

Review Article

Challenges and Strategies for Sustainable Dairy Farming in India: A Review

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ABSTRACT

India is undoubtedly the largest milk producing country of world. India has highest population of cow and buffalo. Since Indian independence dairy industry is showing steady and robust growth rate of 3 percent. Sector has seen huge improvement in supply chain and milk processing facilities. Despite of robust growth, cattle farms has not adopted modernization and cattle farms are facing multiple challenges. Livestock plays an important role in Indian economy. It also provides employment to about 8.8 % of the population in India. India has vast livestock resources. Livestock sector contributes 4.11% GDP and 25.6% of total Agriculture GDP. Livestock production is the vital sector which action a major source of income to the impoverished rural households throughout the world. Livestock equip people with food, income, draught power and fertilizer and act as the major livelihood means of millions of our country, where crop farming faces challenges India is one among the fastest growing economics of the world and mainly depends on the agrarian sector as a tool for progress. Dairy sector is emerging as the highest contributor to the agricultural wealth of India, surpassing even cereals. India is the highest milk producing country in the world contributing 17% of the world production. The annual milk production in India has reached 187.7 million tonnes in 2018-19 against the 17 million tonnes in 1951 and the annual growth rate in this sector is 6.5 % which is nearly three times that of the world. Sustainable dairy farming is an interaction of many factors that influence production and reproduction environment, longevity of live and input management. Milk production is a livestock enterprise in which small-scale farmers can successfully engage in order to improve their livelihoods.

Keywords

Dairy farming,
Challenges,
Livelihood,
Livestock,
Sustainable

Introduction

Livestock plays a vital role in the Indian economy. About 20.5 million people depend upon the livestock sector for his or her livelihood. India has vast livestock resources. The livestock sector contributes 4.11% of the gross domestic product and 25.6% of the agricultural GDP. India has the most

important buffalo population within the world, with the most important livestock within the world also in India at 535.78 million. The most important number of cows in the country is 192.49 million and buffalo is 109.85 million. The contribution of dairy animal is widely recognized. Our country is blessed with vast dairy resource. Dairy farming involves a group of interaction of

many factors that influence production and reproduction, environment and management. Dairy cooperatives cover about 60,000 villages all over India and only 12-14 per cent of total milk production is canalized through organized sector. Concerted efforts should, therefore be directed towards unorganized dairy farmers by providing necessary inputs and make them to adopt newer milk production technologies. India has become the world's largest milk producer but its share in the world milk trade is very minimal. An attempt to identify problems of the farmers and to resolve the same for improving the export earnings and higher returns to dairy farmers is discussed in this paper. Various tips have also been given for efficient identification and formulation of dairy husbandry. Ever since the creation of mankind, the major thrust has been on the search for food for existence. Thus, for human population, the nature provided a continuous supply of food. Plants and animals were utilized by man as foods during the prehistoric period. Subsequent domestication of animals and evolution of crop raising activities made animals farming as a subsidiary to agriculture. In western countries, animal husbandry is even now referred to as 'Animal Agriculture'. However, of late, dairy industry has shown the ability to sustain itself as a profitable industry in many sphere over-powering the traditional dominance exercised by agriculture. This trend is witnessed all over the world. Fortunately, our country is blessed with vast dairy resources. Cattle and buffaloes population are the highest in India (Annual report, 2000). Dairying is acknowledged as the major instrument in bringing about socio-economic transformation of rural poor in our country. Milk is the second largest agricultural commodity produced in our country next only to rice. India's bovine population is about 19.2 per cent of worlds and 51.0 per

cent of Asia's population with annual production of about 121.50 million tons of milk (2011). Considering the biological value of milk protein, our traditional habit of including milk in daily dietary have been one of the most important factors that had saved millions of children of our country from developing malnutrition syndromes. Since, ever growing human population is making scarcely available land still more scarce, our aim to improve milk output should be by way of improving productivity of the animals rather than increasing the heads of bovine population. Concerted efforts should henceforth be directed towards the dairy farmers contributing major proportion of our country's milk production to provide necessary input and make them adopt newer technologies in breeding, housing, feeding, rearing and health care to ensure substantial growth in milk output. Further, even though India has become the world's largest major milk producer with the cost of milk production being very low next only to New Zealand, its share in world's milk trade is very minimal. Exports earnings through ghee, skim and whole milk powders are increasing, while import of special cheeses and butter oil is also showing an increasing trend. Under the most favourable environment, created by WTO agreement, to improve our export earnings through this sector and ensure better returns to dairy farmers, research efforts should be directed towards new product development through biotechnology (genetically modified cultures and convenient packaging, ensuring, higher shelf life). Further, improved compliance to milk food legislation and conforming to international standards will also aid in improving export avenues for dairy products. Indian dairy industry is so well developed on modern lines. It has acquired the technologies and engineering capabilities so well that now it is in a position to even export such technologies to other nations.

