Report No. 45

Assessment of the Status of Dairying in the Eastern States and Potential to Improve Socio-Economic Status of the Milk Producers and Convergence of All Central & State Schemes at District Level in Jharkhand

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Sponsored by
Ministry of Agriculture & Farmers Welfare
Government of India, New Delhi -110 001

Co-ordinated by
AER Centre, Vallabh Vidyanagar (Gujarat)

Submitted by
AGRO-ECONOMIC RESEARCH CENTRE FOR BIHAR & JHARKHAND
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September, 2017

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Report No. 45/2017

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Citation: Choudhary, Rambalak & Marandi, Rosline Kusum (2017); Assessment of the Status of Dairying in the Eastern States and Potential to Improve Socio-Economic Status of the Milk Producers and Convergence of All Central and State schemes at District level in Jharkhand, Agro-Economic Research Centre for Bihar & Jharkhand, T M Bhagalpur University, Bhagalpur – 812 007 (BIHAR).

Preface

The study entitled **Assessment of the Status of Dairying in the Eastern States and Potential to improve Socio-Economic Status of the Milk Producers and Convergence of all Central and State Schemes at District Level in Jharkhand** has been assigned by the Directorate of Economics and Statistics, Ministry of Agriculture & Farmers Welfare, Government of India to this Centre under the Co-ordination of Agro-Economic Research Centre, Vallabh Vidyanagar, Anand, Gujarat.

The study reveals that Jharkhand is placed at 16th place in regard to total milk production of India contributing only 1.20 per cent in the national basket. The state has 3.53 per cent of total livestock population of India, whereas milch animals comprised only 2.97 per cent. The state is faced with the deficit of 30.17 per cent crop residue used as main cattle feed. The availability of crop residue is only 4.10 MT against its requirement of 13.59 MT. There are scope and need of expanding and strengthening dairy co-operative infrastructure in Jharkhand. It can be better understood by the fact that to meet its milk and milk product demand, about 6 to 8 lakh litres of milk have to be procured from organised dairy sector of the neighbouring states of Bihar & West Bengal. However, it is encouraging to note that there was 99.79 per cent increase in total quantum of milk production during the last 15 years' period of 2000-01 to 2015-16 (from 910 thousand tones to 1812.38 thousand tones). An increase of nearly 58.33 per cent could also be viewed in per capita availability of milk in the state during the same period, i.e., 2001-02 to 2015-16. It increased from 96 gms/day to 152 gms/day.

We wish to express our thanks to all the members of the project team namely; Dr. Ranjan Kumar Sinha, Dr. Rosline Kusum Marandi and Dr. Rajiv Kumar Sinha for their hard efforts in bringing it in to perfect shape. We also extend our heart full thanks to the Co-ordinating Centre i.e., AER Centre, Vallabh Vidyanagar, Anand, Gujarat for providing necessary guidelines through e-mail and telephonic talk during the conduct of the study. We are also grateful to Prof. (Dr.) S S Kalamkar, Director, AER Centre, Vallabh Vidyanagar, Gujarat for his valuable comments on the draft report.

Really, we express our best thanks to Deptt. of Agriculture, Animal Husbandry & Co-operation, Jharkhand, and Dr. B S Khanna, Managing Director, Jharkhand COMPFED, and their staff for providing us secondary data and helping in collection of primary data.

We do hope that the findings and suggestions made in this study would be useful to policy makers, functionaries, professionals and scholars as well.

Basant Kumar Jha
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Introduction

Dairying has been an integral part of the agriculture since an ancient time in India. India has vast scope and resources of livestock, which play key role in the national economy and also in the socio economic development for millions of rural households, especially for women empowerment. India has one of the largest stocks of the cattles and buffaloes accounting for more than 50.00 per cent of the world's buffaloes and 20.00 per cent of its cattles. The contribution of agriculture and allied sector to the national GDP has declined during last few decades but that of livestock sector has increased from less than 5.00 per cent in the early 1980 to over 6.00 per cent in the late 1990 (www.fao.org). India is the largest producer of milk in the world with an annual output of 130 MT. It also has the largest milch animal population of over 118 million. On account of NDDB, demand of milk is expected to increase at CAGR of 5.00 per cent from 138 MT in 2017 to 200 MT in 2022. According to the report of CARE ratings, the share of value added products in milk and milk deliveries segment in India is growing at 25.00 per cent every year and it is also expected to grow at the half rate until 2019-20 (www.indianmirror.com).

The per capita availability of milk in India has increased from 176 grams per day in 1990-91 to 322 grams per day during2014-15. Considerably, it was more than the world average of 294 grams per day during 2013-14. It represents a sustainable growth in availability of milk and milk products for growing population. The dairying has becomes an important secondary source of income for millions of rural households, especially for rural women which engaged in agriculture and allied activities. Livestock play a key role in the socio-economic life of Indian rural mass. As it is a rich source of high quality food such as milk, meat and eggs. Besides it, also a good source of income and employment to millions of rural farmers, particularly rural women.

An Overview of Jharkhand

The State of Jharkhand came into existence on 15 November 2000, having total geographical area of 7.97 million hectare, out of which, net sown area is 18.10 lakh ha. The state is primarily rain fed and crop production mainly depends on monsoon. Cropping intensity is 126.00 per cent, while irrigated area is less than 15.00 per cent.

The farming situation in the state depends on the type of land. Land is upland, medium and low land. Upland are red to brown in colour, light textured, low pH and well drained, medium soil are yellow in colour medium textured, moderately acidic and moderately drained, while low land are grey in colour, heavy textured neutral in pH and poorly drained.

Animal Husbandry and milk production is an integral part of the diversified agriculture system. The animal husbandry sector plays a crucial role in the rural economy by providing gainful employment particularly to small, marginal farmers and agriculture labourers. It provides gainful employment and source of income and livelihood among landless labour and additional source of income to families through employment of women. In the agrarian economy Jharkhand

livestock plays an important role in contribution to income generation, self employment, tribal development and women empowerment.

Agriculture and livestock rearing is a backbreaking occupation, not rewarded by return because of unproductive land, climate factor and breed of livestock (yielding 0.5 to 1.5 litre of milk per day).

State wise Livestock and Milch Animal Population in India

The state of Uttar Pradesh has play 1st stage in the percentage share of milch animals (18.38%) to all India milch animal population followed by Rajasthan (10.06%) and Madhya Pradesh (8.41%). Meanwhile, Jharkhand has stay 16th place in the percentage share of milch animals (2.27%) to all-India milch animals. Moreover, Uttar pradesh has also highest percentage share (13.42%) of all India livestock population followed by Rajasthan (11.27%), Andhra Pradesh (10.96%) and Madhya Pradesh (7.10%) but Jharkhand has only 3.53 percentage share in all India livestock population.

State wise Milk Production in India

The total milk production in India has increased to 155491 thousand tones in 2015-16 from 84406 thousand tones in 2001-02. Moreover, Uttar Pradesh has highest milk production (26387 thousand tones) with share of 17.00 per cent in India's milk production followed by Rajasthan with 11.90 per cent, Gujarat with 7.90 per cent while Jharkhand has only 1.20 per cent share.

State wise area under Fodder Crop, Permanent Pastures and Grazing land in India

India has an area under fodder crops (9188 thousand ha) with percentage share of 2.8 to GCA of India whereas, area under permanent pastures and other grazing land was calculated to 10256 ('000 ha) with 3.10 per cent of GCA of India, consequently, Rajasthan has highest area under fodder crops with 14.20 per cent to GCA of respective states followed by Punjab (10.10%, Haryana (9.80%), Gujarat (4.30%), Uttar Pradesh (3.30%) and Bihar (0.30%) while Jharkhand has no area under fodder crops. Therefore, Himachal Pradesh has highest area under permanent pasture and other grazing land accounting for 27.10 per cent of its GCA followed by Chhattisgarh (6.50%), Rajasthan (4.90%), Karnataka (4.70%), Madhya Pradesh (4.20%) and Jharkhand has only 1.40 per cent which is few little than other states.

State wise availability and requirement of Fodder in India

The availability of India's green fodder was estimated to be 142.82 MT against requirement of 221.63 MT with deficit of 55.18 per cent and crop residues shows 64.19 per cent deficit with availability and requirement of 253.26 MT and 415.83 MT respectively. Moreover, Rajasthan has highest amount of green fodder availability (33.53 MT) against requirement of 17.88 MT followed by Maharashtra (25.12 MT) with surplus of 26.50 per cent, Uttar Pradesh (15.73 MT) with deficit of 93.99 per cent requirement and Bihar has 16.23 MT against 12.53 MT of requirement with 22.79 per cent surplus while Jharkhand has only 0.88 MT against requirement of 7.25 MT with deficit of 723.86 per cent. Now, in regards of crop residues, UP had highest amount (42.07 MT) of availability of crop residues against 57.19 MT of requirement with deficit of 35.94 per cent followed by MP (24.30 MT), Maharashtra (22.21 MT), Rajasthan (21.67 MT) and Bihar (16.23 MT) against requirement of 23.49 MT crop residues with 44.73 deficit of us

while Jharkhand has only 4.1 MT of crop residues availability against 13.59 MT of its requirement with deficit of 9.49 MT.

In the state of Jharkhand, livestock rearing is mainly taken as a household activity being managed by family members particularly women. So, development programme need to keep it in view while addressing the emerging issues related to this sector. The major challenges for the dairy sector in the state of Jharkhand is to increase the milk production in order to meet the increasing demand of milk and milk products resulting from the almost inevitable expansion of population ad growth of income. To meet this challenge, policies must be market oriented. The adoption of appropriate technologies for production, procurement, processing and marketing of milk with unique environment of social, economic, political and cultural environment of the state has been considered as an important aspect of dairy development. In order to make the state self sufficient in milk production, the bread improvement, feed and fodder development programme and other productivity enhancement programme are intensively implemented by central, state and milk unions. As a result, production of milk in rural area is increasing significantly. It is an important to encourage clean milk production in rural area as to facilitate the remunerative price of milk producer in order to make the milk production professional as well as employment generation entrepreneurship in rural area.

The state of Jharkhand lags behind in milk production during bifurcation of state from Bihar. However, after the creation of state, the dairy development programmes are being implemented intensively in order to create rural self employment through dairy farming. As a resultant of intensive implementation of various dairy development schemes, the production of milk was increased to 16.43 lakh MT in 2011-12 from 7.74 lakh MT in 2001-02 accounted for 112.27 per cent increased during 2001-02 to 2011-12. (Directorate of Dairy Development, Deptt,. of AH &Fisheries, Govt. of Jharkhand).

The state of Jharkhand emerged as 28th state on the political map of India on 15 November, 2000. The state is covered by forest lands and hills varying from 300 to 1000 mitres in altitude. The state has sizeable tribal population and rich in vegetation and mineral resources. Presently, it has been organised into 24 districts. The state covers about 2.42 per cent of country's land area and about 2.62 per cent of the country's population (as per census, 2001).

The state has basically rural economy as 70-80 per cent of the population is engaged in agriculture and allied activities. The incidence of poverty is very high, particularly among tribes and scheduled caste. Tribal constitute about 26.30 per cent and scheduled caste around 11.80 per cent of the state population. The economic development of the SC & ST population is one of the prime concerns of the state.

Agricultural economy of the state is characterized by the existence of large number of small and marginal farmers. About 72.00 per cent of land holdings belong to small and marginal farmers. Only 0.69 per cent operational holdings are above 10 hectares covering about 9.00 per cent of area. The state's agriculture is predominance of cereal crops. About 92.00 per cent cropped

areas are covered under food grains and hardly 3.50 per cent area is under cash crops while 4.00 per cent of the total cropped area is mono-cropped under rice.

Land utilization patter of the state of Jharkhand

The state's total cultivable land is 38.44 lakh hectare and out of it, 12.04 lakh ha is current fallow land, other fallow land (8.45 lakh ha), and 17.95 lakh ha is net sown area. About 24.40 lakh hectares is irrigated land and cropping intensity is 114.00 per cent.

Socio-economic characteristic of the selected districts in the state of Jharkhand

i. ***Lohardaga*** *is a part of the South Chotanagpur division in the state of Jharkhand. Lohardaga district came into existence in 1988, after the split of Ranchi in three districts namely; Ranchi, Lohardaga and Gumala. The economy of the district is mainly depends on agriculture and forest produces. More than half of its population are engaged in agriculture to earn his/her livelihood. In the year of 2008-09, GDP in the district was Rs. 70,896 lakhs at current price and net domestic product in the district was Rs. 62,333 lakhs at current price.*

ii. ***Hazaribagh*** *district is one of the twenty four districts of Jharkhand comprising 16 revenue Anchals. The district has very rich land bank available for various infrastructures, industrial, education and service covering 433634 hectare. Out of it, 135203 hectare (about one third) comes under cultivation. Therefore, agriculture is a vital component of the district economy.*

iii. ***Deoghar*** *district is spread over an area of 2500 sq. km and divided into two sub-divisions i.e., Deoghar and Madhupur, which consist of 8 blocks. Deoghar is an important place in the Jharkhand from the view of milk production. The cow and buffalos are of short height and thin built but milk production is satisfactory. The government of state has taken some steps to improve breed as steed bull, Haryana and tharparkar bulls are distributed.*

iv. ***Ranchi*** *district is one of the twenty four districts of Jharkhand state in eastern India. It is also the capital of Jharkhand state and located is the heart of city. The economy of the district mainly depends on cultivation or related work. More than 51.00 per cent of the total workers are engaged in primary sector (census 2011). It has red laterite, loam, fine loam and fine mixed loam soil. A large variety of crops are grown in the district of Ranchi paddy, millets, pulses and oil seeds are the main crops of present districts.*

Socio-Economic characteristics of selected milk producer

On an overall among the sample milk producers of DCS category, male (75.84%) and female (24.16%) were decision maker while in case of NDCS category, 88.00 per cent male and 12.00 per cent female were decision maker. Therefore, distribution of social groups of milk producers among DCS, the majority were OBC (48.60%), General (30.14%), SC (12.27%) and ST

(8.99%) whereas in NDCS, 49.14 per cent was OBC followed by General (26.72%) and SC/ST (24.00%).

Family profile of selected milk producers

On overall, the average household size of male was 2.33 and that of female and children were 2.12 and 1.88 respectively among DCS category whereas that of male, female and children were 2.35, 1.98 and 2.38 respectively among NDCS category. 79.15 per cent respondent and 20.85 per cent respondent were male and female among DCS category of sample households while 71.67 per cent and 28.33 per cent respondent were male and female respectively among NDCS category households. In DCS category of households, average age of male and female were 45.43 and 44.60 respectively while in NDCS category, that of male and female were 49.54 and 46.91 respectively. Average age of respondent in both DCS and NDCS category was less than 10th and average number of family member works in dairy among both DCS and NDCS was less than two.

Cropping pattern of sample milk producers

On an overall, the GCA during 2015-16 was estimated 2.93 ha per milk producer in the category of DCS against 3.17 ha per milk producer in the category of NDCS. Thus, GCA per milk producer was comparatively little less in NDCS milk producer than DCS milk producers. The size group wise distribution shows that total area coverage varied from 2.17 ha (small) to 3.35 ha in large milk producers of DCS category whereas, in NDCS category, it varied from 2.72 (small) to 3.50 ha (large). However, coverage was comparatively higher in case of larger milk producers of NDCS category. Among both DCS and NDCS, the coverage was higher in kharif season than in rabi and summer season.

Details on herd strength and cattle shed

Total animal among DCS category was 416. Out of which, 265 was milch animal while total number of animal among NDCS category was 404. Out of which, 261 was milch animals. The cattle shed among DCS and NDCS category was 140 and 138 respectively. However, all the shed for animal were semi pucca and kuccha.

Details of animal breeds of sample household (DCS & NDCS)

Average yield (litre/day) per crossbred was highest (6.46 litres) followed by buffalo (5.64 litres) and local cow (3.63 litres) in DCS milk producers whereas that of cross bred was 6.16 litres per day followed by buffalo (5.07 litres) and local cow (3.42 litres) in NDCS milk producers. However, average milk yield of all breed in DCS category was little higher than that of NDCS category.

Details of breedable animals on survey date in DCS and NDCS members

On an average, the average age of all animals was estimated to 6.57 year among DCS member against 6.63 years in NDCS member. Average age at first calving among was 36.77 month against 37.65 month among NDCS on overall. However, buffalo take more time for first calving in comparison to cattle. Length of lactation on period (days) was estimated to 247.07 among DCS against 238.15 in NDCS members on overall average. The peak yield of last lactation was

6.47 in DCS households against 5.98 in NDCS members while present lactation of peak yield was 7.29 among DCS members against 6.27 in NDCS members.

Availability of water for dairy among DCS and NDCS milk producers

The main source of water available for dairy in rainy season with almost all the selected milk producers of DCS and NDCS household was village talawadi/pond followed by canal while the source of water available during winter season was also village talawadi/pond in both case of DCS and NDCS followed by tube well and bore well. The main source of water during summer season was tube well/bore well in both cases of NDCS and DCS groups followed by hand pump and open well at the distance of 1-2 km. The supply of water in rainy season was adequate replied as 'yes' by 72.68 per cent and 74.20 per cent by both DCS and NDCS respondent respectively while 27.32 per cent and 25.80 per cent by DCS and NDCS replied as 'No' whereas that in winter season replied as 'Yes' by DCS (52.18%) and NDCS (26.75%) and replied as 'No' by DCS (47.82%) and NDCS (73.25%) while that in summer season. Majority of respondent was replied as 'No' supply of water is adequate by both DCS and NDCS farmers. Alternative source of water supply during all three season was open well followed by tube well as replied by majority of DCS and NDCS members.

Details about income received from dairying and its use among DCS and NDCS categories of sample farmers

Under DCS and NDCS category of milk producers, 66.74 per cent and 78.04 per cent of income from dairy was held up by males of both respectively while 33.26 per cent and 21.96 per cent of income from dairy was held up by females of both DCS and NDCS category respectively. Maximum about 73.80 per cent and 46.83 per cent of male members' income was expended on family expenditure by both DCS and NDCS members respectively and about 26.20 per cent and 53.17 per cent of male members income was expended on animal feed and health by both DCS and NDCS respectively. Whereas, 55.00 per cent of females income was expended on her family and 45.00 per cent on animal feed and its health by DCS category while 52.00 per cent of NDCS female's income was expended on her family and 48.00 per cent on animal feed and its health. However, 67.55 per cent on family and 32.45 per cent on animal feed and its health of total income from dairy were expended by DCS category while 52.92 per cent on his/her family and 47.08 per cent on animal feed and its health of total income from dairy were expended by NDCS category.

Feed and Fodder per animal at the time of survey (kg/ani/day)

Under the stall feeding, self cultivated dry fodder was fed at the rate of 2.72 kg to local cow, 2.5 kg to cross bred and 3.5 kg to the buffalo among DCS category of milk producers. Almost similar rate of feeding to respective animals was also found under NDCS category. Self cultivated green fodder was also fed at the rate of 3.50 kg to the local cow, 3.10 kg to cross bred and 5.25 kg to the buffalo by DCS farmers and almost similar trend was found under NDCS category. After that, home prepared and prepared concentrate were also fed at the rate of ½ kg to 2.00 kg to all groups of animals by both DCS and NDCS farmers. Some molasses, salt and mustard oil were also fed to all groups of animal varied from 50 gms to 200 gms by both DCS and NDCS categories of farmers.

Veterinary and breeding expenditure during last year (2015-16) under DCS and NDCS categories of milk producers

Total amount of Rs. 1555.00 was expended on local cow comprising Rs. 555 on vaccination, Rs. 350 on medicine, Rs. 150 on AI and Rs. 500 on Doctor Charges. Rs. 1955.00 was expended on crossbred cow and Rs. 1490.00 on buffalo under different category of expenditures by DCS members. Whereas, total amount of Rs. 1580.00 was expended on local cow, Rs. 1670.00 on crossbred cow and Rs. 1380.00 on buffalo under different category of expenditure by NDCS members. However, expenditure on crossbred cow under both DCS and NDCS was higher than on local cow and buffalo due to more sensitive with climatic changes.

Cost of feed and fodder per animal at the time of survey under DCS and NDCS categories of milk producers.

Under DCS member on an overall average, the cost Rs. 34.08 was incurred per animal on dry fodder, Rs. 20.23 on green fodder and Rs. 39.25 on concentrate. Almost similar figures were also found under NDCS category.

The present value of adult animal (Rs. /animal) on an overall average was Rs. 37333 (crossbred cow), Rs. 27523 (local cow) and Rs. 38752 (buffalo) under DCS category while that of crossbred local cow and buffalo of NDCS categories were Rs. 36868, Rs. 22415 and Rs. 38961 respectively. Therefore, the value of buffalo in both DCS and NDCS was comparatively higher than that of local cow and crossbred cow.

Season wise milk yield (per day) during 2015-16 under DCS and NDCS categories of milk producers

Under DCS category, the average yield per animal was found maximum during winter season with 4.15 litres of local cow, 6.75 litres of crossbred cow and 6.00 litres of buffalo followed by summer season while under NDCS categories, the average yield per animal was found maximum during same season with 3.75 litres of local cow, 6.75 litres of crossbred cow and 5.75 litres of buffalo followed by summer season. However, yield per animal of all animals category was few higher under DCS than that of NDCS members.

Awareness about various schemes among milk producers of DCS and NDCS categories

On an overall average, awareness about different vaccination schemes/programmes, 62.50 per cent was replied as 'Yes' against 'No' (37.50%) among DCS categories of sample farmers while about that, 52.50 per cent was replied as 'Yes' against 47.50 per cent 'No' by NDCS category.

Details about milk production, use and sale (yesterday) among DCS category

Under DCS category of sample milk producers, the total milk drawn yesterday from local cow was 834.90 litres followed by buffalo (152.28 litres) and crossbred cow (51.68 litres). The use of total milk at home by milk producer was 113.34 litres comprising 72.21 litres of local cow, 12.75 litres of crossbred and 28.38 litres of buffalo as direct consumption. It means less than one litre of milk was used at home by each farmer. The sold of total raw/liquid milk by all 120 farmers was 925.52 litres comprising 762.69 litres of local cow, 38.93 litres of crossbreeds and 123.90 litres of buffaloes. So, about 7.71 litres of milk per farmer was sold to DCS of Rs. 26.83 per litres

of local cow milk, Rs. 25.54 per litre of crossbred and Rs. 29.67 per litre of buffalo milk. However, the price of buffalo milk was higher than that of local and crossbred cow.

Details about milk production, use and sale (yesterday) among NDCS category

Under NDCS category of sample milk producer, the total milk drawn from all categories of animal by all NDCS sample farmers was estimated to 966.25 litres yesterday comprising 755.82 litres of local cows, 43.12 litres of crossbred cows and 167.31 litres of buffalo. The milk drawn yesterday by each NDCS member was calculated to 8.05 litres. The use of total milk at home by all NDCS members was calculated to 101.01 litres comprising 65.32 litres of local cow milk, 9.55 litres of crossbred cow milk and 26.15 litres of buffalo milk as direct consumption. It means about 800 gms milk was consumed by each farmer per day. The sold of total raw/liquid milk by all sample farmers was 865.23 litres comprising 650.50 litres of local cow milk, 33.57 litres of crossbred cow milk and 141.18 litres of buffaloes milk through different channels. Therefore, out of total local cow milk sold, 250.75 litres of milk was sold direct to consumer of Rs. 32.80 per litre, 243.50 litres of milk to private vendor/middlemen of Rs. 31.50 per litre and 196.25 litres of milk to sweetshops/others of Rs. 32.36 per litres. Out of total crossbred cow milk sold, about 20.15 litres was sold to direct consumers @ Rs. 32.65 per litre, 13.42 litres to private vendor/middlemen @ Rs. 31.25 per litre and out of total buffalo milk sold, 43.60 litres to the private vendor /middlemen @ Rs. 36.42 per litre and 97.56 litres to the sweetshop/others @ Rs. 37.62 per litre. However, weighted average price of buffalo milk was higher about Rs. 37.25 per litre that of local cow milk and crossbred milk.

Marketing constraints of DCS sample farmers

On an overall average, 85.00 per cent of DCS milk producers had reported that an irregular sell of milk was never marketing constraint followed by sometimes (17.50%). Lack of time for marketing had reported as 'never' by 77.50 per cent of sample farmers followed by sometimes (22.50%) less knowledge about marketing had reported as always by 70.83 per cent of sample farmers and remaining as sometimes. Low risk taking behaviour had reported as 'Always' by 66.67 per cent of sample farmers followed by sometimes (33.33%). 100 per cent farmers had reported as 'No advance payment for milk by society. 100 per cent farmers had reported as inability to market for value added products.

Marketing constraints of NDCS sample farmers

On an overall sample size, 65.00 per cent of NDCS farmers had reported that irregular sell of milk was sometimes marketing constraints against 35.00 per cent of 'Never.' Lack of time for marketing had reported by 55.83 per cent of sample farmers as sometimes constraints followed by 'Never' (44.17%). Less knowledge about marketing had replied by 72.50 per cent of sample farmers as 'always' followed by sometimes (27.50%). Low risk taking behaviour had also reported as constraints of sometimes by 69.17 per cent of sample farmers followed by 'Never' (20.83%). No or less advance payment for milk by vendor/sweetshops had also reported as constraints of sometimes by 65.00 per cent of sample milk producers followed by always (35.00%). 100 per cent of sample milk; producers had reported as inability to market for value added products.

Service delivery system in DCS category of milk producers

On an overall average, 82.50 per cent of total sample size had replied that supply of cattle feed under input delivery system was adequate and remaining replied as inadequate. Most of the respondent had replied that there was no any certain time for payment of milk. 100 per cent respondent replied that incentives or bonus for supplying of milk was low. 100 per cent respondent replied that the acceptability of crossbred cow milk in family was accepted and advance payment for milk by society was not available.

Service delivery system in NDCS category of milk producers

On an overall average, about 69.00 per cent of respondent had replied that under input delivery system, supply of cattle feed was adequate and 31.00 per cent replied as inadequate. The provision of loan in government for purchasing of cattle was adequate as replied by 71.00 per cent of respondent and 29.00 per cent replied as inadequate.

Infrastructural constraints among DCS category of milk producers

On an overall average, 78.00 per cent of total sample size had replied that there was always lack of improved equipments. About 18.00 per cent of respondent replied as sometimes irregular and inadequate supply of cattle feed. About 27.00 per cent of respondent replied as sometimes unavailability of EVS. About 52.00 per cent of respondent viewed as sometimes infrequent visit of veterinary staff and 10.00 per cent replied in favour of 'Always.' About 33.00 per cent of respondent replied as sometimes unavailability of vaccines.

Infrastructural constraints among NDCS category of milk producers

On an overall average, 72.50 per cent of total respondent had replied as always lack of improved equipments. About 40.00 per cent of respondent had viewed that there was sometimes irregular and inadequate supply of cattle feed and unavailability of EVS.

