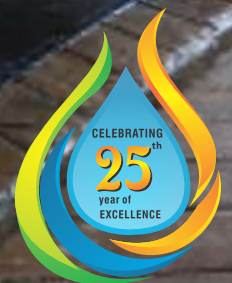




White Paper

*Suruchi
Consultants*

Sustainable **Dairy Farm Structure in India**



**Suruchi Consultants
India**



*Suruchi
Consultants*



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- Cheese manufacturing technologies (2 weeks program)
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Kuldeep Sharma
Chairperson,
Conference on Profitability in Commercial
Dairy Farming
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and author White Paper on Sustainable
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2. Dairy Farming in India

AN INTRODUCTION




India is 7th largest economy at nominal (2.3 Trillion US\$) and 3rd largest at PPP (8 Trillion US\$) in the world in 2015. Agriculture contributes 17% while industry and services contribute 26% and 57% respectively. The labor force distribution is around 50% for agriculture and rest in manufacturing and services. India ranks second in farm output and first in milk production with estimated production levels of around 143 Million Metric ton in 2014-15 at a moderate growth rate of around 4%. At current levels the per capita availability of milk is at 310 ml per day which is far above the required levels as stated by WHO. India also has the largest cattle livestock population in the world at 512 million as per 2012 data. Out of this the population of indigenous cows, cross bred cows and buffaloes are 151.00 million, 39.71 million and 108.70 million respectively. The population of milch animals is 48 million cows (growth rate 0.17%), 19.5 million cross bred cows (growth rate 35%) and 51.0 million buffaloes (growth rate 5%). The bovine genetic resource of India is represented by 37 well recognized indigenous Breeds of cattle and 13 breeds of buffaloes. Indigenous bovines are robust and resilient and are particularly suited to the climate and environment of their respective breeding tracts.

The total population of milch cattle is divided in 3 segments namely buffalo (46%), Indigenous cows (39%) and Cross bred cows (15%). Around 55% of the milk produced is from buffaloes. This milk has better acceptability in India markets due to higher fat (which is synonym to health in major parts of the country) and whiteness of the product being made out of it. Our pricing strategy is also based on fat so buffalo milk fetches better prices at both institutional (B2B) and consumer (B2C) levels.

The respective average yields of these animals are 2.36 litres per day for indigenous cows (growing @ 2.3% per annum), 4.8 liters per day for buffaloes (growing @ 1.7% per annum) and for cross bred cows 7 litres per day (growing at 1.6% per annum).

Feed and fodder situation

There has been a decline in area under fodder crops as well as for pastures and grazing land. Rapid urbanization and development of peri-urban areas is partly contributing to it but the major factor is intent of farmers to grow high value crops with farm realization or shift to some other form of businesses. It is estimated that currently there is a deficit of around 62% in demand-supply for green fodder and around 23% for dry fodder. The deficit may rise to 65% and 25% by 2025 respectively for green and dry fodder if measures through policy driven support are not implemented at war footing. The alternative sources like hydroponics and commercial production of hay and silage is under way to fill the fodder gap for commercial dairy farms. Due to lack of demand the cost of the supplies through these sources is very high and thus a farmer could look for better realization for his produce to cover up these costs. The installed cattle feed capacity is also just enough to meet hardly 20% of the total requirement (if run on 100% capacity) and the balance is met through compound feed preparation at farmer level.

Dairy farm structure			
Description	India	Poland	USA
Typical dairy farming systems			
Farm type 1 - small scale	2-4 cows/ buffaloes, representing 85% of dairy animals	10-20 cows –crossbred cattle, with 32 ha land representing 55% of the cows in Poland	80 Holstein Friesian Cows with about 70 Ha land; stanchion barn/ pipeline milking representing 30% of the cows
Farm type 2 - medium scale	20 cows/ buffaloes, representing 12% of dairy animals	60-100 cows with 100 ha land- free stall barn with parlour representing 40% of dairy cows	200-500 Holsteincows with 350 Ha land- Free stall barn–25% of cows in USA
Farm type 3 - larger scale	50-200 cows representing 3% of the dairy animals	100-200cows representing 5% of dairy cows	ca. 2000 cows/ free stall about 500-2000 ha land representing 45% of cows
Source: IFCN data based on national statistics and estimation. IFCN is happy to collect feedback on its number to improve them steadily. In such case please contact info@ifcndairy.org			

The prevailing farm structure in India could be shown as per above illustration. A comparison has also been created by showcasing the farm structure at Poland and USA. In India there has been a high traction in Farm type 2 and 3. There have been a corporate intent for setting up intensive farms at large scale on the lines of type 3 farm in USA but the plausibility of success of those farms need to be tested over a period of time.

Currently there have been a large number of success stories at commercial dairy farm levels emerging from 20-200 categories. One of the major reasons for success in these categories is manageability of all the inputs at this scale.

Veterinary support services

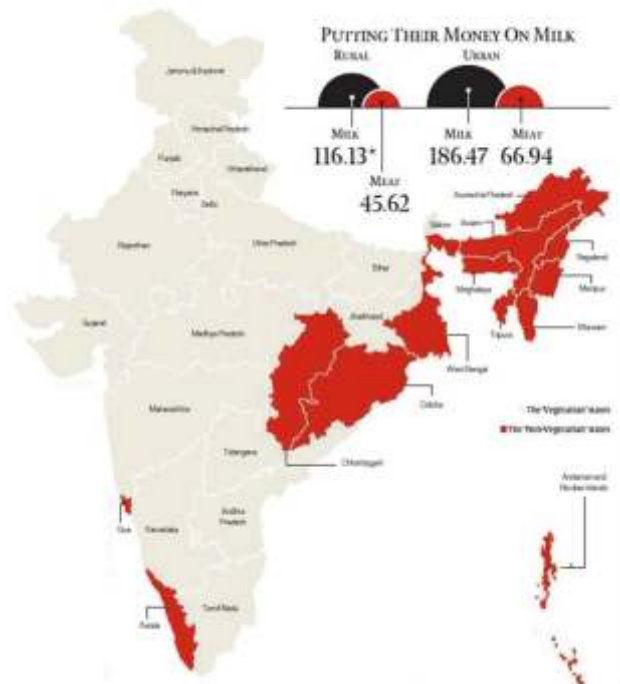
This is one of the weakest link in supporting the dairy farming business in India. There are around 90 veterinary hospital per million of milch cattle and around 170 vet dispensaries per million of milch animals as per the government records. As per the records around 62 million artificial inseminations were carried out during 2013-14 in India (with 22 million animals under AI coverage). Around 54369 Government stationary AI centres have been converted into mobile AI centers. A significant number of 31676 private AI centers are also under establishment. 28400 breeding bulls with high genetic merits have been identified and 49 frozen semen bull station have been strengthened as per Minimum Standard Protocol (MSP). These are the outcome of National Project for Cattle and Buffalo breeding. Foot and mouth disease is very common

in livestock and government is running various programs for FMD vaccinations. Still against an annual requirements of around 625 million doses the production capacity is around 350 million of trivalent doses per year. Other area of concern is brucellosis which is a killer disease for a commercial dairy farm business, where government of India must take some immediate actions on war footing.



