

Contaminated animal products resulting from compromised feed safety can be harmful to consumers and environment. Food-borne pathogens such as *Escherichia coli* O157, *Salmonella*, *Listeria* and *Campylobacter* can get into animal products through animal feed. Use of antibiotics as feed supplements leads to antibiotic resistance. Animal feed losses because of presence of aflatoxins and other contaminants leads to economic loss and has a negative impact on global food security. In 2012-13 one-third of global cereal production was used for animal feed manufacturing which would be sufficient to meet annual calorie needs of 3.5 billion people. Biofuel industry is an emerging competition to use of grains for animal feed and human food. Food-fuel-feed competition is as big a challenge as climate change, which needs immediate attention.

Feeding is the single most important element of livestock farming and feed costs can be up to 70 percent of total farm expenses. Improper nutrition impacts animal health directly and also indirectly through reducing immunity. It can lead to conditions like ketosis, acidosis, laminitis and milk fever, among others and has adverse effects on animal welfare. Poor nutrition also has negative impact on quality of animal products. On the other hand good feeding has positive impact on livestock production. It increases growth rate of animal, milk production and reproductive efficiency. Feed impacts almost all components of the livestock sector.

There are number of ways in which efficiency of livestock production can be measured. So far the most widely used unit of efficiency in the environment direction has been emission intensity (GHG emission as CO2 equivalent per unit of animal product). We must think efficiency in multi-dimension; for example the unit of efficiency could be water use per unit of animal product, arable land use per unit of animal product and disruption of global nitrogen cycle per unit of animal product. For the social dimension, the efficiency could be measured as number of people lifted out of poverty per unit of milk or number of jobs created per unit of milk, among others. So, the efficiency dilemma is much more complex than is normally understood.
The method of efficiency calculation can have drastic impacts on conclusion by researchers. For example if we only take emission intensity ($\text{kg CO}_2\text{ equivalent/kg milk produced}$) as measure of efficiency, then the grassland based production systems becomes highly inefficient. But if we measure in terms of human edible protein output/human edible protein input, then such systems are highly efficient.

The key messages are that we need to optimize production and not maximize. For this, we need to improve our understanding of trade-offs and synergies from interactions between animal nutrition and other components of biophysical and socioeconomic systems. Furthermore, feed has interactions with product quality, animal production, reproductive efficiency to animal welfare (see figure 1). A proposed framework for future strategic R&D in animal nutrition is to: a) obtain a better understanding of these interactions and generate quantitative relationships, b) obtain a better insight into impacts of various ongoing changes on the interactions, and c) provide solutions through identifying and implementing proper technology solutions, policy options and institutional support mechanisms.
Dairy development is a route out of poverty and potential areas for improving animal productivity in Africa and Asia are animal health, animal genetics and nutrition. Health is important area and poor nutrition predisposes animals for diseases. The animal genetics provides largest opportunity across all geographies for improving animal productivity, but realising the actual genetic potential also depends on how we feed livestock. The success comes from access to appropriate genetics plus ability and inputs to manage health, feeding, and general animal husbandry.

The key strategy for helping smallholders is through increasing realised productivity by providing improved animals to farmers. Accelerating and sustaining potential productivity by genomics and other on-farm genetic gains. Increasing access of smallholders to input and output markets.

The smallholders need access to right genotype and breeding services. Access to input and knowledge on health, breeding, livestock husbandry and markets is also necessary. The performance of genotype depends on production environment. If the environment is harsh then indigenous cattle perform better than crossbred, in poor conditions cross bred performance is better than indigenous animals. If environment is good then it is better to rear pure bred exotic cattle which will give more production. Under tropical smallholder dairy conditions cross bred perform better in terms of production.

The realised yield of crossbreds in tropical conditions is higher as compared to indigenous cattle. But there are three major challenges. a) Ensuring reliable breeding services, b) Providing optimum management conditions and practices and c) Finding out optimum breed composition.

With respect to reliable and better breeding services, in India, only 20 percent of cattle are covered by artificial insemination (AI) services and rest 80 percent get natural services from planned or unplanned mating with bulls of unknown genetics. Even switching from normal semen to sexed semen is a major economic challenge for smallholder farmers as the cost of sexed semen is 12 - 25 USD as against normal semen costing 0.3 USD. The sexed semen delivers more than 90 per cent calves of desired sex but conception rate is very low. At country level there is need to produce more cross bred F1 female heifers.

There is large productivity variation among smallholders and commercial dairies. The smallholders can’t get the yield levels of commercial dairies because of lack of proper management, feeding, and
health services. Livestock feeding is most important part and ration balancing coupled with other management practices can improve performance of dairy cattle.

For analysing the optimum or desired breed composition, there is need to work with smallholders rearing cross bred animals and generate data of high accuracy. Recent studies from Kenya shows that under similar feeding systems, mid-grade crossbred cows produced 100% more milk than high-grade cows.

For accelerating genetic gains there is need to utilize existing genetic resources but the gains have been very slow as in case of Africa and India. Potential opportunity exists to utilize existing DNA from historic bull semen and performance data. Use of ICT based on farm recording by smallholders and generating data for analysis and processing of information. Using and applying multiple ‘omics’ tools for herd improvement like in case of Brazil they have improved average lactation yield from 1400 litres in 1976, to 3400 litres in 2006.

There is great need to address the inefficiencies in conventional breeding practices by precision breeding techniques for better livestock production. Precision breeding can be used to stimulate immunity in new born exotic calves.

There are a number of technologies that can help improve productivity in a range of biophysical environments. These technologies can also be adapted to smallholder production systems but the successful adoption and adaptation of these technologies requires a system – a national genetics system to deal with all aspects of genetic improvement including breeding services, biotechnology, quantitative genetics and so on.
Manure—A valuable resource

Theun Vellinga
Senior Scientist
Wageningen University and Research Centre

Manure is often considered an environmental pollutant. We need to change this view. Manure is a resource and should be seen as such.

Integrated manure management includes everything from collection of manure to its application. It includes processing of manure and storage. The different drivers of manure problem are regional and global. These includes huge increase in livestock numbers, change in character (intensive use of limited land resources), change in scales: smallholders increasing in numbers, while in other sectors the development goes to large scale operations, getting footloose: this happens at small/medium and large scale farms, shifting to hard to manage liquid manure systems.

There are issues of dislocation of resources, deficiency and surplus of phosphorus in different regions of the world. Phosphorus deficiency leads to productivity issue for agriculture crops. The poor utilisation of manure is partly due to the use of synthetic fertilizers because these are easy to use, less voluminous and easily available in the market. There is a need to recycle nutrients in manure: especially phosphorus and nitrogen.

The nutrient cycle is not a closed cycle. There are inputs in form of animal feed and outputs in form of milk and meat. In normal nutrient cycling manure is used to supplement soil nutrients, but often manure is not returned to the soil as a fertilizer. This leads to disruption of normal nutrient recycling and leads to nutrient deficiency and low organic matter contents. Manure is otherwise a rich of carbon (organic matter), nitrogen, phosphorus and potassium to soil.

In considering the commercial value of manure, also biogas comes to mind. It is implemented widely, also in Asia. Unfortunately, the fertiliser value (nutrients and organic matter) to the soil are often ignored. The key issues with manure management is poor utilization. 40 – 60 percent farmers do not recycle dung and almost all urine flows away. Main barriers for (small) farmers: awareness, knowledge, labour and investment opportunities. Awareness of the value of manure is limited. This
also holds for local extension and policy makers. The policies are mainly driven by biogas, public health, pollution. Almost never by the fertilizer value. Coordination is often lacking and commercial credit suppliers are not interested in financing or giving credit for manure management projects.

The strategic framework paper has a section on manure. This section recommends undertaking strategic analysis, data collection, analysis of feedback systems etc. It is stated that there is already a lot of knowledge and that development of pilot/demonstration farms (incorporating appropriate levels of technology); and designing and implementing appropriate training courses on nutrient budgets and improved manure management practices should have priority.

For improving manure management practices there is need to stimulate investments in on farm hardware and in developing the enabling environment. Part of the enabling environment is the development of stimulating policies, taking a smallholder approach. Smallholders also need support in the form of tailor made solutions, training and credit. For large scale footloose operations, there is a need to develop feed and manure strategy plans for better management of manure as a resource.
Dr Dilip Kumar Rath
Managing Director
National Dairy Development Board

India is the largest milk producer in the world with total milk production of 137.7 million tons in 2013-14. It is estimated that demand for milk is likely to be about 155 million tons by 2016-17 and 200 million tons by 2021-22. To meet the growing demand of milk annual incremental milk production from 4 million tonnes per year in past 10 years to about 7.5 million tonnes in the next 10 years will be required. The national dairy plan (NDP 1) is a scientifically planned multi-state initiative to increase the productivity of milch animals and thereby increase milk production to meet the rapidly growing demand for milk.

Total outlay of NDP is 362 million USD with World Bank (IDA) credit of 255 million USD and rest is contribution by NDDB and end implementing agencies. It is being implemented by NDDB and other end implementing agencies (EIA). The objectives of NDP 1 is to increase the productivity of milch animals and thereby increasing milk production to meet the growing demand of milk by scientific breeding (producing good quality breeding bulls, high quality semen for AI) and feeding practices (balanced feeding, total mixed ration, mineral supplementation). The other objective is to provide rural milk producers access to organised milk processing sector by strengthening and expanding village milk procurement structure.