About 65.00 per cent respondent replied as some time unavailability of green/dry fodder throughout the year. About 63.00 per cent of respondent had replied as 'Never' unavailability of cattle feed and fodder seed on credit followed by sometime unavailability of cattle feed and fodder seed on credit. About 65.00 per cent of respondent had viewed as always low average milk yield of animal followed by sometime 35.00 per cent.

Economic constraints among DCS milk producers

On an overall average, about 58.00 per cent of total respondent had replied that there was always high cost of fodder seed and 42.00 per cent told as sometime high cost of fodder seed. Sometime delay in payment of milk had replied by 52.00 per cent of respondent and 48.00 per cent told as always delay in payment of milk.

Economic constraints among NDCS milk producers

On an overall average, 55.00 per cent of respondent told that there was always high cost of fodder seed ad 45.00 per cent told as sometime high cost of fodder seed. Never delay in payment of milk was reported by 60.00 per cent of respondent but 40.00 per cent reported as always delay in payment of milk.

Technical constraints among DCS category of milk producers

On an overall average, 55.00 per cent of respondent had replied that there was sometime lack of technical guidance followed by always (23.33%) and never (21.67%). 100 per cent had reported that there was always unavailability of high genetic bull. Around 67.00 per cent of respondent had reported that there was sometime poor conception rate through AI followed by never (33.00%). Sometime poor knowledge about feeding and healthcare of animal had reported by 70.83 per cent of respondent followed by always (29.17%) while 60.83 per cent of respondent had reported about always lack of knowledge for cheap and scientific housing of animal followed by sometime (39.17%).

Technical constraints among NDCS category of milk producers

Around 67.00 per cent of respondent had viewed that there was always lack of technical guidance followed by sometime (33.00%). 100 per cent of respondent had told that there was always unavailability of high genetic bull. Sometime poor conception rate through AI had reported by 64.00 per cent of respondent followed by never (36.00%). Around 59.00 per cent of respondent had reported as sometime poor knowledge about feeding and healthcare of animal followed by always (41.00%) whereas 62.00 per cent reported about always lack of knowledge about cheap and scientific housing of animal followed by sometime (38.00%).

Suggestions for improvement in adoption of dairy schemes by milk producers of DCS and NDCS farmers

Among different suggestion reported by respondent of DCS and NDCS, the enhancement of milk price for producers was emerged as most important suggestion followed by easy procedure for loan sanctioning.

Conclusion

- *Milk production activity is an important enterprise as it provides supplement income and reduces unemployment of small & marginal farmers and agriculture labourers. It also helps in improving the nutritional standard of the peoples. It has been realised that dairy development could be used as a tool for bringing change in the socio-economic among the "there is tremendous potential for the milk production in the state of Jharkhand, as the agro-climatic condition of this state are ideally suited for cross bred milch cattle with moderate production capacity especially of 50.00 per cent exotic inheritance from Holstein Friesian. There is an adequate market potential for sale of milk and milk products in this state due to a number of industrially developed areas."*
- *In the state of Jharkhand, rural milk trading practices are not well established and milk marketing network is not much developed. So, milk is produced mostly for household consumption and local marketing. However, there is tremendous scope for dairy co-operative development and milk route development through institution arrangements with milk processing plant.*
- *In order to meet the requirement of milk and milk products in the state of Jharkhand, around 6 to 8 lakh litres of milk is being procured daily from neighbouring states by organised sector player. At the same time to make the state self-sufficient in milk production by implementing the bred improvement, feed and fodder development*

programmes and also by other productivity enhancement programmes intensively. As a result, the milk production in rural area is increasing significantly.

- *Total milk production was increased to 1812.38 thousand tones in 2015-16 from 910 thousand tones in 2000-01 accounting for 99.16 per cent increase during 2000-01 to 2015-16. So we can say that Jharkhand has been achieved just double in milk production during 2000-01 to 2015-16. In this state, per capita availability of milk was also increased to 152 gms per day in 2015-16 from 96 gms/day in 2001-02 accounting for 58.33 per cent increased during 2001-02 to 2015-16.*
- *Total milk production was increased to 1812.37 thousand MT in 2015-16 from 1463.00 thousand MT in 2009-10 accounting for 23.88 per cent increased during 2009-10 to 2015-16. So, we can say that total milk production in Jharkhand has been continuously increased during above mentioned period. Ranchi has highest milk production, which increased to 179.44 thousand MT in 2015-16 from 102.02 thousand MT in 2009-10 followed by Dhanbad with 54.29 per cent increased, Giridih with 13.90 per cent increased, Singhbhum (E) with 91.83 per cent increased and Deoghar with 31.62 per cent increased during 2009-10 to 2015-16. Thus, in Lohardaga district of Jharkhand, the total production of milk was lowest (25.59 thousand MT) in 2015-16 among all the 24 districts of Jharkhand state but its milk production was increased to 25.58 TMT in 2015-16 from 19.47 TMT in 2009-10 accounting for 31.38 per cent increased during 2009-10 to 2015-16.*
- *Total livestock population and, total breedable cattle & buffalo population in the Jharkhand was estimated to be 9916025 and 2957194 respectively. Its means that about 29.82 per cent of total livestock population was breedable. The district of Giridih has highest breedable population of cattle and buffalo (2,46814) accounting for 8.34 per cent of total state's breedable cattle and buffalo population followed by Palamau with 7.50 per cent, Deoghar with 6.22 per cent and Dumka with 6.01 per cent. Whereas, Giridih has also highest livestock population of state livestock population accounted for 8.25 per cent followed by Palamau with 6.34 per cent, Dumka with 6.07 per cent and Gumla with 5.61 per cent. However, Gumla has lowest number of livestock and breedable population accounted for 1.08 per cent and 1.38 per cent respectively of state total livestock and breedable population. Moreover, Chatara district of Jharkhand has highest availability of milk per capita (228 gms/day) followed by Dumka and Gumala both (179 gms/day), Ranchi with 169 gms/day and Garhwa with 164 gms/day.*
- *Total amount of outlay and expenditure by state plan was Rs. 25375 lakh and Rs. 22516 lakh during 11th Five Year Plan. Around 88.73 per cent of total outlay was expended during same period. Under CS/CSS schemes, around Rs. 500.90 lakh was released and its expenditure was Rs. 483.82 lakh accounted for 96.59 per cent of total grant released during same period of time.*
- *Total number of Gokul Gram vikas Kendra in the state of Jharkhand was estimated to 268. Out of which, 52 was in Ranchi district, as the highest number of total state Gokul Gram Vikas Kendra followed by Deoghar with 26, Hazaribagh with 23 and Giridih with 16 Gokul Vikas Kendra.*

- *The total number of Bulk milk cooler in the state of Jharkand was estimated to 20. Out of which, Ranchi has highest 11 number of bulk milk cooler while Palamau, Hazaribagh and Deoghar each has two bulk milk cooler.*
- *The total number of AMCU/PDMCU in the state of Jharkhand was recorded to be 136. Ranchi has highest number of AMCU/PDMCU (48) followed by Palamau with 16, Dumka and Deoghar each has 14 AMCU/PDMCU and Lohardaga has 12 AMCU/PDMCU. However, some districts have no any such types of facilities. So, it should be effort by cooperative/state government to establish such types of facilities in each district of Jharkhand to empower the milk producers.*
- *Total number of DCS in the state was 60 and producer member was 1000 in 2015-16. The capacity of milk procurement in the state of Jharkhand was increased to 61.00 thousand kg/day in 2015-16 from 14.00 thousand kg/day in 2014-15 while liquid milk marketing capacity in the state was decreased to 304 thousand litres per day in 2015-16 from 308 thousand litres per day in 2014-15 accounting for 1.29 per cent decreased during this period.*
- *total number of class-I veterinary hospital was 424, mobile veterinary hospital (04), provincial veterinary hospital (23), cattle breeding farms (03), bull mother farm (01) and AI centres (433) managed by department of animal husbandry & dairy, Govt. of Jharkhand.*
- *There was no any area under fodder crop in the state of Jharkhand and area under permanent pastures and other grazing land were 110 thousand ha during 2005-06 to 2009-10.*
- *The requirement and availability of dry fodder in Jharkhand were 20.09 MT and 35.54 MT respectively which indicates 15.45 MT of dry fodder was surplus in the state of Jharkhand. The requirement and availability of green fodder in the state were 40.18 MT and 21.32 MT respectively which indicates 18.86 MT green fodders was deficit in the state. Moreover, requirement and availability of concentrate in the state were recorded to be 4.02 MT and 1.80 MT respectively which indicates 2.22 MT deficits.*
- *Total milk production in the state was increased to 1699.83 thousand MT in 2013-14 from 1462.61 thousand MT in 2009-10 accounted for 16.22 per cent increased during 2009-10 to 2013-14.*
- *The total milk production of cattle was increased to 1017 thousand MT in 2011-12 from 765.86 thousand MT in 2009-10 accounted for 32.79 per cent increased whereas that of cattle was decreased to 978.44 thousand MT in 2013-14 from 1017 thousand MT in 2011-12. So, in the year of 2011-12, maximum milk production was recorded.*
- *The total production of buffalo milk was varied between 620.81 thousand MT to 636.04 thousand MT during 2009-10 to 2013-14.*
- *The total production of goat milk was also increased to 85.35 thousand MT in 2013-14 from 75.94 thousand MT in 2009-10. Milk production of goat in the Jharkhand was continuously increased except in 2010-11 year. However, the percentage share of cattle milk, buffalo milk and goat milk to total state milk production in 2013-14 were recorded to 57.56 per cent, 37.42 per cent and 5.02 per cent respectively.*
- *As per census of livestock, 2012; total number of livestock population in Jharkhand was 99.16 lakh. Out of which, 29.58 lakh was breedable accounted for 29.83 per cent to the*

total livestock population. Out of total livestock population (99.16 lakh), cattle and buffalo population were 87.30 lakh and 11.86 lakh accounted for 88.04 per cent and 11.96 per cent respectively. Therefore, the percentage share of total livestock and breedable of Jharkhand in all-India were estimated to 3.31 per cent and 2.49 per cent respectively.

- *There was 3.52 per cent share of livestock of Jharkhand in India, poultry (1.85%), bovines' male (6.06%) bovine female (2.22%) and total bovines (3.3%).*
- *Per capita availability of milk among selected districts was highest (202 gms) in Deoghar followed by Ranchi with 169 gms and Hazaribagh (160 gms).*
- *Livestock population was highest in Hazaribagh district (553144) among sample districts followed by Deoghar (550585) and Ranchi (546946).*
- *The population of breedable animal was highest in Deoghar district followed by Hazaribagh and Ranchi district. However, Lohardaga district among selected districts was lowest in all regards as in livestock population, breedable population of animal and per capita availability of milk.*
- *Ranchi district of Jharkhand state was laced with all types of health infrastructure for animals as compared to other districts in Jharkhand. However, Ranchi has 424 veterinary hospitals, 04 mobile veterinary hospital, 03 cattle breeding farms and 432 artificial insemination centres. BAIF has been performing well in Ranchi to provide all types of facilities for dairy development in the state of Jharkhand.*
- *Total number of villages' coverage was increased to 990 in 2012-13 from 130 in 2008-09. Also, household coverage of milch animal holding was increased to 41500 in 2012-13 from 4500 in 2008-09.*
- *Total milk procurement was also increased to 90 TLPD in 2012-13 from 08 TLPD in 2008-09. Total liquid milk sold was also increased to 80 TLPD in 2012-13 from 08 TLPD in 2008-09 due to high demand of milk and milk product with increasing population of the state.*
- *Total number of DCS was 1490 with 48.75 thousand of milk producer members while average milk collection per day was 20.65. The processing and chilling capacity of milk by COMPFED was estimated to 185 thousand litres while milk marketing through dairies and chilling centres was estimated 230.45 thousand litres per day.*
- *The achievement in regards to milk production, induction of milch cattle and strengthening of DCS in the state of Jharkhand was estimated to 100 per cent during 10th Five Year Plan. However, the achievement and target of milk production were increased to 14.52 & 14.52 lakh MT respectively in 2006-07 from 9.51 lakh MT and 13.36 lakh MT in 2002-03.*
- *Total number of PDCS was 1490, member of dairy (48750), district cooperative milk union (12) and milk processing and chilling centre was 14 with capacity of 45000 TLPD.*

Policy Implications

There are following policy implications based on main findings of the study, being intimated to Ministry of Agriculture & Farmers Welfare, Government of India; NDDB and all concerned, given as below:

i. *Emphasis should be given for making dairying more viable, particularly for marginal, small and landless farmers so that they could feel encouraged for this venture.*

ii. *The average milk yield of all milch animals was extremely low in Jharkhand. Hence, state department of Animal Husbandry and Dairying should play decisive roles to raise the milk yield rates of the cattle and buffaloes in the state.*

iii. *Large sized milk producers should be persuaded to adopt dairying as a small scale enterprise in the study areas.*

iv. *The costs of veterinary services and medicines were reported to be high by almost all the milk producers. So, Government should evolve mechanizations to reduce the costs of these components or make them available at reduced costs.*

v. *Extension services on dairying should be provided on doorsteps, as majority of the milk producers in state were not getting the same at their places.*

vi. *The average return on production of milk was found lower than the cost incurred thereon so, prices of milk paid to the DCS members should be reasonably fixed by the milk unions/federation.*

vii. *There is need to strengthen the DCS by providing them a good infrastructure, so that it could be made functional for the purpose of sale and purchase of milk and milk products.*

viii. *The procedure for sanctioning loan should be made easier preferably by organising 'Dairy Loan Mela' at village panchayat level.*

ix. *The provisions of advances and bonus made under Dairy Co-operative Societies should be properly and regularly monitored to boost up the milk producers for remaining in the venture.*

x. *Infrastructure available at dairy farmers' level was found very poor. So, it should be improved for better up-keeping of the dairy animals.*

xi. *Awareness in regard to insurance of animals was found very poor in the study area. So, there is need to create awareness for its wider coverage.*

CHAPTER – I

INTRODUCTION

1.1 Introduction

Dairying has been an integral part of the agriculture since an ancient time in India. India has vast scope and resources of livestock, which play key role in the national economy and also in the socio economic development for millions of rural households, especially for women empowerment. India has one of the largest stocks of the cattles and buffaloes accounting for more than 50.00 per cent of the world's buffaloes and 20.00 per cent of its cattles. The contribution of agriculture and allied sector to the national GDP has declined during last few decades but that of livestock sector has increased from less than 5.00 per cent in the early 1980 to over 6.00 per cent in the late 1990 (www.fao.org). India is the largest producer of milk in the world with an annual output of 130 MT. It also has the largest milch animal population of over 118 million. On account of NDDB, demand of milk is expected to increase at CAGR of 5.00 per cent from 138 MT in 2017 to 200 MT in 2022. According to the report of CARE ratings, the share of value added products in milk and milk deliveries segment in India is growing at 25.00 per cent every year and it is also expected to grow at the half rate until 2019-20 (www.indianmirror.com).

The per capita availability of milk in India has increased from 176 grams per day in 1990-91 to 322 grams per day during2014-15. Considerably, it was more than the world average of 294 grams per day during 2013-14. It represents a sustainable growth in availability of milk and milk products for growing population. The dairying has becomes an important secondary source of income for millions of rural households, especially for rural women which engaged in agriculture and allied activities. Livestock play a key role in the socio-economic life of Indian rural mass. As it is a rich source of

high quality food such as milk, meat and eggs. Besides it, also a good source of income and employment to millions of rural farmers, particularly rural women.

An Overview of Jharkhand

The State of Jharkhand came into existence on 15 November 2000, having total geographical area of 7.97 million hectare, out of which, net sown area is 18.10 lakh ha. The state is primarily rain fed and crop production mainly depends on monsoon. Cropping intensity is 126.00 per cent, while irrigated area is less than 15.00 per cent.

The farming situation in the state depends on the type of land. Land is upland, medium and low land. Upland are red to brown in colour, light textured, low pH and well drained, medium soil are yellow in colour medium textured, moderately acidic and moderately drained, while low land are grey in colour, heavy textured, neutral in pH and poorly drained.

Table 1.1 Land use Pattern in Jharkhand State

SN	Particulars	Area in Lakh hectares	Area in %
1.	Total Geographical Area	79.71	100
2.	Total cultivable area	38.00	47.67`
3.`	Net sown area	25.75	28.08
4.	Current fallow land	8.87	11.12
5.	Other fallow land	6.75	8.46
6.	Forest area	23.28	29.20
7.	Barren lands	5.74	7.20
8.	Area under non-agricultural use	6.86	8.60
9.	Pasture and other grazing land	1.97	2.48
10.	Cultivable waste land	2.74	3.44
11.	Irrigated land	3.007	12.73
12.	Cropping intensity		116

Source: Jharkhand Economic Survey 2016-17

Animal Husbandry and milk production is an integral part of the diversified agriculture system. The animal husbandry sector plays a crucial role in the rural economy by providing gainful employment particularly to small, marginal farmers and agriculture labourers. It provides gainful employment and source of income and livelihood among landless labour and additional source of income to families through employment of women. In the agrarian economy Jharkhand livestock plays an important role in

contribution to income generation, self employment, tribal development and women empowerment.

Agriculture and livestock rearing is a backbreaking occupation, not rewarded by return because of unproductive land, climate factor and breed of livestock (yielding 0.5 to 1.5 litre of milk per day).

1.2 State wise Livestock and Milch Animal Population in India

The state of Uttar Pradesh has play 1st stage in the percentage share of milch animals (18.38%) to all India milch animal population followed by Rajasthan (10.06%) and Madhya Pradesh (8.41%). Meanwhile, Jharkhand has stay 16th place in the percentage share of milch animals (2.27%) to all-India milch animals. Moreover, Uttar pradesh has also highest percentage share (13.42%) of all India livestock population followed by Rajasthan (11.27%), Andhra Pradesh (10.96%) and Madhya Pradesh (7.10%) but Jharkhand has only 3.53 percentage share in all India livestock population.

Table 1.2: State wise Milch Animal Population (2012)

State / UT's	Adult Female Bovine Population by States (2012) (In thousands)						Total Livestock	
	Crossbred Over 2 1/2 years	Indiqenous Over 3 years	Total Cows	Female Buffalo >3 years	Total Cows & Buffaloes	% to all India total	(000)	% to all India total
A & N Islands	8	10	18	2	20	0.02	1 55	0.03
Andhra Pradesh	1251	2228	3479	5763	9241	6.93	56099	10.96
Arunachal	11	133	144	1	145	0.11	1413	0.28
Assam	175	3335	3531	1 57	3688	2.77	19082	3.73
Bihar	2023	3959	5982	4017	9999	7.50	32939	6.43
Chandiqarh	5	1	6	10	16	0.01	24	0.00
Chhattisqarh	89	3238	3327	409	3736	2.80	1 5044	2.94
D & N Haveli	0	9	9	1	10	0.01	50	0.01
Daman & Diu	0	1	1	0	1	0.00	5	0.00
Goa	10	14	25	16	41	0.03	146	0.03
Gujarat	1048	3092	4141	5646	9787	7.34	27128	5.30
Haryana	522	322	844	2914	3758	2.82	8820	1.72
Himachal Pradesh	549	403	952	423	1375	1.03	4844	0.95
J& K	703	525	1228	417	1644	1.23	9201	1.80
Jharkhand	137	2486	2622	398	3020	2.27	18053	3.53
Karnataka	1829	2540	4369	2056	6425	4.82	27702	5.41
Kerala	630	36	666	10	676	0.51	2735	0.53
Lakshadweep	0	2	2	0	2	0.00	50	0.01
Madhya Pradesh	41 5	6538	6954	4251	11204	8.41	36333	7.10
Maharashtra	2138	3302	5440	3359	8799	6.60	32489	6.34
Manipur	20	77	96	23	119	0.09	696	0.14
Meqhalaya	19	333	352	4	357	0.27	1958	0.38
Mizoram	6	10	16	2	18	0.01	312	0.06
Naqaland	52	38	90	9	99	0.07	911	0.18
Nct Of Delhi	32	1 5	47	95	142	0.1 1	360	0.07
Odisha	575	2884	3459	250	3709	2.78	20732	4.05
Pondicherry	31	1	32	1	33	0.02	120	0.02
Punjab	1182	1 1 5	1297	2805	4101	3.08	8117	1.59
Rajasthan	929	5540	6470	6933	13403	10.06	57732	11.27
Sikkim	57	5	62	0	62	0.05	292	0.06
Tamilnadu	341 1	1074	4485	423	4908	3.68	22723	4.44
Tripura	54	289	343	4	347	0.26	1936	0.38
Uttar Pradesh	1828	7241	9069	1 5432	24501	18.38	6871 5	13.42
Uttarakhand	259	548	807	582	1389	1.04	4795	0.94
West Benqal	1270	5053	6323	172	6494	4.87	30348	5.93
ALL	21268	5541 7	76685	56586	133271	100.00	512057	100.0

Source: GOI (2016)

1.3 State wise Milk Production in India

The total milk production in India has increased to 155491 thousand tones in 2015-16 from 84406 thousand tones in 2001-02. Moreover, Uttar Pradesh has highest milk production (26387 thousand tones) with share of 17.00 per cent in India's milk production followed by Rajasthan with 11.90 per cent, Gujarat with 7.90 per cent while Jharkhand has only 1.20 per cent share.

Table 1.3: State-wise Milk Production in India

State	Milk Production (000 tonnes)					% to all India Total
	2001-02	2005-06	201 0-11	2014-05	201 5-16	
Andhra Pradesh	5814	7624	11203	9656	1 081 7	7.0
Arunachal Pradesh	42	48	28	46	50	0.0
Assam	682	747	790	829	843	0.5
Bihar	2664	5060	6517	7775	8288	5.3
Goa	45	56	60	67	54	0.0
Gujarat	5862	6960	9321	11691	12262	7.9
Haryana	4978	5299	6267	7901	8381	5.4
Himachal Pradesh	756	869	1 102	1 1 72	1283	0.8
J & K	1 360	1400	1609	1 951	2273	1.5
Karnataka	4797	4022	5114	6121	6344	4.1
Kerala	2718	2063	2645	271 1	2650	1.7
Madhya Pradesh	5283	6283	7514	1 0779	12148	7.8
Maharashtra	6094	6769	8044	9542	1 01 53	6.5
Manipur	68	77	78	82	79	0.1
Meghalaya	66	73	79	83	84	0.1
Mizoram	14	1 5	1 1	20	22	0.0
Nagaland	57	74	76	76	77	0.0
Orissa	929	1 342	1 671	1903	1903	1.2
Punjab	7932	8909	9423	1 0351	1 0774	6.9
Rajasthan	7758	871 3	1 3234	16934	18500	1 1.9
Sikkim	37	48	43	50	67	0.0
Tamil Nadu	4988	5474	6831	71 32	7244	4.7
Tripura	90	87	1 04	141	1 52	0.1
Uttar Pradesh	14648	17356	21031	25198	26387	17.0
West Bengal	3515	3891	4471	4961	5038	3.2
A&N Islands	23	20	25	16	1 5	0.0
Chandigarh	43	46	45	44	43	0.0
D&N Haveli	8	5	1 1	9	9	0.0
Daman & Diu	1	1	1	1	1	0.0
Delhi	294	310	480	280	281	0.2
Lakshadweep	2	2	2	4	3	0.0
Pondicherry	37	43	47	48	48	0.0
Chhattisgarh	795	839	1029	1232	1 277	0.8
Uttarakhand	1066	1206	1 383	1 565	1656	1.1
Jharkhand	940	1 335	1 555	1 734	1812	1.2
Telangana	-	-	-	4207	4442	2.9
All India	84406	97066	121848	146314	155491	100.0

Govt. of India, 2016

1.4 State wise area under Fodder Crop, Permanent Pastures and Grazing land in India

India has an area under fodder crops (9188 thousand ha) with percentage share of 2.8 to GCA of India whereas, area under permanent pastures and other grazing land was calculated to 10256 ('000 ha) with 3.10 per cent of GCA of India, consequently, Rajasthan has highest area under fodder crops with 14.20 per cent to GCA of respective states followed by Punjab (10.10%, Haryana (9.80%), Gujarat (4.30%), Uttar Pradesh (3.30%)

and Bihar (0.30%) while Jharkhand has no area under fodder crops. Therefore, Himachal Pradesh has highest area under permanent pasture and other grazing land accounting for 27.10 per cent of its GCA followed by Chhattisgarh (6.50%), Rajasthan (4.90%), Karnataka (4.70%), Madhya Pradesh (4.20%) and Jharkhand has only 1.40 per cent which is few little than other states.

Table 1.4: State-wise Area under Fodder Cultivation and Permanent Pastures and Other Grazing Lands in India ('000 ha)

States/UTs	Fodder Crops (2012-2013)*		Permanent Pastures and Other Grazing Land (2013-	
	(000 ha)	% to GCA	(000 ha)	% to GCA
Andaman and Nicobar Islands		0.0	4	0.5
Andhra Pradesh	87	0.3	212	1.3
Arunachal Pradesh		0.0	18	0.2
Assam	10	0.1	168	2.1
Bihar	24	0.3	1 5	0.2
Chandiqarh		0.0		0.0
Chhattisqarh	1	0.0	882	6.5
Dadra and Naqar Haveli	1	2.0	1	2.0
Daman and Diu	0	0.0		0.0
Delhi	1	0.7		0.0
Goa		0.0	1	0.3
Gujarat	850	4.3	851	4.3
Haryana	432	9.8	26	0.6
Himachal Pradesh	8	0.1	1 510	27.1
Jammu and Kashmir	53	0.2	114	0.5
Jharkhand		0.0	114	1.4
Karnataka	33	0.2	906	4.7
Kerala	5	0.1	0	0.0
Lakshadweep	0	0.0		0.0
Madhya Pradesh	406	1.3	1291	4.2
Maharashtra	901	2.9	1242	4.0
Manipur		0.0	1	0.0
Meqhalaya		0.0		0.0
Mizoram		0.0	5	0.2
Naqaland		0.0		0.0
Odisha		0.0	524	3.4
Pondicherry	0	0.0		0.0
Punjab	510	10.1	5	0.1
Rajasthan	4853	14.2	1 694	4.9
Sikkim		0.0		0.0
Tamil Nadu	179	1.4	110	0.8
Telanqana			302	2.6
Tripura		0.0	1	0.1
Uttar Pradesh	800	3.3	65	0.3
Uttarakhand	32	0.6	192	3.6
West Benqal	3	0.0	2	0.0
India	9188	2.8	10256	3.1

Source: www.indiastat.com

1.5 State wise availability and requirement of Fodder in India

The availability of India's green fodder was estimated to be 142.82 MT against requirement of 221.63 MT with deficit of 55.18 per cent and crop residues shows 64.19 per cent deficit with availability and requirement of 253.26 MT and 415.83 MT respectively. Moreover, Rajasthan has highest amount of green fodder availability (33.53 MT) against requirement of 17.88 MT followed by Maharashtra (25.12 MT) with surplus of 26.50 per cent, Uttar Pradesh (15.73 MT) with deficit of 93.99 per cent requirement and Bihar has 16.23 MT against 12.53 MT of requirement with 22.79 per cent surplus while Jharkhand has only 0.88 MT against requirement of 7.25 MT with deficit of 723.86 per cent. Now, in regards of crop residues, UP had highest amount (42.07 MT) of availability of crop residues against 57.19 MT of requirement with deficit of 35.94 per cent followed by MP (24.30 MT), Maharashtra (22.21 MT), Rajasthan (21.67 MT) and Bihar (16.23 MT) against requirement of 23.49 MT crop residues with 44.73 deficit of us while Jharkhand has only 4.1 MT of crop residues availability against 13.59 MT of its requirement with deficit of 9.49 MT.

