



Dairy Sector in Bihar (India): Role and Status

AWADHESH K JHA^{1*} AND SONIA KUMARI¹

INTRODUCTION

Livestock production, particularly dairying has been an integral component of India's rural economy, which has contributed significantly to the social and economic development of the rural people. The role of dairying goes even beyond its nutritional function and assumes special significance as a source of employment and income for the rural households (Birthal and Negi 2012). It generates continuous flow of income for rural farm households and acts as a cushion against production risk in agriculture. A similar rate of growth in dairy production has been reported to be more pro-poor than the growth in crop production because of the concentration of livestock resources among the poor and a higher response of the consumption of animal food products to income changes (Birthal and Taneja. 2012). Rapid urbanization, rise in income and purchasing power have substantially triggered the growth in demand of high value commodities including livestock products. Projections indicate that by 2020 India's demand for milk and meat (including fish and eggs) will increase to 143 million tons and 19 million tons, respectively (Joshi and Kumar 2011).

Milk contributes more than one-fifth to the agricultural and 70 percent to the livestock value of outputs. About 21 million people, a majority of whom are resource-poor, depend on livestock for employment (Kumar et al., 2010). Today, India is the world leader in milk production. Though has 70 per cent of Indian milk producers are small landholders and landless households, the country has recorded a tremendous increase in milk production from 15 million tons in 1951 to 156 million tons in 2016-17. However it is concerning that despite of this spectacular stride in milk production value addition is limited to about 36 per cent. The dairy value chains are long, disjointed and inefficient, and often fail to respond to emerging market opportunities. The scenarios of other livestock products are also not better. Livestock processing sector is by and large in the hands of informal market players who often lack formal training and skills and are reluctant to certain changes for various socioeconomic reasons.

But, in the changing economic environment there is an increasing concern about the interaction between economic competitiveness of livestock production and social factors like poverty, unemployment, and food and nutritional security. It is apprehended that the poor livestock keepers may be displaced in the market place by the commercial producers. It is important to understand that organized milk markets handle merely 49 per cent of the milk produced in India. That is, a significant share (51%) of milk, which constitutes 70 per cent of the value of livestock output (VOP), is marketed in informal markets - full of imperfections and skewed unfavorably against smallholder producers.

Most of the milk producers in India are small and unorganized. It affects their production efficiency and profitability. They are hardly in position to bargain in the informal milk markets because of the tiny marketable surplus. Dairy cooperatives have played a phenomenal role in safeguarding the interest and improving the economic status of smallholder dairy producers by integrating and linking them with the organized dairy markets. The role of dairy cooperatives in empowering women and weaker section of the society has also been commendable. The dairy cooperatives have not only provided organized network of milk marketing to the rural households, but also instigated the pace of economic growth. In fact, dairy cooperatives have impacted the whole gamut of rural economy as distribution of livestock is supposed to be more egalitarian in comparison to land



ARTICLE INFO

Received on : 23-06-2019
Accepted on : 26-06-2019
Published online : 09-07-2019

ABSTRACT

Bihar is amongst the most under-developed states of India. In 2009-10, per capita income of Bihar was 65% less than the national average. Nevertheless, the state has started showing signs of economic growth. Dairying is an important source of income and employment in the state of Bihar. Dairy cooperatives have made a strong presence in the state and are commendably involved in uplifting the economic status of the smallholder dairy producers who constitute 92 per of the farmers. Evidence indicate that dairy cooperatives play a significant role not only in improving the income of the dairy producers but they also have a tremendous bearing on milk productivity through providing better facilities for quality, storage, marketing, processing, and other related services for the dairy farmers. Dairy cooperative are helpful in transferring more than fifty per cent of the producer's share in consumer's rupee and playing a vital role in empowering of the women and other weaker sections of the society as the distribution of livestock is more egalitarian than the land. Dairying can play a pivotal role in doubling farmers' income as envisaged by the Government of India. The contributions of dairying is well documented and recognized and it is, therefore, imperative to encourage and promote the growth of dairy sector to accomplish the goals of augmenting income and, empowering women and other weaker sections of society, and also addressing the challenges of providing nutritional security in the state.