The different components of NDP are:

- Production of High Genetic Merit cattle and buffalo bulls. The project will produce 2500 bulls of high genetic merit and import 400 exotic bulls or equivalent embryos.
- Strengthening of “A” and “B” graded Semen Stations. By the end of project period the semen stations will produce 100 million doses of good quality semen from these semen stations.
- Pilot Model for Viable Doorstep AI delivery Services. By the last project year country will have 3000 mobile artificial insemination technicians. They will carry out 4 million doorstep AIs annually.
- Ration Balancing Programme will cover 2.7 million animals in 40,000 villages. The data for these activities will be collected by Information Network for Animal Productivity and Health (INAPH) which is an information collecting program developed by NDDB.
- Fodder Development Programme. Under this component they will produce 7,500 tons certified fodder seeds. They will also do 1350 silage making and fodder conservation demonstration.
- Component B is to strengthen and expand village based milk procurement system. 23,800 additional villages and 1.2 million additional milk producers will be reached by this program.

The different End Implementing Agencies are State Cooperative Dairy Federations, District Cooperative Milk Producers Unions, Producer Companies, State Livestock Development Boards, Registered Societies/Trusts (NGOs), ICAR Institutes/Veterinary Universities, and Central Cattle Breeding Organizations.
Activity wise status of sub projects as on February 2015 is shown in table below:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Nos. of approved SPPs</th>
<th>Total Outlay</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>in Rs. Crore</td>
</tr>
<tr>
<td>Animal Breeding</td>
<td>53</td>
<td>643</td>
</tr>
<tr>
<td>Progeny Testing Programme</td>
<td>13</td>
<td>238</td>
</tr>
<tr>
<td>Pedigree Selection Programme</td>
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<td>58</td>
</tr>
<tr>
<td>Strengthening of Senen Stations</td>
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<td>256</td>
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<tr>
<td>Import of Bulls/ Embryos/ Semen/ BPTIE</td>
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<td>54</td>
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<tr>
<td>Pilot AI Delivery Services</td>
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<tr>
<td>Fodder Development</td>
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<td>74</td>
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<tr>
<td>Village Based Milk Procurement System</td>
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<tr>
<td>Sub Total</td>
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<tr>
<td>Project Management &amp; Learning</td>
<td>18</td>
<td>25</td>
</tr>
<tr>
<td>Total</td>
<td>288</td>
<td>1548</td>
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</tbody>
</table>
Indian Vision - Asia Advantage: The Amul Perspective

R S Sodhi
Managing Director
Gujarat Cooperative Milk Marketing Federation Limited

India is the largest milk producing country in the world producing 140 million tonnes milk which is 17 per cent of global milk production. Along with producer India is the world’s largest consumer of milk and milk products. Growth in milk production in absolute terms is also highest in India.

Milk and dairy products have been part of Indian Culture and Tradition for centuries. Currently, milk is the largest agricultural commodity in value. The total value of milk is more than the value of rice and wheat put together. India also has the largest bovine population in the world. Out of total milk 55 per cent comes from buffalos and 45 percent is contributed by cattle. Growth in milk production is more than 4 per cent per annum for the last five years which is double than the world average.

The farmer’s share is 71 percent of total consumer price which is again highest in the world. India is self-sufficient in milk production but surrounded by milk deficit countries; which is a great opportunity. But India shares no advantage in terms of import duty from neighboring countries for trade of milk. All the neighboring countries in South Asia and East Asia should include dairy products in FTA to take advantage of India as reliable supplier.

AMUL is beyond a brand, a vehicle of economic and social transformation for farmers. The AMUL model is a three tier model. At the first tier are the Primary Village Cooperative Societies. These societies are mainly involved in milk collection and provision of veterinary and other livestock related services to farmers. At the second tier are the district unions and these unions are involved in balancing of milk (excess milk of one district union is shifted to other district union for processing), managing macro level inputs and fixing milk prices for village cooperative societies. At the third tier, the state federation plays a major role in marketing, negotiations for input purchase, centralised planning for quality control and efficient pooling of milk among different plants.

AMUL is a brand owned by more than 3.5 million farmers in Gujarat. There are 17 district unions covering more than 17,000 villages and producing approximately 13.2 million litre per day. In addition to price of milk AMUL provides farmers other facilities like cattle feed, veterinary and animal health services and social schemes.

Apart from milk prices at the end of year farmers are paid additional price difference, annual bonus and dividend on profits earned by AMUL.
District unions under AMUL umbrella have 56 dairy processing plants with total milk handling capacity of 24 million litres per day. In last 9 years the compounded annual growth rate in milk procurement was more than 10 percent. Major program implemented by AMUL for dairy development and promotion are, Cooperative Development Programme, Internal Consultancy Development, Fertility Improvement Programme, Strategic Productivity Enhancement Programme, Strengthening Veterinary Services Programme for developing milk unions of Saurashtra and Kutch milk shed areas and Entrepreneurship Development Programme.

More than 6.6 million transactions are made on daily basis for milk procurement. The quantum of transaction is reflected in the following figure:
BREAKOUT SESSIONS
Break out Session 1: County/Stakeholder Analysis

1. What is major dairy development initiative in your country?
2. What are the key lessons? What works and Why? What does not works and Why?
3. What are 3-5 most critical challenges you are facing in dairy development?
4. What do you need/get from the platform which would help you most to take dairy to next level in your country, which you can get in your country?
5. What you can offer/contribute to platform?

The participating countries presented a detailed response to the above issues as summarized in the table below

1. **India**

   - The major dairy development initiatives in India are National project on bovine breeding and dairy development (NPBBDD), Dairy enterprise development scheme (DEDS), National dairy plan (NDP), National livestock mission (NLM), and Rashtriya krishi vikas yojana (RKVY).
   - The main outcomes and learnings from these initiatives are increase in milk production of country, share of organised sector in dairy increased, the participation of women in dairying activities increased, the number of animals receiving genetic services increased. The overall impact of these initiatives on rural areas is more number of rural entrepreneurs are adopting the organised dairying.
   - The different challenges faced in implementing these initiatives were poor livestock extension services, lack of trained manpower for implanting them. The required infrastructure and institutional setup was very weak. Including all regions in dairy development was a big challenge.
   - The expectations from the Dairy Asia platform are technology and skilled manpower for biomass and manure management. Access to market and trade with the participating countries.
   - India can contribute to Dairy Asia platform the knowledge and vast experience in dairy development sector. Technical expertise in terms of human resources and technology are among other things that can be shared.

2. **Nepal**

   - The major dairy development initiatives and their impact in Nepal are Artificial insemination mission which is being implemented from last 4 years. They had a total budget of 1 million US dollars (USD). It increased the coverage of artificial insemination (AI) services from 5 % to 20 %. Forage mission is being implemented from last 2 years with a budget of 1 million USD. The coverage of forage services are doubled in the project period. From last one year they are importing sexed semen for AI. The cost of the project is 0.3 million USD and the conception rate in cattle is 50 %. Other projects are being implemented for motivating dairy farmers like subsidy on interest and insurance, and grant on commercialization of dairy farms.
They are facing different challenges in dairy development with issues like benchmarking the farm economics. To address the mechanization needs of evolving progressive dairy farmers. Developing an organized milk market and value addition of dairy products. They are also struggling to set benchmarks for milk quality standards and improving the quality of milk produced.

Nepal want help of Dairy Asia platform in issues like farm economics, collaboration for genetic improvement of livestock, increasing the productivity of buffalos, research and development activities on animal nutrition, and developing common milk quality standards and database.

Nepal as a country can offer their market for research, their human resources for database generation, to explore opportunities for feed and organic farming, and agriculture eco-tourism.

3. Bhutan

- Dairy development plan was the major initiative at country level. At farmer level they have taken a lot of initiatives like formation of farmer groups, milk collection centres and loan/subsidy facilities for purchase of dairy animals by department of livestock (DoL).
- The outcome of these interventions were increase in milk production of dairy animals, purchase of animals from India and development of vision and action plan in form of five year plan for the country.
- The different challenges they have to face are availability of quality animals/heifers in country, religious prohibition on slaughter of cattle, availability of feed and fodder in winter months. The major challenge is quality and sustainability of free livestock services in country.
- Bhutan is expecting contribution of Dairy Asia platform on aspects like getting good quality genetic material from other countries, exchange of best practices/experiences in the areas of animal production, packaging and processing of livestock products. Exposure visits for farmers and technical staff and coordination with member countries in developing approaches for trans-boundary or zoonotic diseases.
- Bhutan can offer genetic material to platform (yak and Siri breeds) and fodder germ plasm for temperate areas.

4. Thailand

- The National dairy board (Milk board) is implementing two major projects for dairy development in Thailand. Increase efficiency of dairy development project is a five year project with budget outlay of 40 million USD. The various stakeholders are government, livestock department, banks and cooperatives. The main objective of the project is to increase milk yield of a dairy farm 2-3 times with same number of manpower (labourers). Another program is School milk program with a budget of 450 million USD. The objective of the project is to provide nutrition to school kids by milk and milk products.
- The main factors for success of these initiatives were selection criteria of farmers and area for dairy projects, milk collection system installed in those areas, training and development
of human resources, guarantee of better milk price, incentives for milk production and presence of dairy cooperatives.

