



# **Making Indian Dairy Farming Competitive**

The Small Farmer Perspective

A White Paper —



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## Foreword

India's dairy industry has grown considerably ever since the White Revolution, making it the world's largest milk producer accounting for 17% of world's total milk production. Factors such as rising disposable income and structural changes in food habits, coupled with better margins in the value added dairy products (VADP) have played a pivotal role in driving growth of VADP at around 25%, which is likely to continue for the next 5 years. India currently produces 140 million tonnes of milk annually generating USD 70 billion revenues and with the demand for milk expected to reach more than 180 million tonnes by 2021-22, revenue is expected to touch USD 140 billion.

To leverage this high growth potential and meet the rising demand, a sustainable and strong dairy farming base will be critical. With dairy farming dominated by smallholder dairy farmers, owning an average herd size of 1 to 2 animals and producing an average of less than 4 kg milk per day, it is necessary to address the sector's key challenges such as subsidiary nature of the activity, low yields, rising feed/fodder costs, shift to non-farm activities, deficient veterinary care, increasing quality awareness among the consumers, evolving market dynamics, absence of technological interventions, lack of financial services, amongst others.

Further, it is imperative for the smallholder dairy farmers to introduce new generation institutional arrangements such as Farmer Producer Organisations (FPOs) to leverage the efficiencies of scale, while ensuring livelihood security for all stakeholders. Innovations are required to mitigate the impact of climate change as well as facilitate adoption of cutting-edge technology in health management and breed improvement. Use of modern information technology, universal access to financial services along with innovative models for reaching the last mile farmers, development of human resources through knowledge and skill development as well as increased private sector participation, will enable strategic development of the dairy sector.

On the occasion of the 43<sup>rd</sup> Dairy Industry Conference of Indian Dairy Association (IDA), I am pleased to present the YES BANK white paper which assesses the sustainability of the smallholder dairy farming in the country and identifies the way forward.

I am confident that this paper will be useful for all stakeholders in evaluating the key action points for a resilient, strong and sustainable growth plan for India's dairy industry.

Sincerely,

**Rana Kapoor**

MD & CEO 





**Dr. N.R. Bhasin**  
Ph.D., D.Sc., IAS (Rtd.)  
President

**INDIAN DAIRY ASSOCIATION**



## MESSAGE

I am glad to learn that Yes Bank will be releasing a White Paper on “Making Indian Dairy Farming Competitive – The Small Farmer Perspective” during the 43rd DIC being held at Kolkata from 19th to 21<sup>st</sup> February, 2015. India has recorded a phenomenal production of 139-140 million tonnes of milk this fiscal. Dairy farming, an integral part of Indian economy, forms an important secondary source of income for over 80-90 million rural households. The country also happens to be one of the largest consumers of milk and milk products with an estimated industry size of ₹4347 crores (\$70 billion). In this scenario, it is an opportune time for India to emerge as a major international player.

However despite the importance of dairying in India, smallholder dairy farming is beset with problems. While other countries rely on medium to large scale dairy farms, 80% of India’s milk production is contributed by small and marginal farmers whose fragmented land holdings and limited capacity to increase herd size has resulted in marginal milk yield improvements. Various factors are impacting the sustenance of traditional small farms, namely subsidiary nature of dairying, low yields, rising feed/fodder costs and a shift to non-farm activities.

It is imperative that the smallholder milk production system becomes far more sustainable with well adapted crop-livestock production cycle and resilient characteristics. Focus on productivity of cattle, R&D towards quality and safety of milk and milk products, adoption of innovative dairy farming models, increasing efficiency of the dairy marketing chain and efficient market access for farmers are imperatives. Moreover, dairy services including veterinary care, extension, institutional credit and risk mitigation tools are also essential for enhancing incomes of the small and marginal dairy farmers.

In keeping with the above it is strongly recommended that the status of dairying be accorded the status of “mainstream” activity and not “subsidiary” occupation.

The projected demand for milk by 2021-22 is estimated at 180 million tonnes and as such intensive efforts would be required to augment milk production by 8 million tonnes annually. In this evolving scenario it is therefore important to provide adequate support and strength to the smallholder milk production system in India in order to make it globally competitive.

I congratulate Yes Bank for their efforts in this direction and wish them all success.

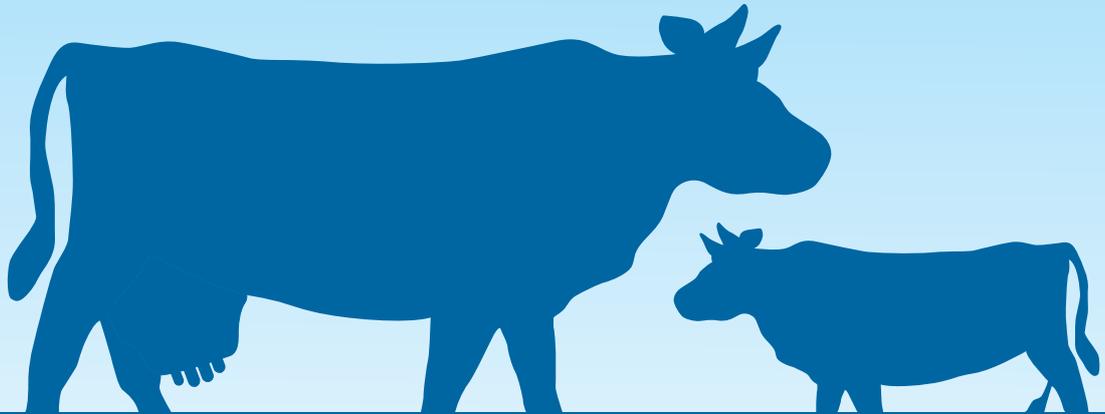
**New Delhi**  
**February 12, 2015**

*N.R. Bhasin*  
(N.R. Bhasin)



