



Actualizing The Second
White Revolution





India has retained the leadership position of the world's largest milk producing nation with an estimated milk production of 121 million tonnes during 2010-11, accounting for about 17 % of the total global milk production. This fact emphasizes the importance of dairying which has played a crucial role in the agro based Indian economy and has been acknowledged as the most successful transformational enterprise in India. The industry is slated to witness the boom in demand for milk in the next decade owing to a growing population, an increased per capita consumption and urbanization. The estimates suggest that the demand for milk is expected to reach 180 million tonnes by 2021-22 warranting the milk production to grow at the rate of almost 5.5 % per annum by the next decade. The effect is visible through rising milk prices contributing to the food inflation in the country. This concern has put us at a juncture where the need for a second White Revolution is being immensely felt.

Is this achievable? The answer is YES! This paper attempts to dissect the reasons for stagnating milk production and evolve the key enablers of change to bridge the milk supply-demand gap ensuring sustainable milk security for the nation.

Need for Second White Revolution

- ✓ Fourteen years ago, India scripted history by achieving the numero uno position in global milk production. This was made possible by one of the world's most successful rural development programs – "Operation Flood" (OF) - which ushered in the White Revolution - transforming India from a milk deficient country to a self sufficient one.
- ✓ The impact of Operation Flood was visible when dairy production started to grow significantly faster in the last couple of decades. The organized dairy sector was put on to a new fast growth trajectory through evolution of the AMUL model of cooperative pattern of dairying involving 9.3 million farmer-members in 1996. Emphasis was put on strengthening the processing and marketing infrastructures in rural and urban areas. Various programmes in the areas of veterinary services and improved animal nutrition were being introduced as measures to improve milk production to pace up with the vigorously growing demand.
- ✓ The annual production of milk which had stagnated between 17-22 million tonnes during 1960s increased by almost seven times to 121 million tonnes (estimated) in 2010-11, thereby significantly altering the socio-economic fabric of the country by providing sustainable livelihood options to millions of farmers.
- ✓ With the changing socio-economic profile of India, demand for milk is increasing phenomenally. Estimates indicate that the demand for milk would grow to 180 million tonnes per annum by 2021, warranting an incremental increase in production of 6 million tonnes per annum hence forth.
- ✓ The momentum of milk production has slowed over the last decade with growth stagnating at about 5 percent per annum. Some of the key bottle-necks hindering growth in milk production are:



- Rapidly shrinking and degrading grazing areas resulting in shortage of green fodder. By 2020, the deficit of dry fodder, concentrates and green fodder is estimated to be 11 percent, 35 percent and 45 percent respectively from the current deficit of 10 percent, 33 percent and 35 percent respectively
 - Increasing feed prices resulting into use of low quality feed
 - Low milk productivity of indigenous breeds
 - Low technology based system of production in rural areas
 - Rise in heat stress among cattle on account of global warming resulting in loss of close to 2 percent of total milk production
- ✓ Recent efforts by National Dairy Development Board (NDDB) to address this gap through the ambitious National Dairy Plan (NDP) are commendable; however the need of the hour is to chalk out innovative supply side strategies that are sustainable, inclusive, scalable and profitable in the long-term, thus maximizing the output that is critical for milk security of the nation.

Key Elements of Framework to change the Paradigm of Dairy from Subsidiary Activity to Mainstream Activity

To realize the dream of the Second White Revolution, it is important that a framework be designed to change the paradigm of dairying from “subsidiary” occupation to “mainstream” activity. Greater emphasis needs to be on achieving economies of scale and continuous yield improvements. This would need conceptualization and implementation of new production models that would inculcate the following crucial requirements of high-tech dairying:

- ✓ Mechanization and automation of dairy farms
- ✓ Sustainable measures to provide better quality feed and fodder through developing technologies that increase productivity of crops in rain-fed areas
- ✓ Provision of improved seed varieties for fodder cultivation, and also encouraging seed replacement
- ✓ Maximization of environmental benefits through adoption of green energy measures such as re-utilization and effective disposal of manure
- ✓ Establishment of community based high herd size farms which would ensure investment in scaling-up, thus improving dairy management systems

However, there are certain challenges which are impeding the above approach:

- ✓ Low corporate participation in the production sector which could otherwise bring in the desired innovation and consequentially increase milk production
- ✓ Lack of awareness of best practices implemented in dairy farming worldwide
- ✓ Higher costs for provision of specialized input services like medicines and feed which overshoots the advantages offered by low labour costs



Key Enablers of Change

With rapidly shrinking land and natural resources, sourcing of feed and fodder resources is challenging the very aim of augmenting milk production in India. Application of newer tools of technology to produce large scale feed blocks, feed enzymes, bypass nutrients and other innovative feed resources need to be enhanced. This coupled with the efficient cultivation and harvesting techniques including irrigation management can greatly improve the fodder production in the country. NDDDB's Ration Balancing Programme (RBP) and Accelerated Fodder Development Programme (AFDP) implemented by the Ministry of Agriculture are some of the commendable initiatives to ensure better animal productivity under low costs.

The following models and key enablers of change would go a long way in realizing the success of the second White Revolution:

(i) **Effective development & utilization of Feed & Fodder Resources:**

With rapidly shrinking land and natural resources, sourcing of feed and fodder resources is challenging the very aim of augmenting milk production in India. Application of newer tools of technology to produce large scale feed blocks, feed enzymes, bypass nutrients and other innovative feed resources need to be enhanced. This coupled with the efficient cultivation and harvesting techniques including irrigation management can greatly improve the fodder production in the country. NDDDB's Ration Balancing Programme (RBP) and Accelerated Fodder Development Programme (AFDP) implemented by the Ministry of Agriculture are some of the commendable initiatives to ensure better animal productivity under low costs.

The following imperatives assume significant importance to optimize the feed and fodder production and management specifically in India, where a crop-livestock production system exists without hampering the food security and conservation of natural resources:

- ✓ Maximize the usage of crop residues and leguminous forages. Use Research and Development (R&D) interventions to enhance the nutritional quality and adaptability of crop residues and forage crops through genetic improvement programmes and selection techniques
- ✓ Treatment of cereal straws, use of urea-molasses mineral blocks, maize and sorghum stovers, spent tea leaves etc. through a participatory approach involving village cooperatives
- ✓ Explore the possibilities of additional sources of feed supply like intercropping with cereal crops, relay cropping, food-feed systems etc. to ensure year-round feeding systems and counteract seasonal scarcities
- ✓ Promote the use of organic systems for sustainable production of fodder production systems
- ✓ Effective utilization of an Integrated Watershed Development approach towards evolution of fodder production systems. This would also ensure the restoration of ecological balance in fragile and degraded ecosystems.
- ✓ Promote quality fodder production through effective seed production, harvesting, processing, storage and marketing systems



- ✓ Design methods to estimate the feed intake and quality for various feeding systems as these have a major bearing on methane generation from livestock. This would assist in improvement of feed resources.

(ii) **Promotion of Collective Dairy Farming/Integrated Dairy Farms (IDFs):**

To address the challenges of low productivity of milch animals, poor quality of raw milk and high costs of domestic production, improved technology and better management are crucial. In order to achieve the same, the concept of high tech IDFs can be implemented across the country. IDFs aim at significant reduction of production costs, maximizing environmental benefits, a dramatic improvement in product quality and productivity.

Collective Dairy Farming is based on the concept of building “hostels” for cows. It has been successfully implemented in countries such as China which have witnessed an increase in the productivity of cattle and improvement in the quality of raw milk. Development of such models would help farmers achieve economies of scale in a collective manner. This would also result in better dairy management systems. The advantages offered by this model are:

- ✓ Enhancement of productivity of cattle and improvement in the quality of raw milk
- ✓ Scientific training to farmers in the areas of farm management, animal nutrition, breeding and health care
- ✓ Assured employment and returns to the farming community

Collective Dairy Farm Model implemented by New Hope Dairy Group (NHDG), China:

- ✓ New Hope Dairy Group is one of the largest private dairy companies in China
- ✓ Employed collectivized, mechanized milking facilities among other sources of raw milk supply
- ✓ The ‘collective farm’ model in Sichuan province not only enhanced productivity and milk quality but also generated higher income
- ✓ Under this model:
 - Village director finds a person or an organization to invest in farm infrastructure
 - Capital is recovered and repaid through the sale of stalls in the ‘collective farm’ to individual farmers
 - Ownership of the stall is passed to the individual milk producer who is responsible for housing the cows in the collective and managing them
 - Farmers gather fodder and forage from their plots of land daily to feed their animals. The milking machines, equipment, bulk coolers and milk storage facilities installed at the ‘collective farm’ are provided and owned by the company that purchases milk
- ✓ **In 2002, the annual per capita income of rural households in Sichuan Province was about RMB 2,900. Poverty is rampant in the province with no county having a per capita income in excess of RMB 4,000, and 33 counties having a per capita of less than RMB 1000. The analysis of dairy farms at the Hong Xing Collective Farm reveals a net income of RMB 3,200 RMB per cow per year, which demonstrates the potential of dairy farming to generate income in rural Sichuan.**



The following key enablers would pave the way for effective implementation of collective dairy farming/IDF:

- ✓ The Reserve Bank of India (RBI) should allow banks and financial institutions to finance purchase of land for IDF as the land cost constitutes a major cost component of the project.
- ✓ The Government should encourage private sector participation in providing land for the project as well as setting-up the project and managing the Operations & Maintenance (O&M) of the project.
- ✓ Suitable incentives by the Central and State Governments, including subsidy to private investors on plant and machinery, single window clearance and subsidized basic infrastructural support like power and water for such projects would evince interest in private investors to undertake such projects across the country.

The various models encompassing the importance of various stakeholders can be envisaged to operationalize IDFs or Collective Dairy Farms. (See Exhibit No. 1).