Milk demand and consumption pattern

The consumption pattern for milk and milk products is solely dependent on the food preference like vegetarian or non vegetarian in India . Indeed the whole country is divided as per these preferences. The following diagram illustrates the same. As per NSSO report 2011-12, the average MPCE on milk and milk products in India, at Rs 116.13 (8% of total expenditure) in rural areas and Rs 186.47 (7% of total expenditure) in urban areas. It was way above the corresponding combined spending of Rs 45.62 and Rs 66.94 on egg, fish and meat. The monthly per capita consumption of liquid milk alone is around 4.33 litre in rural and 5.42 litre in Urban areas. As per Planning commission report of 11th 5 year plan the demand of milk is increasing by 6-8 % while the production is hovering around 4-4.5 % only. As India is on a path of economic development, the increase in consumption of milk and milk products is inevitable. Looking at the current numbers and linking it to the projected populations of 1.41 billion in 2025 for rural and urban (64 % and 36 % respectively) the estimated demand for milk alone in 2025 will be around 190 Million MT considering 50% of milk produced will come to the market . In other words we would be requiring around 6 Million MT of milk production for next 10 years with a growth rate of around 4% in order to meet the supply meets the demand.



Future scenario

Dairy is by far the most farmer friendly business with a large percentage of market price reaching back to the dairy farmer. There are two major obstacles for inclusion of dairy farmer in dairy value chain. The first one is the poor financial infrastructure to support the farmer for his micro requirements on need based requisites and second one is poor up time for power in most part of the country. Due to the poor financial support, the farmer ends up in the shackles of a middle man and in the absence of power , the cold chain could not be created at the rural community level.

The upcoming generations are also not considering dairy to be a profitable business due to lack of skill for doing hi tech farming in a manageable manner. The aspirations of the rural youth are more to be associated with IT and technology. Partially their desire is getting fulfilled by induction of milking machine, automatic milk collection units with milk analyzers and farm milk cooling tanks but there is a lot much to be done at national level.

On the other side in the professional and corporate world , a large number of IT and other qualified personnel are opting dairy as their first choice in entrepreneurship. They have a vision to be associated with the roots as well as to make use of the technology to get better results in farming and agriculture than the conventional uneducated folks.

Such farms from 50-200 animals categories are getting established around large metros and mini metros and the entrepreneurs are making use of latest technology in social media and mobile apps to reach to their consumers directly with farm fresh milk. They are selling milk at a much higher price than the existing private and cooperative sector and ensuring hygiene and food safety by supplying milk free from any adulterant, antibiotic or hormone.

In next 10 years India may see about one fourth of the total milk being supplied to main towns from these farms only. The consumer has also started to appreciate the need for fresh and pure milk and slowly but steadily this niche of premium paying consumer group is expanding to smaller towns also.

3. Dairying as a Driver of Inclusive Growth

The table 2 below shows the global dairy structure in which India is being compared with two other countries having small to medium farm structure as prevailing in India also. The comparison clearly shows the intent of the comparative countries to increase the milk production per cow and not number of farms or number of cows at farms.

Intensive dairy farming is practiced in limited countries only and that too in small number. Large scale or intensive dairy farming is one of the best solution for countries where most of the inputs are to be bought out and opportunities of inclusion of communities is limited like USA, China, Middle east, Saudi Arabia, etc.



5 I model for dairy development in India

Global Dairy Structure (2014)				
Description	Units	India	Poland	USA
Milk production and dairy farms 2014				
Milk production (cow & buffalo)	in Mill Ton ECM	157.4	12.37	89.16
Average milk yield (cow & buffalo)	kg/ cow/year	1248	5504	9633
Number of dairy farms/ households	in Thousands	76136	286	51
Average farm size	cow/farm	2	8	182
Annual Average Growth rate (2000-2014)				
Milk production	%	4.7%	0.1%	1.9%
Number of dairy farms	%	1.8%	-9.3%	-4.7%
Milk production / farm	%	2.9%	11.0%	6.9%
Source: IFCN data based on national statistics and estimation. IFCN is happy to collect feedback on its number to improve them steadily. In such case please contact info@ifcndairy.org				

Table 2. The global dairy structure in India in relation to Poland and USA for 2014

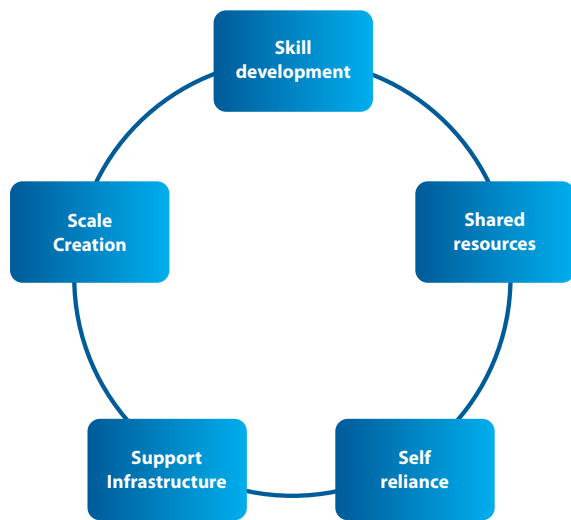
India follows the philosophy of Mahatma Gandhi which says that “Mass production is production by masses”. The milk production in India is highly fragmented and majority of milk is produced and collected through household farms at small and marginal levels. The average animal holding is around 2 with milk production per animal at 2-3 litres per day. Suruchi Consultants in its vision document published in 2014 mentioned about the need for changing the focus from individual farmer to community farming for sustainability and inclusion. A 5 I model was provided which emphasized the need as follows :

- Identification and registration of farm, farmers and animals;
- Inventorization of local practices of animal rearing ;
- Integrating and mapping the value chain on both production and market linkage levels ;

- Institutionalization of all key enablers like Feed and fodder, genetics and breeding, cold chain and infrastructure, Animal health and welfare, environment and Food safety ; and
- Investments flow to fill the gap at all possible areas of value chain by developing cluster based approach rather than a single national policy of dairy development.