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# Indian Dairy Industry

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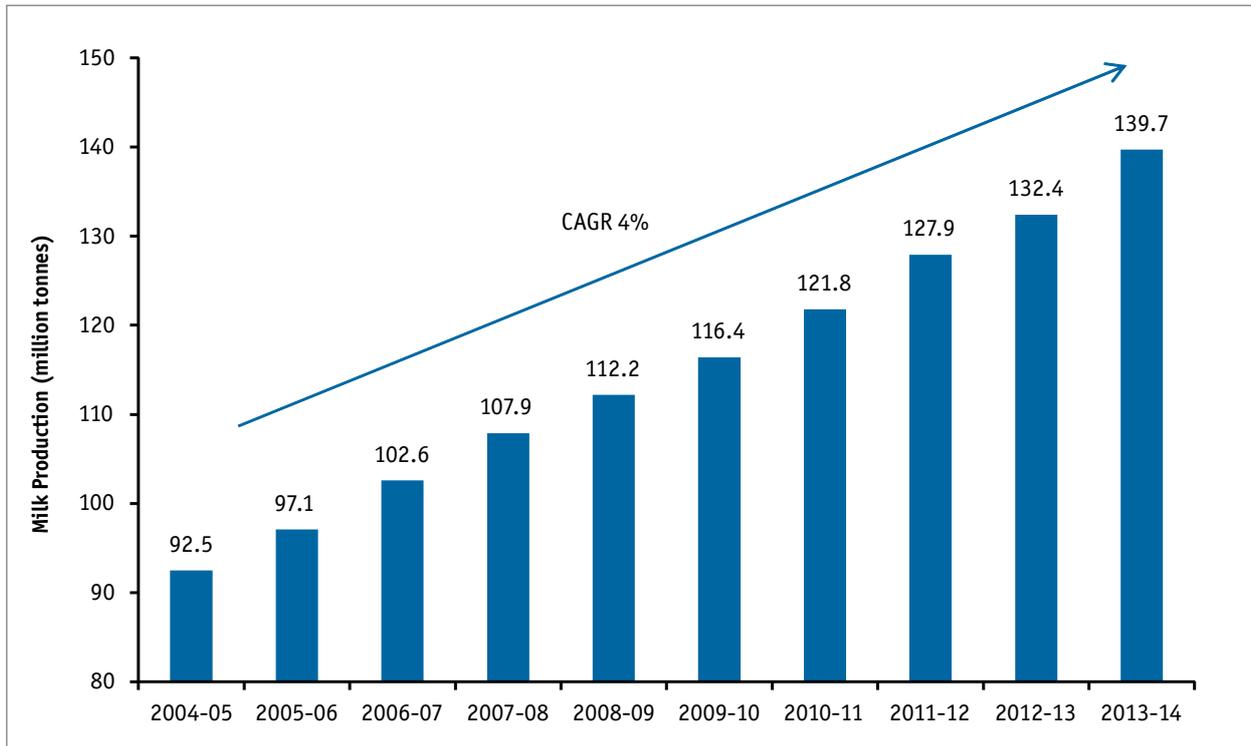
## 1. Dairy Sector and Agricultural Economy

Dairy sector continues to be one of the major livelihood sources for rural India and a significant contributor to the country's agricultural economy. India has vast resources of livestock, which play an important role in the socio-economic development of millions of rural households. With continual efforts from the cooperative and private sector, along with prudent policy intervention by the government, India has been transformed from being a milk scarce nation to the largest producer. Livestock sector, which comprises majorly milk and milk products, contributes a large share to the agricultural gross domestic product (GDP). It contributed over 4.1% to the overall GDP during 2012-13.

Dairying has assumed a very important role in providing employment and income generating opportunities. Milk production and marketing system in India is unique as production is largely undertaken by small farmers and landless labourers. More than 70 million rural households are engaged in milk production, the majority being small and marginal farmers.

"Anand Pattern" of dairy cooperatives in India has created an economic network that links more than 155 million village milk producers with millions of consumers in India and abroad. It includes 1.62 lakh Village Dairy Cooperative Societies (VDCS) at the village level, affiliated to 187 District Cooperative Milk Producers' Unions at the District level and 24 State level milk federation.

The Indian dairy market is amongst the largest and fastest growing markets in the world. India has been able to maintain its numero uno position in milk production during the past 16 years. With an estimated 139.7 million tonnes production, the country accounts for 17% of world's milk production, majority of which is consumed domestically. Milk production has increased by approximately 51% during last 10 years.



Source: NDDB, Press Information Bureau of India

Strong farm gate prices and rising domestic demand for value-added dairy products are the major factors providing impetus to a steady increase in milk production. Milk production has witnessed a CAGR of around 4% from 2004-05 to 2013-14. Uttar Pradesh is the highest milk producing state contributing approximately 17.6% to total production, followed by Rajasthan, Andhra Pradesh, Gujarat, Punjab, Madhya Pradesh, Maharashtra, Haryana, Tamil Nadu and Bihar. These 10 states account for over 82% of the milk production in the country. With this sustained growth rate, the production is expected to reach more than 180 million tonnes by 2021-22.

Growing private sector investment in dairy farming, supply chain, processing facilities and backward integration is providing further impetus to India’s dairy industry. The government is also supporting the industry through various schemes and programmes including National Dairy Plan (NDP) which aims to increase milk productivity and provide direct access of milk producers to the organized dairy market.

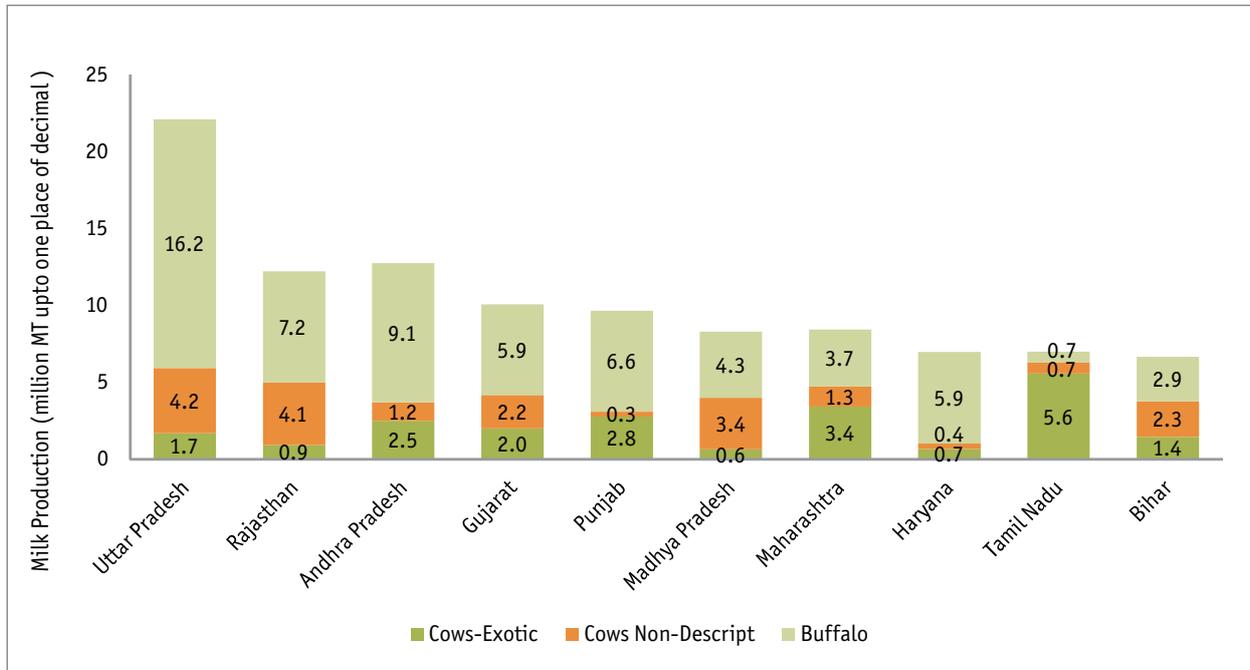
## 2. Dairy Farming in India

India is one of the largest consumers of milk and milk products with an estimated industry size of around USD 70 billion. Unlike other major milk producing countries, the growth story in India is driven largely by small scale dairy farmers. Around 80% of Indian cattle belong to farmers having herd size of 1 to 2 animals, producing on an average less than 4 Kg milk per day. However, a number of factors are impacting the sustenance of these traditional small farms, such as subsidiary nature of dairying as an activity, low milk yields, rising feed/fodder costs and a shift to non-farm activities. The smallholder milk production system needs adequate support and strength to compete in such an evolving market as it is one of the primary livelihood sources for millions of dairy farmers.