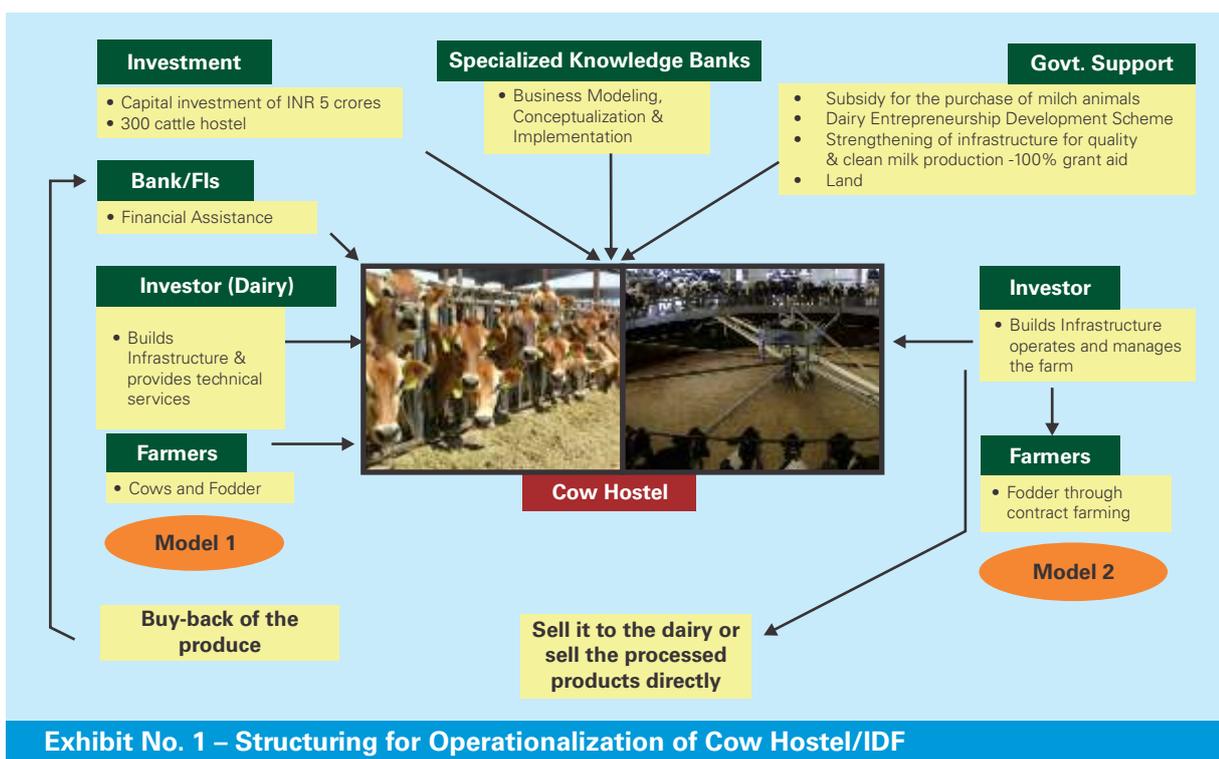


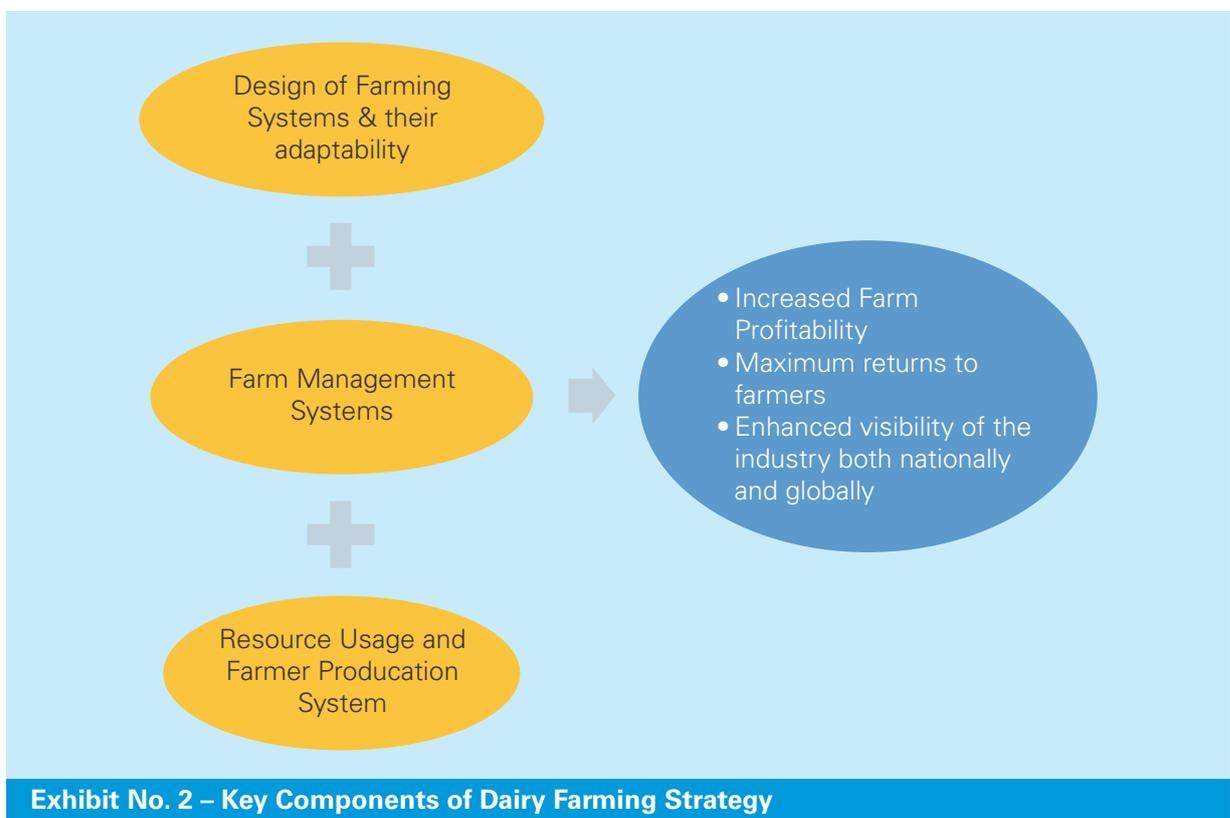
Exhibit No. 1 – Structuring for Operationalization of Cow Hostel/IDF

(iii) Facilitation of Knowledge and Technology Transfer:

Advanced and computerized milking and feeding systems, cow-cooling systems as well as milk processing equipments are some of the areas where joint ventures and strategic alliances with the international technology providers can bring in the desired level of improvements. The following steps need to be taken to facilitate technology infusion and knowledge transfer to scale up milk productivity:



- ✓ The Government should promote selective import of heifers and frozen semen from countries like Israel whose genetic sources have the potential for better adaptation and performance under hot climatic conditions. This paves the way to improve the existing genetic potential of the Indian cattle and milk production enhancement.
- ✓ The cooperatives must explore the successful models of commercial dairy farming including Israel's Kibbutz model, which is a large collective production unit responsible for buying, breeding and maintaining around 1,000 animals.
- ✓ Re-design concrete strategies which set the directions to increase profitability, sustainability and competitiveness for Indian Dairy Farmers. (See Exhibit No. 2).