In this paper we would like to introduce a concept of 5 S for nurturing inclusion of these small farmers and communities with the emerging industry structure of medium to large scale commercial dairy farmers. The 5 S model will help the industry by creating a critical mass of high quality farm fresh milk for justifying the investment at block or district levels for processing milk and making value added products.

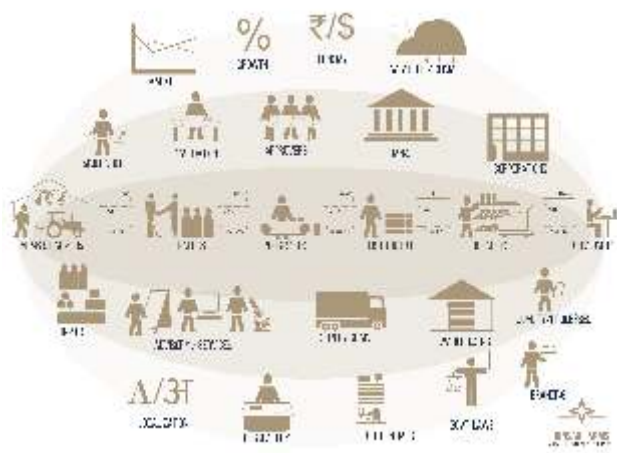
The 5 S model could be explained as follows :



**5S model for community inclusion
by Suruchi Consultants ©2015**

Skill development : At all nine levels of commercial dairy farming , skill plays an overarching role as the most important critical success factor for profitability of dairy farming. It is very difficult for a small and marginal farmers to get this skill developed on his own and it could be achieved through community inclusion by the existing and emerging commercial dairy farms. Commercial dairy farms have to manage skilling and multi skilling as a continual process at farms. The key learning and insights later on could be disseminated to the nearby communities so as to ensure better animal health management and quality milk production.

Few such models wherein the entrepreneur is focusing more on the community based commercial dairy farm development by adopting village(s) rather than creating a large farm on its own. The entrepreneur with his resources and competence could create a knowledge environment as well as robust market linkages using the latest techniques of social media, better packaging and supply chain management. Such effort may also be aligned with government run dairy extension services for better efficiencies and effectiveness. A symbolic model for carrying out such initiative has been shown as below.



Shared resources : The first principle of inclusion is to utilize available resources to curb exclusion. One of the major factor of exclusion of small and marginal farmer from the main stream dairy development is availability of resources at their end. As of now these small milk farmers are supported through cooperative structure in some part of the country but their petty requirements of money is not met properly except for 5-6 states where cooperative structure is strong and Federations are making profits. Most of the state run cooperatives themselves are not in a good financial situation due to their operational inefficiencies & poor management.

A few of them were till late dependant upon high level of government subsidies for supporting farmers pouring milk to them. It may not be the right practice to support federations linked farmers and leave others because they are pouring milk to the private dairy owners. It creates an imbalance and does not ensure equal level playing field for healthy competition. A system need to be created so that the available resources for dairy development could be utilized equally at all levels of milk production.

The existing and emerging dairy farms may also keep some reserve of their resources so as to strengthen the communities around so as to create a sustainable eco system. The resources to be shared could be money, knowledge, technology, high skilled man-power and a progressive thinking mind-set. There could also be models like shared milking being used in New Zealand or livestock leasing as in case of Canada.

Support Infrastructure : In India there have been multitude of schemes for dairy development . The latest of them being National Dairy Plan. On the face of it the scheme looks very attractive and the performance results are also impressive but when looked in depth it may not be following the path of true inclusion. The availability of funds have been majorly restricted to top milk producing states and are getting routed for building capacities of the state run federations and their cooperative network.

There has been a great potential of developing the support infrastructure under PPP mode in different areas as follows :

- a. for milk production (by supporting existing commercial dairy farms),
- b. milk collection to chilling and processing (through PPP mode with existing local dairy players),
- c. feed, fodder, animal health and breeding (by developing individual entrepreneurs through skill development and training for best practices)

A special program like ODOP i.e one district one product could be initiated by setting up a common dairy service centre with required infrastructure so as to meet the value addition requirements of small and marginal players at local level.

Scale Creation : All development schemes at micro level could be designed to create critical mass or sufficient scale at local or regional level and not at national level. Dairy

comes under fragmented industries as per the theory of strategy given by Michael Porter. It means that the local requirement should be met through local produce. Even the most successful cooperative model in India is also creating a situation of monopoly.

Large cooperative is a bigger killer of local federations than the private sector in most of the cases. There has been a strong competitor rivalry being created by a single brand which is eating away all the opportunities for local and regional players to create value. New category of fresh farm milk is the only category which has got some risk proofing while facing the giants in the market place. The government should take some measures so as to protect the interest of local players so that instead of cut throat competition, there could be a collaborative competition.

Self reliance : This whole model of 5S is to create self reliance at the farmer as well as community level. If we look at the current situation then it is the market dynamics at domestic as well as global level which is affecting the realization of the dairy farmers than the input costs like feed and fodder. The last 3 years have shown all kinds of possible scenarios to the farmers as well as to other stakeholders. The abrupt policies of government to provide export subsidies for milk powder at times when the international price was also high, gave opportunities to the large dairy plant owners only to make money.

The farmers also got a part of that realization but to a certain extent, the same was set off by the increase in feed prices during the same period. The consumer of fresh milk was affected the most in towns as the milk prices were soaring even at the peak time of flush around two years back.

The opportunity which got created due to global market dynamics as well as government policies were not sustainable. The farmer on the other hand expanded his production capacity in anticipation of a similar range of prices in the next season while the feed prices were also dropping. But this time the wave was in opposite direction. The global prices crashed and so the prices of milk in India. The farmers in a couple of states saw the worst realization for their milk. In this period the large dairy players (which were present in fresh milk category) began to make big money by neither increasing the milk prices for farmers nor decreasing it for the consumers. Poor integration of the value chain has created silos and almost everyone in the value chain is more concerned about his level of margin without getting it shared with the other link.

By implementing 5 S model we link all the farmers and farms with the main stream and create a feeling of self reliance wherein at a local level all the players could decide on their fate through participatory management and evaluation. We may need to go beyond cooperative and begin to adopt villages, communities and cluster by multiple stakeholders.