## Share of Cow and Buffalo in Milk Production

In India, buffalo and cow contribute 51% and 45% to the total milk production respectively. Production in top milk producing states is largely contributed by buffalo milk, as evident from the following graph.

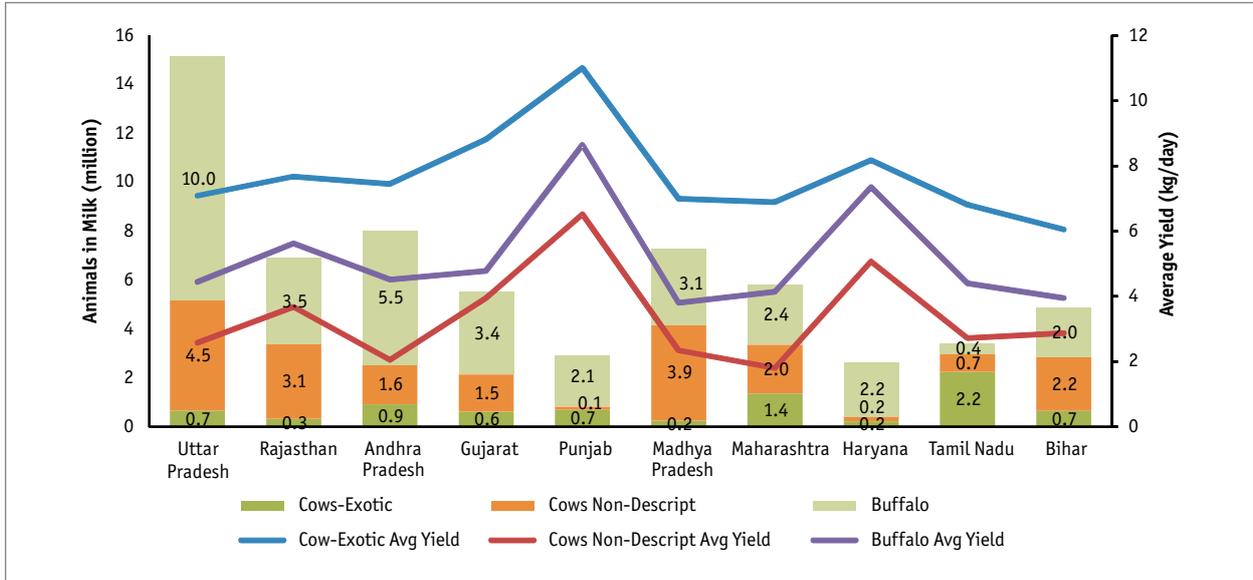


Source: Department of Animal Husbandry, Dairying and Fisheries (DAHD), Government of India

Tamil Nadu is the largest producer of cow milk having 11% share of the total cow milk in the country, out of which 89% is produced by exotic cows. Uttar Pradesh ranks second having 10% share of the total cow milk, of which 71% is produced by indigenous cows.

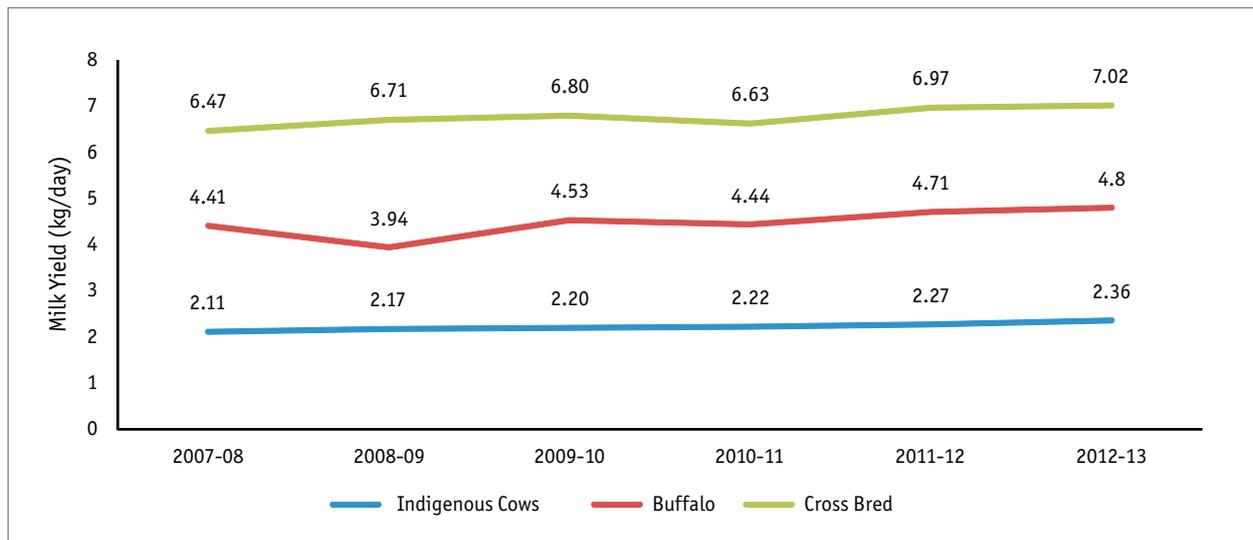
## Milk Yield in India

The average milk yield per day is highest for exotic cows at 7.0 kg, followed by buffalo at 4.8 kg and non-descript cows at 2.4 kg. Uttar Pradesh ranks first in dairy herd size with approximately 15 million cattle and buffalo in milk followed by Andhra Pradesh, Madhya Pradesh, Rajasthan, Maharashtra and Gujarat. The productivity of milch animals is highest in states like Punjab, Haryana, Uttar Pradesh and Rajasthan. Milch cattle and buffalo population and average yield of top milk producing states is presented in the following graph.



Source: Department of Animal Husbandry, Dairying and Fisheries (DAHD), Government of India

The average milk yields of indigenous cow, buffalo and cross bred cow have increased by 12%, 9% and 9% respectively during 2007-08 to 2012-13. In spite of this increase, average milk yield per animal in the country is dismally low at less than a litre per kg of feed, as against 1.6 litre for the same quantity globally.



Source: Department of Animal Husbandry, Dairying and Fisheries (DAHD), Government of India

## Institutional Innovations

Traditionally, the Indian dairy sector has been dominated by the cooperative model due to its proven track record of providing comparatively higher returns to the member farmers, be it small or large. The impact of Operation Flood was visible when the dairy industry started to grow significantly faster and the organized dairy sector was put on to a new growth trajectory through evolution of Anand model. Apart from Gujarat, the cooperative model in dairying has been instrumental in improving the livelihoods of farmers in all the other major states including Karnataka, Rajasthan, Punjab, Bihar, Andhra Pradesh, Maharashtra, Madhya Pradesh, Tamilnadu, Kerala which



procure more than 1 million litres of milk each day. But with rising demand and competition for milk procurement, the cooperative model requires structural transformation. Collective models by forming producer companies have also evolved in some regions in which members undertake all the responsibilities from procurement to marketing of the milk. While collective models have been running successfully in some regions, private players are also experimenting with various models for procurement.