Problems Confronting Sustainable Dairy Production

There is wide variation in

Agro-climatic condition,

Biodiversity and ecology

Socio economic and cultural background of people,

Types/breeds of dairy cattle reared.

It is therefore necessary to plan for dairy development specific to each micro level, viz., a block, a village, a taluka and a district. This planning not only would result in optimum utilization of local resources, but will also ensure better viability of the programs and higher cost benefits ratio. Before embarking on planning and formulation of dairy development programs, it is necessary to consider environmental impact (water bodies' pollution, over grazing of grasslands, degradation of watersheds, deforestation). Nowadays, environmental aspect is very much stressed by the private parties and multinational agencies while funding the animal husbandry projects. Notwithstanding above consideration, it is essential to adopt the following tips for efficient identification and formulation of animal husbandry and veterinary projects: Need for identifying such technologies, which demand less capital, less time and minimum operations. Need to explore the possibilities of providing loans at the lowest interest rates with subsidies for dairy development activities. Need for Gradual improvement of existing indigenous breeds of animals. Need for Gradual removal of useless stock and replacement with high yielding superior quality animals. Need to Gradual manipulation in husbandry practice for improving animal productivity and adoption

of biotechnological interventions in feed and fodder, reproduction and growth aspects. Need for Government role in improving the supply of inputs and service to dairy farmers / beneficiaries at their doorsteps with minimum cost. Need Contribution from various nongovernmental agencies/organization to ease the problems of farmers in association with the governmental agencies. Need for developing viable farmer's cooperatives societies / federations like, milk producers cooperative societies at village and district levels, federations, boards and corporations. Need for simultaneous development of cold chain storage and marketing facilities especially for milk and milk products. Need for extensions services from the Government, Agriculture Universities, R&D institutions, federations and corporation, besides mobilization of various input services from various agencies.

Challenges in the Indian Dairy Sector

India has rapidly emerged as one of the largest producers of milk over the last three decades, accounting for 18.5% of global milk production but inefficiencies in our dairy supply chain pose a serious health risk, which needs to be addressed immediately.

Planning a Sustainable Dairy Project

It may be useful to consider the following information for planning and development of new dairy husbandry and veterinary projects which would be sustainable throughout.

Dairy Cattle Population

The country has 108.7 million buffaloes and 190.9 million cattle. First step is to know the existing number position of dairy animals in the different dairy sub zones of the country through available records such as Census report of both human and dairy cattle

populations, reports of survey conducted, actually conducting a sample survey, with these records, we can obtain the appropriate information for identification and development of suitable dairy development projects and schemes at grassroots level. The information can be classified as follows: Number of cattle, buffalo, total males and females, females in milk, dry and pregnancy, males as breeding bulls, young males and females, etc. Work animals: regional requirement and availability of drought animals. Productivity-high yielder, low yielder, etc. in respect of milk Breed-Nondescript, indigenous, exotic upgraded or crossbreed etc.

Dairy farming challenges in India

Shortage of feed/fodder

Breeding system

Education and Training

Hygiene Conditions and

Marketing and Pricing

Challenges faced by the Livestock sector in India

Improving the productivity of farm animals is one of the major challenges. The average annual milk yield of Indian cattle is 1172 kg which is only about 50 per cent of the global average. The frequent outbreaks of diseases like Foot and Mouth Diseases, Black Quarter infection; Influenza, etc. continue to affect Livestock health and lowers productivity.

India's huge population of ruminants contributes to greenhouse gases emission. Reducing greenhouse gases through

mitigation and adaptation strategies will be a major challenge. Crossbreeding of indigenous species with exotic stocks to enhance the genetic potential of different species has been successful only to a limited extent. Limited Artificial Insemination services owing to a deficiency in quality germ plasm, infrastructure and technical manpower coupled with poor conception rate following artificial insemination have been the major impediments. After more than three decades of crossbreeding, the crossbred population is only 16.6 per cent in cattle, 21.5 per cent in pigs and 5.2 per cent in sheep. The sector will also come under significant adjustment pressure to the emerging market forces. Though globalization will create avenues for increased participation in international trade, stringent food safety, and quality norms would be required. The livestock sector did not receive the policy and financial attention it deserved. The sector received only about 12 per cent of the total public expenditure on agriculture and allied sectors, which is disproportionately lesser than its contribution to agricultural GDP. The sector has been neglected by financial institutions. The share of livestock in the total agricultural credit has hardly ever exceeded 4% in the total (short-term, medium-term and long-term). The institutional mechanisms to protect animals against risk are not strong enough. Currently, only 6 per cent of the animal heads (excluding poultry) are provided insurance cover. Livestock extension has remained grossly neglected in the past. Only about 5 per cent of the farm households in India access information on livestock technology. These indicate a sub-optimal outreach of the financial and information delivery systems. Livestock derives a major part of its energy requirement from agricultural by-products and residues. Hardly 5 per cent of the cropped area is utilized to grow fodder.