This calls for the need of a regulator who could keep a sharp eye on all the activities happening around. The business of government is not doing business at all. The business of government is more of a regulator or a facilitator of process of inclusion. We recommend that this model of 5 S may be discussed in a round table at different levels of stakeholders and could be used as a food for thought for more effective utilization of available resources for holistic dairy development in India. We should not forget that if actions are not taken up at this stage then most likely post 2022 we may become a net importer of milk and milk products.



4. Critical Success Factors in **COMMERCIAL DAIRY FARMING IN INDIA**



Commercial dairy farming is a synthetic field of study. It is not dependant on a single faculty of science or management. A successful commercial dairy farm is like an orchestra where numerous pieces of instruments of varied kinds integrate to produce an everlasting melodious symphony of music. In India the management of commercial dairy farming is largely controlled by the principles of veterinary science rather than anything else. It may be attributed to the following factors :

- a. Poor adaptability of cross bred cows in Indian environment
- b. Poor skill at the farm level to diagnose and differentiate among the problems arising out in animals due to farm management or animal health or feeding management at level.
- c. Cross bred cows due to their high productivity are the first choice of an entrepreneurs at a commercial dairy farms.
- d. At conventional commercial dairy farms the problems occur more due to optimization of resources while keeping a mixed set of animals like buffaloes, indigenus cows and at times cross bred cows. The management practices for such a mixed lot have not been disseminated thoroughly.

In order to understand the critical success factor for profitability of commercial dairy farming in India we need to have a holistic point of view and for that we shall be using a nine element model of managing and implementing best practices at a commercial dairy farm.

This model has been adapted from a seminal work by Dr John Moran from Australia in which he tried to develop a right context for developing best practices for the profitability of a commercial dairy farm. We shall now be discussing the critical success factors at each of these nine elements to have a 360 degree view of the whole situation. The model has been shown as an illustration on the page no. 12.

In Indian context all milk are treated the same. The customer talks about all kinds of adulteration and malpractice happening in milk and milk products but still prefer to buy milk from a local milk man with no identity and integrity. The pouch milk from factories are considered as powder milk or soya milk while the one in tetra pack is considered as a product creating a deep hole in the pocket.

The farm fresh milk is the new category which is picking up and is being positioned as the milk being produced at the farm in a hygienic environment and free from any hormone or antibiotics. It is becoming first choice of young high income class families working in IT or MNC environment with an exposure to developed world. Success of commercial dairy farming in India would depend mainly on the level of patronization this generation would provide to this category of milk.

1. Soil and Forage Management

Oceania perspective on key success factors for commercial dairy farming clearly defines as 3F or Feed, Feed and Feed. Most of the times in Indian conditions an entrepreneur neglects the three most important part in milk production i.e

- a. Feed requirements of the animals in an year
- b. Land required to generate and produce that much of feed and
- c. Yield of respective feed per unit of land.

A deep understanding of all these three points is a must before you decide the size of the farm. This factor is also the most contributing factor for defining future typical farm size leading to profitability as researched by IFCN world wide. An input from an agronomist will define the productivity and diversity of fodder crops on the chosen land in the region. A further input from the seed supplier and an agriculture engineer would ensure that the harvest matches the potential of the seed to a large extent without any surprise. So the profitability of a commercial dairy farm begins with optimization of feed, land and seed at the outset.

“Availability of Land is the most common factor which brings entrepreneurs to this business so let them evaluate the quality of the land from feed perspective also.”

2. Young Stock Management

Young stock or calves are the most precious asset of any commercial dairy farm. It is a myth that you require a best cow or someone is offering you the best cow. What a farm requires is a good cow with healthy reproductive system and free from any serious disease. The best cow is developed and produced at the farm through feeding and nutrition, comfort management, appropriate genetic control from the stage of infancy. In Indian conditions, nurturing male calves may be a deterrent to the profitability of the farm so they need to be culled out through existing network of community based cow hostels. Ignoring calves at any stage may have a serious impact on the bottom line of the farm.

“In our culture the boy in the family is responsible for taking care of the family in future and torch bearer of the name of the family. Similarly the female calf at the farm should be considered and treated so as the one who would bring laurels and prosperity in the farm in future.”

3. Nutrition and Feeding management

We need to learn on how to differentiate between feeding and nutrition. Feeding is an activity and Nutrition is a science. The convergence of both creates a concept of balanced mixed ration. Poultry industry has done wonderfully well in this aspect as they integrated all aspects of management to improve feed conversion ratio for weight gain of the animal. In a dairy farm a similar attempt is required to improve feed

conversion ratio into milk. There are numerous local and international companies working in this area in India for improving the yield of the animal without putting her into stress through nutritional additives. Creating consistency in the feed quality and increasing use of hay and silage is not only ensuring year long availability of the same kind of fodder for the animal, irrespective of seasonality but improvement in productivity also. Our alternative sourcing of nutritional supplement from Ayurvedic and medicinal plants are also showing very good results even on cross bred cows. The days of offering similar feed for all the animals are numbered as the bottom line is directly linked to the differential balanced mixed ration as per the diverse group of animals at farm in terms of age, productivity, genetic potential and health conditions.

“Irrespective of social class in India, around 46% children under 5 years are malnourished. It is not because they are not fed, it is because they are not fed the nutritional food.”

4. Disease prevention and control

Animal health is a function of feed and nutrition and also of culture (in case of indigenous cattle) and comfort (in case of cross bred with exotic genetic). Indigenous cattle are more immune to most of the diseases and they show better self corrective mechanism in the times of calamity. A robust vaccination and health management protocol is a must for all the animals at the farm. If a farm could afford then preventive hardware and software for prognosis could be installed which could very well make the farm team aware of animal health problems in advance. Creating an SOP and sticking to that religiously is the key to success. All diseases related to reproduction and movement of the animal should be at the top priority of the health protocol at the farm. The farm team must also be imparted with the skill of identifying animal conditions and relating it to some diseases in advance. The veterinary doctor visits to the farm should be more of a preventive maintenance rather than a break down maintenance.

“Do we keep a doctor always at home with us? if No then why do we require one at farm?”

5. Reproductive Management

Dairy is a business of production and reproduction. America having a not so old history of cow rearing followed the principle of 3 R i.e recording, recording and recording. Americans created highest milk yielding animal on earth through continuous improvement in reproductive management of the herd by managing and reviewing records. They did not miss any data of any animal over almost three centuries. Milk is the most valuable product with very high potential for value creation. In a profitable farm a cow without milk is a direct loss and natural milk production is a function of reproduction management of an animal. Reproductive



Nine element model on Commercial dairy farm productivity and Profitability

management is at the locus of the farm's profitability. The most important Key performance indicator for any commercial dairy farm is linked to the first age of calving and inter-calving period of any cow. Both of these indicators have to be optimised at the lowest possible levels through a strong reproduction management program. It is the strategic necessity of all other functions at farm to ensure production and reproduction in the farm at desired level. Heat detection in animals could be done through visual identification as well as activity monitoring and herd management systems.