Table 1.5: State-wise Availability and Requirement of Fodder in India (2008)

(Dry Matter in Million Tonnes)

States/UTs	Availability		Requirement	
	Crop Residues	Greens	Crop Residues	Greens
Andhra Pradesh	1 5.69	4.88	31.71	16.91
Arunachal Pradesh	0.47	1.57	1	0.53
Assam	5.82	0.95	12.39	6.61
Bihar	16.23	0.81	23.49	12.53
Chhattisgarh	9.93	2.83	14.93	7.96
Goa	0.13	0.05	0.1 5	0.08
Gujarat	10.61	14.48	22.32	1 1.9
Haryana	8.75	6.57	9.95	5.31
Himachal Pradesh	2.3	1.98	4.6	2.45
Jammu and Kashmir	2.53	0.64	6.79	3.62
Jharkhand	4.1	0.88	1 3.59	7.25
Karnataka	14.59	3.55	20.66	1 1.02
Kerala	0.71	0.39	2.91	1.55
Madhya Pradesh	24.3	1 1.65	37.41	19.95
Maharashtra	22.21	25.12	33.68	1 7.96
Manipur	0.36	0	0.72	0.38
Meghalaya	0.31	0.4	1.17	0.62
Mizoram	0.1 5	0.5	0.06	0.03
Nagaland	0.56	0.3	0.74	0.4
Orissa	12.25	2.46	22.27	11.88
Punjab	1 3.71	7.38	10.58	5.64
Rajasthan	21.67	33.53	33.53	1 7.88
Sikkim	0.23	0.01	0.25	0.13
Tamil Nadu	7.01	3.7	16.46	8.78
Tripura	0.53	0.19	1.09	0.58
Uttar Pradesh	42.07	1 5.73	57.19	30.5
Uttarakhand	2.05	1.73	4.9	2.61
West Benqal	1 3.77	0.51	30.3	16.16
A& N Islands	0.02	0	0.1 1	0.06
Chandiqarh	0	0	0.04	0.02
Dadra & Naqar Haveli	0.04	0.2	0.8	0.4
Daman and Diu	0.01	0	0.1	0
Delhi	0.09	0.1	0.43	0.23
Lakshadweep	0	0	0.1	0
Pondicherry	0.06	0.01	0.1 1	0.06
India	253.26	142.82	415.83	221.63

1.6 Need and Scope of the Study

Dairying is an important source of subsidiary income to small/marginal farmers and agricultural labourers. In addition to milk, the manure from animals provides a good source of organic matter for improving soil fertility and crop yields. The gobar gas from the dung is used as fuel for domestic purposes, as also for running engines for drawing water from well. Almost all draught power for farm operation and transportation is supplied by bullocks. Since, agriculture is mostly seasonal; there is a

possibility of finding employment throughout the year for many persons through dairy farming. Thus, dairy also provides employment throughout the year. The main beneficiaries of dairy programmes are small/marginal farmers and landless labourers. There is huge scope of dairy farming in India for marginal and small farmers as such India is endowed with the largest livestock population in the world. It accounts for 57.3 per cent of the world's buffalo population and 14.7 per cent of the cattle population. The value of output of milk is Rs. 3,05,484 crore in 2011-12. The total milk production in the country is 127.9 million tones per annum at the end of the 11th Plan (2011-12) and the demand is expected to be 180 million tones by 2020. To achieve this demand, annual growth rate in milk production has to be increased from the 2.5 per cent to 5 per cent. The annual growth rate for production of milk is about 5 per cent in 2011-12. Thus, there is a tremendous scope/potential for increasing the milk production through profitable dairy farming.

1.7 Objectives of the Study

Objectives of the study are given below:

i. *To prepare an outline of socio economic status of the region with respect to standard economic, social and infrastructural parameters.*
ii. *To assess present status of dairying with reference to typology of animal distribution, yield, milk production, consumption and marketable surplus.*
iii. *To identify the constraints in dairy development from supply side, institutional deficiency and processing infrastructure.*
iv. *To high light facilitating factors that could help promoting dairying development to improve socio-economic status of the milk producers.*
v. *To suggest broad areas for focused interventions for promoting dairy development in the region and the way forward.*
vi. *To identify different Central and State Government Schemes related to dairy development at the district level and document technical as well as operational details of the schemes, correspondent wise, and guidelines to implement them and ascertain controlling department, implementing department and monitoring department and understand how convergence is ensured.*
vii. *To suggest possible measure to ensure compliance of effective convergence of various schemes by central and state government for the benefits of dairy farmers.*

1.8 Data, Methodology and Sampling Framework

The present study is mainly based on secondary and primary data. As per Methodology, we had selected four milk unions:

1.8.1 Selections of village--- four villages had been selected from each sample district. Two villages nearest to sample milk union and two 25-50 kms away from sample milk union. One DCS and other non-DCS village from each selected/respective tehsil/block have been considered. It is predicted in as given in table 1.6.

Table 1.6 Selections of Milk Unions /DMUs/Districts and Villages

SN	District Milk Union	Selected Villages nearer Sample Milk Union	Selected Villages 25-50 kms away from sample Milk Union
1.	Ranchi Milk Union District- Ranchi	1. Sitamtoli (DCS) 2. Pundag (NDCS)	1. Harhi (DCS) 2. Narcopi (NDCS)
2.	Hazaribagh Milk Union Dist-Hazaribagh	1. Harli (DCS) 2. Baliya (NDCS)	1. Bendubara (DCS) 2. Shokhi (NDCS)
3.	Lohardaga Milk Union	1. Rampur (DCS) 2. Ambrela (NDCS)	1. Kumariya (DCS) 2. Chatti (NDCS)
4.	Deoghar Milk Union	1. Tetariya (DCS) 2. Ajberadih (NDCS)	1. Uparbandhi (DCS) 2. Amba (NDCS)

Source: MD & Procurement Officer, Govt. of Jharkhand

1.8.2 Selection of Milk Producers

From each selected village, 15 milk producers comprising 5 each of small, medium and large milk producers had been selected randomly so, 60 milk producers falling in each sample milk union, therefore, total sample size of milk producers in each state will be 240.

Table 1.7 Sampling Frameworks

DU/D	District Unions/District				DU2/D2				DU3/D3				DU4/D4			
Villages	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	V13	V14	V15	V16
Location	close	close	away	away	close	close	away	away	close	close	away	away	close	close	away	away
DC/NDC	DC	NDC	DC	NDC	DC	NDC	DC	NDC	DC	NDC	DC	NDC	DC	NDC	DC	NDC
Small	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Medium	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Larqe	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Total sample	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
	60				60				60				60			

Note: DU- District Union; In case PDCS (Primary Dairy Cooperative Society) members are not available, Non DC. Villages: considered 16; Milk Producers- 240; PDCS- 08 (whatever available); Milk Unions-04 (whatever available)

Table 1.8: Selection of DCS and NDCS across Selected Districts

Districts/Milk Unions	DCS				NDCS			
	Small	Medium	Large	Total	Small	Medium	Large	Total
Ranchi	10	10	10	30	10	10	10	30
Hazaribagh	10	10	10	30	10	10	10	30
Lohardaga	10	10	10	30	10	10	10	30
Deoghar	10	10	10	30	10	10	10	30
Jharkhand	40	40	40	1 20	40	40	40	1 20

1.9 Limitations of the Study

1. The study area was confined to only two DCS villages under each sample district, more number of DCS villages would have been better for greater reliability of results.
2. The study was confined to only one agricultural year, that is, 2015-16 as mentioned in milk producer's questionnaire and households' survey schedule. It would have better to have the data for at least 2 to 3 years to reduce the variation.
3. The survey method of data collection was used, which could not be free from memory bias, particularly in case of uneducated farmers.
4. The information obtained from DCS members and Non-members farmers, particularly relating to their expenditure and income statements may not be free from certain margin of errors because of their hesitation in responding to such types of questions and queries.
5. Because of the large sample size and paucity of time and other resources of the Research Faculties and Investigators the findings of the study may have its own limited acceptability. However, it raises many vital issues of practical importance, which may be pursued for future research. The conclusions drawn may not have universal applicability on account of diverse agro-economic and physical environments. It is; however, felt that the value of the study would have increased manifold, had a large size of sample been drawn from a wider area related with the study.

CHAPTER – II

STATUS OF DAIRY DEVELOPMENT IN JHARKHAND

2.1 Introduction

Milk production activity is an important enterprise as it provides supplement income and reduces unemployment of small & marginal farmers and agriculture labourers. It also helps in improving the nutritional standard of the peoples. It has been realised that dairy development could be used as a tool for bringing change in the socio-economic among the rural farming communities by production of milk as a subsidiary occupation. There is tremendous potential for the milk production in the state of Jharkhand, as the agro-climatic condition of this state are ideally suited for cross bred milch cattle with moderate production capacity especially of 50.00 per cent exotic inheritance from Holstein Friesian. There is an adequate market potential for sale of milk and milk products in this state due to a number of industrially developed areas.

In the state of Jharkhand, rural milk trading practices are not well established and milk marketing network is not much developed. So, milk is produced mostly for household consumption and local marketing. However, there is tremendous scope for dairy co-operative development and milk route development through institution arrangements with milk processing plant.

In order to meet the requirement of milk and milk products in the state of Jharkhand, around 6 to 8 lakh litres of milk is being procured daily from neighbouring states by organised sector player. At the same time to make the state self-sufficient in milk production by implementing the bred improvement, feed and fodder development programmes and also by other productivity enhancement programmes intensively. As a result, the milk production in rural area is increasing significantly.

2.2 Milk Production and per capita availability of Milk in Jharkhand (2001 to 2015 -16)

The year wise milk production and per capita availability of milk are presented in table 2.1. An analysis of this table reveals that total milk production was increased to 1812.38 thousand tones in 2015-16 from 910 thousand tones in 2000-01 accounting for 99.16 per cent increase during 2000-01 to 2015-16. So we can say that Jharkhand has been achieved just double in milk production during 2000-01 to 2015-16. In this state, per capita availability of milk was also increased to 152 gms per day in 2015-16 from 96 gms/day in 2001-02 accounting for 58.33 per cent increased during 2001-02 to 2015-16.

Table No. 2.1: Year wise Milk Production and per capita availability of milk in Jharkhand (2000-01 to 2015-16)

(In 000 tones)

SN	Years	Production	Per capita availability (gms/day)
1.	2000-01	910	---
2.	2001-02	940	96
3.	2002-03	952	94
4.	2003-04	954	92
5.	2004-05	1330	127
6.	2005-06	1335	126
7.	2006-07	1401	130
8.	2007-08	1442	132
9.	2008-09	1466.35	132
10.	2009-10	1463.00	130
11.	2010-11	1555.64	136
12.	2011-12	1745.00	145
13.	2012-13	1679.00	146
14.	2013-14	1699.83	146
15.	2014-15	1733.72	147
16.	2015-16	1812.38	152

Source: Jharkhand Economic Survey, 2016-17 & Deptt. of AH, Dairying & Fisheries, Ministry of Agriculture, GoI

2.3 District wise Milk Production in Jharkhand

The district wise total milk production in the state of Jharkhand is presented in table 2.2. Analysis of this table reveals that total milk production was increased to 1812.37 thousand MT in 2015-16 from 1463.00 thousand MT in 2009-10 accounting for 23.88 per cent increased during 2009-10 to 2015-16. So, we can say that total milk production in Jharkhand has been continuously increased during above mentioned period. Moreover, district wise analysis reveals that Ranchi has highest milk production, which increased to 179.44 thousand MT in 2015-16 from 102.02 thousand MT in 2009-10 followed by Dhanbad with 54.29 per cent increased, Giridih with 13.90 per cent increased, Singhbhum (E) with 91.83 per cent increased and Deoghar with 31.62 per cent increased

during 2009-10 to 2015-16. Thus, in Lohardaga district of Jharkhand, the total production of milk was lowest (25.59 thousand MT) in 2015-16 among all the 24 districts of Jharkhand state but its milk production was increased to 25.58 TMT in 2015-16 from 19.47 TMT in 2009-10 accounting for 31.38 per cent increased during 2009-10 to 2015-16.

2.4 District wise Cattle and Buffalo Population and per capita availability of Milk

The district wise cattle and buffalo population and per capita availability of milk are presented in table 2.3. An analysis of this table reveals that total livestock population and total breedable cattle and buffalo population in the Jharkhand was estimated to be 9916025 and 2957194 respectively. Its means that about 29.82 per cent of total livestock population was breedable. The district of Giridih has highest breedable population of cattle and buffalo (2,46814) accounting for 8.34 per cent of total state's breedable cattle and buffalo population followed by Palamau with 7.50 per cent, Deoghar with 6.22 per cent and Dumka with 6.01 per cent. Whereas, Giridih has also highest livestock population of state livestock population accounted for 8.25 per cent followed by Palamau with 6.34 per cent, Dumka with 6.07 per cent and Gumla with 5.61 per cent. However, Gumla has lowest number of livestock and breedable population accounted for 1.08 per cent and 1.38 per cent respectively of state total livestock and breedable population. Moreover, Chatara district of Jharkhand has highest availability of milk per capita (228 gms/day) followed by Dumka and Gumala both (179 gms/day), Ranchi with 169 gms/day and Garhwa with 164 gms/day.

Table No. 2.2: District wise Milk Production in Jharkhand, (2001 -02 to 2015-16)

(In 000 MT)

SN	Districts	2009-10 (%)	2010-11 (%)	2011-12 (%)	2012-13 (%)	2013-14 (%)	2014-15 (%)	2015-16 (%)
1.	Bokaro	65.8077 (4.50)	70.7502 (4.54)	70.9906 (4.50)	75.6181 (4.50)	76.5023 (4.50)	84.54 (4.88)	101.5701 (5.60)
2.	Chatara	79.6888 (5.45)	84.3379 (5.42)	85.6673 (5.42)	89.9076 (5.35)	90.9014 (5.35)	87.91 (5.07)`	86.8896 (4.79)
3.	Deoghar	83.6902 (5.72)	89.1832 (5.73)	91.2283 (5.77)	97.5582 (5.81)	98.8169 (5.81)	99.59 (5.74)	110.1496 (6.08)
4.	Dhanbad	84.363 (5.77)	91.0955 (5.86)	90.3687 (5.72)	95.5199 (5.69)	96.5273 (5.68)	109.95 (6.34)	130.1698 (7.18)
5.	Dumka	78.5562 (5.37)	83.2638 (5.35)	86.3921 (5.46)	93.1135 (5.54)	94.431 (5.56)	90.82 (5.24)	86.5392 (4.77)
6.	Garhwa	77.4148 (5.30)	81.9034 (5.26)	83.124 (5.26)	87.0705 (5.18)	88.016 (5.18)	84.80 (4.89)	79.3958 (4.38)
7.	Giridih	112.5312 (7.69)	119.7947 (7.70)	122.4975 (7.75)	131. 0252 (7.80)	132.714 (7.81)	134.34 (7.75)	128.1760 (7.07)
8.	Godda	76.3873 (5.22)	80.6909 (5.19)	82.2006 (5.20)	86.3262 (5.14)	87.2963 (5.14)	83.22 (4.80)	74.7628 (4.13)
9.	Gumala	64.7833 (4.43)	67.9848 (4.37)	70.0754 (4.43)	74.4362 (4.43)	75.3768 (4.43)	70.93 (4.09)	66.8896 (3.69)
10.	Hazaribagh	79.8046 (5.45)	84.9038 (5.46)	86.3121 (5.46)	92.0282 (5.48)	93.1639 (5.48)	96.45 (5.56)	101.2033 (5.58)
11.	Jamatara	39.0097 (2.67)	41.4874 (2.67)	43.0513 (2.72)	46.622 (2.78)	47.2996 (2.78)	46.42 (2.68)	47.2305 (2.61)
12.	Khunti	26.6581 (1.82)	28.2068 (1.81)	28.9632 (1.83)	30.9501 (1.84)	31.3515 (1.84)	30.95 (1.79)	31.1076 (1.72)
13.	Kodarma	30.6142 (2.09)	32.7087 (2.10)	33.1037 (2.09)	35.1511 (2.09)	35.5675 (2.09)	36.97 (2.13)	37.4034 (2.06)
14.	Latehar	42.3433 (2.89)	44.5837 (2.87)	45.2944 (2.86)	47.4021 (2.82)	47.9137 (2.82)	45.87 (2.65)	39.0422 (2.15)
15.	Lohardagga	19.475 (1.33)	20.7823 (1.34)	21.012 (1.33)	22.4246 (1.34)	22.6973 (1.34)	24.34 (1.40)	25.5887 (1.41)
16.	Pakur	48.3473 (3.30)	50.8693 (3.27)	52.3906 (3.31)	55.4948 (3.30)	56.1837 (3.31)	52.20 (3.01)	49.0019 (2.70)
17.	Palamau	104.9233 (7.17)	110.7022 (7.12)	112.6291 (7.12)	117.6121 (7.00)	118.8735 (6.99)	111.07 (6.41)	94.3164 (5.20)
18.	Singhbhum (W)	33.025 (2.26)	34.6476 (2.23)	36.0375 (2.28)	39.1831 2.33)	39.763 (2.34)	39.72 (2.29)	42.1477 (2.33)
19.	Singhbhum (E)	60.8504 (4.16)	66.0418 (4.25)	65.7393 (4.16)	70.8027 (4.22)	71.6655 (4.22)	86.21 (4.97)	116.7344 (6.44)
20.	Ramgarh	30.4505 (2.08)	32.6574 (2.10)	32.4169 (2.05)	34.2728 (2.04)	34.6335 (2.03)	39.62 (2.28)	45.8900 (2.53)
21.	Ranchi	102.0192 (6.97)	109.5733 (7.04)	108.4639 (6.86)	114.5902 (6.82)	115.7599 (6.81)	136.60 (7.88)	179.4398 (9.90)
22.	Sahibganj	59.5909 (4.07)	63.4162 (4.08)	64.1403 (4.06)	67.5327 (4.02)	68.3019 (4.02)	66.36 (3.83)	62.6320 (3.45)
23.	Saraikela	30.8108 (2.11)	32.5376 (2.09)	33.7685 (2.14)	36.7276 (2.20)	37.2705 (2.19)	37.62 (2.17)	40.4513 (2.23)
24.	Simdega	31.8552 (2.18)	33.5205 (2.15)	35.1128 (2.22)	38.2196 (2.28)	38.803 (2.28)	37.23 (2.15)	35.6440 (2.00)
	Total	1463 (100%)	1555.6428 (100%)	1580.98 (100%)	1679.5892 (100%)	1699.83 (100%)	1733.73 (100%)	1812.3757 (100%)

Source: Jharkhand Economic Survey, 2015-16 & 2016-17.

Table No. 2. 3 District wise Cattle & Buffalo Population, Milk Production and its per capita availability

(Population in No)

SN	District	Live stock Population			Breedable Cattle & Buffalo (%)	Annual Milk Production (MT) (%)	Per Capita Availability in gms.
		Cow (%)	Buffalo (%)	Total (%)			
1.	Bokaro	311748 (3.57)	37455 (3.16)	349203 (3.52)	112248 (3.80)	101570.08 (5.60)	135
2.	Chatara	404132 (4.63)	83289 (7.02)	487421 (4.92)	156672 (5.30)	86889.57 (4.79)	228
3.	Deoghar	507325 (5.81)	43260 (3.65)	550585 (5.55)	184103 (6.22)	110149.62 (6.08)	202
4.	Dhanbad	304360 (3.48)	32292 (2.72)	336652 (3.40)	118429 (4.00)	130169.75 (7.18)	133
5.	Dumka	562389 (6.44)	39108 (3.30)	601497 (6.07)	177880 (6.01)	86539.17 (4.77)	179
6.	Garhwa	392257 (4.49)	60397 (5.10)	452654 (4.56)	149858 (5.07)	79395.81 (4.38)	164
7.	Giridih	718845 (8.23)	98930 (8.34)	817775 (8.25)	246814 (8.35)	128175.99 (7.07)	143
8.	Godda	389048 (4.46)	60186 (5.07)	449234 (4.53)	163812 (5.54)	74762.77 (4.13)	156
9.	Gumala	486668 (5.57)	69968 (5.90)	556636 (5.61)	133958 (4.53)	66889.55 (3.69)	179
10.	Hazaribagh	446400 (5.11)	106784 (9.00)	553184 (5.58)	159596 (5.40)	101203.27 (5.58)	160
11.	Jamatara	297107 (3.40)	20325 (1.71)	317432 (3.20)	95071 (3.21)	47230.53 (2.61)	163
12.	Khunti	232346 (2.66)	24158 (2.04)	256504 (2.59)	70424 (2.38)	31107.55 (1.72)	160
13.	Kodarma	163259 (1.87)	30584 (2.58)	193843 (1.95)	58617 (2.00)	37403.42 (2.06)	143
14.	Latehar	277380 (3.18)	37798 (3.19)	315178 (3.18)	83498 (2.82)	39042.22 (2.15)	147
15.	Lohardagga	141135 (1.62)	15160 (1.28)	156295 (1.58)	38039 (1.29)	25588.74 (1.41)	152
16.	Pakur	378246 (4.33)	57051 (4.81)	435297 (4.39)	125819 (4.25)	49001.89 (2.70)	149
17.	Palamau	540055 (6.20)	88732 (7.48)	628787 (6.34)	221806 (7.50)	94316.44 (5.20)`	133
18.	Singhbhum (W)	415993 (4.77)	32643 (2.75)	448636 (4.52)	103316 (3.49)	42147.67 (2.33)	77
19.	Singhbhum (E)	340457 (3.90)	19484 (1.64)	359941 (3.63)	104044 (3.52)	116734.44 (6.44)	139
20.	Ramgarh	124421 (1.43)	36546 (3.08)	160967 (1.62)	40839 (1.38)	45889.98 (2.53)	132
21.	Ranchi	446146 (5.11)	100800 (8.50)	546946 (5.52)	143705 (4.86)	179439.77 (9.90)	169
22.	Sahibganj	261982 (3.00)	53655 (4.52)	315637 (3.18)	123226 (4.17)	62632.04 (3.45)	149
23.	Saraikela	239298 (2.74)	19633 (1.66)	258931 (2.61)	59093 (2.00)	40451.26 (2.23)	104
24.	Simdega	349086 (4.00)	17704 (1.50)	366790 (3.70)	86327 (2.91)	35644.03 (2.00)	163
	Total	8730083 (100%)	1185942 (100%)	9916025 (100%)	2957194 (100%)	1812375.68 (100%)	

Source: Census, 2012

Notes: Figure in bracket indicates percentage

2.5 Annual outlays and Expenditures under Dairy Development (11th Five Year Plan)

Annual outlays and expenditures under dairy development in Jharkhand is presented in table 2.4. An analysis of this table reveals that total amount of outlay and expenditure by state plan was Rs. 25375 lakh and Rs. 22516 lakh during 11th Five Year Plan. Around 88.73 per cent of total outlay was expended during same period. Under CS/CSS schemes, around Rs. 500.90 lakh was released and its expenditure was Rs. 483.82 lakh accounted for 96.59 per cent of total grant released during same period of time.

Table 2.4: Annual Outlays and Expenditures during 11th Five Year Plan under Dairy Development in Jharkhand

(Rs. In lakh)

SN	Year	State Plan		CS/CSS	
		Outlay	Expenditure	Grant Released	Expenditure
1.	2007-08	3965.00	3453.33	107.64	107.64
2.	2008-09	4600.00	4415.21	93.50	89.25
3.	2009-10	4710.00	4609.45	19.76	6.93
4.	2010-11	5500.00	4674.41	280.00	143.4375
5.	2011-12	6600.00	5364.04	---	136.5625
	Total	25375.00	22516.44	500.90	483.82

Source: Deptt. of Animal Husbandry & Fisheries, Annual Plan, 2012-13 of Jharkhand

2.6 District wise infrastructure Facilities for Milk Production, Procurement, Processing and Marketing in Jharkhand

The district wise infrastructure facilities for milk; production, procurement, processing and marketing is presented in table 2.5. An analysis of this table reveals that total number of Gokul Gram Vikas Kendra in the state of Jharkhand was estimated to 268. Out of which, 52 was in Ranchi district, as the highest number of total state Gokul Gram Vikas Kendra followed by Deoghar with 26, Hazaribagh with 23 and Giridih with 16 Gokul Vikas Kendra. The total number of Bulk milk cooler in the state of Jharkand was estimated to 20. Out of which, Ranchi has highest 11 number of bulk milk cooler while Palamu, Hazaribagh and Deoghar each has two bulk milk cooler. The total number of AMCU/PDMCU in the state of Jharkhand was recorded to be 136. Ranchi has highest number of AMCU/PDMCU (48) followed by Palamu with 16, Dumka and Deoghar each has 14 AMCU/PDMCU and Lohardaga has 12 AMCU/PDMCU. However, some districts have no any such types of facilities. So, it should be effort by cooperative/state

government to establish such types of facilities in each district of Jharkhand to empower the milk producers.

The total number of dairy cattle development centre in the state of Jharkhand was 1010. Out of which, Palamu has highest number of cattle development centre followed by Hazaribagh, Giridih, Godda and Deoghar each has 65. The total number of milk processing plant/milk chilling plant in the state was 9. It means 9 districts each has one chilling plant while remaining district has no any such types of facilities.