- They faced a variety of challenges in achieving these outcomes like shortage of human resources (labour), quality of milk was not very good, reduction of cost of milk production and transport. There were animal productivity issues because of poor farm management, heifer replacement rate and improper feeding practices.
- Thailand as a country expects from Dairy Asia platform the vast experience and knowledge they have in dairy development. Learnings from other countries, milk processing technology and variety of milk products development are other things that can help them in dairy development.
- Thailand would be happy to share with the platform their Regional dairy training centre (RDTC), Chiang Mai for providing learning experience to other countries. Apart from this they have adapted technology for tropical countries and South-South cooperation for sharing.

5. Myanmar

- The major initiatives for dairy development in Myanmar are formation of national dairy development board (NDDB), School milk program, formation of livestock development zones, installing processing equipment and developing foreign partnerships.
- The impact of these initiatives is not evident because these are in initial phases of implementation. In some areas these are successful and in other areas these are not working well, some have issues of government funding. The breed and fodder development programs are working well there. They have very limited availability of milk in their country which is because of poor infrastructure facilities available.
- The critical challenges in dairy development are land use policy and land prices in the country. The infrastructure, market potential is very poor and dairy product market is also not very reliable. The import policy of dairy products is also a major challenge.
- Myanmar expects knowledge and technology from Dairy Asia platform. They can contribute the country data and information for research in dairy development.

6. Afghanistan

- The major dairy development initiatives in country are integrated dairy schemes (IDS), traditional approaches of dairy production and Private sector intervention.
- The major outcomes of these initiatives are cooperative development, social impact on people, leveraging public resources for dairy development and more involvement of women. They failed in large scale replication of these initiatives because of scattered milk availability, no social aspects were considered and integrated approach was not followed while implementing.
- The biggest challenge in success of dairy development initiatives is absence of any institution like dairy board or dairy federation at country level. Other major challenges are lack of viable policies for dairy development, competition from imported dairy products which are much cheaper as compared to products made in country, lack of capacity at farmers and
government level. Security issues in country as a whole and women participation because of cultural issues are other challenges.

- Afghanistan wishes help of Dairy Asia platform in creation of dairy board/ federation in their country. They can share with platform the knowledge they have acquired for overcoming the challenges.

7. **Philippines**
   - The key initiatives in dairy development in Philippines are establishment of breeding farms by private sector, import of dairy animals by government, initiatives in pasture and forage development (grass legume combination, corn silage) for increasing productivity of livestock, upgrading local cattle and goats through cross breeding with a buy back fund and establishment of finance (credit) facility for dairy sector.
   - Key learning from these initiatives are developing cheap packaging of dairy products and producing good quality animal feed. They developed a buy back fund for purchasing cross bred animals (to prevent their slaughter), and engagement of private sector by providing them credit facility at reasonable rate.
   - The challenges they are facing with dairy development are to increase the number of dairy animals. There is a need to develop cost effective cold chain, which is a challenge here being an island country and animal nutrition.
   - Philippines expects support from Dairy Asia platform in raising awareness on dairy development in Asia for convincing policy makers of country to provide more attention and support to local dairy industry. The information on innovative technologies, best practices in industry and dairy supportive policies. Information on availability of dairy equipment and inputs.
   - They can contribute to platform their experiences of becoming foot and mouth disease (FMD) free without vaccination, cooperative organizations, advocacy and professional network.

8. **Vietnam**
   - Up to 2001 there was no dairy development initiatives in Vietnam. After 2001 they developed policy for dairy development and the sector grow remarkably after that.
   - The challenges are unique in their case as the milk consumption is very low there, because it is not involved their food habits. The competition in dairy sector is very less. The linkage between the producers and processors is very weak.
   - Vietnam expects to get international dairy experiences in dairy development, utilization of dairy by products, waste management and milk quality and safety standards.
   - They can contribute best practices and cooperation in technical institutions.

9. **Bangladesh**
   - Dairy development initiatives are very old in country beginning in 1900s in form of superior breeding bulls for natural service. In 1960, Central cattle breeding centre was established which was extended to every upzilla and union level. Dairy cooperative Milk Vita was
established in 1973 to boost up dairy production, processing and marketing. Private milk processing industry started flourishing after 1990.

- The outcome of these initiatives was increase milk production at country level. This leads to various changes like stimulation of milk market development, introduction of high yielding fodder varieties, intensive training to dairy farmers for improving livestock management (and feeding), and immunization of livestock.
- The challenges faced by country in achieving these outcomes were lack of good and suitable breeds of livestock, frequent occurrence of diseases and adulterated milk in milk channel and market.
- Their expectations from platform are getting information regarding genetic improvement of livestock, economic feeding for profitable livestock rearing and developing market value chain of dairy products.
- They can contribute their experience in dairy and will provide full support to the Dairy Asia platform.

10. **Sri Lanka**

- The biggest initiative in dairy development was identifying dairy as government priority area and setting up a mission to become self-sufficient in milk production by 2020. They have developed a master plan for next 5 years to develop dairy infrastructure and feed resources.
- The outcome of the initiatives are increase in milk production at country level, pasture development programs and incentives paid to milk producers. They have a political instability in their country with ethnic violence, there is no stable policy for dairy development and they are also not able to achieve economy of scale.
- The different challenges they are facing are high concentrate price, problem in milk marketing and improving the services to dairy producers, scarcity of funding and making dairy as an attractive and income generating occupation.
- Their expectations from Dairy Asia platform are getting training and education of their human resources, assessment of feed resources and feeding techniques, getting access to dairy technology, good practices in dairy industry and use of manure as resource.
- They can contribute Dairy Asia platform in all aspects of dairying.
Breakout Session 2: Cross country analysis

1. *What are three most critical/common challenges across countries?*
2. *What are most common demands/expectations on platform delivery?*

**Common challenges:**

The common challenges shared by all the countries are listed below:

- Feed and fodder availability, land availability for producing fodder
- Natural resource scarcity challenge
- Pro dairy policy at the country level and proper implementation mechanism
- Genetic improvement of livestock population
- Quality of milk produced and milk quality standards
- Disease control in livestock
- Availability and effectiveness of dairy extension services
- Supply chain management and cold chain management across value chain
- Increasing the number of dairy animals at country level
- Safety issues
- Human resource development through training and exposure.
- Marketing and pricing policy for dairy products.

**Expectations from platform:**

The participant vision for the dairy platform was to function like a multinational cooperative working for dairy development in member nations. Specific expectations of participating countries include:

- Getting technical assistance (TA) for developing dairy in different countries.
- Developing platform as a knowledge hub and access of information to member countries.
- Knowledge sharing and collaboration on different aspects of dairy development.
- Capacity building in member countries.
- Institutional support
- Developing regional strategy for dairy development.
- Facilitate exchange and trading of dairy inputs like genetic material, scientific equipment, dairy plants.
- Sharing of country level database on different aspects of dairy and analytic work done on the data.
- Building and improving trade relationships within member countries
- Sharing best practices in dairy with all members
- Helping members in advocacy for investment and partnership in dairy sector.
- Learning from global platform about dairy development.
- Developing and sharing common tools like least cost feed formulation.
Breakout Session 3: Priority areas for the platform

What are the 3 focal priority areas which the platform should address? Take into account the following criteria:

- Areas/thrusts where the regional level can add substantive value to the country.
- Areas/thrusts which address issues which the countries have great interest and energy in.
- Where the likelihood of success in 1-2 years is high.

The identified priority areas were categorised under 6 heads including: Genetic improvement, institutional development, policy and advocacy, productivity enhancement and technology, enhancing market access and sharing of database.

i. Genetic improvement
   - Sharing information related to breeding, feeding and dairy development.
   - Technical knowledge about genetic improvement and fodder development sharing.
   - Sharing information regarding regional gene bank.
   - Formulation of breeding policy.
   - Genetic improvement by developing appropriate breeding policy. Upgrading local breeds by selection, cross breeding, progeny testing and quality semen production.
   - Genetic improvement and increasing number of animals.

ii. Institutional development
    - Training of human resources and institutional development.
    - Training on common needs and pooling of resources.
    - Building institutions like farmer’s organizations, marketing institutions and cooperatives.

iii. Policy and advocacy
Developing and promoting dairy centred policy.
- Promotion of dairy as income generating activity
- Promoting milk marketing in backward or difficult terrains.
- Policy analysis of different countries.
- Policy advocacy.

iv. **Productivity enhancement and technology**
- Productivity enhancement initiatives in form of feed and fodder resource development and conservation.
- Ration balancing for optimizing productivity.
- Sharing the technologies of feed resource utilization,
- Documentation of local feed resources, animal husbandry practices and performance recording.

v. **Market access**
- Developing milk procurement systems
- Providing market access to milk producers.

vi. **Database**
- Developing livestock database on all parameters of dairying.
- Collecting grass-root information of different production parameters and centralize use for research.
Breakout Session 4: Identifying focus areas/thrusts for the program

1. What are underlying issues/challenges which this thrust should address?
2. If successful in thrust what should be achieved at country and regional level?
3. How should the thrust be achieved:
   - What needs to be done/delivered at regional level, which cannot be done at country level?
   - What needs to be done at country level to enable the regional level to platform?
4. Who else is working on this and should be collaborated (other actors, network, and platform)?
5. How should these operations be organised best?
   - Who should be doing what and who should be responsible and take lead?
   - How should countries engage?
   - How should the regional level operate for effective delivery?