KEYWORD

Dairying, Per capita income, Dairy co-operation, Small holders

¹Sanjay Gandhi Institute of Dairy Technology, Jagdeo Path, Patna-800014

²ICAR-Research Complex for Eastern Region, Patna-800014

*Corresponding Author Email: akjha.in@gmail.com

holdings. Thus, considering the significant role of dairy the paper attempts to examine the status of dairy sector in Bihar.

MATERIALS AND METHODS

The study is based on time series secondary data elicited from various published sources. Other relevant information were also collected, compiled and analyzed to draw inferences about the dairy sector in Bihar.

RESULTS AND DISCUSSION

Livestock Sector in Bihar

Bihar has started showing signs of economic growth. Bihar's economy, which has made spectacular strides during last decade or so, identifies agriculture and dairying as tools to promote inclusive growth in the state. The 'Agriculture Road Map 2012-17' of the government of Bihar has laid considerable emphasis on animal husbandry and dairying, which has been further emphasized in recent 'Agricultural Road Map 2012-17'. The new Agricultural Road Map 2017-22 (GOB 2017) envisages creating and strengthening milk processing and value addition in the state. Table 1 depicts selected indicators of livestock and economic development of Bihar. The state has registered impressive growth on various fronts. During 2000-01 to 2002-13 per capita income grew at 6.1% per annum in Bihar which is comparable to the growth at national level. However, the states poverty remains intense and all-pervasive, more so among the rural populations. Over 55% of rural population in Bihar is poor. The state is also one of the least urbanized states in the country, but urban population is growing faster. Nevertheless, sustained rise in per capita income and a fast-growing urban population offer an opportunity to poor livestock producers to increase returns from animal agriculture, and enhance their income and escape poverty.

Table 1: Selected indicators of livestock and economic development of Bihar

| Particular | Bihar | India |
|--|-------|-------|
| Per capita income (Rs at 2004-05 prices) | | |
| 200001 | 8140 | 22895 |
| 201213 | 16537 | 39143 |
| % annual growth | 6.1 | 4.6 |
| Urban population (%) | | |
| 2001 | 10.5 | 27.8 |
| 2011 | 11.3 | 31.2 |
| %growth in population | | |
| Rural | 2.2 | 1.2 |
| Urban | 3.1 | 2.8 |
| Total | 2.3 | 1.6 |
| Poverty rate in 2011-12 (%) | | |
| Rural | 34.1 | 25.7 |
| Urban | 31.2 | 13.7 |
| Overall | 33.7 | 21.9 |
| Share of livestock in agricultural VOP (%) | | |
| 200001 | 25.4 | 24.5 |
| 201415 | 33.9 | 27.9 |
| % Annual growth | | |
| Livestock sector | 8.2 | 3.6 |
| Agricultural sector | 3.8 | 2.7 |
| Gross Domestic Product | 7.9 | 7.7 |

Source: Jha and Singh, 2015.

Livestock producers have responded to the emerging opportunities. In Bihar, livestock sector grew at a rate of around 8% per annum during the period 2000-01 to 2014-15, which is more than double the rate of growth in their agricultural sector. It is worth mentioning that, the rate of growth in the livestock sector in Bihar was also double the rate of growth in the sector at the national level during this period. The share of livestock in the value of output of the agricultural sector in Bihar increased to 38.4% in 2009-10 from 25.4% in 2000-01.

Distribution of Livestock holding

In Bihar, the agriculture economy is dominated by small landholders. Close to 60% of the rural households in the state possess landholdings of less than one hectare, often termed as marginal landholders (Table 2). Their corresponding share in land is merely 28%. Their share in livestock, however, is much more. About two-third of the cattle and buffaloes are owned by the marginal farm households. This distribution pattern of land and livestock implies that growth in livestock sector is likely to have a larger impact on poverty reduction than the growth in crop sector.