Table No. 2.5: District wise Infrastructure for Milk Production, Procurement, Processing and Marketing

SN	Districts	Gokul Gram Vikas Kendra	Bulk Milk Cooler	AMCU/PDMCU	Dairy Cattle Development Centre	Milk Processing Plant/Milk Chilling Plant
1.	Bokaro	07	---	---	40	---
2.	Chatara	07	01	06	35	---
3.	Deoghar	26	02	14	65	01
4.	Dhanbad	11	---	---	40	01
5.	Dumka	16	01	14	60	01
6.	Garhwa	06	---	---	60	---
7.	Giridih	16	---	01	65	01
8.	Godda	12	---	07	65	---
9.	Gumala	05	---	---	35	---
10.	Hazaribagh	23	02	08	65	01
11.	Jamatara	06	---	---	35	---
12.	Khunti	08	01	01	20	---
13.	Kodarma	09	---	06	30	01
14.	Latehar	08	---	---	40	01
15.	Lohardagga	15	---	12	30	01
16.	Pakur	06	---	---	20	---
17.	Palamau	04	02	16	75	---
18.	Singhbhum (W)	03	---	---	25	---
19.	Singhbhum (E)	09	---	---	30	---
20.	Ramgarh	07	---	03	25	---
21.	Ranchi	52	11	48	60	01
22.	Sahibganj	04	---	---	35	---
23.	Saraikela	03	---	---	30	---
24.	Simdega	05	---	---	25	--
	Total	268	20	136	1010	09

Source: Dept. of Agri., Animal Husbandry & Cooperation (Dairy Development Sector), Jharkhand.
Note: AMCU/DPMCU --- Computerised Milk Collection Unit

2.7 Dairy Co-operatives in the State

The dairy cooperative in the state of Jharkhand is presented in table 2.6. An analysis of this table reveals that total number of DCS in the state was 60 and producer member was 1000 in 2015-16. The capacity of milk procurement in the state of Jharkhand was increased to 61.00 thousand kg/day in 2015-16 from 14.00 thousand kg/day in 2014-15 while liquid milk marketing capacity in the state was decreased to 304 thousand litres

per day in 2015-16 from 308 thousand litres per day in 2014-15 accounting for 1.29 per cent decreased during this period.

Table 2.6: Status of Dairy Co-operative in Jharkhand

SN	Items	2014-15	2015-16
1.	Dairy Cooperative Societies (In Nos.)	60	60
2.	Producer members (In '000)	01	01
3.	Milk Procurement (In '000 kg/day)	14	61
4.	Liquid milk Marketing (In '000 litres/day)	308	304

Source: NDDB, Annual Report 2015-16

2.8 Veterinary Facilities in the State

The veterinary facilities in the state of Jharkhand is presented in table 2.7 and reveals that the total number of class-I veterinary hospital was 424, mobile veterinary hospital (04), provincial veterinary hospital (23), cattle breeding farms (03), bull mother farm (01) and AI centres (433) managed by department of animal husbandry & dairy, Govt. of Jharkhand.

Table 2.7 Status of Veterinary Facilities in Jharkhand

SN	Infrastructure Status	Nos.
1.	Class – I, Veterinary Hospital	424
2.	Mobile Veterinary Hospital	04
3.	Provincial Veterinary Hospital	23
4.	Cattle Breeding Farms	03
5.	Bull mother Farm	01
6.	A. I. Centres (managed by Department	433

Source: Deptt. of AH (Annual Plan 2013-14 of Jharkhand)

2.9 Area under Fodder Crop, Permanent Pastures and other Grazing Lands (2005 to 2010-11)

The area under fodder crop, permanent pastures and other grazing land are presented in the table 2.8 and reveals that there was no any area under fodder crop in the state of Jharkhand and area under permanent pastures and other grazing land were 110 thousand ha during 2005-06 to 2009-10.

Table No. 2.8: Area under Fodder Crop, Permanent Pastures and other Grazing Land 2005-06 to 2010-11

(In '000 ha)

SN	Year	Fodder Crop	Permanent pastures & Other Grazing Land
1.	2005-06	---	110
2.	2007-08	---	110
3.	2008-09	---	110
4.	2009-10	--	110

Source: State Animal Husbandry Department

2.10 Requirement and availability of Feed and Fodder in Jharkhand and India (2011-12)

The requirement and availability of feed and fodder in India and Jharkhand are presented in table 2.9 and reveals that the requirement and availability of dry fodder in Jharkhand were 20.09 MT and 35.54 MT respectively which indicates 15.45 MT of dry fodder was surplus in the state of Jharkhand while that was 163 MT deficits in India. The requirement and availability of green fodder in the state were 40.18 MT and 21.32 MT respectively which indicates 18.86 MT green fodders was deficit in the state while deficit of green fodder in India was 79 MT. Moreover, requirement and availability of concentrate in the state were recorded to be 4.02 MT and 1.80 MT respectively which indicates 2.22 MT deficits while deficit of concentrate in India was 30 MT.

Table No. 2.9: Requirement and Availability of Feed & Fodder in Jharkhand and India (2011-12)

(In MT)

SN	Particular	Jharkhand		India	
		Requirement	Availability	Requirement	Availability
1.	Dry Fodder	20.09 (4.82)	35.54 (14.04)	416.00 (100)	253.00 (100)
2.	Green Fodder	40.18 (18.09)	21.32 (14.90)	222.00 (11)	143.00 (100)
3.	Concentrate Feed	4.02 (7.58)	1.80 (7.82)	53.00 (100)	23.00 (100)

Source: State Animal Husbandry Department

Note: Figure in bracket indicates percentage share of Jharkhand in India

2.11 Animal wise Production of Milk in the State (2009-10 to 2013-14)

The animal wise production of milk in the state of Jharkhand is presented in table 2.10 and reveals that total milk production in the state was increased to 1699.83 thousand MT in 2013-14 from 1462.61 thousand MT in 2009-10 accounted for 16.22 per cent increased during 2009-10 to 2013-14. The total milk production of cattle was increased

to 1017 thousand MT in 2011-12 from 765.86 thousand MT in 2009-10 accounted for 32.79 per cent increased whereas that of cattle was decreased to 978.44 thousand MT in 2013-14 from 1017 thousand MT in 2011-12. So, in the year of 2011-12, maximum milk production was recorded. The total production of buffalo milk was varied between 620.81 thousand MT to 636.04 thousand MT during 2009-10 to 2013-14. The total production of goat milk was also increased to 85.35 thousand MT in 2013-14 from 75.94 thousand MT in 2009-10. Milk production of goat in the Jharkhand was continuously increased except in 2010-11 year. However, the percentage share of cattle milk, buffalo milk and goat milk to total state milk production in 2013-14 were recorded to 57.56 per cent, 37.42 per cent and 5.02 per cent respectively.

Table No. 2.10: Animal wise production of milk in Jharkhand (2009-10 to 2013-14)

(In '000 MT)

SN	Year	Cow Milk			Buffalo Milk	Goat Milk	Total
		Exotic/CB	Indigenous Cow	Total			
1.	2009-10	121.04	644.82	765.86 (52.36)	620.81 (42.45)	75.94 (5.19)	1462.61 (100%)
2.	2010-11	147.00	695.24	842.24 (54.17)	647.13 (41.62)	65.42 (4.21)	1554.80 (100%)
3.	2011-12	123.00	894.00	1017.00 (58.28)	648.00 (37.13)	80.00 (4.58)	1745.00 (100%)
4.	2012-13	136.00	826.21	962.21 (57.31)	633.05 (37.70)	83.74 (4.99)	1679.00 (100%)
5.	2013-14	137.34	841.10	978.44 (57.56)	636.04 (37.42)	85.35 (5.02)	1699.83 (100%)

Source: State/UT Animal Husbandry Department

Note: Figure in bracket indicates percentage of total milk production

2.12 Animal wise Breedable Population of Jharkhand and India

The animal wise breedable population of Jharkhand and India are presented in table 2.11 and reveals that as per census of livestock, 2012; total number of livestock population in Jharkhand was 99.16 lakh. Out of which, 29.58 lakh was breedable accounted for 29.83 per cent to the total livestock population. Out of total livestock population (99.16 lakh), cattle and buffalo population were 87.30 lakh and 11.86 lakh accounted for 88.04 per cent and 11.96 per cent respectively. Therefore, the percentage

share of total livestock and breedable of Jharkhand in all-India were estimated to 3.31 per cent and 2.49 per cent respectively.

Table 2.11: Animal wise breedable and total population in Jharkhand and India

(No. in Lakh)

	Breed	Jharkhand		India	
		Total	Breedable	Total	Breedable
Cattle	Indigenous cow	84.74 (5.61)	24.34 (5.06)	1511.72 (100)	481.00 (100)
	Crossbreed cow	2.56 (0.64)	1.35 (0.70)	397.32 (100)	194.20 (100)
	Total cow	87.30 (4.57)	25.69 (3.80)	1909.04 (100)	675.20 (100)
	Buffalo	11.86 (1.09)	3.89 (0.76)	1087.00 (100)	510.54 (100)
	Total	99.16 (3.31)	29.58 (2.40)	2996.04 (100)	1185.74 (100)

Source: Deptt. of Animal Husbandry, Govt. of Jharkhand, Livestock Census, 2012,
Note: Figure in bracket indicates percentage share of Jharkhand in India

2.13 Percentage share of Livestock in Jharkhand and India

The percentage share of livestock of Jharkhand in India is presented in table 2.12 and reveals that there was 3.52 per cent share of livestock of Jharkhand in India, poultry (1.85%), bovines' male (6.06%) bovine female (2.22%) and total bovines (3.3%).

Table 2.12 Percentage share of Livestock of Jharkhand in India

SN	Particulars		Jharkhand (In Nos.)	Country (In Nos.)	% share of country
1.	Total Livestock	Total	18052746	512057301	3.52
2.	Total Poultry	Total	13559528	729209320	1.85
3.	Bovines Male	Total	5107916	84187200	6.06
4.	Bovines Female	Total	4808109	215793953	2.22
5.	Total Bovines	Total	9916025	299981153	3.3

Source: 19th Livestock Census 2012

2.14 Livestock Population, Milk Production and per capita of milk in sample districts.

An analysis of its may been seen in table 2.13 and reveals that per capita availability of milk among selected districts was highest (202 gms) in Deoghar followed by Ranchi with 169 gms and Hazaribagh (160 gms). Livestock population was highest in Hazaribagh district (553144) among sample districts followed by Deoghar (550585) and Ranchi (546946) whereas the population of breedable animal was highest in Deoghar district followed by Hazaribagh and Ranchi district. However, Lohardaga district

among selected districts was lowest in all regards as in livestock population, breedable population of animal and per capita availability of milk.

Table 2.13 Livestock Population, Milk Production and its per capita availability in sample districts

SN	District	Livestock population (In Nos.)			Breedable cattle & Buffalo	Annual Milk Production (MT)	Per capita availability in gms.
		Cow	Buffalo	Total			
1.	Deoghar	507325	43260	550585	184103	110149.62	202
2.	Hazaribagh	446400	106784	553144	159596	101203.27	160
3.	Ranchi	446146	100800	546946	143705	179439.77	169
4.	Lohardaga	141135	15160	156295	38039	25588.74	152

Source: As per census, 2012-13, Govt. of Jharkhand

2.15 Animal's Health Infrastructure

Animal's health infrastructure facilities in the sample districts of Jharkhand is presented in table 2.14 and analysis reveals that Ranchi district of Jharkhand state was laced with all types of health infrastructure for animals as compared to other districts in Jharkhand. However, Ranchi has 424 veterinary hospitals, 04 mobile veterinary hospital, 03 cattle breeding farms and 432 artificial insemination centres. BAIF has been performing well in Ranchi to provide all types of facilities for dairy development in the state of Jharkhand.

Table 2.14 Animal Health Infrastructure in the Sample District

SN	Item	Ranchi Dist. (In Nos.)	Hazaribagh (In Nos.)	Lohardaga (In Nos.)	Deoghar (In Nos.)
1.	Class – I, Veterinary Hospital	424	01	NA	NA
2.	Mobile Veterinary Hospital	04	27 (C-1 Vet.disp.)	NA	NA
3.	Provincial Veterinary Hospital	23	---	NA	NA
4.	Cattle Breeding Farms	03	---	NA	NA
5.	Bull mother Farm	01	---	NA	NA
6.	Gokul Gram Vikas Centre	04	---	NA	NA
7.	No. of State run Poultry Farm	02	---	NA	NA
8.	No. of State run Pig Farm	06	---	NA	NA
9.	No. of State run Goat Farm	01	---	NA	NA
10.	No. of AI Centres Managed by the Department	405	07	NA	NA
11.	No. of Dairy Cattle development centre managed by BAIF	410	---	NA	NA
12.	No. of Milk chilling centres/dairies	16	---	NA	NA
13.	No. of Biological Production Unit	01	---	NA	NA

Source: Deptt. of AH (Annual Plan 2013-14 of Jharkhand)

2.16 Infrastructure facilities of milk marketing in Jharkhand is presented in table 2.15 and reveals that total number of villages coverage was increased to 990 in 2012-13

from 130 in 2008-09. Also, household coverage of milch animal holding was increased to 41500 in 2012-13 from 4500 in 2008-09. Total milk procurement was also increased to 90 TLPD in 2012-13 from 08 TLPD in 2008-09. Total liquid milk sold was also increased to 80 TLPD in 2012-13 from 08 TLPD in 2008-09 due to high demand of milk and milk product with increasing population of the state.

Table 2.15 Infrastructure facilities of milk marketing in Jharkhand

SN	Description	Unit	2008-09	2009-10	2010-11	2011-12	2012-13
1.	Coverage of Village	No	130	360	580	850	920
2.	Milch animal Holding households coverage	No	4600	11800	20850	32450	41500
3.	Total milk procurement	TLPD	08	21	40	65	90
4.	Liquid milk sale	TLPD	08	21	36	58	80
5.	AMCU positioning at village level	No	10	30	52	80	88
6.	Cattle induction	No	2000	2000	2000	2000	2000

Source: Deptt. of Agriculture & AH

2.17 An overview on animal husbandry and dairy in Jharkhand is presented in table 2.16 and reveals that the total milk production was 1.33 MT in Jharkhand with 30.00 per cent of marketable surplus. Total number of DCS was 1490 with 48.75 thousand of milk producer members while average milk collection per day was 20.65. The processing and chilling capacity of milk by COMPFED was estimated to 185 thousand litres while milk marketing through dairies and chilling centres was estimated 230.45 thousand litres per day.

Table 2.16 An Overview on Animal Husbandry and Dairy in Jharkhand

SN	Items	Achievements
1.	Breedable population of Milch cattle	1.90 M
2.	Breedable buffalo population (in lakh)	0.39
3.	Productivity (kg/day/animal)	1.59
4.	Per capita availability of milk (in grams)	140
5.	Milk production (MT)	1.33
6.	Marketable surplus 30 per cent of total milk production (MT)	0.34
7.	Total Nos. Of milk producers cooperative societies	1490
8.	Total producers members (in '000)	48.75
9.	Average milk collection per day through societies ('000 ltrs)	20.65
10.	Processing and chilling capacity (In '000 litres) managed by District Co-operative Milk Union	45
11.	Processing & chilling capacity (In '000 litres) Managed by COMPFED	185
12.	Per day milk marketing through dairies & chilling centres (in '000 litres)	230.45

Source: Deptt. of Animal Husbandry, Jharkhand (Census 2001)

2.18 Achievement of dairy development during 10th Five Year Plan in Jharkhand is presented in table 2.17 and reveals that the achievement in regards to milk production, induction of milch cattle and strengthening of DCS in the state of Jharkhand was estimated to 100 per cent during 10th Five Year Plan. However, the achievement and target of milk production were increased to 14.52 & 14.52 lakh MT respectively in 2006-07 from 9.51 lakh MT and 13.36 lakh MT in 2002-03.

Table 2.17 Achievements of Dairy Development during 10th Five Year Plan, Jharkhand

SN	Year	Milk Production (In Lakh MT)		Induction of Milch Cattle		Strengthening of Dairy Co-operative Societies	
		Target	Achiev	Target	Achiev	Target	Achiev
1.	2002-03	13.36	9.51	800	800	75	75
2.	2003-04	13.44	9.54	2420	2420	100	100
3.	2004-05	13.83	13.30	1486	1473	125	125
4.	2005-06	13.86	13.36	2438	2283	125	125
5.	2006-07	14.52	14.52	8790	8790	150	150

Source: Jharkhand: An Overview

2.19 Infrastructure of dairy cooperatives in the state of Jharkhand is presented in table 2.18 and reveals that the total number of PDCS was 1490, member of dairy (48750), district cooperative milk union (12) and milk processing and chilling centre was 14 with capacity of 45000 TLPD.

Table 2.18 Infrastructure of Dairy Co-operatives in Jharkhand

SN	Particulars	Nos
1.	Primary Dairy Cooperative Societies (DCS)	1490
2.	Membership of Dairy	48750
3.	District Co-operative Milk Unions	12
4.	Milk Processing and Chilling Centres	14
5.	Milk Processing and Chilling capacity (Litres /day (LPD)	45000

Source: Jharkhand: An Overview

CHAPTER – III

POLICIES AND PROGRAMMES/SCHEMES FOR DAIRY DEVELOPMENT AND CONVERGENCE OF SCHEMES

3.1 Introduction

In the state of Jharkhand, livestock rearing is mainly taken as a household activity being managed by family members particularly women. So, development programme need to keep it in view while addressing the emerging issues related to this sector. The major challenges for the dairy sector in the state of Jharkhand is to increase the milk production in order to meet the increasing demand of milk and milk products resulting from the almost inevitable expansion of population ad growth of income. To meet this challenge, policies must be market oriented. The adoption of appropriate technologies for production, procurement, processing and marketing of milk with unique environment of social, economic, political and cultural environment of the state has been considered as an important aspect of dairy development. In order to make the state self sufficient in milk production, the bred improvement, feed and fodder development programme and other productivity enhancement programme are intensively implemented by central, state and milk unions. As a result, production of milk in rural area is increasing significantly. It is an important to encourage clean milk production in rural area as to facilitate the remunerative price of milk producer in order to make the milk production professional as well as employment generation entrepreneurship in rural area.

The state of Jharkhand lags behind in milk production during bifurcation of state from Bihar. However, after the creation of state, the dairy development programmes are being implemented intensively in order to create rural self employment through dairy farming. As a resultant of intensive implementation of various dairy development schemes, the production of milk was increased to 16.43 lakh MT in 2011-12 from 7.74

lakh MT in 2001-02 accounted for 112.27 per cent increased during 2001-02 to 2011-12. *(Directorate of Dairy Development, Deptt,. of AH &Fisheries, Govt. of Jharkhand)*

3.2 Major Initiatives for Dairy Development in Jharkhand during 11th Five Year Plan

Breed improvement and productivity enhancement

- Apart from 430 AI centres of the department, 609 dairy cattle development centres (DCDC) have been established and establishment of 401 additional DCDC is under process.
- BAIF Development Research Foundation has been nominated as implementing agency for management of DCDC.
- Establishment of 1000 new AI Centres is under consideration.
- Support to farmers for rearing of cross bred/improved heifer for proper growth and timely maturity.

Feed and fodder development programme

- Demonstration of green fodder production, distribution of chaff cutter, perennial grassland development, urea treatment of dry fodder, as olla cultivation, silage making and sale of balanced cattle feed.

Technical input programme

- Distribution of mineral feed, calcium and vitamin supplements, dewormers and other preventive medicines for dairy cattle.

Remunerative milk marketing system

- Infrastructure development for milk procurement at village level.
- Renovation of old and defunct dairy plants of Lohardaga and Hazaribagh.
- Establishment of new dairy plant at Ranchi, Kodarma, Dhanbad, Giridih & Deoghar
- Proposed new dairy plant at Ranchi (1 LLPD), Jamshedpur (25 TLPD) and Godda (10 TLPD).
- Milk and milk products marketing under MEDHA brand in the entire state.

Commercial and viable running of milk processing plants

- Jharkhand dairy project (JDP) has been established as an autonomous organization. Its management has been given to NDDB for initial 5 years with following objectives:

i.	Approved project cost	48.82 crore
ii.	Coverage of villages	920
iii.	District covered	12
iv.	Coverage of milch animal household	41500
v.	Milk procurement by EOP	90,000 LPD
vi.	Setting up of dairy plant at Ranchi	1.00 LLPD at Ranchi

Training and technical manpower development

- Dairy Science College have been sanctioned.
- Dairy training centre at Ranchi has been renovated and new training centre at Dumka have been established.
- Training of paravets.
- Training of "Gokul Mitra" as village level extension worker.
- Independent dairy extension and exhibition unit have been established at Ranchi.

Table 3.1 Status of Physical achievements of Dairy during 11th Five Year Plan

Year	Milk Production (Lakh MT)		Milch Cattle Induction		Training of Milk Producers		Establishment of Dairy Cattle Development Centre (Managed by BAIF)		No. of A I (Artificial Insemination)		Female Calf covered under Heifer Rearing Programme	
	Target	Achie*.	Target	Achie.**	Target	Achie.**	Target	Achie.***	Target	Achie.***	Target	Achie***
2007-08	14.88	14.42	6632	6119	10000	3367	---	160	---	86172	---	3000
2008-09	15.21	14.66	4962	5210	11000	3376	---	410	---	109000	---	6000
2009-10	15.59	14.63	8662	8662	12000	3800	---	410	---	148521	---	10000
2010-11	15.97	15.56	6567	6133	13000	4634	---	510	---	197987	---	10000
Total	---	---	26823	26124	46000	15177	---	510	---	541679	---	10000
2011-12 (Proposed)	16.43	16.43	9234	9234	15000	4700	---	1010	---	345000	---	6000

Source: ** ISS Data*
*** Departmental progress report*
**** BAIF progress report*

3.3 Strategies for dairy development in Jharkhand

In order to achieve 4.00 per cent annual growth rate in agriculture sector, the growth rate in animal husbandry and dairying sector has been targeted to 6-8 per cent with the following strategies:

- Convergence of schemes with NRLM for enduring rural livelihoods
- Allocation of higher plan resources to dairying sector.
- Priority lending to dairy sector especially for milch cattle induction.
- Commercial dairy farming to support entrepreneurs of large scale dairy farms comprising of 500/1000 milch cattle.
- Intensive breed improvement and animal health care at the door step of the farmers.
- Adequate availability of quality feed and fodder.
- Training and awareness amongst milk producers'.
- Restructuring of organizational setup of dairy development with induction of additional technical manpower.
- Establishment of milk; processing plant, cattle feed plant and paravet school on PPP mode.
- Promotion of mini milk processing facilities by private entrepreneurs.
- Remunerative milk marketing by establishing producers' owned professional organization.

3.4 Major interventions proposed for dairy development in Jharkhand during 12th Five Year Plan

- Induction of milch cattle to boost up the milk production as short term strategies.
- Intensive breed improvement and animal health care as door step services to improve the productivity of milch cattle.
- Productivity enhancement and infertility camp at regular basis.
- Insurance of milch cattle and improved heifers.
- Mass deworming and vaccination of dairy animals.
- Training and awareness programme for rural milk producers.

- To set up training-cum-extension unit at divisional level.
- Training of local educated youths as Gokul Mitra & Paravets.
- Accelerated feed and fodder production with application of intensive use of technology for sustained milk production.
- Suitable strategies and programmes shall be put in place for fodder seed and green fodder production.
- To set up cattle feed and other feed supplement plant.
- Strengthening of infrastructure and milk producers' institutions at village level on the line of **"new generation cooperative."**
- To provide remunerative milk marketing for the rural milk producers'.
- Activities of Jharkhand dairy project will be intensified.
- Establishment of dairy plants in PPP/joint venture mode.

3.5 Challenges suggested by Planning Commission

i. Enhancing capacity for growth

In order to achieve the required growth (8-10%) in milk production, apart from existing 1443 AI Centres, additional 1000 new breed improvement-cum-dairy cattle development centres have been proposed during 12th plan.

ii. Enhancing skills and faster generation of employment

In order to enhance the skills to boost up the milk production resulting into proper employment opportunities in rural areas, intensive training for scientific dairy farming and modern dairy technological practices, several training programmes, such as dairy farm management, one year diploma programme in dairy technology (through IGNOU) and 4 years' B Tech. in dairy technology is proposed.

iii. Managing the environment

Environmental and ecological degradation has serious global local implications, especially for the most vulnerable citizens of our country. By undertaking use of

cow dung and urine for organic farming as well as increasing the moisture holding capacity of the soils for better ecological situation in the state.

iv. Markets for efficiency and inclusion

In order to provide organized milk marketing in rural area, activities of Jharkhand dairy project (managed by NDDB) on the line of new generation cooperative/milk producers' company will be intensified. Apart from this, policy to set-up dairy plants on PPP mode is being proposed during 12th Plan.

v. Decentralization, empowerment and Information

In order to active participation of dairy animal breeders especially the women of the family will be actively involved in rearing of milch cattle as their household activities.

vi. Technology and Innovation

Technological and organizational innovation is the key to higher productivity. In order to boost the milk production modern technological interventions will be ensured by NDDB through Jharkhand dairy project and BAIF through dairy cattle development programme.

vii. Securing the Energy Future for India

Cow dung, urine and farm waste can be used as a source of renewable energy.

viii. Accelerated development of transport infrastructure

All weather access road to villages in Jharkhand is limited around the cities and town only. Construction of access road from villages through MNREGA and other related programme may help dairying (for transportation of milk and supply of inputs) in the state.

ix. Rural transformation and sustained growth of agriculture

Rural Jharkhand suffers from poor infrastructure and inadequate amenities for proper development of dairying. Poor productivity of milch cattle and inadequate availability of local feed and fodder resources leads to slow growth i milk production. Dairying sector needs growth of 8-10 per cent in order to ensure sustained growth of agriculture i.e., 4.00 per cent growth.

x. Managing Urbanization

Infrastructure for sale of milk and milk products milk booths/retail outlets will be intensified in the cities and industrial townships of the state.

xi. Improved access to quality education

For quality education in the field of dairy a dairy technology cum research institute has been sanctioned under BAU. Apart from this NDDB, NDRI and other institutions located outside the state will facilitate to impart quality training to progressive milk producers as well as dairy personnel.

xii. Better preventive and curative health care

Mass deworming and vaccination of dairy cattles will ensure prevention of diseases, side by side hygienic practices of milk production will also help to prevent many of the diseases.

3.6 Issues for considerations during 12th Five Year Plan

- Dairying should be given status of agriculture.
- Rate of interest on bank loan should be as per agriculture sector.
- Supply of quality inputs at the door-step of farmers should be ensured.
- Minor veterinary services, mass vaccination and deworming should be brought under the scope of dairy cattle development centre.
- Mobile animal health services.
- Dairy research institute required to be set up in the state.
- Jharkhand should be considered under national dairy plan.
- Adequate fund should be allocated for accelerated fodder development programme under RKVY.
- Establishment of Bull mother farm and semen production station.
- 100 per cent central assistance for establishment of cattle feed, mineral supplement and compact feed block plant.
- Centrally sponsored scheme for research, extension & training programme.

- Establishment of state animal health & production information system as a state database.
- Policy for purchase of inputs and medicines.
- Funds under MNREGA should be earmarked of perennial grassland development on community/gochar/Pasteur land and private uncultivable land.
- Act to control migration/sale of improved female calf to other states.

3.7 Earmarked schemes for dairy development in Jharkhand

1. Rastriya Krishi Vikas Yojana

i. Milch cattle induction
ii. Breed improvement programme
iii. Heifer rearing programme

(i) Milch cattle induction programme

This is a programme to provide subsidy for induction of high yielding milch cattle with a view to boost the milk production of the state and to provide gainful self employment opportunity to the rural families. Under this a prototype scheme shall be implemented for 2 cattle/buffalo, 5 cattle/buffalo mini dairy, 10 cattle buffalo midi dairy, 20 cattle/buffalo commercial dairy, 50 cattle/buffalo modern dairy scheme and large dairy farms with the subsidy and bank loan.