In the past decade, there have been initiatives in the direction of establishing large scale dairy farms (with more than 1,000 animals) by private players to achieve better product quality, traceability and increase productivity with lower cost of production. However, most of the players have been able to achieve limited success due to high operating costs, low productivity, large investment and lack of adequate knowledge to manage large scale farms. Gujarat has also been instrumental in establishing community dairy farms like Akodara cattle hostel at Sabarkantha district. Some of the key innovative models emerging in dairy farming are listed below.

- ✓ **Large scale single location integrated dairy farms** - Large scale integrated dairy farms possess high yielding cross bred cows, milk processing and storage facilities along with feed production systems. In these farms, ownership and responsibility for the operation and maintenance lies with a private player. Players may also enter into contract farming model with the farmers for supply of green fodder.
- ✓ **Progressive dairy farming model** - Mid size dairy farms with 300-500 cattle may evolve in near future as they have comparative advantage of size economics in the business through efficient management of labor, veterinary services, feed etc.
- ✓ **Community dairy farms** - The Chinese model of setting up of community dairy farms or hostels for milch animals owned by people in neighborhood is also gaining acceptance in India. This model envisages investment in farm infrastructure by a private player with ownership of the stall lying with the individual milk producers, who are responsible for housing of cows and managing them under guidance of the private player. The milk is purchased under the buy-back arrangement by the private player.
- ✓ **Hub and spoke model** - Hub and spoke model of dairy farming includes the main farm (hub) having all the integrated facilities including processing and other connected farms (spokes) having basic infrastructure for milking and feeding.
- ✓ **Industry supported farming model** - Various players in the industry provide financial support through tie-ups and technical assistance to farmers for scaling up of their herd size along with extension activities related to farm management, modern breeding techniques and feed management.

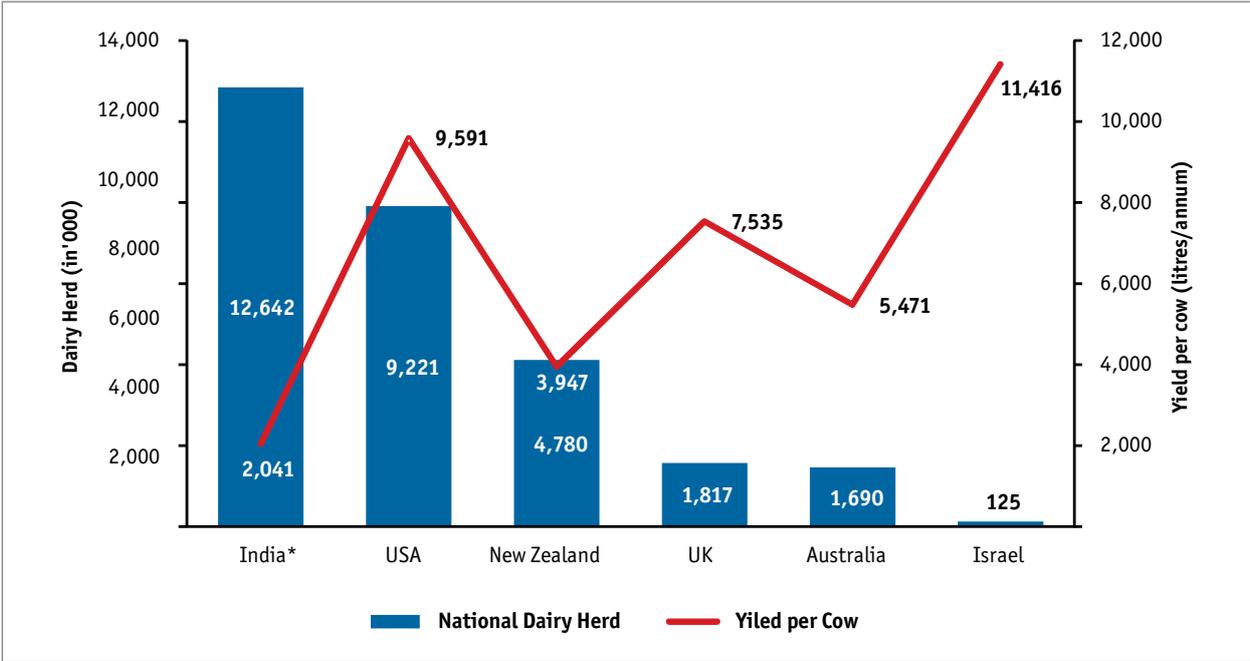
Due to the current diversity in nature of farming systems, prevailing infrastructure, farmer capacities, socio-cultural realities and climatic patterns, a mix of various models may evolve and determine the landscape of commercial dairy farming in India in coming years.

### 3. Major Parameters Defining Dairy Farming Competitiveness

#### Milk Productivity

India has the total bovine population of around 305 million with buffaloes and cattle contributing to 34% and 66 % of population respectively. Owing to this stock, India has managed to attain numero uno position in milk production, but the full potential of Indian milch herd still remains unattained. During last three decades, average productivity of milking animals has grown but it is significantly lower than the best of global standards. While

India is at milk productivity figure of 2,041 litres per annum, other countries such as Israel, US, UK, Australia and New Zealand are at 11,416 litres per annum, 9,591 litres per annum, 7,535 litres per annum, 5,471 litres per annum and 3,947 litres per annum respectively. Dairy herd size and average yield in India and some of the developed nations are depicted in the graph below.



Source: USDA, DairyCo, Dairy Australia, New Zealand Dairy Statistics, DAHD, Israeli Dairy Board  
 \* For India, data for only cross bred cows in milk is given as per DAHD 2012-13 estimates

### Cost of Milk Production

In a dairy value chain, cost incurred in producing the milk is an essential component. It is widely used as a core indicator for benchmarking dairy farms across the geographies operating with different dimensions. According to recent IFCN research on ‘benchmarking cost of milk production in 46 countries’, the level of cost per 100 kg of milk production for South and East Asia (Bangladesh, India, Pakistan, Indonesia) is <USD 30. Whereas the levels are USD 40-50 for EU, Middle East and China, and USD 35-40 for USA, Brazil, and Oceania.

It is evident from the findings that farms in India depend on crop residues leading to lower production costs. The Indian milk producers are competitive in global space with respect to this parameter, primarily due to cheap labour and low cost input systems. Further, Indian dairy supply chain has been globally recognized as the most efficient one, passing around 80% share of the consumer’s rupee to the dairy farmer vis-à-vis around 30%-35% in developed countries like USA, UK, EU, Australia and NZ.