Each breakout group discussed one specific topic. The participants self-selected themselves for the group given their own understanding and interest. The findings are discussed below:

**Group 1: Genetic Improvement**

This thrust area should address issues in genetic improvement including indigenous resources having poor milk productivity, and no indigenous dairy breeds in South and East Asian countries except India and Pakistan. Other issues are:

- Crossbreeding/upgrading of local cattle which should be the long term strategy.
- Breeding policy – what is appropriate (informed breeding policy e.g. adaptation/production etc.)
- Breed improvement program need to be developed – performance recording/data analysis/genetic evaluation/infrastructure/service delivery/human resources
- How to make use of new technologies e.g. Embryo transfer, genomics, sexed semen, synchronization etc.

If successful in genetic improvement the following things will be achieved at country & regional level:

- Productivity improved/less with more (sustainable production)
- Improved adapted breeds/resources
- Exchange human resources/systems/genetic material (e.g. Sahiwal, synthetics (e.g. Tropical Holstein Thailand)

This goal can be achieved by:

- Exchange best practices (e.g. Thailand inter see program, India’s indigenous
- Develop informed breeding policies
- HR development (all levels/technical to service providers – AI technicians/performance recording
- Policy approval by the respective government
- Memorandum Of Understandings (MOU) for regional collaboration
Other countries or regions working on genetic improvement are Brazil, Africa, Program (Recording/analysis/evaluation, & latest technologies e.g. Genomics (America, Europe, Australia) organizations FAO/ILRI/WB/ICIMOD.

The operations should be organized as:

- National body for livestock development policy prepared and approved by respective government
- Implementation by government or authorised agency
- Consultation for the above, with all stakeholders within the country/regional.
- Platform (formal arrangement e.g. administered by recognized body)

**Group 2: A Platform for Policy Dialogue and Advocacy**

The key issues/challenges are:

- Creating incentives for investment in the sector
  - “Enabling environment” for trade
  - Productivity increase
- Changing behaviors
  - Nutritional information
  - Farmer awareness
  - Food safety and quality
  - Regulatory framework
  - “rules of the game”

What should be the themes of the policy?

- Science and Technology
- Regulatory
  - Food safety
  - Environment
  - Trade and competitiveness
  - Support services, extension
- Investment priorities for the public expenditures
- “Crowding in” private investment

What should be achieved?

Currently there is a policy vacuum. The platform can help for Information-sharing and practices across countries – “lessons learned”

- Sharing tools for policy analysis
  - Harmonized data base for common analysis across countries
- Engaging the stakeholders in policy development
- The principles of how to develop policy
- Mechanisms for implementing policy, principally budget and partnerships
Data-driven analytics to inform policy formation
Consistency of policies with International Agreements

How to achieve this? And who’s working on policy and how to collaborate?

Inventory/ scoping on existing sources:
- IFCN – International Farm Comparison Network
- FAO: LEAP – Livestock Environment Analysis Partnership
- IDF – International Dairy Forum
- Existing country- and regional-level policy analysis (IFPRI, World Bank, other CGIAR, e.g., ILRI

**Group 3: Institutional Development**

1. **Underlying issues and challenges**
   Needs to have or strengthen an institution to address issues in the areas of

2. **What should be achieved?**
   o Assessment of institutional development level in each country to find out their existing capacities and their needs
   o At regional level, the platform can provide support and guidance on how the countries can address their needs

3. **How to achieve?**
   o Sharing of expertise and information
   o Pooling of experts
   o Learning from failure
   o Strengthening collaboration
   o Matching needs with resources that can be shared (HR, resources, materials)

4. **Who else?**
   o International development organizations: FAO, ILRI, Stockholm Environment Institute (SEI), Animal Production and Health Commission for Asia and the Pacific (APHCA)
International financial organizations: World Bank, Asian Development Bank (ADB)
National agencies: NDDB, Regional Dairy Training Centre (RDTC), Japan International Cooperation Agency (JICA)
NGOs: IFD, Bill & Melinda Gates Foundation, Cooperative for Assistance and Relief Everywhere (CARE)

5. Operationalization Scheme
- FAO to be a secretariat
- Agreeing countries sign a consensus agreement or other document (informal or formal)
- The countries should take their own responsibilities and initiatives
- The leading countries, like India and Thailand can take an important role to provide technical assistance to other countries in the region.
- Are member countries willing to share finances for the operationalization of this regional platform?

Group 4: Productivity Enhancement Initiatives

Issues/Challenges in productivity enhancement are:

- Known Genetic potential animals are far below than production,
  - Balance ration not in place
  - Internal parasites- heavy loads reduce the productivity.
- Infertility
  - Diseases
  - Nutrition
  - Not timely inseminated
- Short Productive life
  - Diseases
  - Nutrition

The achievements at different levels should be

- At Country level
  - Ration balance system
  - Inventory on local feed resources
  - Feed assessment
  - Unconventional and underutilized feed resources to be conserved
  - Mapping of parasites
  - Strategic interventions of parasitic control
  - Monitoring of AI services
- Regional level
  - Guidelines of ration balance
  - Guidelines of strategic parasitic control
  - Knowledge sharing
  - Software operated by farmers (Milk yield, least cost production)
  - Trained Artificial inseminator- training and exchange of resource persons
  - Soil nutrition and nutrient cycling- exchange best practices and organize trainings.
- Value addition of biomass
- Mechanism of certifying the seeds
- Database information sharing
- Inventory of feed resources and feeding system
- Productivity monitoring
- Feed safety
- Storage
- Post harvesting management
- Pest and rodent control
- Control of aflatoxin - training, knowledge sharing
- Facilitate feed standards and regulations
- Enhancing the strengthening of feed quality testing laboratories – accreditation
- Animal comfort
- Shelter management at low cost based
- Facilitate on the following issues
  - Availability of Vaccines like FMD
  - Production of Vaccines within country
  - Supply of Truthful Seed of fodder
  - Exchange of germ plasm with respect to fodder seed
  - Exchange of mineral mixtures
  - Calf feeding management

The operations should be organized as regional technology platform:

- One member from each country - should have strong technical and institutional building expertise and skills
- Under database, the directory of experts / agencies, organizations

**Group 5: Together we make sustainable food production possible.**

The key underlying issues / Challenges are:

- Milk Collection from Scattered Areas
- High Production Cost
- Feed Scarcity during Summer
- Poor Milk Quality – Low on Hygiene
- Price determination irregularities – e.g Pvt Sector

The achievements at Country / Regional level should be:

- Quality & Quantity of Milk in Organized Sector
- Employment Generation in Dairy Value Chain
- Pricing Regulatory Intervention & Quality Incentive
- Resource Arrangements useful in Scarcity
- Quality Finished Goods
- Quality Social Life
For achieving the goals initiatives should be taken to:

- Sensitizing the Advocacy with Authorities
- Programme / Policy Formulation
- Correct Implementation & Dissemination
- Monitoring & Evaluation
- Propagating on the Results by Motivating Farmers
- Sharing case studies / Good Manufacturing Practices (GMP) among the Hub Members and using Appropriate Technology (BMC’s) to retain Quality
- Introducing Media Campaign for enhanced consumption

Achievements at regional and national level and partnership should include:

- Willing agencies
- Departments
- Concerned Financial Institutions
- Self Help Groups (especially Women SHG’s)
- NGO’s
- Trade Bodies

Organizing Best

- These Operations to be organized in Best Manner:
- Countries with Set Examples under Market Access mentoring for other Hub Members
- Voluntary Involvement with Similar Interest
- Dairy Asia with Back End Support from Organization like FAO/WB to act as regional hub; which to share & guide on info on Market Access…
Breakout Session 5: Structure of Dairy Asia platform

The participants specifically discussed about the structure and functions of Dairy Asia platform. There was general agreement that it should act like a knowledge hub to promote dairy development with the following core functions:

- Facilitate exchange of knowledge and information across Asian countries on all aspects of dairy development.
- Support dairy institutional development.
- Support policy and strategy development for dairy development.
- Advocate and develop new investment partnership in dairy development.
- Facilitation and collaboration of research and development in dairy development.

Consulting groups for different activities should be formed. There should be exchange visits between countries for getting experience. It was not important to work for a longer time for developing a perfect structure and forget the main objectives. The structure should be dynamic and change as per the needs of hour, depending up on the performance.

Different groups suggested different structures involving an apex body or secretariat. The platform will have different expert committees or technical advisors working on different areas. At country level there will be one contact person or department which will be in touch with secretariat. Another group suggested a membership based participation, where countries can join after paying a membership fee.

The final structure of Dairy Asia platform will have following elements: steering committee/technical advisors, leaders of platform, expert committee or advisory groups, secretariat and country officers/networking platforms.

*Figure 1: Structure of Dairy Asia platform*
The thematic working groups (TWG) will be country representatives and external experts. They will be led by subject matter specialists. These groups will assess the problems/needs of different countries and decide the course of action to be taken.

The key functions of the Dairy Asia platform will be to:

- Develop the regional dairy development strategy.
- Provide guidance to thematic working groups and evaluation of their work.
- The platform will ensure that the countries meet periodically to discuss the outcomes and future work.
- The platform will listen to and observe national and international development agencies.

Funding for the activities of platform will be arranged by member countries, different donor agencies, corporates working in dairy sector and international aid agencies.