Beneficiary Selection Procedure and Area of Implementation

- Identification of Milk production potential areas especially in command area and vicinity of JDP, Dairy Cattle Development Centres and Milk route.
- Formation of milk route.
- Identification of potential villages on identified milk route.
- Organizing farmer awareness camps in the identified villages.
- Generation of application forms.
- Scrutinization of applications by Districts level committee under the chairmanship of concerned Deputy Commissioner.
- Training and orientation of selected beneficiaries.

Towards subsidy under this programme, a total sum of Rs. 12184.00 lakh for 12th Five Year Plan (2012-17) and a sum of Rs. 1804.00 lakh for Annual Plan 2012-13 have been proposed.

(ii) Breed Improvement Programme

This is a scheme for providing artificial insemination services for improvement of less productive breed and also to provide other services like feed and fodder development and other inputs, deworming, vaccination and infertility-cum-health of milch cattle. With a view to provide these services, 200 Dairy Cattle Development Centres (DCDC) established under Rastriya Krishi Vikas Yojana (RKVY) required to be funded for their recurring expenditure in the management control of BAIF Development Research Foundation and non-recurring expenditure proposed for 430 AI Centres established under SIA and 1000 AI Centres proposed to be established during the year 2012-13.A sum of Rs. 2058.00 lakh for the 12th Five Year Plan (2012-17) and a sum of Rs. 333.00 lakh for Annual Plan 2012-13 have been proposed towards operation of Dairy Cattle Development Centre.

(iii) Heifer Rearing Programme

This is a programme to support for crossbred heifer rearing especially produced under breed improvement programme as well as from milch cattle inducted under Milch Cattle Induction Programme shall be registered and reared to ensure early maturity of the crossbred heifer to provide longer location life.

Assistance to progressive farmers and small entrepreneurs for establishment of Heifers Farms of improved breed heifers is proposed under this programme.

A sum of Rs. 2025.00 lakh for the 12th Five Year Plan (2012-17) and a sum of Rs. 300.00 lakh for Annual Plan 2012-13 have been proposed under this programme.

3.8 Centrally Sponsored Schemes (CSSs)/Centrally Assisted Scheme (CAS)

1. Fodder Development Scheme

i. Assistance to Fodder Block Making Unit

This is the scheme to promote conservation of fodder by converting crop residues into fodder blocks through the use of modern technologies, bailing machines etc. into fodder blocks in order to fulfil the existing gap between availability and requirement of fodder. This will also be useful during drought.

ii. Establishment of silage making unit

This is the scheme for establishment of silage making unit to preserve surplus fodder available during the period of surplus production of green fodder and to preserve the green fodder in the form of silage for feeding during lean (shortage) period of fodder.

The scheme shall be implemented by District Dairy Development Offices of the concerned district. The farmer having opted for commercial milk production as a source of additional income and having essential resources i.e., land, irrigation facilities and are producing surplus green fodder. However the selection of beneficiary shall be done jointly by concerned District Dairy Development Officer & District Programme Officer of BAIF and representative of Jharkhand Dairy Project in the Project Districts of JDP after due approval of concerned DC.

For setting up new silage making units in the state, 100% central grant-in-aid will be provided by Government of India.

iii. Demonstration of Azolla cultivation and production unit

This is the scheme to encourage production of Azolla as an alternate source of green fodder. The feature of this scheme is to train the farmers for production of Azolla providing necessary material to the farmers for establishing of Azolla production unit on 50.00 per cent central share and 50.00 per cent state share basis. The scheme shall be implemented by dairy cattle development centre managed by BAIF. The Progressive farmers, who used it as commercial milk production for additional income and essential resources, have adopted Azolla

cultivation and demonstration. However, the selection of beneficiary shall be done jointly be concerned district dairy development officer & district programme officer of BAIF and representative of Jharkhand dairy project in the project districts of JDP.

iv. Power driven chaff cutter

This is the scheme to reduce wastage of fodder by chopping and to promote better utilization of fodder. One time grant of 75.00 per cent cost of the chaff cutter (central share) will be provided by Government of India. Balance 25.00 per cent of share will be borne by the beneficiaries. The selection of beneficiary shall be done jointly by concerned district dairy development officer & district programme officer of BAIF and representative of Jharkhand dairy project in the project districts of JDP. The beneficiary selection procedure shall be done under following norms:

a. The beneficiary having minimum five (05) milch cattle and are producing green fodder.
b. Having facility of electricity at their cost.
c. Should not have been benefited earlier under this scheme by any govt./semi govt. agency.

v. Hand driven chaff cutter

This is the scheme to reduce wastage of fodder by chopping and to promote better utilization of fodder. One time grant of 75.00 per cent cost of the chaff cutter (central share) will be provided by Government of India. Balance 25.00 Per cent of share will be borne by the beneficiaries. The selection of beneficiary shall be done jointly be concerned district dairy development officer & district programme officer of BAIF and representative of Jharkhand dairy project in the project districts of JDP. The beneficiary selection procedure shall be done under following norms:

a. The beneficiary having minimum one (01) milch cattle and are producing green fodder.
b. Should not have been benefited earlier under this scheme by any govt./semi govt. agency.

However, the milk pourer members of the nearby dairy managed by government/district milk union shall be preferred during selection process.

vi. Grassland development including grass reserves

This is the scheme for improvement of degraded land as grassland and production of seasonal and perennial green fodder and forage grasses on government land/gochar land/community land/private land. Currently, government of India has decided to implement this scheme in 5-10 hectare area of land. Individual farmers can also take up perennial fodder crops cultivation in their fields on 100 % central assistance.

During the 12th Five Year Plan (2012-17) a sum of Rs. 338.00 lakh and a sum of Rs. 50.00 lakh for Annual Plan 2012-13 have been proposed as state share to various centrally sponsored schemes viz., grassland development including grass reserves/assistance to fodder block making unit/azolla cultivation and demonstration unit and other fodder conservation programme.

3.9 State Sponsored Scheme for Dairy Development

i. Input distribution and productivity enhancement programme

This is a scheme for providing infrastructural facilities to dairy cooperative societies (DCS), such as procurement and testing equipments, distribution of minerals, calcium, vitamin feed supplement and preventive medicines, distribution of hygiene kit for clean milk production, organization of infertility, vaccination and deworming camps for dairy cattle and mastitis control programme and other inputs distribution programme for milch cattle.

The farmers having milch cattle and are being benefitted by dairy cattle development programme through DCDC or are pourer members of the nearby dairy managed by government/district milk union/Jharkhand dairy project (JDP) shall be benefitted under this programme. A sum of Rs. 4046.00 lakh for the 12th Five Year Plan (2012-17) and a sum of Rs. 600.00 lakh for Annual Plan 2012-13 have been proposed under this programme.

ii. Breed improvement programme

To cover the 80.00 per cent breedable cattle population of the state for providing artificial insemination services for improvement of less productive breed and also to provide other services like feed supplement and other inputs, deworming, vaccination and infertility-cum-health camp of milch cattle about 2600 AI centres are required in the state. With a view to provide these services, 609 dairy cattle development centres (DCDC) have been established. Apart from this, establishment of 401 new dairy cattle development centres has been sanctioned and selection of suitable agency for establishment of 1000 AI is under process.

With a view to provide AI services at the farmer's door step, 755 dairy cattle development centres (DCDC) established in the management control of BAIF development research foundation under state plan required to be funded for their recurring expenditure and also recurring expenditure proposed for 430 AI centres established under SIA and 1000 AI centres proposed to be established during the year 2012-13. A sum of Rs. 7690.00 lakh for the 12th Five Year Plan (2012-17) and a sum of Rs. 1367.00 lakh for Annual Plan 2012-13 have been proposed under this programme.

iii. Feed and fodder development

This is a scheme to promote production of quality fodder (especially) green fodder, sale of concentrate balance feed at subsidized rate, enrichment of dry

fodder for milch cattle to get the desired level of productivity in the genetically improved milch cattle with an adequate feed base in terms of both quality and quantity. The farmers having milch cattle and are being benefitted by dairy cattle development programme through DCDC or are pourer members of the nearby dairy managed by government/district milk union shall be benefitted under this programme. Implementation of grassland development scheme on private unproductive land, subsidy on establishment of cattle feed plant by small entrepreneurs, sale of balanced cattle feed on subsidized rate, fodder seed cultivation and distribution by government farm/progressive farmers for meeting the fodder requirement of milch cattles under feed and fodder development scheme. A sum of Rs. 4380.00 lakh for the 12th Five Year Plan (2012-17) and a sum of Rs. 650.00 lakh for Annual Plan 2012-13 have been proposed under this programme.

iv. Training and extension

It is felt that the training of milk producers and the staff dealing with extension is paramount for success of the dairy development programmes. Therefore, it is proposed to train the milk producers, dairy personals and rural unemployed educated youths in the practice of high yielding dairy cattle management, modern techniques of dairy farming, milk testing and society management, clean and hygienic milk production, indigenous milk products manufacturing training, training of Gokul Gram Mitra. Apart from this strengthening of existing farmers training centre, workshop, seminar, milch cattle fair-cum-dairy development exhibition and other extension activities with intervention of new technologies and establishment of new Animal Resource Management Training Institute for advance training of paravet-cum-resource person and refresher training of dairy technologist is proposed. A sum of Rs. 2975.00 lakh for the 12th Five Year Plan (2012-17) and a sum of Rs. 439.00 lakh for Annual Plan 2012-13 have been proposed under this programme.

v. Regional and district administration and extension

To meet the expenses and infrastructural support for proper implementation of the dairy development programme in the state, construction of new building for distinct level offices in Jamshedpur, Dhanbad, Giridih, Lohardaga and Ranchi districts. Purchase of new vehicles for directorate of dairy development, regional level and district level offices as well as administrative expenses for execution of the dairy development activities in the state and milch cattle fair-cum-dairy development exhibition at state level, division level and district level. A sum of Rs. 2075.00 lakh for the 12th Five Year Plan and a sum of Rs. 306.00 lakh for Annual Plan 2012-13 have been proposed under this programme.

vi. Consultancy services

The Scheme to pay the consultancy charges to prepare the suitable project proposal for concurrent and mid-term evaluation and feasibility studies of the different dairy development programmes implemented by the department. A sum of Rs. 277.00 lakh for the 12th Five Year Plan (2012-17) and a sum of Rs. 50.00 lakh for Annual Plan 2012-13 have been proposed under this programme.

vii. Milk procurement, processing and marketing

This is a scheme to provide infrastructure for procurement and processing facilities with a view to provide proper marketing support to milk producers at remunerative price and subsidy for the selected entrepreneurs/agencies for setting up of new dairy farm/milk processing plant on PPP mode. A sum of Rs. 4050.00 lakh for the 12th Five Year Plan (2012-17) and a sum of Rs. 600.00 lakh for annual plan 2012-13 have been proposed under this programme.

viii. Gokul gram vikas yojana

With a view to provide breeding services, milk procurement facilities and for storage of feed and fodder at village level in each cluster of 4-5 villages one gokul gram vikas kendra is proposed to be established. The location for establishment

of gokul gram vikas kendra shall be selected where dairy cattle development centres (DCDC) can be established and the location should be on identified milk route of the nearby dairy.

The proposed gokul gram vikas kendra shall be established in Simdega, Khunti, East Singhbhum, Saraikela-Kharsawan, Pakur, Sahebganj, Garhwa, Palamau, Chatra, Koderma, Dhanbad, Bokaro, godda, Ramgarh, Hazaribagh and Giridih. A sum of Rs. 1342.00 lakh for the 12th Five Year Plan (2012-17) and a sum of Rs. 200.00 lakh for Annual Plan 2012-13 have been proposed under this scheme.

ix. Establishment of multipurpose sale centres and milk vending units (for milk and milk products)

This is the scheme for setting up of milk booths and milk vending units in the urban area for sale of milk and milk products to the urban consumers. These booths will be constructed in the area of Jharkhand dairy project and for dairies under the control of district milk unions. The milk booth shall be established in Ranchi, Gumla, Lohardaga, Latehar, Ramgarh, Dhanbad, Hazaribagh, Deoghar and Bokaro. A sum of Rs. 1350.00 lakh for the 12th Five Year Plan (2012-17) and a sum of Rs. 200.00 lakh for Annual Plan 2012-13 have been proposed under this programme.

x. Khatal rehabilitation plan

Under this by the order of Hon'ble High Court of Jharkhand in the matter of W P (PIL) No. 149/2003 for rehabilitation of khatals located in the Ranchi municipal area a rehabilitation plan has been prepared for rehabilitation of 900 khatals have been prepared by the NABARD consultancy services (NABCONS). A sum of Rs. 10.00 lakh for the 12th Five Year Plan (2012-17) and a sum of Rs. 1.00 lakh for Annual Plan 2012-13 have been proposed under this scheme.

Table 3.2 Outlay Proposed for Various Schemes in Jharkhand

(Rs. In Lakh)

SN	Name of Schemes	Proposed Outlay 2012-13			
		Amount	Flow to TSP	Flow to SCSP	Flow to OSP
A.	**Earmarked (RKVY)**				
1.	Milch Cattle Induction	1804.00	800.00	200.00	804.00
2.	Breed Improvement Programme	333.00	132.00	00.00	201.00
3.	Heifer Rearing Programme	300.00	125.00	75.00	100.00
	Sub-total	2437.00	1057.00	275.00	1105.00
B.	**State Share to CSS, (Fodder Development Scheme)**				
1.	Grass land Development including Grass Reserves/Assistance to Fodder Block making Unit/Azolla Cultivation and Demonstration Unit and other Fodder Conservation Programme	50.00	0.00	0.00	50.00
	Sub-total	50.00	0.00	0.00	50.00
C.	**State Plan Schemes**				
	Continuing Schemes				
	Technical Input Programme				
1.	Input Distribution and Productivity Enhancement Programme	600.00	250.00	100.00	250.00
2.	Breed Improvement Programme	1367.00	621.85	340.70	404.45
3.	Feed and Fodder Development	650.00	250.00	110.00	290.00
4.	Training & Extension	439.00	220.00	69.00	150.00
5.	Regional and District Administration and Extension	306.00	0.00	0.00	306.00
6.	Consultancy Services	50.00	25.00	0.00	25.00
7.	Milk Procurement, Processing and Marketing	600.00	300.00	0.00	300.00
8.	Gokul Gram Vikas Yojana	200.00	80.00	40.00	80.00
9.	Establishment of Multipurpose Sale Centre and Milk Vending Units (for milk and milk products)	200.00	100.00	0.00	100.00
10.	Khatal Rehabilitation Plan	1.00	1.00	0.00	0.00
	Sub-total	4413.00	1847.85	659.70	1905.45
	Grand Total	6900.00	2904.85	934.70	3060.45

Source: Animal Husbandry, Govt. of Jharkhand, Annual Plan of Dairy, 2012-13

Table 3.3 Financial Proposal during 12th Plan

(Rs. in Lakh)

SN	Item	2012-13	2013-14	2014-15	2015-16	2016-17	Total
1.	Milch cattle induction	1804.00	2078.00	2390.00	2750.00	3162.00	12184.00
2.	Breed improvement programme & heifer rearing	2000.00	1955.00	2250.00	2588.00	2980.00	11773.00
3.	Feed & fodder development	700.00	805.00	925.00	1064.00	1224.00	4718.00
4.	Input distribution & productivity enhancement programme	600.00	690.00	794.00	912.00	1050.00	4046.00
5.	Training & extension	745.00	860.00	990.00	1140.00	1315.00	5050.00
6.	Consultancy services	50.00	50.00	52.00	60.00	65.00	277.00
7.	Milk procurement, processing & marketing	800.00	920.00	1060.00	1220.00	1400.00	5400.00
8.	Gokul gram vikas yojana	200.00	230.00	265.00	302.00	345.00	1342.00
9.	Khatal rehabilitation plan	1.00	2.00	3.00	2.00	2.00	10.00

Implementation

- **Involvement of NGOs**

  For breed improvement and feed fodder development BAIF development research foundation has been nominated as implementing agency. Apart from this, for extension of the programmes some more NGOs are proposed to be involved through expression of interest.

- **Consideration of outsourcing**

  Impact study and midterm evaluation of programmes, outsourcings through consultancy services are proposed.
- **Indication of women component involved**

  Rural women empowerment is proposed through their involvement in modern animal husbandry practices for sustainable livelihood.
- **Indication of outlay for special component plan/tribal sub plan**

  Proper and adequate outlay for special component plan/tribal sub plan has been proposed as per set norms.
- **Identification of PPP Projects**

  In this era of inclusive growth, PPPs can serve as a major step towards development of people and economy of state on the whole. The PPP models have been overwhelmingly successful in driving a major wave of urban infrastructure development but now the onus lies on the government to expand the scope of these partnerships into new horizons of rural development.

  Agriculture being a state subject and confined to the rural Jharkhand is yet to get a glimpse of PPP's on the National level but nevertheless opening up avenues for the PPP in agriculture and allied fields like dairy can really churn out benefits in terms of organising the sector as well as diffusing the growth and prosperity to grass root levels.

  The objective to bring in private participation into the dairy sector through public private partnerships is to provide a comprehensive approach towards overcoming the present challenges in the industry and prepare a long term competitive strategy towards inclusive growth. While we narrow down on the various models of PPP in terms of structure, contracts, and operational details, it is imperative to demarcate the areas where private participation can be promoted by the government and most important the inducements that would accrue out from these PPP arrangements currently as well as in the near future.

This section focuses on some of the vital areas of the dairy industry where the private players can integrate into the system and the PPP model can be replicated and transformed in this sector. The potential thrust areas like establishment of dairy plants, cattle feed plant and Paravet School in the dairy sector where the private partner can intervene have been proposed on PPP mode during 12th Plan.

CHAPTER – IV

SOCIO-ECONOMIC PROFILE OF SELECTED MILK UNIONS, PDCS/PRIVATE UNITS AND MILK PRODUCERS

4.1(a) Introduction

The state of Jharkhand emerged as 28th state on the political map of India on 15 November, 2000. The state is covered by forest lands and hills varying from 300 to 1000 mitres in altitude. The state has sizeable tribal population and rich in vegetation and mineral resources. Presently, it has been organised into 24 districts. The state covers about 2.42 per cent of country's land area and about 2.62 per cent of the country's population (as per census, 2001).

The state has basically rural economy as 70-80 per cent of the population is engaged in agriculture and allied activities. The incidence of poverty is very high particularly among tribal's and scheduled caste. Tribal constitute about 26.30 per cent and scheduled caste around 11.80 per cent of the state population. The economic development of the SC & ST population is one of the prime concerns of the state.

Table 4.1 Administrative Set-up of Jharkhand

SN	Particulars	Numbers
1.	Revenue Division	05
2.	Districts	24
3.	Blocks	212
4.	Panchayats	3,702
5.	Villages	32,615
6.	Towns	152
7.	Corporation	02
7.	Municipalities and Nagar Panchayat	37
8.	Population	269.45 lakhs
9.	ST	70.87 lakhs
10.	SC	31.88 lakhs

Agricultural economy of the state is characterized by the existence of large number of small and marginal farmers. About 72.00 per cent of land holdings belong to small and marginal farmers. Only 0.69 per cent operational holdings are above 10 hectares

covering about 9.00 per cent of area. The state's agriculture is predominance of cereal crops. About 92.00 per cent cropped areas are covered under food grains and hardly 3.50 per cent area is under cash crops while 4.00 per cent of the total cropped area is mono-cropped under rice.

4.1 (b) Land utilization pattern of Jharkhand

The state's total cultivable land is 38.44 lakh hectare out of it, 12.04 lakh ha is current fallow land, other fallow land (8.45 lakh ha), and 17.95 lakh ha is net sown area. Therefore, 24.40 lakh hectares is irrigated land and cropping intensity is 114.00 per cent. Per capita net sown area (0.064 ha) is quite low in relation to per capita land holding (0.40 ha) in the state of Bihar.

4.2 Socio-economic characteristic of the selected districts in Jharkhand

4.2.1 District Profile: Lohardaga is a part of the South Chotanagpur division in the state of Jharkhand. Lohardaga district mainly came into existence after the split of Ranchi into three namely Ranchi, Lohardaga and Gumala in 1988. The economy of the district is mainly depends on agriculture and forest produces. More than half of its population are engaged in agriculture to earn his/her livelihood. Paddy is the chief agricultural crop in the district. Despite it, wheat and maize crops are also grown. Although a dairy chilling plant is established in the town headquarter of district. In 2006, Government of India named it one of the country's 250 most backward district and currently receiving funds from Backward Region Grant Fund Programme (BRGF). In the year of 2008-09, GDP in the district was Rs. 70,896 lakhs at current price and net domestic product in the district was Rs. 62,333 lakhs at current price.

4.2.2 District Profile: Hazaribagh district is one of the twenty four districts of Jharkhand comprising 16 revenue Anchals. The district has very rich land bank available for various infrastructures, industrial, education and service covering 433634 hectare. Out of it, 135203 hectare (about one third) comes under cultivation. Therefore, agriculture is a vital component of the district economy. Located in the north Chotanagpur plateau, has red and sandy soil. Besides agriculture, dairy production is

an ever growing activity that generates huge employment opportunities. Hazaribagh also claims to be a hub for fisheries; it produces 7,000 tones of fish annually.

4.2.3 District Profile: Deoghar district is spread over an area of 2500 sq. km and divided into two sub-divisions i.e., Deoghar and Madhupur, which consist of 8 blocks. Deoghar is an important place in the Jharkhand from the view of milk production. The cow and buffalos are of short height and thin built but milk production is satisfactory. The government of state has taken some steps to improve breed as steed bull, Haryana and tharparkar bulls are distributed. As a result of it, the interest of local peoples in this sector has increased and more peoples have taken to rearing new breed of cattle. For the treatment and prevention of diseases of the cows, all required facilities such as veterinary doctors, hospitals and medical stores are available (www.jharkhand.govt.in).

4.2.4 District Profile: Ranchi district is one of the twenty four districts of Jharkhand state in eastern India. It is also the capital of Jharkhand state and located is the heart of city. District Ranchi is located at 23.35° N latitude and 85.33° E longitude. Its geographical area is 5231 sq km. Annual rainfall is 1530 mm. Main minerals are lime stone, coal, asbestos and ornamental stones etc. The economy of the district mainly depends on cultivation or related work. More than 51.00 per cent of the total workers are engaged in primary sector (census 2011). It has red laterite, loam, fine loam and fine mixed loam soil. A large variety of crops are grown in the district of Ranchi paddy, millets, pulses and oil seeds are the main crops of present districts. The lower area provides suitable condition for paddy cultivation. The higher elevations provide condition for orchards and cultivation of pulse, millet and vegetables. The forest covers 20.99 per cent of total area of the district. Only 8.30 per cent area of agricultural land are irrigated and major source of irrigations are well and canals.

4.3 Socio-Economic Characteristics of Selected Milk Producer

The socio-economic characteristics of selected milk producers are presented in table 4.2 and reveals that on an overall among the sample milk producers of DCS category, male (75.84%) and female (24.16%) were decision maker while in case of NDCS category, 88.00 per cent male and 12.00 per cent female were decision maker. Therefore, distribution of social groups of milk producers among DCS, the majority were OBC (48.60%), General (30.14%), SC (12.27%) and ST (8.99%) whereas in NDCS, 49.14 per cent was OBC followed by General (26.72%) and SC/ST (24.00%). Other details may be seen in given table:

Table 4.2: Socio-Economic Characteristics of Selected Households in Jharkhand

Sr. No.	Particulars	DCS (n=120)				NDCS (n=120)			
		S	M	L	T	S	M	L	T
1	**Gender of Decision Maker (%)**								
	Male	85.71	81.82	60.00	75.84	90.91	84.21	88.89	88.00
	Female	14.49	18.18	40.00	24.16	9.09	15.79	16.11	12.00
2	**Religion (% to total)**								
	Hindu	91.43	96.36	100.00	95.93	90.91	100.00	100.00	96.97
	Muslim	8.57	3.64	---	4.07	9.09	---	---	3.03
	Christian	---	---	---	---	---	---	---	---
	Sikh	---	---	---	---	---	---	---	---
	Other	---	---	---	---	---	---	---	---
3	**Social Group (% to total)**								
	Scheduled Tribe	17.00	10.00	---	8.99	22.25	15.26	---	12.44
	Scheduled Caste	22.86	7.27	6.67	12.27	26.79	8.33	---	11.70
	Other Backward Class	46.10	46.46	53.33	48.60	62.50	55.50	66.67	49.14
	General/Open	14.04	36.37	40.00	30.14	10.71	36.11	33.33	26.72
4	Occupation (%)								
	(a) Principal								
	i. Cultivator	50.76	44.62	42.73	46.04	45.30	48.50	52.30	48.70
	ii. AH & Dairy	32.92	38.50	37.50	36.32	33.50	31.04	36.40	33.65
	iii. Agri. Labour	---	---	---	---	---	---	---	---
	iv. Non-Farm Labour	---	---	---	---	21.20	20.46	---	13.89
	v. Own Non-Farm Establishment	---	---	---	---	---	---	---	---
	vi. Trade	10.00	9.45	11.27	10.24	---	---	2.78	0.92
	vii. Employee in	6.32	7.43	8.45	7.40	---	---	8.52	2.84
	viii. Others	---	---	---	---	---	---	---	---
	(b) Subsidiary								
	i. Cultivator	---	---	10.25	3.42	---	---	---	---
	ii. AH & Dairy	---	35.15	15.30	16.82	---	---	---	---
	iii. Agri. Labour	15.20	---	---	5.07	13.38	23.28	20.38	19.01
	iv. Non-Farm Labour	45.35	55.60	---	33.65	28.52	34.75	38.20	33.82
	v. Own Non-Farm Establishment	---	---	---	---	---	---	---	---
	vi. Trade	---	---	28.40	9.47	22.48	29.65	32.50	28.21
	vii. Employee in Service	39.45	9.25	46.05	31.58	35.62	12.32	8.92	18.96
	viii. Others								
5	**Av. Operational land holding (area in ha)**								
	Un irrigated	1.50	2.50	2.25	2.09	1.75	2.50	2.75	2.34
	Irrigated	0.23	0.46	0.49	0.40	0.45	0.75	0.55	0.59
	Total	1.73	2.96	2.74	2.48	2.20	3.25	3.33	2.92
6	**Av. Experience in Dairy (years)**	5.64	4.86	5.81	5.46	5.06	5.70	4.86	5.20
7	**Income Group (%)**								
	BPL	57.14	45.45	33.33	45.83	57.14	33.33	28.57	43.33
	APL	42.86	54.55	66.67	54.17	42.86	66.67	71.43	56.67
8	**House Structure (%)**								
	Pucca	28.57	36.36	60.00	40.00	26.43	27.78	57.14	31.67
	Semi-Pucca	37.14	32.73	40.00	35.83	50.00	38.00	42.86	45.00
	Kuccha	34.29	30.91	---	24.17	28.57	34.22	---	23.33

Source: Field Survey

4.4 Family profile of selected milk producers

The family profile of selected milk producers is presented in table 4.3 and reveals that on overall, the average household size of male was 2.33 and that of female and children were 2.12 and 1.88 respectively among DCS category whereas that of male, female and children were 2.35, 1.98 and 2.38 respectively among NDCS category. 79.15 per cent respondent and 20.85 per cent respondent were male and female among DCS category of sample households while 71.67 per cent and 28.33 per cent respondent were male and female respectively among NDCS category households. In DCS category of households, average age of male and female were 45.43 and 44.60 respectively while in NDCS category, that of male and female were 49.54 and 46.91 respectively. Average age of respondent in both DCS and NDCS category was less than 10th and average number of family member works in dairy among both DCS and NDCS was less than two.