The inventory of records of all the animals on their activity and heat cycles help the farm to achieve its KPI related to reproduction. Entrepreneur could plan well in advance to invest in these technologies for better returns on farm. There are very good technologies available to ensure this aspect by identifying the animal in heat but no technology in the world could actually beat the importance of skill to carry out artificial insemination and making it a success in one go. This aspect of management could be considered as a separate function apart from genetics.

If you can not do it right the first time, how would you ensure doing it right next time ?

6. Genetics

It is the most neglected area in Indian dairy farm business. Europeans with not a very old history of cattle rearing had framed and followed a cardinal rule of 3G i.e Genetics, Genetics and Genetics. Identification of germ-plasm and defining the genotype of an animal is the key to success for any commercial dairy farm. A genetically advanced animal not only ensures large quantities of milk but also perform better on feed conversion ratios. Genetically our indigenous animals and buffaloes are more immune to diseases, indifferent to heat stress and produces A2 milk which is supposed to be more healthier than in many aspect than the milk from exotic breed.

On the other side Cross bred animals using exotic germ-plasm behave just the opposite in Indian conditions and produces A1 milk which is found to have a type of protein responsible for diabetes, autism and hyper tension. Genetics is the game changer and by using appropriate mutative techniques we could bring best of both worlds in our animals.

Sexed semen technologies (type of semen which produces female calf only) is another tool by which one could reduce the pressure of male calves at dairy farm significantly. It is a costly semen product so must be used on either healthy heifers or high quality cows with healthy reproductive system. In India use of imported genetics is not allowed in all the states so the entrepreneur must enquire about the same from the state animal husbandry department before setting up a

dairy farm before planning for using imported semen of any type.

7. Skill Development

Dairying is the oldest farm based activity in India and probably we have the longest history of cow rearing in the world. The knowledge is good enough at a small holder farm level. When it comes to commercial dairy farming in India then we completely lack skill in the area of farm management. Farm management is different from cow management. We have developed skill in the area of health management and to some extent in the area of artificial insemination and management of mechanical farm operations. The areas which require immediate attention are farm costing and accounting, feed and fodder management, nutrition and balanced mixed ration, cow comfort management, calf management, quality and hygiene management, manure management and management of alternative source of energy at farm. We hardly have any institution providing farm management as a high end professional course. There is a need for training manpower at farm and also to build a scope for multiskilling. The profitability gets hampered greatly once a high cost manager enters with high level of indispensability. Our commercial dairy farms can afford a high cost trainer for a short duration but not a high cost farm manager for years.

Instead of appointing a high cost chef in the kitchen it is better to train the staff on how to cook ?

8. Manure management & renewable energy

A cow is the most efficient bio fermenter. It eats grass and gives milk and valuable manure and urine as a by product. Every farm need to look at conversion opportunity of waste into something commercially tradable for better profitability at farm. A farm offers two significant opportunities for monetizing renewable energies.

The first one is from manure and the second one is by using the free space at the roof top of the large sheds. The empty space thus could be utilised for fixing solar panels and using the energy or selling it back to the grid. Now solar energy set up may not fetch you any subsidy but provision for selling excess energy back to the grid is allowed every where in India. Biogas is the other type which is produced using the ever increasing manure and waste from animal and its follower. There are three options which bio gas provide, namely;

- a. Heating purposes in milk processing or cooking at labour quarters
 - b. Producing electricity by setting up a Bio Gas engine Set (subsidy available for this purpose)
 - c. Bottling methane for selling at market place.
- Utilising all renewable energy opportunities at farm is more apt for our conditions as the power cost is amongst the top 3 costs at farm after feed.

9. Milk harvesting and Value addition

A commercial dairy farm can be defined as the one in which rearing of animals is done to produce and sell milk. It is mandatory for these farms to produce high quality milk under hygienic conditions from healthy cows. The farm must ensure proper harvesting of milk using appropriate milking system. In most states of India there has been subsidy on installing milking machine(s) or parlor. Good milk manufacturing practices must be followed while milking the animals and it must be ensured that the produced milk is immediately cooled down below 4 deg c for better value addition. A small processing plant at farm could

also be set up so as to pasteurize, homogenise and pack it (as per requirements of the customer) for getting very high value from the consumers. Fresh farm milk itself is a new category of milk in India and somewhere replacing that old system of buying milk from those filthy and shabby animal sheds in which the milking was done by inducing hormones in an unregulated manner. A modern commercial dairy farm could also give an opportunity to its consumer for a visit on weekends. A similar exercise for school kids who could become a spokes person for the farm at their household levels. Fresh farm milk is fetching roughly 20% to 100% more price than the milk from conventional milk plants which

Herd milk yield (kg/cow/day)	Adequacy of dairy farm management practices
5 7	Very poor feeding and herd management and low genetic merit cows (or milking buffalo)
9	Typical of many SE Asian smallholder farms, even with high grade Friesians
11 13 15 17 19	Gradual response with grade and crossbred Friesian cows to improved feeding, herd, young stock and shed management. <i>Milk yields of 15 kg/day are considered acceptable by many government dairy advisers.</i>
20	Potential level in lowland humid tropics following improved management of body condition throughout lactation
25	High genetic merit cows in tropical highlands or lowland dry tropics with excellent farm management
30	Typical peak milk yields in herds with 25 kg/cow/day rolling herd averages. This is an outcome of proper recording and meeting the KPIs on year to year basis through robust farm management systems and an efficient team.
35	Unrealistic in tropical Asia except where all major constraints to milk production have been overcome and the farm is under very high technological interventions and a team of expert farm technicians and managers at all nine levels of farm management. This is a point from where Economies of Scale may unleash above the threshold.

are run by private sector and the government. There has been mushroom growth of such players around large cities like Metros and mini metros. It has become mandatory for all dairy actors handling more than 100 liters of milk to get registered under Food safety act in India but more stringent regulatory requirements are needed to curb these low time seasonal players with no back ground of farm or processing facility.

Milk yield of the animal is considered as the most important indicator for profitability. The chart on page no. 14 indicates the factors responsible for getting the required yield in subtropical conditions in south Asian countries like India. Now we can see that improvement in milk yield is attributed to different kinds of farm management techniques rather than feed or health management alone.