Table.1 Per Capita Availability and Production of Milk in India

Year	Per Capita Availability of Milk (g/day)	Production (Million tones)
2001-2002	222	80.9
2002-2003	234	85.9
2003-2004	237	89.4
2004-2005	240	92.2
2006-2007	246	100.9
2007-2008	252	104.8
2008-2009	258	108.5
2009-2010	263	112.5
2010-2011	281	121.8
2011-2012	290	127.9
2012-2013	299	132.4
2013-2014	307	137.7
2014-2015	322	146.3
2015-2016	337	155.5
2016-2017	355	165.4
2017-2018	375	176.3
2018-2019	394	187.7

India is a deficit in dry fodder by 11 per cent, green fodder by 35 per cent and concentrates feed by 28 per cent. The common grazing lands to have been deteriorating quantitatively and qualitatively. Indian milk producers have to reduce the cost of milk production. The main reason of the high cost of milk production is due to average milk yield of Indian cattle is much less i.e. 987 kg/year compare to 6273 kg/year in Denmark, 5289 kg/year in France, , 5938 kg/year in Canada, 5462 kg/year in United Kingdom, 7038 kg/year in USA and 11000 kg/year in Israel. So farmer of other countries have to spend much times less in compare to Indian farmers.

So this high yield has been achieved through proper feed, water management and housing, apart from superior quality germ plasm. Israel cows have archive this much high milk yield by giving up high fat content. Then also per capita fat production of Israel is higher than India.

Market scenario in the India dairy sector

Increasing preference for a healthy lifestyle is expected to nudge the Indian dairy industry to grow at a compounded 15% annually till 2020

The sector is touted to emerge as a Rs. 9.4-lakh crore industry – which presents a immense opportunity for businesses.

Significantly, over the last few years, several well established Indian companies and multinationals have made efforts to move in into the sector. This has resulted in a slew of new and innovative products being launched at the upper-end of the spectrum.

However, the dynamics of the Indian dairy industry is very different from that of more developed countries. Hence, amidst the growing output, a serious health issue is also looming large, which is primarily due to our supply chain inefficiencies.

Feed Resources Available

Pasture grazing land Green fodder available and short falls in supply Availability of dry fodder Concentrate, type and cost, quality, brand Mineral mixer.

Categories of Holdings

One is landless agricultural workers, marginal, small, medium and large farmers. Other is extent of Usage of Natural Resources like Land, Human (labor), Capital and entrepreneurship.

Existing Infrastructure facilities

Veterinary hospitals, dispensaries, and rural veterinary dispensaries (veterinary primary health centers).

AI centers- AI breeding facilities with liquid or frozen semen.

Semen banks – semen collection, evaluation and freezing, facilities with adequate facilities for storing, of frozen semen.

Cooperatives – primary / secondary societies for meeting the farmers demands and provision of inputs inclusive of soft term, short term and medium term loans.

Extension services – Animal husbandry and dairying.

Chilling centers – Milk collection and chilling units and transportation to processing units.

Availability of manpower.

Drought Power

Worldwide, animals are stills very important source of power for agriculture operations

and for transportation of goods and people. It is widely used in developing countries like India. Bullocks, buffaloes, horses, mules and camel are very widely use in our country for drought purpose and their role in saving of energy and there by the most precious foreign exchange. It is estimated to be Rs. 45,000 crore per year. It should be emphasized that depleting levels of fossils fuels may slow down or even reverse the mechanization trends witnessed even in developed countries.

India is one of the highest milk producing country then also per capita milk production in Indian is much low compare to other milk producing county. India is not able to meet its local milk demand. The average milk production per cow and buffalo per year in India is too low. The cost of milk in India is too high. Indian cattle farm is working on very low efficiency. Due to lack of knowledge, lack of proper medical history the mortality of cattle is too high. Cattle farmer also face problem in maintaining vaccination and health history of his livestock. Other major challenges of dairy industry are inefficient supply chain and traditional way of rearing cattle. For the revival of industry now it become necessary to adopt modernization in cattle farms, Increase the use of technology and shifting towards organized way of cattle rearing. It is time to restructure and revitalize the present institutional set-up in the livestock sector, enhance institution-level efficiency, and promote new institutional models to handle the emerging challenges in livestock sector development. The efforts should aim to promote and nurture the grass-root level participatory bodies all over the state as the organic link between the animal husbandry department and the small holders. Dairy industry is poised to play a major role in our nation's economy in the years to come. The value of milk is set to achieve a new boom. The industry's major contribution in

providing newer avenues for employment, both direct and indirect, and its role in improving the nutritional standards of our people also add to the importance that needs to be attached to this sector during the 21st century.

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