Table 4.3: Family Profile of Selected Households

Sr. No.	Particulars	DCS (n=120)				NDCS (n=120)			
		S	M	L	T	S	M	L	T
1	Av. Household Size (Nos.)								
	Male	3.14	2.10	1.76	2.33	2.95	2.09	2.00	2.35
	Female	2.50	2.10	1.75	2.12	2.43	1.78	1.72	1.98
	Children (Below 15 Year)	2.36	1.80	1.49	1.88	2.54	2.34	2.25	2.38
	Total	2.67	2.00	1.67	2.11	2.64	2.07	1.99	6.70
2	Gender of Respondent/HH (%)								
	Male	85.71	81.82	66.67	79.15	75.00	66.67	71.43	71.67
	Female	14.29	18.48	33.33	20.85	25.00	33.33	28.57	28.33
3	Av. Age of respondent/HH (years)								
	Male	43.17	46.45	46.50	45.43	48.36	49.15	51.09	49.54
	Female	43.80	44.00	45.60	44.60	45.75	46.78	48.19	46.91
4	Av. Age of family (years)	29.34	31.51	35.63	33.01	31.27	33.12	33.55	32.65
5	Av. Education of respondent/HH (years)	8.31	8.02	8.34	8.23	8.08	8.04	8.68	8.27
6	Av. No. of Family members works in dairy	1.43	1.91	2.25	1.87	1.34	1.52	2.31	1.73

Source: Field Survey

4.5 Cropping pattern of sample milk producers

The cropping pattern of sample milk producer is presented in table 4.4 and reveals that on an overall, the GCA during 2015-16 was estimated 2.93 ha per milk producer in the

category of DCS against 3.17 ha per milk producer in the category of NDCS. Thus, GCA per milk producer was comparatively little less in NDCS milk producer than DCS milk producers. The size group wise distribution shows that total area coverage varied from 2.17 ha (small) to 3.35 ha in large milk producers of DCS category whereas, in NDCS category, it varied from 2.72 (small) to 3.50 ha (large). However, coverage was comparatively higher in case of larger milk producers of NDCS category. Among both DCS and NDCS, the coverage was higher in kharif season than in rabi and summer season.

Table 4.4: Cropping Pattern of Sample Households (2015-16)

Area in ha

Sr. No.	Season	Cropping Pattern (2015-16)	DCS (n=120)				NDCS (n=120)			
			S	M	L	T	S	M	L	T
A	Kharif	Food grains Crop								
		Paddy	1.14	1.34	1.25	1.24	1.09	1.17	1.23	1.16
		Maize	0.21	0.44	0.50	0.38	0.35	0.42	0.48	0.42
		Cash Crop								
		Vegetables	---	---	---	---	---	---	---	---
		Fodder Crop	0.04	0.14	0.21	0.13	0.13	0.19	0.20	0.17
		Sudan								
		Other crops	---	---	---	---	---	---	---	---
B	Rabi	Food grains Crop								
		Wheat	0.37	0.75	0.75	0.62	0.53	0.58	0.73	0.61
		Pulses	0.32	0.35	0.38	0.35	0.39	0.42	0.48	0.43
		Cash Crop								
		Oilseeds	---	---	---	---	---	---	---	---
		Fodder Crop	---	---	---	---	---	---	---	---
		Other crops	---	---	---	---	---	---	---	---
C	Summer	Food grains Crop								
		Maize	---	---	---	---	---	---	---	---
		Cash Crop								
		Vegetables	0.09	0.25	0.26	0.20	0.23	0.28	0.38	0.38
		Fodder Crop	---	---	---	---	---	---	---	---
		Other crops	---	---	---	---	---	---	---	---
D	All		2.17	3.27	3.35	2.93	2.72	3.06	3.50	3.17

Source: Field Survey

4.6 Details on herd strength and cattle shed

The details on herd strength and cattle shed is presented in table 4.5 and reveals that total animal among DCS category was 416. Out of which, 265 was milch animal while total number of animal among NDCS category was 404. Out of which, 261 was milch animals. The cattle shed among DCS and NDCS category was 140 and 138 respectively. However, all the shed for animal were semi pucca and kuccha.

Table 4.5 Details on Herd Strength & Cattle Shed

Sr. No.	Particulars	DCS (n=120)		NDCS (n=120)	
		Total Animal (No.)	Milch Animal (No)	Total Animal (No)	Milch Animal (No)
1	Local Cattle	355	230	340	221
2	Cross Bread	15	08	12	07
3	Buffalo	46	27	52	33
4	Others	---	---	---	---
	Total	416	265	404	261
	Cattle Shed				
	i. Pucca	---	---	---	---
	ii. Semi-Pucca	65	NA	60	NA
	iii. Kuccha	75	NA	78	NA
	Total	140	NA	138	NA

Source: Field Survey

CHAPTER – V

COST OF MILK PRODUCTION AND AWARENESS ABOUT THE SCHEMES

5.1 Details of animal breeds of sample households (DCS & NDCS)

The details of animal breed is presented in table 5.1 and shows that average yield (litre/day) per crossbred was highest (6.46 litres) followed by buffalo (5.64 litres) and local cow (3.63 litres) in DCS milk producers whereas that of cross bred was 6.16 litres per day followed by buffalo (5.07 litres) and local cow (3.42 litres) in NDCS milk producers. However, average milk yield of all breed in DCS category was little higher than that of NDCS category.

Table 5.1 Details of Animal Breeds

Sr. No.	Particulars	Name of breeds	Av. Yield (lit/day)/ Range	
			DCS	Non-DCS
1	Local Cow (indigenous)	Shaiwal, Haryana	3.63	3.42
2	Crossbred Cow	Holstein, Jersy	6.46	6.16
3	Buffalo	Mehsana, Murrah	5.64	5.07
4	Others	----	---	---

Source: Field Survey

5.2 Details of breedable animals on survey date in DCS and NDCS members

The details of breedable animals of sample farmers is presented in table 5.2 and analysis shows that on an average, the average age of all animals was estimated to 6.57 year among DCS member against 6.63 years in NDCS member. Average age at first calving among was 36.77 month against 37.65 month among NDCS on overall. However, buffalo take more time for first calving in comparison to cattle. Length of lactation on period (days) was estimated to 247.07 among DCS against 238.15 in NDCS members on overall average. The peak yield of last lactation was 6.47 in DCS households against 5.98 in NDCS members while present lactation of peak yield was 7.29 among DCS members against 6.27 in NDCS members.

Table 5.2: Details of Breedable Animals on Survey Date

(In Average)

Sr. No.	Particulars	Animal (DCS)				Animal (NDCS)			
		Local Cow	Crossbred Cow	Buffalo	All	Local Cow	Crossbred Cow	Buffalo	All
1	Age (year)	7.30	4.55	7.88	6.57	7.16	5.89	6.86	6.63
2	Age at First Calving (Month)	37.12	27.70	45.50	36.77	38.58	28.47	45.89	37.65
3	Lactation Order @ Lit/day	3.62	6.46	5.64	5.24	3.42	6.16	5.07	4.88
4	Length of Lactation on Period (Days)	245.56	225.65	270..00	247.07	234.55	222.76	257.14	238.15
5	Peak Yield-								
	a. Last Lactation	4.28	8.07	7.06	6.47	4.15	7.35	6.43	5.98
	b. Present Lactation	5.00	8.42	8.45	7.29	4.50	7.46	6.86	6.27
6	Covered Under Insurance (Y/N)								
	If yes, premium paid (RS/animal)	---	---	---	---	---	---	---	---
	Government	---	---	---	---	---	---	---	---
	Self	---	---	---	---	---	---	---	---

Source: Field Survey

5.3 Availability of water for dairy among DCS and NDCS milk producers

The availability of water for dairy is presented in table 5.3 and analysis shows that the main source of water available for dairy in rainy season with almost all the selected milk producers of DCS and NDCS household was village talawadi/pond followed by canal while the source of water available during winter season was also village talawadi/pond in both case of DCS and NDCS followed by tube well and bore well. The main source of water during summer season was tube well/bore well in both cases of NDCS and DCS groups followed by hand pump and open well at the distance of 1-2 km. The supply of water in rainy season was adequate replied as 'yes' by 72.68 per cent and 74.20 per cent by both DCS and NDCS respondent respectively while 27.32 per cent and 25.80 per cent by DCS and NDCS replied as 'No' whereas that in winter season replied as 'Yes' by DCS (52.18%) and NDCS (26.75%) and replied as 'No' by DCS (47.82%) and NDCS (73.25%) while that in summer season. Majority of respondent was replied as 'No' supply of water is adequate by both DCS and NDCS farmers. Now, they also replied about quality of water during rainy season was poor by majority of both respondents while during winter season, quality of water was normal replied by both

DCS and NDCS and more than 60.00 per cent of both DCS and NDCS respondent was replied poor quality of water during summer season. Alternative source of water supply during all three season was open well followed by tube well as replied by majority of DCS and NDCS members.

Table 5.3 Availability of Water for Dairy

(In %)

Sr. No.	Particulars	DCS			NDCS		
		Season			Season		
		Rainy	Winter	Summer	Rainy	Winter	Summer
A	Source of Water Available for Dairy Purpose						
1	Open Well	---	24.05	26.75	---	26.25	28.55
2	Tube well/Bore well	25.61	27.18	30.82	27.36	28.62	32.15
3	River/Streams	---	---	---	---	---	---
4	Canal	32.36	---	---	35.20	---	---
5	Village Talawadi/Pond	42.03	48.77	16.24	37.44	48.13	25.68
6	Farm Pond	---	---	---	---	---	---
7	Hand pump	---	---	26.19	---	---	13.62
	Av. Distance (kms)	2.30	1.78	1.85	1.65	1.35	1.20
B	Supply of Water is adequate						
1	Yes	72.68	52.18	22.36	74.20	26.75	18.55
2	No	27.32	47.82	77.64	25.80	73.25	81.45
C	Water Quality						
1	Normal	22.50	56.45	25.65	18.35	54.35	27.08
2	Poor	68.35	36.64	64.38	62.10	32.76	62.22
3	Very Poor	9.15	6.91	9.97	19.55	12.89	10.70
D	Alternative source of Water supply in shortage						
1	Open Well	42.25	48.30	58.25	45.68	46.05	59.23
2	Tube well	38.65	35.62	37.15	32.50	32.18	34.07
3	River/Streams	---	---	---	---	---	---
4	Canal	---	---	---	---	---	---
5	Village Talawadi/Pond						
6	Farm Pond	---	---	---	---	---	---
7	Hand pump	19.10	16.08	4.60	21.82	21.77	6.70
	Av. Distance (kms)	1.09	0.75	0.85	0.72	0.92	0.88
E	Payment Made for Water, If any (Rs)	---	---	---	---	---	---

NB: No any payment made for water.

Source: Field Survey

5.4 Labour use pattern in involvement of family (men and women) in dairy activities under DCS and NDCS categories of milk producers

The table 5.4 reveals that under different activities of dairy management, generally 1-2 male and 1 female family workers were engaged at the rate of 2-4 hours daily in DCS and NDCS category of milk producers while some milk producers also managed these activities by hired labours.

Table 5.4: Labour Use Pattern in Involvement of Rural Men and Women in Dairy activities

Sr. No.	Type of Labour	Family labours				Hired Labour			
		No. of Workers / Day		Total Hours Worked / Person / Day		No. of Workers / Day		Total Hours Worked / Person / Day	
		Male	Female	Male	Female	Male	Female	Male	Female
	DCS								
A	**Fodder Management**	1	---	3	---				
	Grazing								
	Grass Collection								
	Animal Feeding								
B	**Shed Management**	---	1	---	4	---			
	Cleaning the shed /house								
	Washing of animal								
	Watering								
	Dung Collection								
C	**Milking**					1	---	2	
	Milking								
	Milk/Milk preparation								
D	**Animal Health**	---	---	---	---	---	---	---	---
	Breeding								
	Veterinary Health Care								
	NDCS								
A	**Fodder Management**	1	---	4	---				
	Grazing								
	Grass Collection								
	Animal Feeding								
B	**Shed Management**	1	1	2	2				
	Cleaning the shed /house								
	Washing of animal								
	Watering								
	Dung Collection								
C	**Milking**					1	---	2	
	Milking								
	Milk/Milk preparation								
D	**Animal Health**								
	Breeding								
	Veterinary Health Care								

Note: If needed, mention labour use in group of activities (A, B, C, D).

Source: Field Survey

5.5 Details about income received from dairying and its use among DCS and NDCS categories of sample farmers

An analysis of table 5.5 reveals that under DCS and NDCS category of milk producers, 66.74 per cent and 78.04 per cent of income from dairy was held up by males of both respectively while 33.26 per cent and 21.96 per cent of income from dairy was held up by females of both DCS and NDCS category respectively. Maximum about 73.80 per cent and 46.83 per cent of male members' income was expended on family expenditure by both DCS and NDCS members respectively and about 26.20 per cent and 53.17 per cent of male members income was expended on animal feed and health by both DCS and NDCS respectively. Whereas, 55.00 per cent of females income was expended on her family and 45.00 per cent on animal feed and its health by DCS category while 52.00 per cent of NDCS female's income was expended on her family and 48.00 per cent on animal feed and its health. However, 67.55 per cent on family and 32.45 per cent on animal feed and its health of total income from dairy were expended by DCS category while 52.92 per cent on his/her family and 47.08 per cent on animal feed and its health of total income from dairy were expended by NDCS category.

Table 5.5: Details about Income received from Dairying and its use

Sr. No.	Particulars	Income from dairy (sale of milk)	Income from sale of products	Income sale of dung/ FYM	Income spent on (share in approx.)	
					Family Exp	Animal Feed /and Health
A	**DCS (120)**					
1	Male	16772.33	NA	NA	12378.89	4393.44
2	Female	8357.31	NA	150.55	4596.54	3760.77
3	Both (Total)	25129.64	NA	150.55	16975.43 (67.55%)	8154.21 (32.45)
B	**NDCS (120)**					
1	Male	17359.36	NA	NA	9229.76	8129.60
2	Female	4884.18	NA	165.08	2542.09	2342.09
3	Both (Total)	22243.54	NA	165.08	11771.85 (52.92%)	10471.69 (47.08)

Source: Field Survey

5.6 Feed and Fodder per animal at the time of survey (kg/ani/day)

An analysis of tale 5.6 shows that under the stall feeding, self cultivated dry fodder was fed at the rate of 2.72 kg to local cow, 2.5 kg to cross bred and 3.5 kg to the buffalo among DCS category of milk producers. Almost similar rate of feeding to respective animals was also found under NDCS category. Self cultivated green fodder was also fed at the rate of 3.50 kg to the local cow, 3.10 kg to cross bred and 5.25 kg to the buffalo by DCS farmers and almost similar trend was found under NDCS category. After that, home prepared and prepared concentrate were also fed at the rate of ½ kg to 2.00 kg to all groups of animals by both DCS and NDCS farmers. Some molasses, salt and mustard oil were also fed to all groups of animal varied from 50 gms to 200 gms by both DCS and NDCS categories of farmers.

Table 5.6: Feed and Fodder per Animal at the time of Survey (Kg/Ani./day)

Sr. No.	Stall-Feeding Quantity Fed (Kg)	DCS			NDCS		
		Animal type			Animal type		
	Dry Fodder	LC	CB	B	LC	CB	B
A	Self-Cultivated	2.72	2.5	3.5	2.25	2.30	3.75
	Purchased	---	---	---	---	---	---
	Green Fodder						
B	Self-Cultivated	3.50	3.10	5.25	2.75	3.25	4.75
	Purchased	---	---	---	---	---	---
	Collected (Grass, Tree Leaves,)	1.25	---	1.5	1.25	---	1.5
	Concentrates						
C	Home Prepared	½	½	½	½	½	½
	prepared Cattle Feed	---	1.5	½	---	1.25	---
	Supplements						
	Mineral Mixture	---	---	---	---	---	---
	Salt	100 gm	200 gm	200 gm	100 gm	200 gm	200 gm
D	Molasses	½	½	½	½	½	½
	Mustard Oil	---	50 gm	50 gm	---	50 gm	75 gm
	Any Other (Specify)	---	---	---	---	---	---
E	**Out feeding Grazing** (No of Hours/day)	3.5	---	4.25	4.0	---	4.0

Source: Field Survey

5.7 Veterinary and breeding expenditure during last year (2015-16) under DCS and NDCS categories of milk producers

An analysis of table 5.7 shows that total amount of Rs. 1555.00 was expended on local cow comprising Rs. 555 on vaccination, Rs. 350 on medicine, Rs. 150 on AI and Rs. 500 on Doctor Charges. Rs. 1955.00 was expended on crossbred cow and Rs. 1490.00 on buffalo under different category of expenditures by DCS members. Whereas, total amount of Rs. 1580.00 was expended on local cow, Rs. 1670.00 on crossbred cow and Rs. 1380.00 on buffalo under different category of expenditure by NDCS members. However, expenditure on crossbred cow under both DCS and NDCS was higher than on local cow and buffalo due to more sensitive with climatic changes.

Table 5.7: Veterinary and Breeding Expenditure during Last year (2015-16)

SN	Expenditure (Rs)	DCS			NDCS		
		Animal type			Animal type		
A	Vaccination	LC	CB	B	LC	CB	B
	HS						
	BQ	255	300	250	240	245	155
	FMD	300	350	325	325	315	260
B	Medicines (Rs)	350	650	250	360	450	300
C	Av. No. of Visit By Vet./Year	2	2	2	2-3	2-3	3
D	Service	---	---	---	---	---	---
	Artificial Insemination AI	150	155	165	155	160	165
	Natural service	---	---	---	---	---	---
	Amount	---	---	---	---	---	---
E	No. of AI Per conception	---	---	---	---	---	---
F	Per visit rate paid to vet. Doctor (Rs/visit)	250	250	250	250	250	250
	Total Expenditure (Rs.)	1555	1955	1490	1580	1670	1380

Source: Field Survey

5.8 Cost of feed and fodder per animal at the time of survey under DCS and NDCS categories of milk producers.

An analysis of table 5.8 reveals that under DCS member on an overall average, the cost Rs. 34.08 was incurred per animal on dry fodder, Rs. 20.23 on green fodder and Rs. 39.25 on concentrate. Almost similar figures were also found under NDCS category. The labour wages for dairy activities were reported to be varied from Rs. 180 to 200 for men as well as women under both categories of DCS and NDCS. The charges of

permanent labours under DCS and NDCS categories were varied from Rs. 5000 to 6000 for different activities of dairy.

The present value of adult animal (Rs./animal) on an overall average was Rs. 37333 (crossbred cow), Rs. 27523 (local cow) and Rs. 38752 (buffalo) under DCS category while that of crossbred local cow and buffalo of NDCS categories were Rs. 36868, Rs. 22415 and Rs. 38961 respectively. Therefore, the value of buffalo in both DCS and NDCS was comparatively higher than that of local cow and crossbred cow. On an overall average, 56.67 per cent of dung was used as manure and 43.32 per cent as dung cakes in DCS categories while 63.33 per cent of dung was used as manure and 36.67 per cent as dung cakes by NDCS members.

Table 5.8: Cost details of Feed and Fodder per Animal at the Time of Survey

(Rs./livestock)

SN	Particulars	DCS				NDCS			
		S	M	L	T	S	M	L	T
A	Fodder								
	1. Dry Fodder (Rs./kg)	32.50	34.50	35.25	34.08	36.50	40.00	45.00	40.50
	2.Green Fodder	15.25	20.15	25.30	20.23	18.00	25.00	24.00	22.33
	3.Concentrate	32.55	45.00	40.25	39.25	30.50	40.00	42.00	37.50
	4.Supplements	NA	NA	NA	NA	NA	NA	NA	NA
B	Grazing Contract								
	Daily basis	NA	NA	NA	NA	NA	NA	NA	NA
	Monthly basis	NA	NA	NA	NA	NA	NA	NA	NA
	Yearly basis	NA	NA	NA	NA	NA	NA	NA	NA
C	Labour Wages (for Dairy activities)								
	Men	NA	200	200	200	NA	200	200	200
	Women	NA	180	180	180	NA	200	200	200
D	Permanent Labour (for Dairy activities)								
	Cash	NA	5000	6000	5500	NA	5000	6000	5500
	Kind	NA	NA	NA	NA	NA	NA	NA	NA
E	Rental Value of Land (*Rs./ha)*	NA	NA	NA	NA	NA	NA	NA	NA
F	Water Charges paid if any	NA	NA	NA	NA	NA	NA	NA	NA
G	Present Value of Adult Animals (*Rs./Animal)*								
	Crossbred Cow	35000	37500	39500	37333.34	32500	35450	42655	36868.33
	Local Cow	26450	28465	27655	27523.33	21500	22750	22996	22415.33
	Buffalo	38250	36356	41650	38752.00	37690	36865	42330	38961.67
H	Dung*								
	% of Dung used as -Manure	20.00	70.00	80.00	56.67	25.00	80.00	85.00	63.33
	Dung Cakes	80.00	30.00	20.00	43.32	75.00	20.00	15.00	36.67
I	Equipments (In Rs.)								
	Chaff Cutter	4850	5250	5540	5213.30	5020	5340	5495	5285.00
	Bucket	235	235	240	236.67	250	255	375	293.30
	Hoe	150	160	160	156.67	155	160	170	161.67
	Milk Cane	640	660	665	656.78	645	675	695	671.68
	Measurement	75	80	85	78.33	74	82	88	81.32
	Any Other	NA	NA	NA	NA	NA	NA	NA	NA

Source: Field Survey

5.9 Season wise milk yield (per day) during 2015-16 under DCS and NDCS categories of milk producers

An analysis of table 5.9 shows that under DCS category, the average yield per animal was found maximum during winter season with 4.15 litres of local cow, 6.75 litres of crossbred cow and 6.00 litres of buffalo followed by summer season while under NDCS

categories, the average yield per animal was found maximum during same season with 3.75 litres of local cow, 6.75 litres of crossbred cow and 5.75 litres of buffalo followed by summer season. However, yield per animal of all animals category was few higher under DCS than that of NDCS members.

Table 5.9: Season wise Milk Yield (Per day) of Selected Hh 2015-16

Sr. No.	Av. Yield (Lit/animal)	Animal (DCS) n=120			Animal (NDCS) n=120		
		Local Cow	Crossbred Cow	Buffalo	Local Cow	Crossbred Cow	Buffalo
1	Rainy Season	3.25	6.10	5.20	3.00	5.75	4.50
2	Winter Season	4.15	6.75	6.00	3.75	6.75	5.75
3	Summer Season	3.50	6.50	5.75	3.50	6.00	5.00

Source: Field Survey

5.10 Awareness about various schemes among milk producers of DCS and NDCS categories

An analysis of table shows that on an overall average, awareness about different vaccination schemes/programmes, 62.50 per cent was replied as 'Yes' against 'No' (37.50%) among DCS categories of sample farmers while about that, 52.50 per cent was replied as 'Yes' against 47.50 per cent 'No' by NDCS category. Awareness about AI programmes, 80.83 per cent of total sample farmers were viewed as 'Yes' against 'No' (19.17%) among DCS farmers while 59.17 per cent was replied as 'yes' against 'No' (40.83%) among NDCS farmers. Awareness about dairy development programme/schemes, 52.50 per cent was replied as 'Yes' against 'No' (47.50%) among DCS members while about that, 34.17 per cent was replied as 'Yes' against 'No' (65.83%). Dairy cooperative/milk union was emerged as major source of information (60.00 %) about schemes among DCS farmers followed by following farmers/neighbour while among NDCS farmers, 38.33 per cent was replied in favour of dairy owner/neighbour followed by animal husbandry department. About benefited with dairy development schemes/programmes, 03.33 per cent of DCS and 89.17 per cent of NDCS farmers was replied as 'No.'

Table 5.10: Awareness about various schemes (Response In %)

Particulars	DCS				NDCS			
	S	M	L	T	S	M	L	T
1. Awareness about different Vaccinations schemes/programmes (%)								
Yes	42.86	63.648	83.33	62.50	39.29	55.56	75.00	52.50
No	57.14	36.36	16.67	37.50	60.71	44.44	25.00	47.50
2. Awareness about Artificial Insemination (AI) programmes (%)								
Yes	68.57	81.82	93.33	80.83	46.43	63.89	78.57	59.17
No	31.43	18.18	6.67	19.17	53.57	36.11	21.43	40.83
3. Awareness about any dairy development scheme/programmes (%)								
Yes	34.29	50.91	76.67	52.50	28.57	36.11	42.86	34.17
No	65.71	49.09	23.23	47.50	71.43	63.89	57.14	65.83
4. Sources of information about these scheme (%)								
a. Govt. Animal Husbandry Department	---	36.36	43.33	27.50	---	22.22	35.71	15.00
b. Dairy Cooperative/Milk Union	51.43	55.91	86.67	60.00	---	---	---	---
c. Media (Press/TV)	---	---	26.67	6.67	---	---	25.00	5.83
d. Fellow farmer/dairy owner/neighbor	45.71	43.64	46.67	45.00	37.50	38.89	39.29	38.33
e. other	---	---	---	---	---	---	---	---
5. Have you benefited with any dairy development scheme/programmes (%)								
Yes	NA	21.82	26.67	16.67	NA	16.67	25.00	10.83
No	---	---	---	83.33	---	---	---	89.17
a) If benefited, please provide following								
i) Av. No. of visits to concern office	---	2.17	2.13	2.15	NA	2.0	2.29	2.15
ii) Wage days lost, if any (Rs.)								
iii) Total Expenditure to avail scheme (doc/travel/etc)								
iv) Bribe paid to any one								
v) Quality of material received								
Good	---	---	10.00	---				
Bad	---	---	3.33	---				
vi) Satisfied with benefit received (%)								
Yes	---	---	55.5	---				
No	---	---	---	---				
If no, give reason								

NB: No anyone had gotten benefit dairy scheme. Source: Field Survey

CHAPTER – VI

MILK CONSUMPTION AND MARKETABLE SURPLUS

6.1 Milk Production, use of Produced milk at home and processing and sale (yesterday) among DCS and NDCS categories of milk producers

6.1.1 Details about milk production, use and sale (yesterday) among DCS category

An analysis of table 6.1 shows that under DCS category of sample milk producers, the total milk drawn yesterday from local cow was 834.90 litres followed by buffalo (152.28 litres) and crossbred cow (51.68 litres). The use of total milk at home by milk producer was 113.34 litres comprising 72.21 litres of local cow, 12.75 litres of crossbred and 28.38 litres of buffalo as direct consumption. It means less than one litre of milk was used at home by each farmer. The sold of total raw/liquid milk by all 120 farmers was 925.52 litres comprising 762.69 litres of local cow, 38.93 litres of crossbreeds and 123.90 litres of buffaloes. So, about 7.71 litres of milk per farmer was sold to DCS of Rs. 26.83 per litres of local cow milk, Rs. 25.54 per litre of crossbred and Rs. 29.67 per litre of buffalo milk. However, the price of buffalo milk was higher than that of local and crossbred cow.