To sum up, the main concerns in commercial dairy farming is linked to the various facets of milk production like investment, funding, cash flow, economic efficiency, milk quality, feeding, veterinary and other relevant services. It needs to be seen what kind of support mechanism through extension services or trained and skilled consultancy services to overcome these constraints are taken up in the near future to ensure a sustainable milk supply in the country.



5. Government Policies And Initiatives

Press Information Bureau

(Government of India Ministry of Agriculture)

22-December-2014 15:28 IST

Year end Review for the Ministry of Agriculture for the Year 2014-15

1. Agriculture sector employs 54.6% of the total workforce.
2. The total Share of Agriculture & Allied Sectors (Including Agriculture, Livestock, forestry and fishery sub sectors) in terms of percentage of Gross Domestic Product is 13.9 percent during 2013-14 at 2004-05 prices. [As per the estimates released by Central Statistics Office]
3. Rashtriya Gokul Mission : India ranks first among the world's milk producing Nations are such 1998 and milk production peaked at 137.97 million tonnes in 2013-14. India has the largest bovine population in the world. An allocation of Rs. 50 crore for development of indigenous cattle breed has been provided which would be increased to Rs 550 crores later.
4. Rail Milk Network : In order to promote Agri Rail Network for transportation of milk, overs have been placed by AMUL and NDDB on behalf of Dairy Cooperative Federations for procurement of 36 new Rail Milk Tankers and will be made available by Railways. This will help in movement of milk from milk surplus areas to areas of demand providing dairy farmers with greater market areas.
5. Target for providing institutional agricultural credit to farmers during 2014-15 has been enhanced to Rs. 8 lakh crore which is expected to surpass.
6. Agriculture credit at a concessional rate of 7% with an interest subvention of 3% for timely repayment will continue during 2014-15. This concessional rates have also been requested for dairy industry and dairy farming. Few states have requested for treating tax free income from dairy farming also at par with agriculture income.
7. An allocation of Rs. 5,000 crore for 2014-15 has been made for scientific warehousing infrastructure for increasing shelf life of agricultural produce and thereby increasing the earning capacity of farmers. Special request from a few states for cold chain requirement of dairy has also been made.
8. A higher allocation of Rs. 25,000 crore has been made to the corpus of Rural Infrastructure Development Fund during 2014-15 which helps in creation of infrastructure in agriculture and rural sectors.
9. An initial corpus of Rs. 4,000 crore is being created to set up long term rural credit fund in NABARD to give a boost to long term investment credit in agriculture.
10. For ensuring increased and uninterrupted credit flow to farmers and to avoid high cost market borrowings by NABARD an amount of Rs. 50,000 crore during 2014-15 has been made for Short Term Co-operative Rural Credit (STCRC- refinance fund).
11. Government has initiated a scheme for Soil Health Card for every farmer in a mission mode with an initial allocation of Rs. 100 crore in 2014-15.
12. An additional amount of Rs. 56 crore has been made to set up 100 mobile soil testing laboratories countrywide. It would help farmers to decide on the fodder crops more scientifically.
13. To protect landless farmers from money lenders 5 lakh joint farming groups of Bhoomiheen Kisan will be financed through NABARD in the current financial year.
14. A Kisan TV - Channel dedicated to agriculture will be launched with the initial allocation of Rs. 100 crores in the current financial year.
15. An initial allocation of Rs. 200 crore has been allocated for establishing Agriculture Universities in Andhra Pradesh and Rajasthan and Horticulture Universities in Telangana and Haryana.
16. An allocation of Rs. 100 crore has been made in the current financial year for setting up of two institutions of excellence in Assam and Jharkhand which will be at par with Indian Agricultural Research Institute, Pusa.
17. An allocation of Rs. 100 crore is made for 2014-15 for setting up Agritech Infrastructure Fund with a view to increasing public and private investments in agriculture and making farming competitive and profitable.
18. Various initiatives taken by Government to support agriculture and allied sectors is to sustain the growth rate at 4%.
19. In order to increase profitability for small and marginal farmers, Rs. 200 crore has been earmarked for setting up of 2000 Farmer Producer Organisations. Dairy could be amongst the top priority sector for this initiative.
20. Wage employment under MGNREGA will be mainly used for more productive asset creation substantially linked to agriculture & allied activities. Recently in a conference growing grasses in forest land under MNREGA and allowing cattle to graze has been discussed by a minister.
21. Sum of Rs. 14,389 crore for Pradhan Mantri Gram Sadak Yojana for 2014-15 which will improve access for rural population including farmers.

22. With a view to develop commercial organic farming in the North Eastern Region a sum of Rs. 100 crore has been allocated. Dairy could have a symbiotic relationship with Tea estates where in around 25% land is allowed to be used for non Tea business.
 23. Central Government recognizes and discharges its responsibility to assist State Governments in overall development of Agriculture sector. Effective policy measures are in position to improve agricultural production and productivity and address problems of farmers. State Governments are also impressed upon to allocate adequate funds for development of agriculture sector in State plan, as well as initiate other measures required for achieving targeted agricultural growth rate and address problem of farmers.
- j. Promoting innovative pilot projects and mainstreaming of successful pilots relating to livestock sector.
 - k. Providing infrastructure and linkage for marketing, processing and value addition, as forward linkage for the farmer's enterprises.
 - l. Promoting risk management measures including livestock insurance for farmers.
 - m. Promoting activities to control and prevent animal diseases, environmental pollution, promoting efforts towards food safety and quality, and supply of quality hides and skins through timely recovery of carcasses.
 - n. Encouraging community participation on sustainable practices related to animal husbandry, involvement of community in breed conservation and creation of resource map for the states.

Special Programs for dairy development:

1. National Livestock Mission (NLM) :

The NLM intends to achieve the following objectives:

- a. Sustainable growth and development of livestock sector, including poultry
- b. Increasing availability of fodder and feed to substantially reduce the demand – supply gap through measures which include more area coverage under quality fodder seeds, technology promotion, extension, post-harvest management and processing in consonance with diverse agroclimatic condition.
- c. Accelerating production of quality fodder and fodder seeds through effective seed production chain (Nucleus - Breeder - Foundation - Certified- Truthfully labelled, etc.) with active involvement of farmers and in collaboration with the dairy / farmers cooperatives, seed corporations, and private sector enterprises.
- d. Establishing convergence and synergy among ongoing Plan programmes and stakeholders for sustainable livestock development.
- e. Promoting applied research in prioritized areas of concern in animal nutrition and livestock production.
- f. Capacity building of state functionaries and livestock owners through strengthened extension machinery to provide quality extension service to farmers.
- g. Promoting skill based training and dissemination of technologies for reducing cost of production, and improving production of livestock sector
- h. Promoting initiatives for conservation and genetic up gradation of indigenous breeds of livestock (except bovines which are being covered under another scheme of the Ministry) in collaboration with farmers / farmers' groups / cooperatives, etc.
- i. Encouraging formation of groups of farmers and cooperatives / producers' companies of small and marginal farmers / livestock owners.