Key points Discussed:

- The structure should be kept flexible. And team should not spend too much time on structure instead focus on objectives.
- The country coordination group should not be mandatory.
- All stakeholders are not included and some are missing like researchers, external agencies, and private dairies. The steering committee will be like parent body whereas members and other stakeholders can form executive committee.
- There should be membership fee (even nominal) for the sake of buying ownership by members. They will show more concern after paying membership fee. Membership is voluntary but not free.
Break out Session 6: Country action plans for all participating countries

How do you want to take forward the actions emerging from here?

- How do you utilize and mainstream the regional framework in your country? (come up with your process and activities)
- How do you develop a representative forum/body/node to drive dairy development in your country and as the country arm of the regional platform? (who should be in-charge or contact person)
- How do you want to engage in five focal areas?

Please come up with indicative action plan for next nine months with responsibilities.

The representatives of participating countries came forth with the following responses for the country action plan.

**Thailand**

They will utilize regional framework for representing steering committee, facilitate dairy processing training at regional dairy training centre (RDTC) Chiang mai and support technical experts in pasture management, seed production and laboratory training.

The country arm of regional platform will have following departments as representatives Dept. of Livestock services (DLS), Dairy Farming Promotion Organization of Thailand (DPO), milk board, RDTC Chiang Mai. DPO will be the local contact point for the platform.

The indicative action plan is increase efficiency of dairy development projects and productivity enhancement. This will be achieved by:

- Restructuring the dairy farms which will include installing bulk milk coolers, increasing the herd size to up to 50 animals, feeding total mixed ration and mechanisation of dairy farming.
- Producing replacement heifers by formation of heifer rearing cooperatives and reducing the number of non-productive cows.
- Use of mobile bulk milk cooler for collecting milk from hilly areas.
- Dairy herd health management for improving productivity of cows.

**Philippines**

They are planning to establish dairy Philippines platform by November 2015. Local representatives and contact points will be dairy confederation and national dairy authority. The different activities local arm will undertake are:

- Dissemination of information.
- Conduct a regional/provincial consultative forum by May June of this year.
- Convene national stakeholder forum in September.
- Assessment and evaluation of existing practices/policies/systems/requirements for improvement by October and November.
Myanmar

They will utilize the regional platform for getting knowledge, information and technology. The Myanmar dairy development board (MNDDB) and executive committee will be the local contact point. Secretory LBVD will be the local contact person for the regional platform. There will be advisory groups and working groups for dairy development. Different departments engaged in different activities will be:

- Genetic improvement – LBVD, MLFRD
- Institutional development – LBVD, MLFRD, UVS
- Policy and advocacy – LBVD, MDA
- Productivity enhancement – LBVD, MDA, UVS
- Market access – MDA, MLFRD

Nepal

They will utilize the framework for data collection, knowledge sharing, policy making, selecting animals for semen collection and organising promotional campaigns. The National dairy development board will be the contact point. The structure will consist of one national head, 5 regional directors, 14 zonal officers, 15 district coordinators and 1400 village development committees.

In different areas their focus activities will be:

- Genetic improvement – develop a breeding plan and import of sexed semen.
- Institutional development – establishment of country office. The national dairy development board will lead the country secretariat.
- Policy and advocacy – review of dairy development policy and launching of incentive schemes.
- Market access – identify market players, coordinate with private and public sector companies and integrating primary cooperative societies.

Bhutan

They will utilize the platform in revising livestock policy and dairy development plan of Bhutan and make changes where required. They will also include relevant activities in annual budget of department of livestock. The national dairy development centre (NDDC) will be focal centre in country for contacting and activities related to dairy development. Program director, NDDC will be the lead contact person in Bhutan. They will be engaged in focal areas as:

- Breed development – access to different germ plasm for country like cattle, buffalo and goats. They will provide indigenous germ plasm of yak and Siri cattle.
- Institutional development – exchange visits of experts, access to research and development facilities, access to dairy processing and technologies, and access to good manufacturing practices.

**Vietnam**

They will utilize the regional framework in mainstreaming the framework to annual plan and then to 5 year plan for dairy development. They will develop a task force and national dairy board which will act as local contact point. Their priority areas will be:

- Institutional development
- Policy and advocacy
- Productivity enhancement
- Market access
- Genetic improvement

**Sri Lanka**

The Director General (Animal production and Health) will be local arm of platform in Sri Lanka. They will form 5 advisory/ working group for each focus area within department and provincial administrative services. External institutions like private and public sector will also work with them. Their work will be monitored and reviewed by Dairy monitoring committee at regular intervals.

**Bangladesh**

There is a national livestock policy, and the country can utilize platform to make necessary changes and updates to it. They will develop local arm by developing a forum consisting of different stakeholders associated with dairy development. They will be engaged in the following activities:

- Appointing focal point to collect information regarding breeding, feeding and diseases from neighbouring countries.
- They will introduce hybrid fodder with better productivity in the country.
- Expand the coverage of AI services all over the country.
ANNEX 1: COUNTRY/STAKEHOLDER STATEMENTS ON THE DAIRY ASIA STRATEGIC FRAMEWORK PAPER
Afghanistan is largely a rural society with a subsistence agriculture based economy. The rural population urgently needs to improve food security by diversifying and developing its economic base and developing new sources of household income. While the country recently has registered a healthy growth, the base of its growth remains rather narrow and the growth in rural economy remains below potential. Accordingly, the Government of Islamic Republic of Afghanistan has instigated a number of national initiatives under the Livelihood and Social Protection Public Investment Program which is showing good results.

Making more rapid and sustainable impact on poverty and nutritional status of course requires investment in sector with higher participation of poor and those that can withstand shocks and reduce vulnerabilities. In this context, we believe smallholder dairy offers a unique entry point for accelerated poverty reduction, enhanced nutritional and food security status, off farm job creation and livelihood support for rural poor.

There is a very strong demand for milk and dairy products in Afghanistan but dairying is still at an early stage of development. Farmers typically maintain one to four local breed animals producing six to twelve litres of milk a day. The family needs are normally met first and surplus milk is domestically processed and locally traded or sold to the milk collection centres or cooperative societies where they exist. Thus, milk is mainly produced by small scale producers, who are widely scattered in villages. There is some semi intensive production of milk in and around the major urban markets like Kabul and Mazar.

Over the last nine years, FAO and MAIL have demonstrated a number of successful and robust interventions in villages through Integrated Dairy Development approach. These projects have followed a development approach under which the farmers are encouraged to establish a network of community based milk producer cooperatives societies and dairy unions. This has helped improve rural food security, job creation, income generation and empowerment of women. But, in the process, we have realised that there is insufficient expertise in integrated dairy industry development in Afghanistan.

In addition, the country needs to invest in putting in place an organizational and institutional structure for sustainable dairy development. In thinking through this process and putting in place a
long term dairy vision, we found that elements outlined in strategic framework paper can help in structuring out thinking and streamlining the dairy industry development and approach. We are currently considering establishment of a national dairy development board and dairy industry association and the experience of other countries such as India and Thailand can be extremely useful guide. We therefore fully support the strategic framework and the establishment of Dairy Asia platform and look forward to better mainstreaming the dairy sector in cooperation with other countries in the region.

Tashakor
Asia is the home of two-thirds of the world’s poor and under nourished people and of to some countries under nourished children is 40% of the total child population. Milk is an excellent source of maximum nutrients. Daily a glass of milk for Asian children can significantly boost their nutritional level.

Bangladesh one of the most densely populated countries of the world with an economy based on agriculture where livestock plays a vital role to provide animal protein. Our vision is to supply quality animal protein for all the inhabitants of our country.

The milk production efficiency and productivity are increasing rapidly day by day due to improvement of genetic techniques, extensions of Artificial insemination and relatively good management practices in our country. We have about 10 million dairy cows including 3.2 million cross-bred produce 6.09 million tons of milk. Per capita availability of milk is 108.66 ml of milk per day against the requirement of 250 ml of milk per day.

Dairy farming in Bangladesh is affected by several constraints such as; scarcity of feeds and fodder, poor quality of feeds, frequent occurrences of diseases, lack of appropriate breed, lack of credit support, Absence of insurance coverage, Absence active regularity bodies, inadequate value chain efficiency, Disaster and natural calamities.

To mitigate the situation and achieve the goals the following policies are adapted:

- Cooperative Dairy development model like Milk Vita are being expanded in the potential areas of the country
- Small holder integrated dairy farming is being introduced.
- To boost up the nutritional level of under nourished children the school Milk Program has been introduced.
- High yielding and nutritious fodder and technologies of fruitful utilizing of crop residues are being introduced in farmer level.
- Sustainable upgrading policy has been adapted and implemented by the Livestock Department.
- Trying to boost up our veterinary facilities.
- Intensive research for developing breeds, disease control and feeds and feeding are going on.

Expectation from Dairy Asia Platform

- Appropriate policy intervention, Institutional support could be helpful for increasing hygienic production, processing, marketing and creating habits of milk consumption with collaboration of Dairy Asia Forum.
• We can enrich our knowledge regarding Genetic improvement, economical feeding and Dairy management technologies with the help of Dairy Asia Forum.
• We may be benefitted linking with Dairy Asia Forum for sustainable dairy development, quality issue, including value chain and public health concerned.
• A uniform national data base system may be developed for dairy cattle in Bangladesh with sharing knowledge with Dairy Asia Forum.