6.1.2 Details about milk production, use and sale (yesterday) among NDCS category

An analysis of table 6.1 reveals that under NDCS category of sample milk producer, the total milk drawn from all categories of animal by all NDCS sample farmers was estimated to 966.25 litres yesterday comprising 755.82 litres of local cows, 43.12 litres of crossbred cows and 167.31 litres of buffalo. The milk drawn yesterday by each NDCS member was calculated to 8.05 litres. The use of total milk at home by all NDCS members was calculated to 101.01 litres comprising 65.32 litres of local cow milk, 9.55 litres of crossbred cow milk and 26.15 litres of buffalo milk as direct consumption. It means about 800 gms milk was consumed by each farmer per day. The sold of total raw/liquid milk by all sample farmers was 865.23 litres comprising 650.50 litres of local cow milk, 33.57 litres of crossbred cow milk and 141.18 litres of buffaloes milk through different channels. Therefore, out of total local cow milk sold, 250.75 litres of milk was sold direct to consumer of Rs. 32.80 per litre, 243.50 litres of milk to private vendor/middlemen of Rs. 31.50 per litre and 196.25 litres of milk to sweetshops/others of Rs. 32.36 per litres. Out of total crossbred cow milk sold, about 20.15 litres was sold to direct consumers @ Rs. 32.65 per litre, 13.42 litres to private vendor/middlemen @ Rs. 31.25 per litre and out of total buffalo milk sold, 43.60 litres to the private vendor /middlemen @ Rs. 36.42 per litre and 97.56 litres to the sweetshop/others @ Rs. 37.62

per litre. However, weighted average price of buffalo milk was higher about Rs. 37.25 per litre that of local cow milk and crossbred milk.

Table 6.1 Milk Production, Use and Sale (Yesterday)

Sr. No.	Particulars	DCS				NDCS			
		LC	CB	B	O	LC	CB	B	O
1	Milk Drawn								
	(Lit/Day)	834.90	51.68	152.28	---	755.82	43.12	167.31	---
2	Use of Milk at Home (lit)								
	For Direct Consumption	72.21	12.75	28.38	---	65.32	9.55	26.15	---
3	Raw/Liquid Milk sold (Lit)	762.69	38.93	123.90	---	690.50	33.57	141.16	---
4	Agency (may be multiple)	4	4	4	`---	1,2,3	1,2,3	1,3	---
i)	**Cooperative Society**								
	Total Quantity (Lit)	762.69	38.93	123.90	---	---	---	---	---
	Price (Rs./Lit)	26.83	25.54	29.64	---	---	---	---	---
	Payment								
	Weekly	√	√	√	---				
	Monthly	√	√	√	---				
	Distance (Kms)	1-2	1-2	1-2	---				
ii)	**Consumer**								
	Total Quantity (Lit)	---	---	---	---	250.75	20.15	---	---
	Price (Rs./Lit)	---	---	---	---	32.80	32.65	---	---
	Payment	---	---	---	---	---	---	---	---
	Weekly	---	---	---	---	√	√	---	---
	Monthly	---	---	---	---	---	---	---	---
	Distance (Kms)	---	---	---	---	1.5 to	1.5 to	---	---
iii)	**Private Vendor/ Middlemen/Shop**								
	Total Quantity (Lit)	---	---	---	---	243.50	13.42	43.60	---
	Price (Rs./Lit)	---	---	---	---	31.50	31.25	36.42	---
	Payment								
	Daily	---	---	---	---	√	√	---	---
	Weekly	---	---	---	---	√	√		
	Distance (Kms)					2 to 3	2 to 3	1 to 2	---
iv)	**Sweet Shop/ Creameries/ Catering Services/others**								
	Total Quantity (Lit)	---	---	---	---	196.25	---	97.56	---
	Price (Rs./Lit)	---	---	---	---	32.35	---	37.62	---
	Payment								
	Daily	---	---	---	---	√	√	√	---
	Weekly	---	---	---	---	√	√	√	---
	Monthly	---	---	---	---	√	√	√	---
	Distance (Kms)	---	---	---	---	½ to 2	½ to 2	2 to 3	---
5	Weighted average price WAP (Rs./litre)	26.83	25.54	29.64	---	32.21	32.09	37.25	---
6	How many cooperative dairy members did not sale milk to dairy. Why-specify reasons).	NA	NA	NA	NA	NA	NA	NA	NA

Note: WAP= Total amount received through milk sale using all channels /total quantity sold.

Source: Field Survey, LC = Local Cow, CB = Cross Breed, B = Buffalo & O= Others

6.2 Marketing constraints of sample milk producers of DCS and NDCS categories

6.2.1 Marketing constraints of DCS: Sample Farmers

An analysis of table 6.2 reveals that on an overall average, 85.00 per cent of DCS milk producers had reported that an irregular sell of milk was never marketing constraint followed by sometimes (17.50%). Lack of time for marketing had reported as 'never' by 77.50 per cent of sample farmers followed by sometimes (22.50%) less knowledge about marketing had reported as always by 70.83 per cent of sample farmers and remaining as sometimes. Low risk taking behaviour had reported as 'Always' by 66.67 per cent of sample farmers followed by sometimes (33.33%). 100 per cent farmers had reported as 'No advance payment for milk by society. 100 per cent farmers had reported as inability to market for value added products.

6.2.2 Marketing constraints of NDCS sample farmers

The table 7.2 shows that on an overall sample size, 65.00 per cent of NDCS farmers had reported that irregular sell of milk was sometimes marketing constraints against 35.00 per cent of 'Never.' Lack of time for marketing had reported by 55.83 per cent of sample farmers as sometimes constraints followed by 'Never' (44.17%). Less knowledge about marketing had replied by 72.50 per cent of sample farmers as 'always' followed by sometimes (27.50%). Low risk taking behaviour had also reported as constraints of sometimes by 69.17 per cent of sample farmers followed by 'Never' (20.83%). No or less advance payment for milk by vendor/sweetshops had also reported as constraints of sometimes by 65.00 per cent of sample milk producers followed by always (35.00%). 100 per cent of sample milk; producers had reported as inability to market for value added products.

Table 6.2 Marketing Constraints (MC)

(In %)

SN.	Constraints	DCS				NDCS			
		S	M	L	T	S	M	L	T
1	Irregular sell of milk								
	Never	80.00	81.82	86.67	82.50	39.29	33.33	28.57	35.00
	Sometime	20.00	18.18	13.33	17.50	60.71	66.67	71.43	65.00
	Always	---	---	---	---	---	---	---	---
2	Lack of time for marketing								
	Never	74.29	76.36	83.33	77.50	42.86	44.44	46.43	44.17
	Sometime	25.71	23.64	16.67	22.50	57.14	55.56	53.57	55.83
	Always	---	---	---	---	---	---	---	---
3	Less knowledge about marketing strategies								
	Never	---	---	---	---	---	---	---	---
	Sometime	22.86	29.09	36.67	29.17	25.00	27.78	32.14	27.50
	Always	77.14	70.90	63.33	70.83	75.00	72.22	67.86	72.50
4	Low risk taking behaviour								
	Never	---	---	---	---	28.57	30.56	35.71	30.83
	Sometime	28.57	32.73	40.00	33.33	71.43	69.44	64.29	69.17
	Always	71.43	57.27	60.00	66.67	---	---	---	---
5	No or less advance payment for milk by society/vendors								
	Never	---	---	---	---	---	---	---	---
	Sometime	---	---	---	---	60.71	63.89	75.00	65.00
	Always	100.00	100.00	100.00	100.00	39.29	36.11	25.00	35.00
6	Inability to market for value added products								
	Never	---	---	---	---	---	---	---	---
	Sometime	---	---	---	---	---	---	---	---
	Always	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source: Field Survey

CHAPTER – VII

CONSTRAINTS FACED IN PRODUCTION AND MARKETING OF MILK AND ITS SUGGESTIONS FOR IMPROVEMENT

7.1 Service delivery system in DCS and NDCS categories of milk producers

7.1 (A) Service delivery system in DCS category of milk producers

An analysis of table 7.1 reveals that on an overall average, 82.50 per cent of total sample size had replied that supply of cattle feed under input delivery system was adequate and remaining replied as inadequate. 100 per cent respondent had replied that cattle feed and fodder seed on credit was not available and its cost was high. About 73.00 per cent respondent had replied that emergency veterinary services were available and 27.00 per cent replied as not available but its charges were high replied by 100 per cent of respondents. The availability of vaccines was adequate as replied by 64.17 per cent of respondents and 35.83 per cent respondent replied as inadequate. About 66.00 per cent of respondents had replied as 'Yes' for delivery and applications of quality and requisite quantity of vaccines while 34.00 per cent replied as 'No.' About 77.00 per cent of respondent had replied that semen at AI centre was adequate while 23.00 per cent replied in favour of inadequate. 100 per cent of respondent had replied that provision of loan in society for purchasing of cattles was not available. No anyone had replied about charges for insurance of animals. 100 per cent of respondent had replied that price of milk per litres was low. Most of the respondent had replied that there was no any certain time for payment of milk. 100 per cent respondent replied that incentives or bonus for supplying of milk was low. 100 per cent respondent replied that the acceptability of crossbred cow milk in family was accepted and advance payment for milk by society was not available.

7.1 (B) Service delivery system in NDCS category of milk producers

Its analysis may be seen in table 7.1 and reveals that on an overall average, about 69.00 per cent of respondent had replied that under input delivery system, supply of cattle feed was adequate and 31.00 per cent replied as inadequate. 100 per cent respondent replied that cattle feed and fodder seed on credit was available but its cost was very high. Emergency veterinary services was available as replied by 63.00 per cent of respondent and 37.00 per cent replied as 'not available' but its charges was high as they paid charges Rs. 182.00 per visit replied by 100 per cent of respondents. About 62.00 per cent of respondent had told that vaccines were adequate and 38.00 per cent viewed as inadequate. About 60.00 per cent of respondent had viewed as 'Yes' for delivery and applications of quality and requisite quantity of vaccines and 40.00 per cent replied as 'No.' The semen at the AI centre was adequate as replied by 67.00 per cent of respondent and 33.00 per cent replied as inadequate. The provision of loan in government for purchasing of cattle was adequate as replied by 71.00 per cent of respondent and 29.00 per cent replied as inadequate. There were no any cases found in study area about insurance of animal. Now, we want to discuss about output delivery such as 100 per cent respondent replied that the price of milk was low but payment made on 15 days. No any an incentive or bonus facility for supplying of milk was found among NDCS category. About 74.00 per cent of respondent had viewed that the milk of crossbred cow in family was accepted and 26.00 viewed as poor acceptable. Moreover, 100 per cent of respondent replied that advance payment for milk by vendor was available.

Table 7.1 Service Delivery

(Response in %)

		DCS				NDCS			
S. N.	Particulars	S	M	L	T	S	M	L	T
A	**INPUT DELIVERY (%)**								
1	Supply of Cattle Feed								
	Adequate	80.00	81.82	86.67	82.50	64.29	72.22	75.00	69.17
	Inadequate	20.00	18.18	13.33	17.50	35.71	27.78	25.00	30.83
	Not Available	---	---	---	---	---	---	---	---
2	Cattle feed and fodder seed on Credit								
	Available	---	---	---	---	100.00	100.00	100.00	100.00
	Not Available	100.00	100.00	100.00	100.00	---	---	---	---
3	Cost of cattle feed and mineral mixture								
	High	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
	ok	---	---	---	---	---	---	---	---
	Not Available	---	---	---	---	---	---	---	---
4	**Emergency Veterinary Services (EVS)**								
	Available	71.43	72.73	76.67	73.33	57.14	66.67	71.43	63.33
	Not Available	28.57	27.27	23.23	26.67	42.86	33.33	28.57	36.67
	Charges for EVS								
	High	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
	Medium	---	---	---	---	---	---	---	---
	Low	---	---	---	---	---	---	---	---
	Rs/Visit	250	275	245	256	296.88	300.00	260.00	182.50
5	**Vaccines**								
	Adequate	62.86	65.45	73.33	64.17	60.71	61.11	67.86	62.50
	Inadequate	37.14	34.55	26.67	35.83	39.29	38.89	32.14	37.50
	Not Available	---	---	---	---	---	---	---	---
6	Delivery and applications of quality and requisite quantity of vaccines								
	Yes	68.57	61.82	70.00	65.83	58.93	58.33	54.29	60.00
	No	34.43	38.18	30.00	34.17	41.07	41.67	35.71	40.00
7	Semen at the AI centre								
	Adequate	74.29	76.36	80.00	76.67	62.50	63.89	78.57	66.67
	Inadequate	75.71	23.64	20.00	23.33	37.50	36.11	21.43	33.33
	Not Available	---	---	---	---	---	---	---	---
8	Provision of loan in society or govt. for Purchasing cattle								
	Adequate	---	---	---	---	66.07	69.44	82.14	70.83
	Inadequate	---	---	---	---	33.93	30.56	17.86	29.17
	Not Available	100.00	100.00	100.00	100.00	---	---	---	---
9	Charges for insurance (Rs. /animal)								
	Very high	NA	NA	NA	NA	NA	NA	NA	NA
	High	NA	NA	NA	NA	NA	NA	NA	NA
	Medium	NA	NA	NA	NA	NA	NA	NA	NA
10	Technical Guidance	57.14	58.18	83.33	64.17	55.36	55.56	60.71	56.67
B	**OUTPUT DELIVERY**								
1	Milk Price(Rs./lit)								
	Adequate	---	---	---	---	---	---	---	---
	Low	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
2	Payment of Milk								
	Immediate	---	---	---	---	---	---	---	---
	Within 2 days	---	---	---	---	---	---	---	---
	Within 15 days	---	---	---	---	100.00	100.00	100.00	100.00
3	incentives or bonus for supplying milk								
	Adequate	---	---	---	---	---	---	---	---
	Low	100.00	100.00	100.00	100.00	---	---	---	---
4	Acceptability cross-bred cow milk in family								
	Poor	---	---	---	---	32.14	30.56	14.29	25.66
	Acceptable	100.00	100.00	100.00	100.00	57.86	69.44	85.71	74.34
	Not acceptable	---	---	---	---	---	---	---	---
5	Advance payment for milk by society/vendors								
	Available	---	---	---	---	100.00	100.00	100.00	100.00
	Not available	100.00	100.00	100.00	100.00	---	---	---	---

Source: Field Survey

7.2 Infrastructural constraints among DCS and NDCS categories of milk producers

7.2.1 Infrastructural constraints among DCS category of milk producers

An analysis of table 7.2 reveals that on an overall average, 78.00 per cent of total sample size had replied that there was always lack of improved equipments. About 18.00 per cent of respondent replied as sometimes irregular and inadequate supply of cattle feed. About 27.00 per cent of respondent replied as sometimes unavailability of EVS. About 52.00 per cent of respondent viewed as sometimes infrequent visit of veterinary staff and 10.00 per cent replied in favour of 'Always.' About 33.00 per cent of respondent replied as sometimes unavailability of vaccines. About 35.00 per cent of respondent had replied that there was sometimes occasional availability of semen at centres. Always lack of training facilities had replied by 35.83 per cent of respondents. About 47.00 per cent of respondent had replied that there was always unsuitability of the time of delivery of milk during winter season due to bitter cold in early hours of the day while 32.00 per cent replied in favour of sometimes. About 72.00 per cent of respondent had replied that there was sometime unavailability of green/dry fodder throughout the year. 100 per cent of respondent had replied that there was always unavailability of cattle feed and fodder seed on credit. About 61.00 per cent of respondent had replied that always low average milk yield of the animal while 39.00 per cent replied as sometimes.

7.2.2 Infrastructural constraints among NDCS category of milk producers

Its analysis may be seen in table 7.2 reveals that on an overall average, 72.50 per cent of total respondent had replied as always lack of improved equipments. About 40.00 per cent of respondent had viewed that there was sometimes irregular and inadequate supply of cattle feed and unavailability of EVS. There were sometime infrequent visit of veterinary staff replied by 55.83 per cent of respondent and 44.17 per cent replied as always infrequent visit of veterinary staff. About 43.00 to 46.00 per cent of respondent had replied that there were sometime unavailability of vaccines and sometime occasional availability of semen at the AI centre. Also, 64.17 per cent of respondent had told as always lack of training facilities. There was always unsuitability of the time for delivery of milk during winter season due to bitter cold in early hours of day as replied by 71.67 per cent of respondent and 28.33 per cent of respondent replied as sometime unavailability of the time. About 65.00 per cent respondent replied as some time unavailability of green/dry fodder throughout the year. About 63.00 per cent of respondent had replied as 'Never' unavailability of cattle feed and fodder seed on credit followed by sometime unavailability of cattle feed and fodder seed on credit. About

65.00 per cent of respondent had viewed as always low average milk yield of animal followed by sometime 35.00 per cent.

Table 7.2 Infrastructural Constraints (IC)

(% to total responses)

SN	Particulars	DCS				NDCS			
		S	M	L	T	S	M	L	T
1	Lack of improved equipments								
	Never	---	---	---	---	---	---	---	---
	Sometime	---	---	---	---	---	---	---	---
	Always	62.86	81.82	86.67	77.50	64.29	69.44	92.86	72.50
2	Irregular & inadequate supply of cattle feed								
	Never	---	---	---	---	---	---	---	---
	Sometime	20.00	18.18	13.33	17.50	35.71	27.78	64.29	40.00
	Always	---	---	---	---	---	---	---	---
3	Unavailability of emergency veterinary services								
	Never	---	---	---	---	---	---	---	---
	Sometime	28.57	27.27	23.23	26.67	42.86	33.33	42.86	40.00
	Always	---	---	---	---	---	---	---	---
4	Infrequent visit of veterinary staff								
	Never	---	---	---	---	---	---	---	---
	Sometime	34.29	58.18	60.00	51.67	53.57	55.56	60.71	55.83
	Always	---	---	40.00	10.00	46.43	44.44	39.29	44.17
5	Unavailability of vaccines								
	Never	---	---	---	---	---	---	---	---
	Sometime	37.14	34.55	26.67	33.33	39.29	38.89	57.14	43.33
	Always	---	---	---	---	---	---	---	---
6	Occasional Availability of semen at the AI centre								
	Never	---	---	---	---	---	---	---	---
	Sometime	42.86	32.73	30.00	35.00	37.50	52.78	53.57	45.83
	Always	---	---	---	---	---	---	---	---
7	Lack of training facilities								
	Never	---	---	---	---	---	---	---	---
	Sometime	---	---	---	---	---	---	---	---
	Always	42.86	41.82	16.67	35.83	44.64	77.78	85.71	64.17
8	Unsuitability of the time of delivery of milk during winters due to bitter cold in early hours of the day								
	Never	---	---	---	---	---	---	---	---
	Sometime	32.14	28.82	26.67	31.67	32.14	27.78	21.43	28.33
	Always	67.86	62.82	73.33	46.67	67.86	72.22	78.57	71.67
9	Unavailability of green/dry fodder throughout the year								
	Never	---	---	---	---	---	---	---	---
	Sometime	65.71	69.09	83.33	71.67	60.71	66.61	71.43	65.00
	Always	---	---	---	---	---	---	---	---
10	Unavailability of cattle feed and fodder seed on credit								
	Never	---	---	---	---	57.14	63.89	75.00	63.33
	Sometime	---	---	---	---	42.86	36.11	25.00	36.67
	Always	100.00	100.00	100.00	100.00	---	---	---	---
11	Low average milk yield of the milk animals								
	Never	---	---	---	---	---	---	---	---
	Sometime	45.71	40.00	30.00	39.17	28.57	38.89	42.86	35.00
	Always	54.29	60.00	70.00	60.83	71.43	61.11	57.14	65.00

Source: Field Survey

7.3 Economic constraints among DCS and NDCS

7.3.1 Economic constraints among DCS milk producers

The economic constraints related to milk production under DCS farmers is presented in table 7.3 reveals that on an overall average, about 58.00 per cent of total respondent had replied that there was always high cost of fodder seed and 42.00 per cent told as sometime high cost of fodder seed. Sometime delay in payment of milk had replied by 52.00 per cent of respondent and 48.00 per cent told as always delay in payment of milk. 100 per cent of the respondent had viewed as always high cost of crossbred cow and low price of milk offered. Thereafter, 65.00 per cent of respondent had replied that there was always high cost of veterinary medicines and 35.00 per cent replied as sometime. 100 per cent of respondent had viewed as always high cost of cattle feed and mineral mixture and low provision of loan in society for purchasing of cattle. About 57.00 per cent of respondent had told that there was sometime low incentives or bonus for supplying of milk and 43.00 per cent told as always low incentives or bonus. Sometime and always high charges of EVS were reported by 60.00 per cent and 40.00 per cent of respondent respectively. No any one of respondent told about charges for insurance.

7.3.2 Economic constraints among NDCS milk producers

An analysis of table 7.3 shows that on an overall average, 55.00 per cent of respondent told that there was always high cost of fodder seed ad 45.00 per cent told as sometime high cost of fodder seed. Never delay in payment of milk was reported by 60.00 per cent of respondent but 40.00 per cent reported as always delay in payment of milk. 100 per cent of respondent had viewed that there was always low price of milk, always high cost of crossbred cow and always high cost of cattle feed and mineral mixture. While only 58.33 per cent of respondent had told that there was always high cost of veterinary medicine followed by sometime high cost of VM (41.67%). Less than 50.00 per cent of respondent had replied as sometime low provision of loan in government for purchasing of cattle. No anyone of respondent had replied about incentive or bonus. Around 50.00 per cent of respondent viewed that there was sometimes high charges of

EVS and 50.00 per cent replied as always. However, awareness about insurance of animal in both the cast of DCS and NDCS milk producers were almost negligible because no any one of respondent had reported about us.

Table 7.3 Economic Constraints (EC)

(In %)

S N.	Particulars	DCS				NDCS			
		S	M	L	T	S	M	L	T
1	High cost of fodder seed								
	Never	---	---	---	---	---	---	---	---
	Sometime	34.29	45.45	43.33	41.67	46.43	44.44	33.33	45.00
	Always	65.71	54.55	56.67	58.33	53.57	55.56	66.67	55.00
2	Delay in payment of milk								
	Never	---	---	---	---	57.14	61.11	54.29	60.00
	Sometime	51.43	52.73	53.33	52.50	42.86	38.89	35.71	40.00
	Always	48.57	47.27	46.67	47.50	---	---	---	---
3	Low price of milk offered								
	Never	---	---	---	---	---	---	---	---
	Sometime	---	---	---	---	---	---	---	---
	Always	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
4	High cost of cross bred cow								
	Never	---	---	---	---	---	---	---	---
	Sometime	---	---	---	---	---	---	---	---
	Always	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
5	High cost of veterinary medicines								
	Never	---	---	---	---	---	---	---	---
	Sometime	37.14	34.55	33.33	35.00	39.29	41.67	46.43	41.67
	Always	62.86	65.45	66.67	65.00	60.71	58.33	53.57	58.33
6	High cost of cattle feed and mineral mixture								
	Never	---	---	---	---	---	---	---	---
	Sometime	---	---	---	---	---	---	---	---
	Always	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
7	Low provision of loan in society or govt. for purchasing cattle								
	Never	---	---	---	---	---	---	---	---
	Sometime	---	---	---	---	53.57	47.22	42.86	49.17
	Always	100.00	100.00	100.00	100.00	---	---	---	---
8	Low incentives or bonus for supplying milk								
	Never	---	---	---	---	---	---	---	---
	Sometime	54.29	58.18	60.00	57.50	---	---	---	---
	Always	45.71	41.82	40.00	42.50	---	---	---	---
9	High charges of emergency veterinary services								
	Never	---	---	---	---	---	---	---	---
	Sometime	57.14	60.00	63.33	60.00	55.36	52.78	39.29	50.83
	Always	42.86	40.00	36.67	40.00	44.64	47.22	60.71	49.17
10	High charges for insurance								
	Never	NA	NA	NA	NA	NA	NA	NA	NA
	Sometime	NA	NA	NA	NA	NA	NA	NA	NA
	Always	NA	NA	NA	NA	NA	NA	NA	NA

Source: Field Survey

7.4 Technical constraints among DCS and NDCS categories of milk producers

7.4.1 Technical constraints among DCS category of milk producers

An analysis of table 7.4 reveals that on an overall average, 55.00 per cent of respondent had replied that there was sometime lack of technical guidance followed by always

(23.33%) and never (21.67%). 100 per cent had reported that there was always unavailability of high genetic bull. Around 67.00 per cent of respondent had reported that there was sometime poor conception rate through AI followed by never (33.00%). Sometime poor knowledge about feeding and healthcare of animal had reported by 70.83 per cent of respondent followed by always (29.17%) while 60.83 per cent of respondent had reported about always lack of knowledge for cheap and scientific housing of animal followed by sometime (39.17%).

7.4.2 Technical constraints among NDCS category of milk producers

Table 7.4 reveals that around 67.00 per cent of respondents were of the view that there was always lack of technical guidance followed by sometime (33.00%). Cent per cent respondent told that there was always unavailability of high genetic bull.