Table 2: Distribution of land and livestock in Bihar (%).

| Type of household | Rural households | Land | Cattle | Buffalo |
|-------------------------------|------------------|-------|--------|---------|
| Landless | 27.6 | 0.0 | 1.2 | 1.8 |
| Sub Marginal (≤ 0.5 ha) | 45.2 | 13.5 | 43.1 | 44.5 |
| Marginal (0.5-1.0ha) | 14.4 | 14.6 | 23.4 | 24.1 |
| Small (1.0-2.0ha) | 9.0 | 17.1 | 20.4 | 21.4 |
| Medium (2.0-4.0ha) | 3.0 | 10.7 | 8.7 | 5.9 |
| Large (>4.0 ha) | 0.9 | 8.8 | 3.1 | 2.4 |
| All | 100.0 | 100.0 | 100.0 | 100.0 |

Source: GoI (2005)

Milk production and yield

Cattle and buffaloes are the main sources of milk in the state. In 2016-17, the state produced 8.71 million tons of milk with the help of 12.6 million cattle and 6.7 millions of buffaloes

Table 5: Production and yield of different animal species in Bihar

| Particulars | Bihar | India |
|---|--------------|---------------|
| Population of dairy animals in thousand) | | |
| Cattle | 12559 (15.7) | 199075(16.6) |
| Buffalo | 6690 | 105343 |
| Milk production (Million tons), 2015-16 | | |
| Crossbred | 1.67 | 36.9 |
| Indigenous | 2.64 | 29.48 |
| Buffalo | 3.25 | 74.70 |
| Total | 8.29 | 155.49 |
| Milk yield (kg/day) 2014-15 | | |
| Crossbred | 6.49 | 7.15 |
| Indigenous | 3.10 | 2.54 |
| Buffalo | 4.24 | 5.15 |

Figures in parentheses indicate percentage of cross bred to their respective total number Source: GoI (2016)

Productivity of livestock in Bihar is lower than the national average (Table 5). However, the milk yield of cows and buffaloes are closer to their national averages. Low animal productivity is due to numerous biotic and abiotic constraints including dominance of poor quality breeds, poor animal health and feed and fodder scarcity. Besides, many socio-economic and institutional factors such as a lack of access to animal health and breeding services, markets and credit, and tiny holdings, shrinking common lands, etc. restrict farmers realize the potential yield dairy milch animals.

Cattle lead the milk production in the state. About 65% of total milk production comes from cattle where as remaining 35% is contributed by the buffaloes. The share of crossbred and indigenous cattle and buffaloes is 22%, 43% and 35%, respectively. Bihar ranks ninth in terms of milk production among various major milk producing states. Remarkably the state has made tremendous progress and registered the highest compound annual growth rate in the country. The milk production in the state has grown at rate of 7.68% followed by Rajasthan, Madhya Pradesh, Andhra Pradesh, Gujarat, etc. Milk production in the state is highly skewed towards the smallholder producers. About 65% percent of the total milk is produced by the households which have tiny landholdings (below 1ha) but their contribution in milk marketing is more than 69%. Both in milk production and marketing marginal farm households have clear edge, although their average productivity was the lowest (2.4 L/day) among all farm categories.

The study further highlights that more than 78% of milk in total milk production is contributed by the farms that possess one or two animals. Their share in milk marketing is about 68%. It is therefore imperative that smallholder dairy producers should be the core of any dairy development programme in the state.

Livestock infrastructure

Table 6 shows status of livestock infrastructure in Bihar. Animal health as well as breeding infrastructure has

Table 6: Status of livestock infrastructure in Bihar, 2016

| | Bihar | India |
|--|-------|--------|
| Animal health | | |
| Veterinary hospitals and polyclinics | 39 | 11906 |
| Veterinary dispensaries | 1083 | 25812 |
| Total | 1122 | 37718 |
| Livestock units/Institution | 24858 | 10653 |
| Breeding | | |
| No. of Artificial Insemination centres | 4756 | 84128 |
| No. of AI done (000) | 2633 | 118201 |
| Breedable bovine population (000) | 8038 | 122573 |
| Breedable population covered under Artificial Insemination (%) | 24.2 | 40.9 |
| Feed resources | | |
| Area under fodder crops (000ha) | 24 | 9188 |
| Areapastures and grazing land (000 ha) | 16 | 1040 |

remained poor, as is indicated by the number of livestock units served per veterinary institution, and the proportion of breedable population of cows and buffaloes covered with artificial insemination. The number of livestock units served per livestock institution in Bihar is 2.5 times more than the national average. Likewise, the breedable population artificially inseminated is merely 24% in Bihar as compared to the national average of 41%.