We firmly believe an action plan will be formulated from Dairy Asia Meeting to go ahead unitedly to increase productivity, profitability, safety, and quality of food chain in dairy sector, maintaining well fare of farm animals and environmental sustainability.
The farming systems in Bhutan are essentially mixed (crop-livestock) with a high dependence on the natural resources. Grazing in the forests is a common feature. Over 60% of the population are smallholder farmers living in the rural areas, and over 90% of them own cattle. Gradually peri-urban livestock farming is also emerging in addition to the rural livestock farming.

With increasing human population coupled with economic growth, the demand for milk and dairy products has increased over the years. While domestic milk production has increased by over 6% per annum, the annual production meets only 62% of the domestic demand. As a result, milk and milk products worth Nu. 870 million were imported in 2012 with milk powder being the highest.

The increasing demand for milk has also changed cattle farming practices, such as a gradual shift from transhumance and extensive farming to semi-commercial and commercial farming practices. There are however, many challenges (feed and fodder, management and health services etc) to such farming practices. To support these farmers, field institutions such as farmers groups, associations and cooperatives have been formed, but require strengthening. Currently there are 135 functional dairy farmer groups and associations spread all over the country, spearheading the reform of the dairy value chain. There are supported by 205 livestock extension offices and 20 district veterinary hospitals, coupled with other Regional Livestock Development Centres and National Dairy Programmes. But more needs to be done, as the average milk consumption in 2012 was 178g/person/day which is considered to be low by regional and international standards.

We are happy to endorse our support to the Regional Strategic Framework paper as it has many special attributes for sustainable dairy farming. Besides, this framework is also consistent with the current draft livestock sector policy of Bhutan. We also noted that the Regional Strategy Framework looks at partnerships and has a focus on productivity and profitability, animal nutrition, systematic genetic improvement rather than ad hoc crossbreeding, support to farmer institution and on minimizing the environmental footprint if the dairy sector.

To conclude we endorse the idea of capitalizing on the potential by forming bilateral and multilateral partnerships. Bhutan has already very good collaborations with India (e.g NDDB, AMUL (Anand)) and Thailand (e.g Department of Livestock Development, Dairy Farm Promotional Organization of Thailand). These partnerships are based on the principle of mutual respect, trust and resource sharing. We believe that these are the fundamental ingredients of any successful partnership and we hope we can make the Dairy Asia Platform a reality while ensuring these fundamental principles.

Thank You & Tashi Dalek
I am very grateful to be invited to the event and look forward to engage with you all over the next few days.

The Dairy Asia strategy recognises the fact that to move to a sustainable path the key pillars economic, ecological and social must be addressed as a partial solution will not produce the desired results. The strategic objectives identified including:

1. Increasing farm profitability
2. Promoting fair and efficient markets
3. Improving dairy food quality and safety
4. Enhance education
5. Strengthen stakeholder capacity
6. Minimize environmental footprint

resonate very strongly with us as regardless of where we operate in the world; our approach is underpinned by a similar set of pillars: dairy excellence, nutrition for all and responsible dairying.

These pillars are addressed within an integral model – from grass to glass – where security and food safety is built into the supply chain from start to end. We recognises however that there is not a single solution that can be adapted to every market but what is clear that in every the focus on farm profitability is critical. Farm profitability is the key driver of the dairy system and as we drive profitability for farmers we can unlock the potential for addressing the sustainability challenge.

Our strategy is based on growing the volumes of milk that we sell and adding value to that milk so we generate a sustainable return. The principle is the same everywhere – a sustainable return for our shareholders and for every farmer we do business with.

As highlighted in the Dairy Asia strategy we are taking a pragmatic view to engaging and adapting farming systems that work in specific environments given there is no single simple approach to dairy farming – A global co-op taking a local approach. What works in New Zealand is not the best approach for China or Sri Lanka or Indonesia. So we listen and adjust, collaborating with local farmers and industry in the way which suits them best, rather than imposing one rigid model.

Our dairy development partners with local communities to develop sustainable dairying industries. We are looking share our dairy expertise with farmers, Governments and communities to improve the productivity, income and sustainability of local dairy industries and to contribute to food security, safety and nutrition.
This is our take on dairy development – it makes sense commercially, it makes sense for the communities we work in and it makes sense for the world where demand for nutrition is only going to grow.

As a group Fonterra is only just embarking on Dairy Development journey however so don’t profess to be expert in tropical / smaller scale farming as of yet.

Recognizing the challenges ahead for all of us all, Fonterra is very much a willing participant and looking to engage in constructive dialogue and look to support through its dairy expertise – capital is harder for us given that we are a farmer owned cooperative.

I am very much looking forward to the next few days and future engagements.
Namaste, Good morning,

India is one of the largest and fastest growing economies of the world competing with some of the most developed economies to become second largest economy if not the number one. Unlike western world our livestock sector is very unique. More specifically dairying in particular is an integral part of rural India and it is a system of production by masses but not the mass production. 80 per cent of milk producers are small with an average herd size ranging between 1-3 animals and production average with less than 4 kg milk per day mainly utilizing crop residue as a part of crop livestock farming system.

The livestock sector has been instrumental in promoting economic changes and for improving the quality of human life, including that to the nutrition. The farm-gate value of milk at current prices was about 35,000 billion rupee i.e. approximately 67 billion USD which is more than that of total value output from wheat and rice put together across the country.

With the success of operation flood program, spearheaded by NDDB, India has emerged as the largest milk producer of the world from 22 million MT in 1970 to almost around 140 million MT currently. This translates to a steady growth rate of 4.4 percent which is almost double than the world growth. As a result the per capita availability of milk has risen from 111 g in 1970 to almost 302 g in 2013-14.

India has around 39 breeds of indigenous cattle and 13 breeds of buffalos with various specific characters with reference to adaption and disease resistance. The biggest challenge has been increasing productivity of each breed through scientific feed, breeding and management practices. India being a tropical country the milk collection, storage and processing is also a challenge like in many Asian countries.

Even though our growth in milk production about 5 million tonnes per annum is quite respectable, unlike major developed countries, milk production in India provides employment generation opportunities, asset creation, coping mechanism against crop failure, the social and financial security to the farmers and women empowerment. More than 75 percent of farm women are engaged in one or other way with reference to livestock or dairy production.

Along with increase in milk production the demand for milk and milk products is also rapidly increasing with a resultant challenge of enhancing productivity and sustaining production. To address this a careful thought which is scientific, sustainable and locally relevant approach; to breeding, feeding and animal health is necessary.

In this regard breeding programs are important and should lead to producing animals with higher feed conversion efficiency, I emphasize feed conversion efficiency as well as promoting and
conserving indigenous breeds. In these lines some selected organizations are carrying out progeny testing (PT), pedigree selection (PS) programs to produce indigenous bulls across the country. More specifically the breeds of Rathi, Sahiwal, Gir, Kankrej, Tharparkar and Haryana as far as cattle is concerned. And for buffalos Mehsana, Murrah, Jaffarabadi and Pandharpuri. These can compete well if not better than cross bred animals under harsh and arid conditions of Asia.

Balancing the ration out of available feed resources and area specific mineral mixture supplementation can considerably increase the net dairy income with increased milk fat and reduction in cost of production. This also can reduce the chances of metabolic diseases like milk fever, ketosis and mastitis etc. that affect the milk output, malnutrition and reduce the methane emission which is the key concern to all of us.

The National Dairy Plan (NDP) phase 1 of NDDB, with total outlay of around 360 million USD. And it is focused on increasing the productivity through improved breeding, providing ration balancing advisory for a better feed conversion efficiency and health programs.

We expect that India’s concern and priorities are reflected in the vision statement and strategic objective articulated in the framework paper of Dairy Asia. We do hope that Dairy Asia could facilitate mutual sharing of experiences and lessons learnt among the participating countries including India to mutual advantage and creating synergies among the nations of region to greater value additions.

Thank you.
I represent the government of the republic of the union of Myanmar, the second largest country in Southeast Asia with population of more than 50 million. Throughout Myanmar, farm households raise and depend on farm animals including cattle, buffalo, goat, sheep, chicken, and ducks. Women play an important role in animal production in Myanmar and that contributes to the direct contribution of livestock of food security and nutrition. There are also some commercial and semi-commercial farms but mostly the sector is dominated by small family farms. Husbandry practices on these farms are low input and fairly basic. Herd performance is therefore poor with average milk yields between 1 and 2 liters per day with average lactation period of around 7 months.

A large portion of milk in Myanmar is used by private sweetened condensed Milk factories. The sweet condensed milk is mostly used on tea shops. Remaining milk goes to the local market or converted into products such as local cheese, sweet milk balls and yogurt and sold through various channels. We estimate that there are about 440 small and medium scale sweetened condensed milk enterprises in Myanmar.

There is limited organized marketing of milk and milk products in Myanmar. Dairy Farmers usually sell milk to small scale local dairy processors or directly to the restaurants, hotels and roadside liquid milk markets. Only a few local processors practice milk quality testing and incentive payment schemes but the coverage of these schemes is limited.

Rising incomes and growing consumer awareness on nutrition and food safety offers significant opportunities for dairy sector but local producers face significant competition from imported products. A wide range of dairy products are imported in Myanmar including milk, condensed milk, evaporated milk, butter, yoghurt, cheese, etc.

Myanmar government is committed to the development of dairy sector in an equitable and sustainable manner. For us food security, equity and local industry development is extremely important. The dairy sector is still like an infant in Myanmar and it need huge public investment assistance in service and market support, farm advisory services as well as public policy to promote a fair playing field. Myanmar has several small and medium dairy association. The government and Myanmar Dairy Association work together for dairy development in Myanmar.