Table 7.4 Technical Constraints (TC)

(In %)

SN.	Constraints	DCS				NDCS			
		S	M	L	T	S	M	L	T
1	Lack of technical guidance								
	Never	22.86	21.82	20.00	21.67	---	---	---	---
	Sometime	60.00	52.73	53.33	55.00	32.14	33.33	35.71	33.33
	Always	17.14	25.45	26.67	23.33	67.86	66.67	64.29	66.67
2	Unavailability of high genetic merit bull								
	Never	---	---	---	---	---	---	---	---
	Sometime	---	---	---	---	---	---	---	---
	Always	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
3	Poor conception rate through artificial insemination								
	Never	28.57	32.73	36.67	32.50	33.93	36.11	39.29	35.83
	Sometime	71.43	67.27	63.33	67.50	66.07	63.89	60.71	64.17
	Always	---	---	---	---	---	---	---	---
4	Poor knowledge about Feeding and health care								
	Never	---	---	---	---	---	---	---	---
	Sometime	68.57	70.91	73.33	70.83	55.36	58.33	67.86	59.17
	Always	31.43	29.09	26.67	29.17	44.64	41.67	32.14	40.83
5	Lack of knowledge about cheap & scientific housing of animal								
	Never	---	---	---	---	---	---	---	---
	Sometime	37.14	38.18	43.33	39.17	35.71	38.89	42.86	38.33
	Always	62.86	61.82	56.67	60.83	64.29	61.11	57.14	61.67

Source: Field Survey

Sometime poor conception rate through AI had reported by 64.00 per cent of respondent followed by never (36.00%). Around 59.00 per cent of respondent had reported as sometime poor knowledge about feeding and healthcare of animal followed by always (41.00%) whereas 62.00 per cent reported about always lack of knowledge about cheap and scientific housing of animal followed by sometime (38.00%).

7.5 Socio-psychological constraints among DCS and NDCS categories of milk producers

7.5.1 Socio-psychological constraints among DCS category of milk producers

An analysis of table 7.5 shows that on an overall average, around 70.00 per cent of respondent had reported that there were always lower socio-economic conditions of the milk producers followed by sometime (30.00%). Always lack of purchasing power had reported by 65.83 per cent of respondent followed by sometime (34.17%). Around 65.00 per cent of respondent told that there was sometime lack of time due to busy in domestic/agricultural work followed by always (35.00%). Also, around 61.00 per cent of respondent reported that there was sometime lack of cooperation and coordination among members followed by never. Around 70.00 per cent and 30.00 per cent of respondent told that there was some time and always treated to milk producers as meant for influential peoples respectively. Consequently, around 74.00 per cent of respondent had reported that there was sometime poor acceptability of crossbred cow's milk followed by never (26.00%).

7.5.2 Socio-psychological constraints among NDCS category of milk producers

Its analysis may be seen in table 7.5 and shows that around 73.00 per cent of respondent reported that there was always lower socio-economic condition of the milk producers followed by sometime (27.00%). Always lack of purchasing power was reported by 67.00 per cent of respondent followed by sometime (33.00%) whereas sometime lack of time due to busy in domestic/agricultural work was reported by 68.33 per cent followed by always (31.67%). Around 63.00 per cent of respondent was reported that there was sometime lack of cooperation and coordination among milk producers followed by never (37.00%). Sometime milk producers are meant for influential people

by 57.50 of respondent followed by always (42.50%) while around 79.00 per cent of respondent reported that there was sometime poor acceptability of crossbred cow milk among family members followed by never (21.00%).

Table 7.5: Socio-Psychological Constraints (PSC)

(In %)

SN.	Constraints	DCS				NDCS			
		S	M	L	T	S	M	L	T
1	Lower socio- economic conditions								
	Never	---	---	---	---	---	---	---	---
	Sometime	22.86	30.91	36.67	30.00	25.00	27.78	28.57	26.67
	Always	77.14	69.09	63.33	70.00	75.00	72.22	71.43	73.33
2	Lack of purchasing power								
	Never	---	---	---	---	---	---	---	---
	Sometime	28.57	34.55	40.00	34.17	32.12	33.33	35.71	33.33
	Always	71.43	65.45	60.00	65.83	67.86	66.67	64.29	66.67
3	Lack of time due to busy in domestic/ agricultural work								
	Never	---	---	---	---	---	---	---	---
	Sometime	74.29	63.64	56.67	65.00	71.43	69.44	60.71	68.33
	Always	25.71	36.36	43.33	35.00	78.57	30.56	39.29	31.67
4	Lack of cooperation and coordination among members								
	Never	31.43	40.00	46.67	39.17	33.93	36.11	42.86	36.67
	Sometime	68.57	60.00	53.33	60.83	66.07	63.89	67.14	63.33
	Always	---	---	---	---	---	---	---	---
5	Milk producers are meant for influential people								
	Never	---	---	---	---	---	---	---	---
	Sometime	65.71	70.91	73.33	70.00	60.71	55.56	53.57	57.50
	Always	34.29	29.09	26.67	30.00	39.29	44.44	46.43	42.50
6	Milk of cross-bred cow has poor acceptability (family members)								
	Never	20.00	25.45	33.33	25.83	17.86	22.22	25.00	20.86
	Sometime	80.00	74.55	66.67	74.17	82.14	77.78	75.00	79.17
	Always	---	---	---	---	---	---	---	---

Source: Field Survey

7.6 Other constraints among DCS and NDCS categories of milk producers

7.6.1 Other constraints among DCS category of milk producers

An analysis of table 7.6 shows that on an overall average, 61.67 per cent of total sample size had reported that there were unavailability of chilling facilities at village level for milk preservation. Only 26.67 per cent of respondent had reported about diversion of feed and fodder in gradients for industrial use. Majority of grazing land are either degraded or encroached had reported by 60.00 per cent of respondent. Around 44.00 per cent of respondent had reported about poor access to organized markets for deprive farmers in getting proper milk price. An irregular quality electricity supply was another constraint reported by 53.33 per cent of respondent. However, among different other constraints, politics in cooperative is not good was emerged as major constraint reported by 80.00 per cent of the respondent followed by lack of veterinary service in village quality milk production (72.50%), lack of finance to invest and poor knowledge about scientific animal husbandry practice and dairy farming.

7.6.2 Other constraints among NDCS category of milk producers

Its analysis may be seen in table 7.6 and reveals that on an overall average, an unavailability of chilling facilities at village level for milk preservation was a constraint reported by 60.00 per cent of respondents. Only 22.50 per cent of respondent had reported that there was diversion of feed and fodder in gradients for industrial use. Majority of grazing lands are either degraded or encroached was viewed by 36.67 per cent of respondents. Poor access to organized markets to deprive farmers in getting proper milk price was reported by 44.17 per cent of respondent and 51.67 per cent reported that there was an irregular quality electricity supply. However, out of different other constraints among the respondents, politics in cooperative is not good was emerged as major constraint reported by 75.83 per cent of respondent followed by lack of veterinary services in village for quality milk production (72.50%), lack of awareness about quality milk production, (70.00%), poor knowledge about scientific animal husbandry practices and dairy farming (65.00%) and poor livestock extension services (62.50%).

Table 7.6: Other Constraints (OC)

SN.	Constraints	DCS				NDCS			
		S	M	L	T	S	M	L	T
1	Unavailability of chilling facilities at village level for milk preservation	51.43	65.45	66.67	61.67	57.14	61.11	64.29	60.00
2	Diversion of feed and fodder ingredients for industrial use	22.86	27.27	30.00	26.67	21.43	22.22	25.00	22.50
3	Majority of grazing lands are either degraded or encroached	34.29	69.09	73.33	60.00	35.71	38.89	39.29	36.67
4	Poor access to organized markets deprive farmers in getting proper milk price	40.00	45.45	46.67	44.17	42.83	44.44	46.43	44.17
5	Irregular quality electricity supply	48.57	54.55	56.67	53.33	50.00	52.78	63.57	51.67
6	Poor irrigation facility to grow fodder crops	54.29	61.82	60.00	59.17	53.57	55.56	57.14	55.00
7	Non availability of improved fodder seed	42.86	50.91	53.33	49.17	46.43	47.22	50.00	47.00
8	Poor livestock extension services	57.14	63.64	63.33	61.67	60.71	63.89	64.29	62.50
9	Poor knowledge about scientific animal husbandry practices and dairy farming	60.00	67.27	70.00	65.83	62.50	66.67	67.86	65.00
10	Poor knowledge of mastitis (mastitis in dairy animal) in dairy animals	---	---	---	---	---	---	---	---
11	Lack of awareness about quality milk production	62.86	47.27	33.33	48.33	66.07	72.22	75.00	70.00
12	Poor housing to milch animals	28.57	43.64	43.33	39.17	32.14	33.33	39.29	34.17
13	Unavailability of medicine and equipment required for quality milk production	45.71	49.09	50.00	48.33	44.64	50.00	57.14	49.17
14	Lack of milk testing and animal screening facilities	31.43	41.82	40.00	38.33	37.50	41.67	42.86	40.00
15	Lack of veterinary services in village for quality milk production	74.29	72.73	70.00	72.50	67.86	75.00	78.57	72.50
16	Lack of nutrition's feed for quality milk production	25.71	36.36	36.67	33.33	39.29	58.33	60.71	50.00
17	Lack of ecto parasites control programmes	---	---	---	---	---	---	---	---
18	Lack of finance to invest in dairy business for quality milk production/ Inadequate finance	62.86	74.55	80.00	72.50	28.57	30.56	32.14	30.00
19	Lack of necessary space required for tying the milking animals	---	---	---	---	---	---	---	---
20	Lack of marketing facility for dairy business	---	---	---	---	---	---	---	---
21	Uneconomical capital investment on quality milk production	65.71	52.73	53.33	56.67	---	---	---	---
22	Lack of water supply	---	---	---	---	---	---	---	---
23	Inadequate labour supply	---	25.45	43.33	22.50	---	25.00	28.57	14.17
24	Ecological factors- High heat/temperature, High cold, etc	---	29.09	56.67	27.50	26.79	27.78	32.14	28.33
25	Competition from established and large units	55.71	32.73	30.33	42.50	41.07	19.44	17.86	29.17
26	Difficulty to store milk in summer	---	30.91	46.67	25.83	---	36.11	42.86	20.83
27	low acceptability of AI in buffalo	37.14	34.55	26.67	33.33	30.36	33.33	35.71	32.50
28	Disease outbreak: mortality and morbidity	---	---	---	---	---	---	---	---
29	Politics in Cooperative is not good	91.43	76.36	73.33	80.00	71.43	77.78	82.14	75.83

Source: Field Survey

7.7 Suggestions for improvement in adoption of dairy schemes by milk producers of DCS and NDCS farmers

An analysis of table 7.7 reveals that on an overall average, 42.50 per cent respondent of DCS and 35.00 per cent respondent of NDCS had suggested to provide market facilities for outlets of milk and milk product at the village level. 19.17 per cent DCS and 40.00 per cent of NDCS had suggested for providing technical knowledge to manage the dairy enterprises. 52.50 per cent of DCS respondent and 34.17 per cent of NDCS respondent had suggested for regular and planned supply of vaccines. 45.83 per cent of DCS respondent and 29.17 per cent of NDCS respondent had suggested for subsidy on veterinary medicines and fodder seeds. 100 per cent respondent of both DCS and NDCS had suggested for enhancing the price of milk for producers. 90.00 per cent of DCS ad 88.33 per cent of NDCS had suggested that there should be easy procedure for sanctioning of loan. About 40.00 per cent of DCS and 47.50 per cent of NDCS respondent had suggested that the loan amount for purchasing the dairy animal should be increased. 42.50 per cent of DCS and 50.00 per cent of NDCS had suggested that the concentrates should be made available at cheaper rate. 43.33 per cent of DCS and 65.00 per cent of NDCS respondent had suggested that AI facilities should be available at the village level. 50.83 per cent of DCS and 37.50 per cent of NDCS respondent had reported that the cost of veterinary services needs to be reduced. 50.83 per cent of DCS and 42.50 per cent of NDCS had reported that small scale dairy industries must be encouraged at village level. 37.50 per cent of DCS and 41.67 per cent of NDCS respondent had reported that service delivery should be improved. However, among different suggestion reported by respondent of DCS and NDCS, the enhancement of milk price for producers was emerged as most important suggestion followed by easy procedure for loan sanctioning.

Table 7.7: Suggestions for improvement in adoption of dairy schemes by milk producers under DCS & NDCS categories

SN	Suggestion for Improvement (%)	DCS (%)				NDCS (%)			
1.	Marketing facilities be provided at village level for the outlet of milk and milk products	34.28	45.45	46.46	42.50	35.71	33.33	35.71	35.00
2.	Providing technical knowledge of manage the dairy	14.28	21.81	20.00	19.17	39.28	38.88	42.86	40.00
3.	There should be regular and planned supply of vaccines (100%)	57.14	49.09	53.33	52.50	41.07	27.78	28.57	34.17
4.	Subsidies should be given on certain inputs like veterinary medicines, fodder seed, etc.	40.00	47.27	50.00	45.83	32.14	22.22	32.14	29.17
5.	Enhanced milk price for the producers	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
6.	Loan sanction procedure should be made easy	91.42	90.91	86.67	90.00	89.28	88.88	85.71	88.33
7.	The loan amount for the purchase dairy animals need to be increased	42.86	36.36	43.33	40.00	46.42	44.44	53.57	47.50
8.	Concentrates should be made available at cheaper rate and in time	48.57	40.00	40.00	42.50	53.57	47.22	46.42	50.00
9.	Providing proper AI facility at village level/door step	51.42	41.81	36.66	43.33	71.42	55.55	64.28	65.00
10.	Cost of veterinary services need to be reduced	45.71	50.91	56.67	50.83	42.85	30.55	50.00	37.50
11.	Provide veterinary literature in village	---	---	---	---	---	---	---	---
12.	Small scale dairy industries be encouraged at village level	37.14	54.54	60.00	50.83	44.64	41.67	39.28	42.50
13.	Need to improve service delivery	31.42	43.64	33.33	37.50	37.50	36.11	57.14	41.67

Source: Field Survey

CHAPTER – VIII

CONCLUSIONS AND RECOMMENDATIONS

Conclusion

- Milk production activity is an important enterprise as it provides supplement income and reduces unemployment of small & marginal farmers and agriculture labourers. It also helps in improving the nutritional standard of the peoples. It has been realised that dairy development could be used as a tool for bringing change in the socio-economic among the *"there is tremendous potential for the milk production in the state of Jharkhand, as the agro-climatic condition of this state are ideally suited for cross bred milch cattle with moderate production capacity especially of 50.00 per cent exotic inheritance from Holstein Friesian. There is an adequate market potential for sale of milk and milk products in this state due to a number of industrially developed areas."*
- In the state of Jharkhand, rural milk trading practices are not well established and milk marketing network is not much developed. So, milk is produced mostly for household consumption and local marketing. However, there is tremendous scope for dairy co-operative development and milk route development through institution arrangements with milk processing plant.
- In order to meet the requirement of milk and milk products in the state of Jharkhand, around 6 to 8 lakh litres of milk is being procured daily from neighbouring states by organised sector player. At the same time to make the state self-sufficient in milk production by implementing the bred improvement, feed and fodder development programmes and also by other productivity enhancement programmes intensively. As a result, the milk production in rural area is increasing significantly.

- Total milk production was increased to 1812.38 thousand tones in 2015-16 from 910 thousand tones in 2000-01 accounting for 99.16 per cent increase during 2000-01 to 2015-16. So we can say that Jharkhand has been achieved just double in milk production during 2000-01 to 2015-16. In this state, per capita availability of milk was also increased to 152 gms per day in 2015-16 from 96 gms/day in 2001-02 accounting for 58.33 per cent increased during 2001-02 to 2015-16.
- Total milk production was increased to 1812.37 thousand MT in 2015-16 from 1463.00 thousand MT in 2009-10 accounting for 23.88 per cent increased during 2009-10 to 2015-16. So, we can say that total milk production in Jharkhand has been continuously increased during above mentioned period. Ranchi has highest milk production, which increased to 179.44 thousand MT in 2015-16 from 102.02 thousand MT in 2009-10 followed by Dhanbad with 54.29 per cent increased, Giridih with 13.90 per cent increased, Singhbhum (E) with 91.83 per cent increased and Deoghar with 31.62 per cent increased during 2009-10 to 2015-16. Thus, in Lohardaga district of Jharkhand, the total production of milk was lowest (25.59 thousand MT) in 2015-16 among all the 24 districts of Jharkhand state but its milk production was increased to 25.58 TMT in 2015-16 from 19.47 TMT in 2009-10 accounting for 31.38 per cent increased during 2009-10 to 2015-16.
- Total livestock population and, total breedable cattle & buffalo population in the Jharkhand was estimated to be 9916025 and 2957194 respectively. Its means that about 29.82 per cent of total livestock population was breedable. The district of Giridih has highest breedable population of cattle and buffalo (2,46814) accounting for 8.34 per cent of total state's breedable cattle and buffalo population followed by Palamau with 7.50 per cent, Deoghar with 6.22 per cent and Dumka with 6.01 per cent. Whereas, Giridih has also highest livestock population of state livestock population accounted for 8.25 per cent followed by Palamau with 6.34 per cent, Dumka with 6.07 per cent and Gumla with 5.61 per cent. However, Gumla has lowest number of livestock and breedable population accounted for 1.08 per cent and 1.38 per cent respectively of state total livestock

and breedable population. Moreover, Chatara district of Jharkhand has highest availability of milk per capita (228 gms/day) followed by Dumka and Gumala both (179 gms/day), Ranchi with 169 gms/day and Garhwa with 164 gms/day.

- Total amount of outlay and expenditure by state plan was Rs. 25375 lakh and Rs. 22516 lakh during 11th Five Year Plan. Around 88.73 per cent of total outlay was expended during same period. Under CS/CSS schemes, around Rs. 500.90 lakh was released and its expenditure was Rs. 483.82 lakh accounted for 96.59 per cent of total grant released during same period of time.
- Total number of Gokul Gram vikas Kendra in the state of Jharkhand was estimated to 268. Out of which, 52 was in Ranchi district, as the highest number of total state Gokul Gram Vikas Kendra followed by Deoghar with 26, Hazaribagh with 23 and Giridih with 16 Gokul Vikas Kendra.
- The total number of Bulk milk cooler in the state of Jharkand was estimated to 20. Out of which, Ranchi has highest 11 number of bulk milk cooler while Palamau, Hazaribagh and Deoghar each has two bulk milk cooler.
- The total number of AMCU/PDMCU in the state of Jharkhand was recorded to be 136. Ranchi has highest number of AMCU/PDMCU (48) followed by Palamau with 16, Dumka and Deoghar each has 14 AMCU/PDMCU and Lohardaga has 12 AMCU/PDMCU. However, some districts have no any such types of facilities. So, it should be effort by cooperative/state government to establish such types of facilities in each district of Jharkhand to empower the milk producers.
- Total number of DCS in the state was 60 and producer member was 1000 in 2015-16. The capacity of milk procurement in the state of Jharkhand was increased to 61.00 thousand kg/day in 2015-16 from 14.00 thousand kg/day in 2014-15 while liquid milk marketing capacity in the state was decreased to 304 thousand litres per day in 2015-16 from 308 thousand litres per day in 2014-15 accounting for 1.29 per cent decreased during this period.

- total number of class-I veterinary hospital was 424, mobile veterinary hospital (04), provincial veterinary hospital (23), cattle breeding farms (03), bull mother farm (01) and AI centres (433) managed by department of animal husbandry & dairy, Govt. of Jharkhand.
- There was no any area under fodder crop in the state of Jharkhand and area under permanent pastures and other grazing land were 110 thousand ha during 2005-06 to 2009-10.
- The requirement and availability of dry fodder in Jharkhand were 20.09 MT and 35.54 MT respectively which indicates 15.45 MT of dry fodder was surplus in the state of Jharkhand. The requirement and availability of green fodder in the state were 40.18 MT and 21.32 MT respectively which indicates 18.86 MT green fodders was deficit in the state. Moreover, requirement and availability of concentrate in the state were recorded to be 4.02 MT and 1.80 MT respectively which indicates 2.22 MT deficits.
- Total milk production in the state was increased to 1699.83 thousand MT in 2013-14 from 1462.61 thousand MT in 2009-10 accounted for 16.22 per cent increased during 2009-10 to 2013-14.
- The total milk production of cattle was increased to 1017 thousand MT in 2011-12 from 765.86 thousand MT in 2009-10 accounted for 32.79 per cent increased whereas that of cattle was decreased to 978.44 thousand MT in 2013-14 from 1017 thousand MT in 2011-12. So, in the year of 2011-12, maximum milk production was recorded.
- The total production of buffalo milk was varied between 620.81 thousand MT to 636.04 thousand MT during 2009-10 to 2013-14.
- The total production of goat milk was also increased to 85.35 thousand MT in 2013-14 from 75.94 thousand MT in 2009-10. Milk production of goat in the Jharkhand was continuously increased except in 2010-11 year. However, the percentage share of cattle milk, buffalo milk and goat milk to total state milk

production in 2013-14 were recorded to 57.56 per cent, 37.42 per cent and 5.02 per cent respectively.

- As per census of livestock, 2012; total number of livestock population in Jharkhand was 99.16 lakh. Out of which, 29.58 lakh was breedable accounted for 29.83 per cent to the total livestock population. Out of total livestock population (99.16 lakh), cattle and buffalo population were 87.30 lakh and 11.86 lakh accounted for 88.04 per cent and 11.96 per cent respectively. Therefore, the percentage share of total livestock and breedable of Jharkhand in all-India were estimated to 3.31 per cent and 2.49 per cent respectively.
- There was 3.52 per cent share of livestock of Jharkhand in India, poultry (1.85%), bovines' male (6.06%) bovine female (2.22%) and total bovines (3.3%).
- Per capita availability of milk among selected districts was highest (202 gms) in Deoghar followed by Ranchi with 169 gms and Hazaribagh (160 gms).
- Livestock population was highest in Hazaribagh district (553144) among sample districts followed by Deoghar (550585) and Ranchi (546946).
- The population of breedable animal was highest in Deoghar district followed by Hazaribagh and Ranchi district. However, Lohardaga district among selected districts was lowest in all regards as in livestock population, breedable population of animal and per capita availability of milk.
- Ranchi district of Jharkhand state was laced with all types of health infrastructure for animals as compared to other districts in Jharkhand. However, Ranchi has 424 veterinary hospitals, 04 mobile veterinary hospital, 03 cattle breeding farms and 432 artificial insemination centres. BAIF has been performing well in Ranchi to provide all types of facilities for dairy development in the state of Jharkhand.
- Total number of villages' coverage was increased to 990 in 2012-13 from 130 in 2008-09. Also, household coverage of milch animal holding was increased to 41500 in 2012-13 from 4500 in 2008-09.

- Total milk procurement was also increased to 90 TLPD in 2012-13 from 08 TLPD in 2008-09. Total liquid milk sold was also increased to 80 TLPD in 2012-13 from 08 TLPD in 2008-09 due to high demand of milk and milk product with increasing population of the state.
- Total number of DCS was 1490 with 48.75 thousand of milk producer members while average milk collection per day was 20.65. The processing and chilling capacity of milk by COMPFED was estimated to 185 thousand litres while milk marketing through dairies and chilling centres was estimated 230.45 thousand litres per day.
- The achievement in regards to milk production, induction of milch cattle and strengthening of DCS in the state of Jharkhand was estimated to 100 per cent during 10th Five Year Plan. However, the achievement and target of milk production were increased to 14.52 & 14.52 lakh MT respectively in 2006-07 from 9.51 lakh MT and 13.36 lakh MT in 2002-03.
- Total number of PDCS was 1490, member of dairy (48750), district cooperative milk union (12) and milk processing and chilling centre was 14 with capacity of 45000 TLPD.

Policy Implications

There are following policy implications based on main findings of the study, being intimated to Ministry of Agriculture & Farmers Welfare, Government of India; NDDB and all concerned, given as below:

i. Emphasis should be given for making dairying more viable, particularly for marginal, small and landless farmers so that they could feel encouraged for this venture.
ii. The average milk yield of all milch animals was extremely low in Jharkhand. Hence, state department of Animal Husbandry and Dairying should play decisive roles to raise the milk yield rates of the cattle and buffaloes in the state.
iii. Large sized milk producers should be persuaded to adopt dairying as a small scale enterprise in the study areas.

iv. The costs of veterinary services and medicines were reported to be high by almost all the milk producers. So, Government should evolve mechanizations to reduce the costs of these components or make them available at reduced costs.

v. Extension services on dairying should be provided on doorsteps, as majority of the milk producers in state were not getting the same at their places.

vi. The average return on production of milk was found lower than the cost incurred thereon so, prices of milk paid to the DCS members should be reasonably fixed by the milk unions/federation.

vii. There is need to strengthen the DCS by providing them a good infrastructure, so that it could be made functional for the purpose of sale and purchase of milk and milk products.

viii. The procedure for sanctioning loan should be made easier preferably by organising 'Dairy Loan Mela' at village panchayat level.

ix. The provisions of advances and bonus made under Dairy Co-operative Societies should be properly and regularly monitored to boost up the milk producers for remaining in the venture.

x. Infrastructure available at dairy farmers' level was found very poor. So, it should be improved for better up-keeping of the dairy animals.

xi. Awareness in regard to insurance of animals was found very poor in the study area. So, there is need to create awareness for its wider coverage.

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Annexure - I

Comments on draft report

Assessment of the status of Dairying and Potential to improve Socio-Economic Status of the Milk Producers and Convergence of all Central & State Schemes at District Level in Jharkhand

Comments received from the Coordinating Centre
Agro-Economic Research Centre
For the states of Gujarat and Rajasthan
(Ministry of Agriculture & Farmers Welfare, Govt. of India)
Sardar Patel University, Vallabh Vidyanagar, Dist. Anand, Gujarat

1.	Title of report	Assessment of the status of Dairying and Potential to improve Socio-Economic Status of the Milk Producers in **Jharkhand**
2.	Date of receipt of the Draft report	03.10.2017
3.	Date of dispatch of the comments	22.12.2017
4.	Comments on the Objectives of the study	Objectives of the study have been satisfied.
5.	Comments on the methodology	As suggested, proper sampling and methodology have been used.
6.	Comments on analysis, organization, presentation etc.	Detailed analysis is undertaken and organized as suggested. Following suggestion are made: • Suggest the Convergence of Schemes • Write appropriate and feasible policy implications relevant to study

- Rewrite policy implication No. 1
- Correct the grammatical errors

7. References: Use correct style of references writing.

8. General remarks: The study is a comprehensive study on dairy sector in Jharkhand, however, **appropriate and feasible policy measures need to be suggested**.

9. Overall view on acceptability of report: The report is acceptable after incorporation of the comments/suggestions as mentioned above.

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Annexure – II

Action Taken Report

1.	Name of the Study	:	**Assessment of the Status of Dairying in the Eastern States and Potential to Improve Socio-Economic Status of the Milk Producers and Convergence of all Central and State Schemes at District Level in Jharkhand**
2.	Date of receipt of Comment	:	22/12/2017
3.	Date of dispatch of Report	:	25/01/2018
4.	Comments on the Objectives of the Study	:	No action is required.
5.	Comments on the Methodology:		No action is required.
6.	Comments on analysis, Organization and Presentation, etc.	:	All suggestions addressed.
7.	References	:	Style of references writing corrected.
8.	General remarks	:	Appropriate and feasible policy measures added.
9.	Overall view of acceptability of report	:	Incorporated all the comments/suggestions as mentioned at SN 6 to 8 in the Annexure-I.

Rambalak Choudhary
Research Officer-Cum-Project Leader