2. Rashtriya Gokul Mission :

Rashtriya Gokul Mission a project under the National Program for Bovine Breeding and Dairy Development has been launched with the objective of conserving and developing indigenous breeds in a focused and scientific manner. The productivity of the indigenous breeds will be enhanced to its potential through professional farm management and superior nutrition, as well as gradation of indigenous bovine germ-plasm . The total outlay of the project is Rs. 550 crores (around 85 Million US-\$) .

3. Cattle and Buffalo breeding policy in different states under National Project for Cattle and Buffalo Breeding (NPCBB)

Policy Objectives:

- Preservation and conservation of indigenous breeds in their breeding tract through selective breeding.
- Use of recognized indigenous breeds (Gir, Sahiwal, Tharparkar, Red Sindhi, Rathi, Haryana, Ongole, Deoni) for grading up indigenous non-descript stock.
- Crossbreeding of nondescript cattle population with exotic breed's min resource rich areas. Jersey and Holstein Friesian (breed of choice).
- Grading up of nondescript buffaloes with recognized breeds (Murrah, Surti, Mehsani, Jaffarabadi, Nili Ravi,)
- Preservation and conservation of indigenous buffalo breeds in their breeding tract through selective breeding.

4. Dairy Entrepreneurship Development Schemes

This scheme is run in collaboration with NABARD but as

on date is covering small farms and farmers upto 10 animals. In one of the recent steering committee meetings it has been suggested to extend the support to upto 25 animals at state level which is a very good commendable. In changing scenario this scheme may be extended for medium sized farm from 50 to 200 also. A similar successful initiative has been taken up by Government of Uttar Pradesh under their Kamdhenu Scheme.

Recently KVIC is also offering some good schemes for milk processing plant in 25 lacs and 50 lacs range (to be announced soon) under Pradhan MantriRojgarYojana.

5. **Foot & Mouth Disease Control Programme (FMD-CP)**

FMD-CP was initiated during 10th Plan (2003-04) in 54 identified districts spread over eight states and five union territories and extended to cover additional 167 districts during 11th Plan. During 12th Plan (Since February, 2014), all the remaining districts of Uttar Pradesh and all the districts of Rajasthan have been included under the programme thus covering 313 districts as of now. It has been decided that FMD-CP will be extended to whole of India during 12th Plan subject to availability of funds and vaccine.

States of Rajasthan and Uttar Pradesh have therefore to strengthen their veterinary services for intensive vaccination, pre/post vaccination, collection of samples for sero monitoring and the sero surveillance for FMD prevention and control. States under FMD-CP also need to ensure availability of adequate manpower for carrying out vaccination in campaign mode, maintenance of cold chain facilities for storage of FMD vaccine in the field, availability of the logistics for proper vaccination, well in advance so as to complete the six monthly vaccinations within the stipulated time of 30 days.

6. **Policy on cow slaughter** : In most states of India slaughtering of cow, bull is prohibited, however in a few states slaughtering is allowed on fit to slaughter basis. This policy needs a review as non productive animals or sick animals are a major area of concern for the profitability of a commercial dairy farm. These unproductive animals are a big burden on available feed and fodder resources which are otherwise running under heavy shortage.

7. **Central Herd Registration Scheme**

Objectives: This scheme is also linked to National Livestock Mission. The scheme aims to, in case of cattle and buffalo, fulfill the following objectives:-

- Identification and location of superior germ plasm.
- Using this data for producing superior germ plasm.
- Preservation of indigenous germ plasm.
- Milk recording of cattle and buffaloes as the first step for improving dairy cattle milk production.

8. **National Dairy Plan I**

National Dairy Plan Phase I (NDP I) is a Central Sector Scheme for a period of 2011-12 to 2016-17. NDP I is being implemented with a total investment of about 2242 crore comprising 1584 crore as International Development Association (IDA) credit, 176 crore as Government of India share, 282 crore as share of End Implementing Agencies (EIAs) that will carry out the projects in participating states and 200 crore by National Dairy Development Board and its subsidiaries for providing technical and implementation support to the project.

Objectives

NDP I is a scientifically planned multi-state initiative with the following Project Development Objectives :

The back drop of National Dairy Plan is increase milk production in India so as to meet the demand of 180 Mill MT by 2021. The plan focuses on a holistic growth of the industry by covering genetics, health, feeding and extension.

- To help increase productivity of milch animals and thereby increase milk production to meet the rapidly growing demand for milk.
- To help provide rural milk producers with greater access to the organized milk-processing sector.

These objectives would be pursued through adoption of focused scientific and systematic processes in provision of technical inputs supported by appropriate policy and regulatory measures.

Project Area

NDP I is focussing on 14 major milk producing states namely Andhra Pradesh, Bihar, Gujarat, Haryana, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh and West Bengal which together account for over 90% of the country's milk production. Coverage of NDP I will however be across the country in terms of benefits accruing from the scheme

6. Recommendations

The business of government is not doing business. Indian dairy industry has come to a cross roads and the government has to play the role of a wise mentor and a strict regulator. We can not expect everything to be done by government alone.

All the stakeholders like private sector, cooperatives, state federations, civil society, research institute, intermediaries, feed, genetics and medicine suppliers, technology provider, marketers, quality certifying agencies, environment workers, NGOs, Public sectors and their CSR wings and all relevant government departments need to come together for providing impetus to this industry.

We have conceived a dairy hub model which could be created at various dairy zones levels. These zones might be at block, district or state levels. These dairy zones will represent high level of homogeneity in the requirements for dairy development.

This homogeneity could be identified through mapping and inventorizing the practices at farm level at national level. Dairy zones would be evolving out of the scattered diagrams and thus cluster formation. The concept of this dairy hub could create a one stop solution to all dairy based requirements in the specified zones.

The critical success factor for such hubs would be a Public Private partnership model. There could be a local entrepreneur with stake in this model for the long term sustainability without recurring demand from government to subsidize such hubs. The dairy hub may be developed and implemented based on the following objectives.