We recognize that the government needs to give special attention to understanding the problems of smallholder producers and processors and to assist them. In view of that background we welcome the strategic framework and would take this onto account in developing our dairy development policies and programs. We appreciate the inclusion of ration balancing and fodder development, dairy field schools, the school milk program and improvement of dairy food quality and safety in the strategic framework.
Myanmar is currently formulating food safety standards so this element of the framework is consistent with what Myanmar is already doing, so we are happy to endorse the framework paper and we will be happy to work together with other countries in the region in developing the dairy sector in a suitable manner.
Namaskar!

I am pleased to represent Nepal—the “Roof of the world”, a country with ancient culture and the mighty Himalayas as a backdrop—at this very important meeting. Nepal is primarily an agriculture oriented country, contributing 34 percent in its gross domestic production in which the livestock sector contributes about 13 percent with more than 75 percent of the population depending on agriculture for their livelihoods and almost 65 percent for their employment. Although Nepal faces many constraints, there are many opportunities to help ensure an adequate food supply for all Nepalese. The government of Nepal has made food security a national priority and has been quoted in the interim constitution as the most basic right of the Nepalese people.

Nepal has long tradition of dairy farming including several technical assistance projects implemented by FAO. Over the last three decades or so, milk production in Nepal has grown by about 2.5 percentage per annum and recent years have seen some acceleration in this growth rate. Dairy sector is supposed to be the most important commodity after rice in the country, it gives almost 30 million cash flow urban to rural areas and directly production of about 1.7 million metric tons. Average productivity however continues to be low due to poor genetics, shortage of quality feed and fodder and poor health status of dairy animals.

To promote organized dairy development, the government of Nepal established a dairy development commission in 1955 which was later repositioned as the dairy development corporation (DDC) in 1969. The main objectives of the DDC are to provide assured remunerative market access for rural milk producers and to supplying consumers with safe and quality milk. DDC manages over 1800 milk producers’ cooperative societies, 38 district milk producers’ union and 45 chilling centres across the country. Private dairies have also played a pivotal role and are major market players, contributing around 38 percent in competition to DDC, which contributes 34% of marketing of dairy products.

Department of livestock services (DLS) has been adopting several technological and extension services through its networks in all seventy five districts and with 999 village based service centres. The national dairy development board of Nepal is the national body responsible for formulating policies and plans for development of the dairy sector. The minister of agricultural development serves as chairman of 14 member’s executive committee that includes six nominees of the government of Nepal. An executive director appointed by the government is the chief executive.

Like many other countries in the region, the Nepalese dairy sector is facing numerous challenges due to rising feed costs, poor support services and high and rising opportunity costs of land and labour.
In these challenging time, we are pleased to see multiple stakeholders coming together under one umbrella and discussing the way forward for Asia’s dairy sector.

We have examined the strategic framework paper prepared under the dairy Asia umbrella and believe it can help us in our future thinking and program planning activities. As the paper rightly notes that a single regional dairy strategy cannot capture the diversity that exists in dairy production system and policy priorities across countries in the region. So the paper tries to articulate some of the elements which may be considered as a common framework and provide strategic guidelines to national governments and other stakeholders to help them develop/adjust their own strategies and programmes in the light of specific national priorities.

We appreciate the approach which recognizes legitimate differences and diversity and yet capitalize on our common strengths. We have no hesitation in endorsing the framework elements and in assuring you that we in Nepal would do our best to develop our strategies and programs in line with the strategic vision and objectives outlined in the paper. We remain committed to smallholder development, improving the nutrition of children and ensuring that in managing our natural resources in a manner that it does not compromise sustainability of production system. We also pledge to work together with other countries in promoting good practices in pursuit of sustainable dairy development in Nepal.

Dhanyawad. Jay pashu dhan
Good morning or in the words of my country, Magáandang umaga!

The Philippines is the second largest archipelago in the world comprising More than 7,000 islands. It is blessed with rich natural resources and extraordinary diversity. In terms of geography, ecology, natural endowments, ethnicity, and culture. But our location in the Pacific Ring of Fire also renders us prone to earthquakes and typhoons.

Our country imports huge amounts of milk and milk products and of the total consumption of about 1.9 million tons of milk and milk products in 2014, only about 20 tons was produced in the country. With a growing population of 100 million and the economy registering a reasonably strong growth, the Philippines represents a large and rapidly expanding market for milk and milk products.

We are well aware of the benefits dairy development can bring both in terms of improved nutrition and improved farmer livelihood and food security. It was this realization that led the Philippine government to create the National Dairy Authority of Philippines in 1995 with the mandate to provide support to dairy farmers, improve children’s nutrition, and facilitate provision of good quality dairy products for the consumers.

To achieve these objectives, the NDA has initiated several programs including measures to accelerate dairy herd build-up, enhance the dairy business through delivery of technical services, and increase coverage of milk feeding programs to promote milk consumption. We also helped establish dairy federations and cooperatives in the country, members of which are dairy farmers, processors, and other individuals whose livelihood are directly related to the local dairy industry. Concerted efforts by the NDA and other institutions have begun to produce some results both in terms of increased productivity and production but considering the gap between demand and domestic production, substantial investments are needed in the Philippines towards herd build-up, enterprise support, and market development.

Among other dairy-related institutions, the Philippine’s carabao Centre (PCC) was set up in 1992 by the government to promote crossbreeding and transform the carabao, into potential producer of milk and meat. In terms of the structure of dairy production, rural cooperatives associations, and other farmer groups, have been at the forefront of the dairy production. The Dairy Confederation of the Philippines is the main umbrella organization of dairy cooperatives and processors.

We appreciate and support the vision statement and the strategic objectives outlined in the strategic framework paper. The six strategic objectives together offer a balanced way forward and we particularly appreciate the attention given on improved dairy animal nutrition, with specific focus on locally available resources and advising the farmers on balanced feeding and improved husbandry.
practices. We also recognize the strategies done on balanced feeding in Thailand and India and believe we can benefit from these models. Another area that is of particular interest to us is the impact of trade policies on domestic producers and how domestic policies can balance the interests of producers and consumers.

With that background we are happy to endorse the elements articulated in the framework paper and are willing to set up a network of professionals in the Philippines and link them to other countries under the Dairy Asia umbrella. And with this strong network of Asian regional support, there is no room for doubt that the dairy industry in my country as well as in other neighbouring Asian countries will emerge as another force and another reliable source of nutritious food in the coming century.

Once again, good morning and May the force and strength to produce be with us all.
Dairy development has been identified as a priority area in Sri Lanka. Due to large revenue from milk and correction in milk prices received over past few years. The country is also dealing with the gap in demand and supply of milk and milk products. The country has vision of becoming self-sufficient in milk in year 2020.

Over the years we have gained genetic improvements in our national herd. And our main concerns today are high cost of feed and forage insufficiency. For scientific feed strategies to get maximum genetic potential that we have arrived during last several decades. Now Sri Lanka has been carrying subsistence liberal economy, but slowly transforming to a commercial level now.

75 percent of milk collected daily is from very small farmers with a production of two to twenty litres per day. We have a program to upgrade small producers to 100 litres per day. In Sri Lanka, we are facing issues with animal welfare, environmental problems and public health issues which are on the rise mostly from last decade. The country has developed conducive policies for dairy sector and the government has put it on high priority for promoting investment from all investors.

Sri Lanka looks forward to participate enthusiastically in Dairy Asia.
It is my honor to give a statement on the dairy strategic framework of Thailand at this Regional Meeting on Sustainable Dairy Development in Asia – From Concept to Action today at NDDB Anand, Gujarat. Many thanks to the Government of India, NDDB and FAO in organizing this important meeting.

Thailand, over the past few decades, has encouraged consumption of milk and milk products for nutrition and health enhancement and invested in dairy development under the Royal Patronage of His Majesty the King. The assistance from the government included technical and financial support for small farmers.

In 1971, the Dairy Farming Promotion Organization of Thailand was established and played an important role in organizing dairy cooperatives and introducing the farmers with new technologies and the dairy industry. As a result the annual production doubled every five years since the mid 1970s. The per cow yield also increased from about 1,000 kilogram in 1961 to about 3,000 kilogram in 2001 and today over 4,000 kilogram. From 1970s onwards production has grown faster than import growth and as a result the share of imports in consumption has come down from more than 95 percent in 1970s to less than 50 percent in 2012. This has happened despite growing consumption of milk and milk products. There are now 20 thousand dairy farmers raising over 250,000 dairy cows.

The Royal Thai Government by the Department of Livestock Development, Department of Cooperative Promotion, the Dairy Farming Promotion Organization of Thailand and other stakeholders continue supporting smallholder dairy sector in order to increase efficiency of dairy farms and strengthen the capacity of dairy cooperatives in Thailand.

The dairy development instruments in Thailand included dairy breed development, promotion of dairy farming as an alternative to crop farming, support services to dairy farmers, promotion of dairy cooperatives alongside private dairy processors, and development policy to enhance the competitiveness domestic dairy sector from international competition.