(iv) Curtailing Climatic Risks to reduce Milk Loss:

Dairy Farming has the biggest potential across the dairy value chain to reduce Greenhouse Gas (GHG) emissions. There is thus an urgent need to curtail the effects of global warming through development of a focused policy on environment. The following action points capture key and immediate priorities to achieve this objective:



- ✓ Invest in Research and Development (R&D) initiatives for reduction in GHG emissions with a focus in the areas of animal selection and breeding, manure and effluent handling and disposal management and cattle nutrition.
- ✓ Develop and execute an Indian Dairy Sustainability Commitment with targets and strategies to reduce GHG emissions across the Indian Dairy Supply Chain by 2020. Involve Corporates to develop sustainable strategies to collectively achieve the same.
- ✓ Develop tools for measurement and monitoring on-farm emissions like the carbon footprint calculator. This would help to determine the impact of adopting different mitigation strategies on the total farm GHG emissions.

Concluding Remarks

Owing to the vast vegetarian population of India and cultural significance, the demand for milk remains in-elastic despite the recent surge in milk prices. Substantial increase in demand for milk over a period of time, with limited increase in production, has contributed significantly to milk inflation. Milk prices have already risen over 25 percent over the past two years in India. If this trend continues, the overall food inflation would soar to sky-rocketing levels as milk is a key contributor to food inflation. With the stress on dairy production systems increasing to cope up with the demand, the strategy should be aimed at strengthening the supply driven systems and technologies which are sustainable, scalable and profitable. This would also require development of innovative and implementable production models that are futuristic, and have a long-term vision of producing more milk per cow so as to ensure a milk secure country, and actualizing the Second White Revolution.

For more information, please contact:

Mr. Saurabh Bhat

President and Managing Director
Development & Sustainable Banking
YES BANK Limited
E-mail: saurabh.bhat@yesbank.in

Mr. Girish Aivalli

Group Executive Vice President & Country Head
Food and Agribusiness Strategic Advisory & Research
YES BANK Limited
E-mail: girish.aivalli@yesbank.in

Mr. Kumar Gaurav

Assistant Vice President
Food and Agribusiness Strategic Advisory & Research Group
YES BANK Limited
E-mail: kumar.gaurav@yesbank.in



About YES BANK

YES BANK, India's new age private sector Bank, is the outcome of the professional & entrepreneurial commitment of its Founder, Dr. 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 Branch Banking (Individuals and SMEs) and Corporate clients. As a part of this knowledge driven approach, YES BANK focuses on key growth sectors like Infrastructure, Lifesciences, Food & Agribusiness, Telecommunications, Information Technology, Renewable Energy, Media & Entertainment, Manufacturing and Textiles, among others.

YES BANK's differentiated approach to banking provides industry specific financial solutions which facilitate superior structuring and tailored financial solutions. YES BANK is steadily evolving as the Professionals Bank of India with the long term mission of "Building the Best Quality Bank of the World in India"



Say YES to Agribusiness

Strategic & Financial Advisors for:

- Development of Agro-Parks, Mega Food Parks, Terminal Markets & Supply Chain Management



Strategic & Financial Advisors for:

- Integrated Dairy Farms
- Warehousing, Cold Storage and Plantation Acquisition



End-to-end Financial Solutions for:

- Stakeholders across the Agricultural Value Chain & Food Processing Units
- Development of Agri Infrastructure



Strategic end-to-end Advisory to Corporates for Large Scale Farming in Africa and Latin America



Research-led Advisory on Market Entry, Diversification and Expansion Strategies

YES BANK is dedicated to catalyzing the business and financial transformation of the Indian Agribusiness sector

YES BANK

Over 330 Branches Pan India | 425 ATMs | 2 National Operating Centres

Corporate and Registered Office: Nehru Centre, 9th Floor, Discovery of India, Dr. A.B. Road, Worli, Mumbai 400018. www.yesbank.in