Feed resources in Bihar are inadequate and of poor quality. Landholdings are too small to allow farmers to allocate any land to fodder crops. Area under grazing and pastures is extremely small. Infrastructure for marketing and processing of livestock products is also underdeveloped. Feed and fodder trades are highly unorganized and there is no formal body to regulate and supervise fodder markets (Singh *et al.*, 2011).

Milk supply chain in Bihar

Although dairy cooperatives procure hardly 6.8% of milk produced in the state but it in the areas where the coverage of dairy cooperatives is good, they play a very important role in the dairy value chains. Figure 4 depicts the milk supply chains in Bihar. It emanates that 51% of milk produced on farm households are used for the domestic consumption and rest of 49% are available as marketed surplus. Majority of milk in the state is sold as the liquid milk. Out of total marketed surplus 21.4 5.4% milk is marketed to the household consumers, 38.4% to the dairy cooperative societies, 34.8% to the private traders/ milk vendors and only 5.4% milk is handled by the private processors. It is obvious that informal players (private traders. Vendors) still constitute an important segment in the milk markets. However, dairy cooperative societies are playing a lead role and handling 38.4% of the volume of marketed milk in the areas where it has its coverage.

Dairy Cooperatives in Bihar

Visualizing the success of dairy cooperatives in Gujarat, the Bihar State Milk Co-Operative Federation Ltd. (COMFED) was established in 1983 to in accomplish the goals of Operation Flood programme. The same "Anand Pattern", which has a three tier system, was adopted and implemented having village level societies at the base; district milk producers' cooperative unions in the middle and COMFED at the state level on the top of the pyramid.

At present there are eight district level milk unions covering thirty three districts of Bihar. COMFED endeavors to create enabling environment in the districts in terms of dairy development by developing the capacity of milk producers to shoulder broader responsibilities and then hands over the entire operations to the representatives democratically elected by the milk producers. Dairy cooperative system has facilitated milk production and marketing in Bihar. Evidence indicates that the milk contribution to dairy co-operative and found that cooperatives are transferring a large share of benefits to the member producers where as there is evidence that shows producer's share in consumers rupee as low as 17 per cent in backward regions where the organized milk

markets are virtually non-existent and dominated by the profit seeking motive of the intermediaries. The facts clearly establish the positive contribution and impacts of dairy cooperatives. Therefore, efforts are required to spread the success of dairy co-operatives so that the advantages of collective action can be harnessed for better performance in the sector. However, there are several issues across the value chains that need to be addressed aptly to enhance the efficacy and efficiency of dairy cooperative societies. For instance, economics of production, pricing, quality and standards, marketing, etc. are some of the issues which are extremely important for future growth.

Milk processing in Bihar

Cooperatives are mainly engaged in liquid milk operations and consumer goods and lesser emphasis is given to other dairy products, whereas private dairies are engaged mainly in production of value added products such as powder, ghee, dairy whiteners, and butter and whey products. Innovations in marketing, sources of energy, product design and diversification of products with special emphasis on adoption of efficient production technologies are essential to harness the potentials of dairy sector in general and cooperatives in particular.

Table 7: Status of Dairy Cooperative in Bihar

| Marketing | Bihar | India |
|----------------------------------|-------|--------|
| No. of dairy cooperatives | 9425 | 144246 |
| No. of farmer members (000) | 523 | 14461 |
| Milk procured (000 tonnes/annum) | 398 | 9559 |
| Total milk produced (%) | 6.3 | 8.2 |
| No. of dairy plants | 16 | 1065 |

Source: [GoI \(2016\)](#)

There are 9425 dairy cooperative societies in the state that accounts for about 6.5 per cent of the dairy cooperative societies in India (Table 7). The state has 5.23 lakh farmer members that constitute merely 3.6 per cent of the member farmers in the country. Obviously, the dairy cooperatives in the state still has to go a long way in comparison to Gujarat, Maharashtra, Karnataka, Kerala, Tamil Nadu, etc.