On the other hand, in spite of rapid income growth in the economy malnutrition was widespread especially among children even though a school lunch programme was in place in Thailand. About that time, FAO drew the attention of policy makers through its school milk advocacy programme about the virtue of school milk to address malnutrition among school children. Against this background, the Government of Thailand launched a school milk programme in 1992 with full government funding alongside an ongoing school lunch programme, to provide dairy producers an outlet for a share of their milk output and to reduce malnutrition among school children. Nowadays, almost 450 million US dollar of government funding support to the school milk programme in Thailand.
Since then, the dairy sector has experienced rapid growth in terms of number of dairy farmers, dairy cattle population, yield and output, number of dairy cooperatives and processing capacity, and a stable dairy income growth. Today, Thailand is the largest dairy producer and exporter in Southeast Asia.

Following the Chiang Mai Declaration on a regional dairy strategy and investment plan for smallholder dairy development, the Government of Thailand in collaboration with FAO, CFC and APHCA implemented the regional smallholder dairy development programme in order to enhance more efficient, productive, profitable, and responsible dairy chain in the country and region. A two-year training programme for the small-scale dairy sector was implemented and supported by FAO. The project provided support for development of short training courses for dairy farmers and milk-processors in South and Southeast Asia.

In addition, a Regional Dairy Training Centre in Chiang Mai Province in northern Thailand was established to provide hands on training on milk collection techniques, quality testing, processing, marketing and quality control. The training centre has been very active in meeting the training needs not just within Thailand but also that of neighbouring countries. We would be pleased if the dairy training centre in Chiang Mai can make its contribution to dairy sector in this region.

Although Thai dairy sector has made steady progress, it still faces many challenges and we realize that it is important to support the dairy sector by increasing production efficiency at the farm and cooperative levels and by encouraging R&D for new milk products. In particular, it is necessary to further strengthen the cooperatives. Dairy cooperative managers need to be trained on how to keep farm records and develop business plans to maximize returns and reduce risks.

Recently, in the early of this year, the Government of Thailand endorsed and approved the new dairy and buffalo development projects which aim to increase efficiency of dairy production chain and increase a number of dairy cows and buffaloes in Thailand. A total budget of about 180 million US dollar has been allocated. Initially, 3 selected dairy cooperatives will participate in this project. Since then, the project will expand to other dairy cooperatives throughout the country.

Under this intervention of new dairy strategic framework, the five strategic packages of new dairy development project include:

- Improving and restructuring dairy farms,
- Producing better replacement heifers,
- Establishing TMR Feed Center at cooperatives,
- Improving milk quality and reducing logistics cost of milk transportation, and
- Connecting farmers, cooperatives and government agencies through Dairy Herd Health Unit.

Finally, we realize that despite our progress we have a lot of work ahead and the nature of production and market environment is now changing with ASEAN and new free trade agreements, growing concerns about health, environment, food safety and food security, etcetera (etc). We feel the strategy prepared is quite comprehensive and can help in our thinking about the future plans and strategies. We therefore endorse the vision, the strategic objectives and other elements outlined in the framework paper. We also eagerly support the idea of establishing a Dairy Asia platform that can allow various stakeholders to continue the dialogue and learn from each other’s experiences.
WE, Thailand, will join hands and move forward with friends and colleagues in the region and other international development agencies to build better sustainable dairy development in Asia. WE together will also bring all the concepts to actions in the field for better livelihoods of dairy farmers in the region.

Thank you very much.
Dairy sector in Vietnam has seen a historic development over 50 years, but it really has been developed since 2001 after the issue of Decision 167/2001/QD-TTg of Prime Minister on some policies and measures for dairy production for the period 2001-2010. Dairy production has increased remarkably for more than 10 years in Vietnam. Dairy population increased over 5 times from 41 thousand heads in 2001 up to 227.62 thousand heads in 2014 and it is planned to reach 500 thousand heads by 2020. Milk production increased from 64.7 thousand tonnes in 2001 to around 550 thousand tonnes in 2014, —a growth rate of 17.9 percent per year, the highest growth rate in the entire Asia Pacific region. Despite the strong growth in production, however, the domestic supply of dairy products continues to fall significantly short of consumption. Currently, Vietnam meets about 28 percent of the demand for domestic production and Vietnamese government aim at raising the level of that level to about 38 percent by 2020. The per capita consumption of liquid milk increased from about 7 kg in 2004 to 28 kg in 2014. Viet Nam has also implemented a school milk program to further promote the consumption of dairy products as a means to improve children’s health in 2010. Milk quality in Vietnam has improved quite considerably in the last few years although few smaller companies still buy and sell untested milk.

Vietnam dairy sector is also scaling up. Overall, there has been shift from small-scale farming to medium and large scale farms. But the majority of dairy farms in Vietnam are small with less fewer 20 cows. The establishment of processing factories and networks of collection points has enabled dairy farms better access to markets and better prices. Vietnam has also established cooperative dairy farms with less than 1.000 cows. The cooperatives generally focused on smallholder farmers. At present, more than 80 per cent of dairy farms have a waste treatment system to reduce the environmental footprint of the sector. The outlook for dairy farming in Viet Nam is positive.

We expect that the dairy sector will continue strong growth in the next decade. The higher income, increased industrialization and lifted urbanization come along with the higher demand of dairy products consumption. It is expected that milk production in Vietnam will grow by about 10 percent per annum over the next five years or so. The government is encouraging national and international companies to invest in dairy farming and processing and to make full use of domestic resources.

A major issue for dairy farming in Vietnam is how to increase domestic consumption, the linkage in value chain to balance value added of producers and processers, and sustainable development.

This time, we appreciate the strategic framework developed by FAO. It gives us new directions to take into consideration. We particularly appreciate the emphasis on improving dairy food quality and safety as a separate strategic objective. This is an area of emerging importance in Vietnam and the Government is working towards strengthening systems to minimize health risks. We are eager to learn from other countries in the area of sustainable development.
Similarly, we appreciate the strategic objective on consumers’ education and school milk programs. Nutrition is an important focus area for Vietnam Government and there is good evidence that school milk programmes can make substantial contribution towards children’s nutrition. We are aware of Thailand’s government-sponsored school milk programme and the benefits it has generated.

We appreciate the overall vision and other strategic objectives as well. It is great pleasure to endorse the strategic framework of this strategy. We also strongly support the idea of promoting a Self-Sustaining Dairy Asia Group and look forward to more international collaboration and cooperation in dairy development sub sector.
ANNEX 2: JOINT COMMUNIQUE
ADOPTED BY THE MEETING PARTICIPANTS
We, the delegates to the High Level Dairy Asia Meeting on Sustainable Dairy Development, convened jointly by the Food and Agriculture Organization of the United Nations (FAO), the National Dairy Development Board of India, the Animal Production and Health Commission for Asia and the Pacific (APHCA) and the Global Agenda of Action for Sustainable Livestock (GASL) from 23-26 March 2015, in Anand, India:

Consider the rapid growth in the demand for milk and milk products an opportunity to make substantial contribution to the national and regional food security, nutrition, rural development and empowerment of women in Asia.

Appreciate that while capitalizing on this opportunity, we need to be conscious about growing pressure on natural resources (land, water and biodiversity), increasing feed scarcity, climate change and the need for more equitable national and regional development.

Stress that the notion of sustainability must be considered in its full complexity encompassing all its pillars—economic, social and ecological; and sustainability must be considered a societal issue.

Recognize that meeting the future challenges requires integrated efforts by a wide range of stakeholders so as to capitalize on the strength of dairy production systems in the region and to minimize the potential negative impact of rapid growth in demand and supply of dairy products.

Agree that the cause of future dairy development in the region would be better served by promoting and adopting technologies and management practices that facilitate integration of economic profitability, social and economic equity, and ecological sustainability goals.

Together, we endorse the **Strategic Framework for Sustainable Dairy Development in Asia** and commit to work towards raising awareness and implementing the strategic objectives outlined in the Framework paper. In this context, we agree to promote measures to

(i) strengthen advisory and other support on improved animal nutrition, appropriate breeding programs, good animal health support and more efficient nutrient recycling with the objective of increasing efficiency and profitability of the dairy value chain

(ii) promote fair and efficient markets including institutional structures to integrate small producers in the modern value chain

(iii) create employment and income generation opportunities, especially for rural women, and promote household food security and rural livelihoods

(iv) improve dairy food quality and safety including improvement of regulatory and support measures

(v) enhance consumer awareness to enable them to make more informed choices
advocate within our respective countries consideration of school milk programs as part of the national nutrition strategy and programs

strengthen stakeholder capacity to cope with production and market risks and for innovation

raise the profile of dairy in national and international policy making fora/processes

minimize the negative impact on natural resources — land, water and biodiversity; and improve mitigation/adaptation to climate change.

We support strong institutional linkages between research, extension and stakeholders for and promotion of more efficient husbandry practices and environmentally sound interventions. We agree to promote solutions that rely on improving the knowledge base of stakeholders, emphasizing learning-oriented dairy extension systems and encourage the formulation of conducive policies and investment climate in sustainable dairy development in support of food security, nutrition and livelihoods.

We recognize the complexity of future challenges including the diversity across countries. While recognizing the legitimacy of differences in challenges, opportunities and the response mechanisms, we also recognize that these challenges can be better dealt via coordinated joint action among and within all countries in the region. In view of this, we pledge to work together and create regional and national multi-stakeholder partnerships in pursuit of our joint vision.

Our Vision

A Socially and Environmentally responsible Asian Dairy Sector that enhances rural livelihoods, improves nutrition, and contributes to economic prosperity.
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