### Farm Size

While other countries rely on medium to large scale dairy farms, 80% of India’s milk production is contributed by small and marginal farmers with average herd size of approximately 1–2 animals. The average herd size in UK, Australia and New Zealand is 126, 268 and 402 respectively with efficient farm management and better economies of scale. Over the years, size of dairy farms has increased in the developed nations. But India being more reliant on small holder farmers, increase in share of organized farming and farm size will take place gradually.



## Food Safety

A large share of the production in India still does not conform to domestic and global food safety standards. This is due to adulteration, lack of awareness and inadequate infrastructure. Food safety continues to be a challenge due to poor farm management and the presence of a large informal/unorganized dairy sector, which represents approximately 70 to 80% of total dairy production.

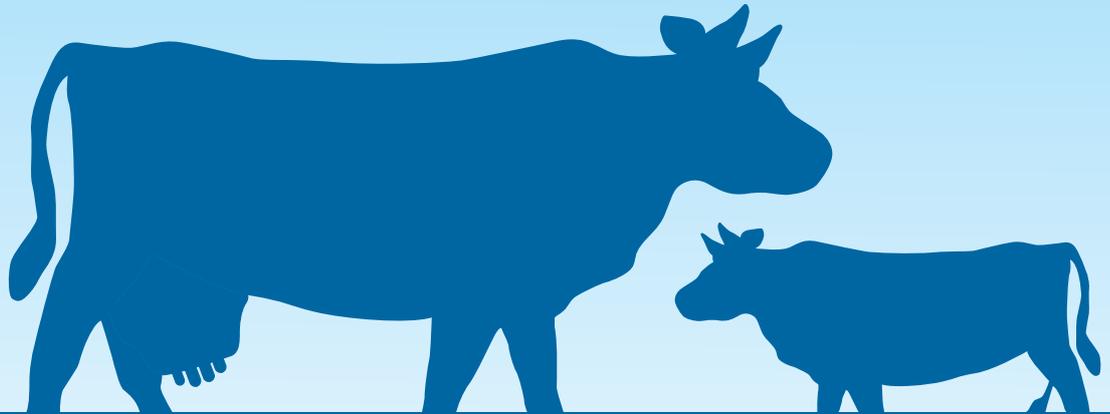
With rise in demand of value added dairy products (VADP), the focus on food safety is bound to increase in coming years. The government has also enacted Food Safety and Standards Authority of India (FSSAI) Act to address food safety issues and set legal standards for quality to be followed by the industry. Milk and milk products manufactured by Indian dairy industry are gradually getting recognition all over the world. But, to strengthen our position on global dairy trade platform, small holder dairy farmers need to be adequately trained on food safety and quality measures.

### 4. Major Challenges Faced by Small Holder Dairy Farming Systems

Dairying in India is characterized by mixed-crop livestock farming. The small holder production system suffers due to lack of awareness of good farm management practices, lack of access to credit and unavailability of input resources (like feed, water, land, medicines and vaccines). Following characteristics define the dynamics of small holder dairy farming systems in India and the implications thereof:

- ✓ Scattered land and cattle holdings make provisions of extension services and technology transfer a herculean task and are big impediment towards investments in backend infrastructure development.
- ✓ Access to institutional credit for small holder dairy farmers is hampered due to cumbersome and complex procedures, lack of collaterals and financial literacy. It makes farmers vulnerable to moneylenders' trap where they are being charged high interest rates.
- ✓ Rapid shrinkage and degradation of grazing land has resulted in green fodder shortage. Lack of knowledge on feed management, indiscriminate grazing on common property resources and wastelands have led to negative environmental footprints.
- ✓ Disease and health management of cattle is one of the most neglected areas. Lack of qualified veterinarians and para vets, inadequate medical facilities and curative approach adopted by the farmers to treat various livestock ailments drastically hit the production system.
- ✓ Although India has the largest single artificial insemination (AI) network in the world, its delivery services are inefficient and of poor quality. Improper genetic evaluation and lack of record keeping have resulted into generation of inferior quality progenies.
- ✓ Lack of access to organized marketing channel.
- ✓ Gradual migration of manpower from agriculture and allied activities to other non-farm lucrative occupations.

These issues are primarily responsible for impacting the sustainability of small holder dairying in India. To realize the dream of second White Revolution in the country, a framework needs to be designed for changing the status of dairying from a "subsidiary" to a "mainstream" occupation. Selective farm mechanization and automation, improving quality and availability of fodder, adoption of green energy measures and establishment of community based farms will make such production systems viable, sustainable and scalable.

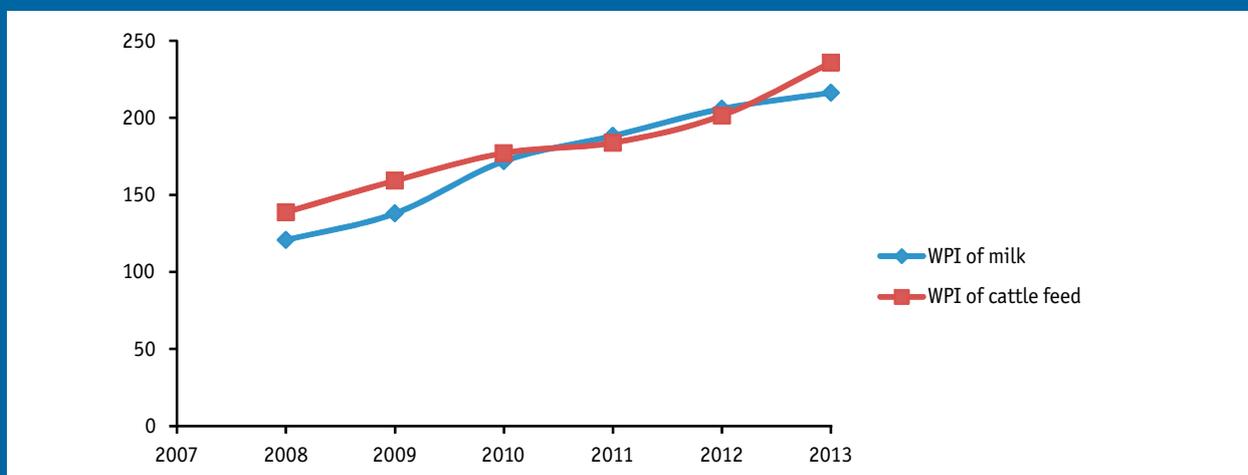


# Factors Impacting the Competitiveness of Small Holder Dairy Farms

With rising income levels, health consciousness and increasing demand for consumer convenience, the demand for milk is bound to show an upward trend. Sustainable growth of small holder dairy farmers will help in meeting the targeted milk demand of more than 180 million tonnes by 2021-22. Major factors which impact the sustainability of small holder dairy farms and essential for making it globally competitive are presented below.