There are sixteen dairy plants in Bihar, which has a total processing capacity of 2240 TLPD. These plants are involved in processing and marketing of a diverse range of products, ranging from pasteurized milk to traditional dairy products and western dairy products like ice-cream and cheese. Besides, there are two cattle feed plants that manufacture feed concentrates which are supplied to the member farmers to ensure supply of quality feed concentrate for the dairy animals. Apart from these cooperative's plants, a number

REFERENCES

- Birthal, P.S. and D.S. Negi. 2012. Livestock for higher, sustainable and inclusive agricultural growth. *Economic and Political Weekly*, XLVII, 26-27.
- Birthal, P.S. and V.K. Taneja. 2012. Operationalizing the pro-poor potential of livestock: Issues and strategies. *Indian Journal of Animal Sciences*, 82(5): 441-447.
- GOI. (Government of India). 2005. Livestock Ownership across

private dairy plants is also involved in milk procurement and processing.

Milk is processed by the formal and informal milk processors. About 82% of the marketed milk is sold as liquid milk. Rest of the 18% milk is utilized for value addition. Out of total value added, khoa based channa based and fermented (basically curd) milk products constitute 37%, 45% and 18%, respectively. Based on the type of products dairy markets in Bihar can be classified into 18 major segments of which Liquid milk, Ghee, Curd, Paneer, Ice-cream, Table butter, Skimmed milk powder, Frozen/flavoured yoghurt, Fresh cream, Lassi, Butter milk, etc. have good market shares.

Traditional dairy products have huge potential and offer tremendous opportunities for marketing and trade. Majority of traditional dairy products are prepared and made available in the markets by the informal processors. However, there are several problems that affect the production and marketing of these products. Problem of non-uniformity, highly energy intensive processes, absence of mechanization, poor attention to hygiene and safety are some of the issues, which are widely observed and require better technological interventions, processing and investment. Industrial dairy Products like casein, whey proteins, lactose etc., are high value-added products with great export potential but require huge investments.

CONCLUSION

Dairying is an important source of income and employment in the state of Bihar. Dairy cooperative have made a strong presence in the state and are commendably involved in uplifting the economic status of the smallholder dairy producers who constitute 92 per of the farmers. Dairy cooperative are helpful in transferring more than fifty per cent of the producer's share in consumer's rupee and playing a vital role in empowering of the women and other weaker sections of the society as the distribution of livestock is more egalitarian than the land. Dairying can play a pivotal role in doubling farmers' income as envisaged by the Government of India. The contributions of dairying are well documented and recognized and it is, therefore, imperative to encourage and promote the growth of dairy sector to accomplish the goals of augmenting farmer's income. Traditional dairy products have huge potential and offer tremendous opportunities for marketing and trade. Majority of traditional dairy products are prepared and made available in the markets by the informal processors. Industrial dairy Products like casein, whey proteins, lactose etc., are high value-added products with great export potential but require huge investments.

Operational Land Holding Classes, Report No 493 (59/18.1/1), National Sample Survey Organisation, Ministry of Statistics and Programme Implementation, New Delhi.

GOI (Government of India). 2012. *Basic animal husbandry statistics*. Department of Animal Husbandry and Dairying, Ministry of Agriculture, New Delhi.

GOI (Government of India). 2016. *Basic animal husbandry statistics*. Department of Animal Husbandry and Dairying, Ministry of

- Agriculture, New Delhi.
- Govt. of Bihar. 2012. Road Map for Agriculture and allied sector (2012-17), Department of Agriculture, Govt. of Bihar, Patna
- Govt. of Bihar. 2017. Road Map for Agriculture and allied sector (2017-22), Department of Agriculture, Govt. of Bihar, Patna
- Joshi, P.K and P. Kumar. 2011. *Food demand and supply projections for India*. Unpublished manuscript. International Food Policy Research Institute, New Delhi.
- Jha, Awadhesh K and Singh, RKP. 2015. Macro level priorities for Livestock research and development for Bihar. *Agricultural Economics Research Review*, Vol. 28(2):pp.271-283
- Kumar, Anjani. 2010. Milk Marketing Chains in Bihar: Implications for Dairy Farmers and Traders *Agricultural Economics Research Review*, Vol. 23 (Conference Number) 2010 pp. 469-477.