- a. To create linkages with existing dairy farms, farmers and cattle in different zones through registration and monitoring of production, feeding and breeding practices.
- b. To develop a zone based strategy for choice of genetics and germ-plasm for the farmers for better productivity and sustainability. All the relevant stakeholders may provide skills and training as well as distribution of required genetics services to farmers through these hubs.
- c. The hub would ensure identifying all the factors responsible for low profitability of farmers e.g high feed cost, old/unproductive animals, poor health and genetics, poor market linkages, exploitation through middleman, unavailability of financial support at micro and macro level, etc. These factors would then be shared with various stakeholders and if required route of policy and advocacy may be adopted for sensitive issues like cow slaughter.

- d. The hub would ensure availability of all medicines and vaccines required for the prevailing problems of cattle in that zone.
- e. The hub may ensure training and skill development of community worker and particularly woman self help groups to become common resource person for disease identification and first aid treatment of the animals. The hub may enroll local youth for para-vet and AI training programs also.
- f. These hub could have a model dairy farm with a milk collection and chilling as well as a mini processing plant so as to impart skill development and training to local youth for all aspects of dairy development.
- h. These hub could map the local area for soil and agronomy to ensure sufficient land utilization for fodder growing through training under the aegis of leading seed suppliers for fodder crops.
- i. The hub would also ensure training on compound feed making and mineral mixture for total mixed rations at small and marginal farm levels also.
- j. One of the most important responsibility of this hub would be to develop, maintain and run hygienic terminal market for buying and selling of animals. The hub may ensure proper testing and recording of animals at each sales. They must also record prices of the animals and create some models for pricing of animals objectively rather than through subjective orientation which is prevailing today.
- k. The hub should become a nodal point for implementation of any government run scheme for better out reach to farmers in need. The hub could also work closely with Universities and other product research institutions for better modeling of Indian dairy industry.
- l. The hub must also maintain records of all enrolled farmers for milk production, price paid to them and their linkage in the value chain.

All these points are basically to improve the dairy farmer affluence or spending power as discussed in the following empirical equation being mentioned by us in our Dairy industry vision 2030 documents.

Growth in dairy industry could be defined empirically as:

$$Dg = Pa \times Ay \times Dfa \times Lf \times li \times Mo$$

- | | |
|--|--|
| Dg = Dairy Growth potential | Lf = Land availability for feed |
| Pa = Population of milch animals | li = Investment available for infrastructure for milk production, health, feed and nutrition, breeding, chilling, quality and logistics |
| Ay = Average yield of the animal | Mo = Market opportunity |
| Dfa = Dairy farmer affluence as representation of the intent of a dairy farmer to consider dairying as a full time business | |



7. IFCN and Its Research Paradigm

About IFCN

IFCN is the global dairy research network. By addressing challenges in the dairy world, IFCN can contribute to a more resilient and more sustainable future for all of us.

What does IFCN do?

IFCN provides globally comparable dairy data, outstanding knowledge and inspiration to widen your imagination. IFCN creates a better understanding of the global dairy world. The IFCN - International Farm Comparison Network - started in 2000 with the basics - the cow and the dairy farmer. Step by step we deepen and widen the knowledge base every year. The knowledge creation is done via a network of dairy researchers from over 90 countries contributing to our annual processes, managed by the IFCN Dairy Research Center with currently 15 dairy researchers. The IFCN economic models and standards ensure comparability between countries and provide a global picture. More than 100 dairy related companies and organisations support the IFCN and use the knowledge to better solve challenges in the dairy world.

IFCN has innovative ways to share the knowledge with its members and with the dairy world as a whole. The IFCN events are a key element in developing the network spirit.

Analysing the dairy world using the Typical farm approach

In the IFCN, a typical farm represents a certain production system, farm size, production technology used and the related milk volume in a country/dairy region (HEMME 2000). The goal is to have at least two (and up to six) typical farms for each region. The first farm is an average sized farm with an average management performance. The second farm is larger than the first one but also having an average management performance, to show economies of scale. The key issue in creating high quality farm comparison results is to apply a uniform method to all farms. For further details please contact us at info@ifcndairy.org or visit us at www.ifcndairy.org



World Dairy Map 2015

The World Dairy Map 2015 shows us the dairy economic results of the Dairy Report 2014 representing 98% of the world milk production volume. The map gives us an overview of the major economic parameters like milk price, feed price, margin over compound feed costs and cost of milk production at monthly and yearly intervals since 2006. The information on the top 20 milk processors, milk production and milk delivered gives an overview of the dairy supply chain in the world.

IFCN Baseline Results & outlook 2025

The IFCN Baseline is produced every year to show the most probable scenario of the Dairy World in the next 10 years and to show perspective guide line for dairy

industries and all related business. The IFCN results for 2015 predicts that the world milk production will grow on an average of 2.4% reaching 1059 mill ton ECM in 2025. The highest milk production increase is expected in South Asia. It is likely that India and Pakistan may shift from self-sufficient situation to importer under existing conditions.

The world milk demand is likely to grow at an average growth rate of 2.4% per annum meaning an additional 240 million ton of milk ECM to be produced by 2025. This demand growth is likely to be met by an average increase in herd productivity of 1.3% and animal population by 1%. The average farm size will show a rising trend from present 2.9 animals to 3.8 animals indicating decrease in farm numbers.

4th IFCN Regional Workshop – New Delhi, India
25th November 2015

How to sustainably grow milk production in India
at price consumers can afford?

For details Contact prashant.tripathi@ifcndairy.org or visit www.ifcndairy.org



Target	Module	Deliverables
New Projects	Navigator	Site selection/suitability report Raw milk potential area report Potential market report Technology suitability report Channel selection report
New Projects	Simulator	Technical prefeasibility report Commercial prefeasibility report Techno-commercial feasibility report for banks
New Projects	Drawing board	Site layout Plant and machinery layout Process layout P&I diagrams Masterplan Process and piping layouts Drainage and Effluent layout Civil and structural drawings Electrical and cabling drawings Utilities layout Project timeline charts
New Projects	Accerelator	Tender documents for complete plant Comparative of offers Order processing and supply agreements Onsite /vendor site inspection Supervising erection and installation Supervising commissioning Supervising project stabilization
New/Existing Projects seeking expansion or diversification	Integrator	Buying from multiple vendors Integration services of all the vendor in a project Turnkey direct supplies
Existing Projects seeking expansion or diversification or acquisition	Assessor	Due diligence reports on - Technology - Capital expenditure - Operational cost - Quality capability - Manpower capability - Market - Raw milk procurement potential - Viability assessment
New/Existing Projects seeking expansion or diversification	Motivator	Mentoring and capacity building for - Top management - Middle management - Operator in different sections - Food safety coaching and manual preparation - Functional areas - SOP and manual development - Export Inspection certification - Profit making

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