## 1. Feed and Fodder Management

Feed is one of the critical determinants in ensuring good milk yield and also constitutes approximately 60% to 70% of the operating expenses. The current deficit level of green fodder and concentrates is up to the tune of 34%. Further, there is a critical gap for quality forage seeds as well. Reserve Bank of India's (RBI) figures reveal an alarming trend of an average annual increase of 19.5% in fodder prices between 2008-09 and 2012-13. There has been a steep increase in prices of all cattle feed ingredients, such as de-oiled rice bran (DORB) and molasses, constituting 25-35% and 10-12% of the cattle feed respectively. The graphical relationship between wholesale price index (WPI) of milk and cattle feed during 2008-2013 period highlights that WPI of cattle feed has kept almost the same pace as that of WPI of milk.



Source: Office of the Economic Advisor, Ministry of Commerce and Industry, GoI



With rapidly shrinking land and natural resources, availability of good quality feed and fodder is increasingly becoming a challenge. Hence, along with ensuring better feed availability, it is critical to develop farmer's expertise in effective utilization of locally available feed resources. There are several impediments (such as lack of access to timely credit, low levels of awareness on balanced feed regime etc) for small farmers to procure good quality feed at the right price. Farmers in fodder surplus areas even resort to burning crop residues or selling for alternate uses at substantially lower prices. The following factors assume significant importance to optimize the feed and fodder production in India without hampering the food security and conservation of natural resources:

- ✓ Maximize the usage of crop residues and leguminous forages. Research and development (R & D) interventions to enhance nutritional quality and adaptability of crop residues and forage crops through genetic improvement programmes and selection techniques.
- ✓ Practicing intercropping and multi-cropping with cereal crops, relay cropping, food-feed systems etc to ensure year round fodder supply.
- ✓ Balanced feed rations to be developed depending upon the crop/fodder cultivated in a particular region and optimally utilizing locally available feed resources, thus bringing in cost and resource optimization. The total mixed ration project needs to be undertaken on war footing basis. AMUL is encouraging its member unions to undertake such projects.
- ✓ Integrated Watershed Development approach for encouraging fodder production systems which will also ensure the restoration of ecological balance in fragile and degraded ecosystem.
- ✓ Creating awareness amongst the farmers to optimize herd size basis available feed resources.
- ✓ Training farmers in silage preparation to address the problems of year round availability of green fodder.



Source: Google images

### Case: Hybrid Corn Seeds Developed by DuPont Pioneer

DuPont Pioneer has developed special hybrid seeds of corn for livestock feeding. These yield very good tonnage with higher digestibility and ensure the uniform supply of quality nutrients. The company offers solutions that enable farmers to make silage using corn hybrid crop and inoculants. A Corn Silage based diet is more nutritious and also improves the farm productivity by reducing production costs substantially. The innovative inoculants used to prepare silage improve fermentation, retain valuable nutrients, reduce dry matter losses, improve nutritive value of starch and fiber, increase milk and meat production of animals, and improve the quality of milk by increasing fat percentage and protein in milk. The company is working collaboratively with public and private enterprises to train farmers from Punjab, Andhra Pradesh and Maharashtra on proper silage management practices. Apart from this, the company is also promoting good agronomical practices to increase yield and is providing packaging solutions to ensure longer shelf life of feed.

Source: DuPont Product Brochure

## 2. Veterinary Care

Majority of the dairy farmers in India are unaware of technical skills regarding breeding practices including record keeping and progeny testing which acts as an impediment for improving herd quality. It can be overcome by expansion of AI network and extension services through Krishi Vigyan Kendras (KVKs) and encouraging private sector participation. Under NDP, emphasis is being given on production of high genetic merit (HGM) cattle along with import of high quality semen.

A number of diseases affect the calves and milking cows, which if not identified timely and accurately can cause mortality and serious losses to small dairy farmers. The situation is further aggravated due to lack of adequate nutrition and feeding. Breeding services using superior quality, disease free germplasm needs to be given priority for addressing these issues. Timely identification of diseases and knowledge about preventive measures will add to better livestock health which will further improve productivity and quality of milk. For improving fertility of the animals, AMUL has initiated Fertility Improvement Programme (FIP) which involves conducting animal camps and generating awareness on regular basis. Further, it has also initiated Strategic Productivity Enhancement Programme entailing activities like AI, pure breeding, calf rearing, vaccination, deworming etc. to improve productivity of milch animals.

### Case: Livestock Development Initiative by BAIF

BAIF's Livestock development initiative has done a commendable job in exploring the modern technologies in animal breeding, reproductive management and healthcare. Some of these include Marker Assisted Selection (MAS) for breeding bulls, molecular studies on prevalence of Beta-casein and Kappa casein allelic variants in breeding stock, designing metagenomic studies to deduce mastitis pathogens, deducing an adopted genotype to specific environments and possibilities of production and use of sexed semen in small holders' dairy production system. BAIF has also been instrumental in indigenous breed improvement initiatives for Gir and Sahiwal breeds.

*Source: BAIF's Annual Report, 2013-14*

## 3. Climate Change and Sustainability

The estimated annual milk loss due to heat stress in cattle and buffalo in India is about 1.8–2.0 million tonnes. Investment in R&D initiatives for reduction in greenhouse gases (GHG) emissions through cost effective and scalable interventions in the areas of animal selection and breeding, cattle nutrition, manure and effluent handling can go a long way in addressing this challenge. Efficient collection and utilization of waste for vermi compost/bio-manure production and establishment of community biogas plants will further benefit the small and marginal farmers.

Worldwide, dairies are adopting green technologies to meet their energy demand. Today there are several innovative and efficient technologies available in the renewable energy domain. Harnessing solar or other alternative sources of energy for various heat based applications has become a viable option with time. India is endowed with a vast solar energy potential. About 5,000 trillion kWh per year of solar energy is incident over India's land area, with nearly all of India receiving an average 5-7 kWh/m<sup>2</sup>/day. Small holder dairy farmers may be supported with cold chain, bulk milk coolers and energy requiring technologies, harnessing the alternate sources of energy. Also thermal energy is required for various processes in dairy sector such as sterilization, spray drying, evaporation/ steam generation, pasteurization, washing/ cleaning, chemical processes and in chilling/ cold storage. The heavy dependency of the sector on non renewable energy sources for generating this thermal energy has not only made it a costlier affair but also has adverse impact on the environment.



The time is ripe for harnessing the full potential of solar/ alternative sources of energy and along with commercial and residential usage, it must be utilized for industrial purposes too. Switching to cheaper, renewable and cleaner sources of energy in dairy will open new avenues for entrepreneurs to invest in the sector along with connecting all the stakeholders involved in the chain to the last mile.

### Case: NDDB's Ration Balancing Programme

National Dairy Development Board had launched a ration balancing programme to feed least cost balanced ration to milch animals of smallholder dairy farmers, in different agro-climatic regions of the country. Reduction in enteric methane emission per kg of milk yield in lactating cows and buffaloes has been reported earlier, through improved efficiency of utilization of available feed resources. Inefficiencies in the conversion of feed protein into edible animal protein present a major challenge to livestock nutritionists, as excretion of excess nitrogen (N) by the animal is not only an economic loss of a valuable feed component but it also acts as a source of nitrous oxide (N<sub>2</sub>O), a potent greenhouse gas. About 10-40% of the consumed feed nitrogen is retained in the form of animal products like milk and meat and the remainder is excreted into the environment through urine and faeces.

Source: NDDB



Source: <http://www.dairy-sustainability-initiative.org/Public/ListPage.php?ID=143&parentID=109>

#### 4. Extension Services and Skill Development

Dairying is far more demanding than agriculture in terms of skill set requirements. Interventions towards skill development can enhance family income and provide a sustainable source of livelihood. With the paradigm shift of dairying from being a subsidiary occupation to mainstream activity, availability of skilled manpower will be of utmost importance. Augmenting knowledge and skill levels of the workforce is essential to enhance resource productivity, boost innovation, manage finance, mitigate risks and improve decision making ability which will enable sustainable dairy farming.

Private sector participation in extension services needs to be aligned with the public schemes and market led practices are to be encouraged to increase resilience in the smallholder dairy farming ecosystem. The state governments can play a proactive role through collaborations with countries like Israel, Holland, New Zealand for training small and marginal farmers and assist them in managing dairy farms to boost the milk production potential.

#### Case: Village Women Dairy Development Programme by Nestle

Nestle India recognized that village women are the primary caretakers of cattle and play a significant role in dairy farming. As a result, the Village Woman Dairy Development (VWDD) Programme - an initiative focusing on empowering village women engaged in dairy farming was formally launched in 2006. The objective of the programme is to empower women dairy farmers to improve quality and productivity of milk. The village women are educated through women training team on

- ✓ Good dairy practices including good feeding and breeding practices
- ✓ Animal care and treatment
- ✓ Sustainable agricultural practices
- ✓ Personal health, hygiene, water conservation and economic independence.

Over 58,600 village women across Punjab, Haryana and Rajasthan have benefitted from the Village Women Dairy Development Programme by the end of December, 2013.

Source: Company Sources



Source: <http://www.nestle.in/csv/rural-development/milk/dairy-development-programme-for-village-women>



## 5 Access to Finance

Given the importance of dairy sector in rural employment and revenue generation, easy access to credit and instant payments for sale of the milk and milk products are critical for making production system remunerative and sustainable. Financial institutions need to design innovative and tailor made suite of financial products, including systems to immediately credit the milk payment in farmers' accounts. This would pave the way for financial literacy of the farmers and reduce their dependence on moneylenders for credit requirements. Rural financial institutions need to focus on widening their reach to small farmers who are conventionally under-banked or unbanked, offering structured financial products and services to them.

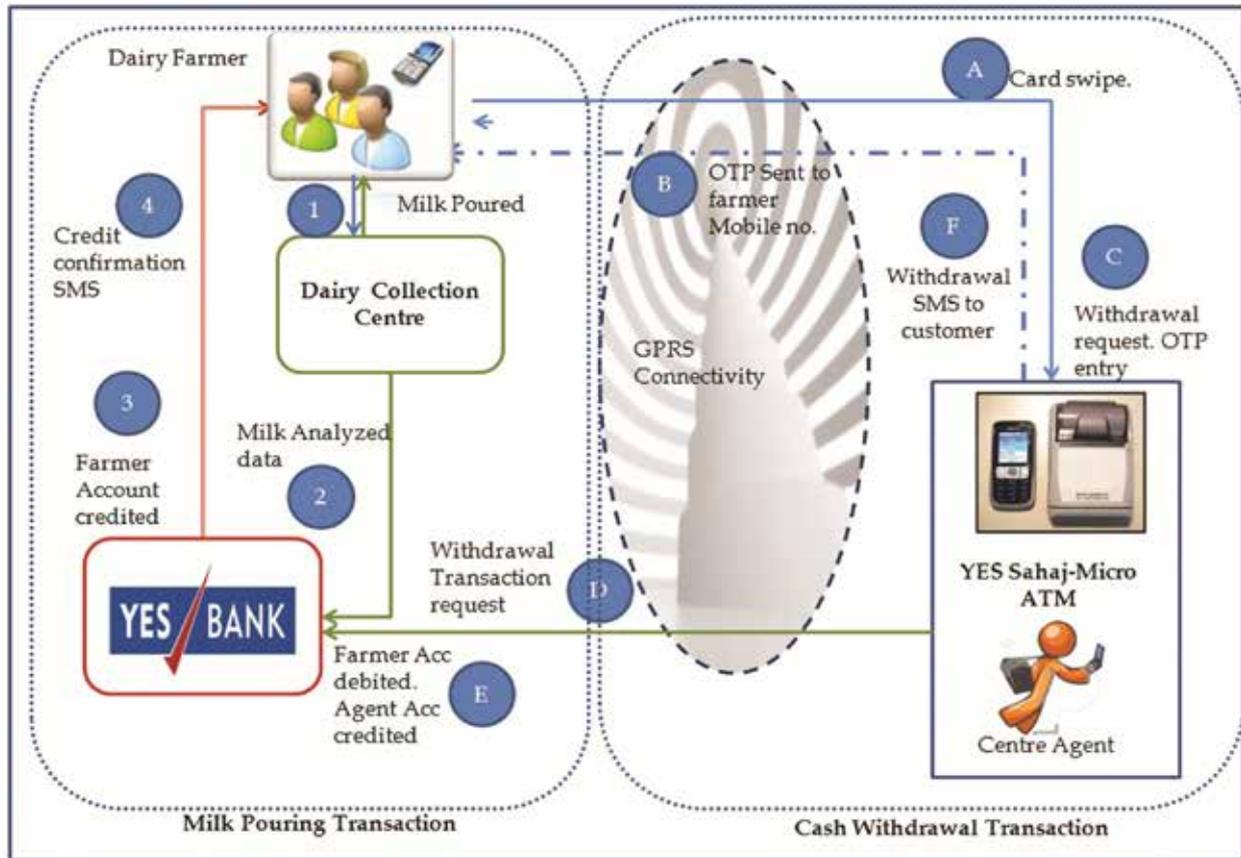
### Case: YES BANK's Kisan Dairy Plus and Pilot Project with PPC

YES Kisan Dairy Plus was implemented as a pilot project in collaboration with one of the largest dairies in South India, based in the Villupuram district of TamilNadu. YES Kisan Dairy plus product proposition comprised of a) Instant milk payment (as applicable, in association with respective dairy) b) Basic Saving Account (BSA) with 6% interest and ATM-cum-debit card c) Free unlimited withdrawals on any bank's ATM d) Lean season Over-draft facility e) Unlimited deposit/withdrawals through YES Bank's specially deployed YES SAHAJ hand-held device f) Domestic inward/outward remittance service g) Annual Group Life Insurance for member and spouse h) Flexible Recurring Deposit facility linked to BSA.

YES Bank started a pilot project with Paayas Producer Company (PPC), promoted by National Dairy Development Board (NDDB), to provide payments to farmers along two milk procurement routes in Renwal and Sri Madhopur Milk Chilling Center in Rajasthan. Farmers were happy to receive direct credit in their accounts and were comfortable with money withdrawal from other bank ATMs during their routine visits to cities/bigger villages. Farmers also used the YES SAHAJ Micro ATM Business Correspondent facility that YES BANK provided, which helped manage their cash flows as per convenience. This model represented an immense opportunity for scale-up given that 60% of farmers supplying to PPC prefer the use of regular ATM network.

*Source: YES BANK Annual Report 2013-14*

## YES Kisan Dairy Plus – Process Flow for Credit and Withdrawal



### 6. Role of Information Technology (IT)

Information technology is an important tool which can be harnessed for efficient management of small scale dairy farms in India. It is important to invest in the information systems to make strategic decisions on optimization of the dairy supply chain and the costs involved. IT finds many applications as an important enabler for information management of demand-supply aggregation of the milk and milk products across production and consumption clusters. It can be used for real time monitoring of transactions for efficiently managing the payment cycle of the farmers.

Small holder farmers do not have direct access to basic financial services including insurance. IT can play a pivotal role in bringing large chunk of small holder farmers under the ambit of financial services. Each of the farmers may be assigned a single account where all the transactions pertaining to payments, financial services, insurance etc. can be monitored through a single platform. This will also enable the government to keep a track of the small scale farmers in order to pass on the benefits of several important schemes run by it.

### 7. Procurement Infrastructure

Milk is one of the allied agricultural produce which fetches comparatively higher returns which has been achieved by transparent pricing model in the system, especially by the large cooperatives. While some of the private players are also following a similar structure, many players restrain to invest in procurement infrastructure due to long gestation period, fragmented suppliers, high investments, low milk volumes and uncertainty of returns. Due to



increased focus on quality and traceability of milk procured as well as increased competition, companies are now gradually shifting to direct procurement from farmers. The share of organized procurement is bound to increase in coming years.

Contract farming ecosystem with best technical advisory services to improve the productivity, tripartite arrangements with banks to provide credit to farmers, investments in cold chain infrastructures are all encouraging small farmers to undertake dairying as mainstream activity. However, intense efforts are required for establishing public-private partnerships (PPP) for regional animal breeding centers for supply of climate resilient & quality animals for a particular agro-climatic zone and feed-fodder systems available locally. The government should further focus on promoting vigorous animal husbandry activities by bringing it under the Corporate Social Responsibility (CSR). This would help the companies in building trust and relationship with the farmers, critical for ensuring secured milk supplies on one hand and sustainable and viable returns for the farmers on other hand.

### Case: Hatsun Milk Banks

Hatsun procures approximately 2 million litres of liquid milk per day, from over 3 lakh farmers in south India covering over 8,000 villages. The company has around 4,500 'Hatsun Milk Banks' (HMBs) and operates more than 800 rural milk procurement routes. These routes have a regular route plan with the timing to pick up milk cans for each HMB/village in the morning and evening. Each farmer's data (quantity, Fat & SNF% along with the farmer's unique number) are captured directly into automated system and based on the same the farmer is paid every day. The entire farmer's data base is managed through a state-of-the-art computer software system.

Hatsun has installed rapid milk chillers at their procurement centers in order to overcome the challenges of irregular power supply, low capacity utilization and low chilling rate of bulk milk cooler (BMC). Hatsun has improved this technology for on ground implementation. These chillers use thermal battery that could store electricity even when available for 12 hours daily and release that energy to run a refrigeration cycle. Hatsun has already installed 20 rapid milk chillers, each costing approximately INR 5 lakh and is planning to increase it to 700 by next year.

Source: Company Sources



Source: <http://www.thehindubusinessline.com/industry-and-economy/agri-biz/a-cool-way-to-chill-milk/article5113234.ece>

## Conclusion

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The Indian dairy sector faces major challenges with respect to milk productivity, fodder availability, inadequate veterinary services and lack of access to institutional credit. Concerted efforts in the areas of feed and nutrition management, improved breeding and health care systems, financial inclusion, dedicated extension services and procurement infrastructure development with IT support are required. Going forward, stakeholders in the dairy value chain need to focus on institutional innovations and adequate capacity building which is essential for inclusive growth of crop-livestock production system, thus making the smallholder dairy farming system globally competitive. Below are some insights from industry stalwarts.

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**Dr. Narayan Hegde**  
Trustee and Principal Adviser  
BAIF Development Research  
Foundation

“ Most of the small holders are maintaining livestock for generating supplementary income, as income agriculture is not adequate for ensuring their food security. However, these families have to struggle to increase their income from livestock due to several reasons as mentioned in the paper. The National policy should be to help small farmers and landless owning livestock, to improve the productivity of their livestock and profitability, enabling them to come out of poverty. Livestock husbandry has an excellent potential to promote inclusive development and hence promotion of large scale dairy farms should not be at the cost of small farmers. Providing breeding services using superior quality, disease free germplasm should also be given priority. Capacity building of small livestock owners, particularly women, promotion of producers’ groups and development efficient value chains should also be given priority.”



**R. S. Sodhi**  
Managing Director  
GCMMF (AMUL)

“ For sustainable & scalable investments in our dairy industry, it needs to be a win-win situation for both - the producers and the consumers. India has become the largest milk producer of milk in the world with 140 million tons of production - by virtue of the C2C (Cow to consumer) supply chain owned by dairy farmers. Today, the Indian farmers get as high as 80% share of the consumer’s rupee as farm gate price for milk as compared to just 35-40% in developed countries. The farmer is ready to produce the milk India needs as long as assured markets with remunerative prices are there.”



Established in 1948, Indian Dairy Association (IDA) is the apex body of the dairy industry in India. The members are from the cooperatives, MNCs, corporate bodies, private institutions, educational institutions, government and public sector units. IDA functions very closely with the dairy producers, professionals & planners, scientists & educationists, institutions and organisations associated with the development of dairying in India. IDA has been providing a common forum to knit the dairy fraternity together and thus, over the years, it has emerged as the reigning czarina of information. The Association is managed by an apex policy making body called the Central Executive Committee (CEC). The CEC is headed by President and supported by two Vice-Presidents and 19 Executive Committee Members. The IDA organises seminars, symposia and exhibitions on a wide range of topics catering to various segments of professionals, scientists, institutions and organisations associated with the development of dairying in India. The IDA's Head Quarter is in Delhi and the zonal branches are in Bangalore, Kolkata, Mumbai and Delhi. It has State Chapters at Anand (Gujarat), Thrissur (Kerala), Jaipur (Rajasthan), Chandigarh (Punjab), Patna (Bihar), Karnal (Haryana), Chennai (Tamil Nadu) and Hyderabad (Andhra Pradesh).



YES BANK, India's fourth largest private sector Bank, is the outcome of the professional & entrepreneurial commitment, vision & strategy of its Founder Rana Kapoor and his top management team, to establish a high quality, customer centric, service driven, private Indian Bank catering to the Future Businesses of India.

YES BANK has adopted international best practices, the highest standards of service quality and operational excellence, and offers comprehensive banking and financial solutions to all its valued customers. YES BANK has a knowledge driven approach to banking, and a superior customer experience for its retail, corporate and emerging corporate banking clients. YES BANK is steadily evolving its organizational character as the Professionals' Bank of India with the uncompromising Vision of "Building the Best Quality Bank of the World in India by 2020!"



