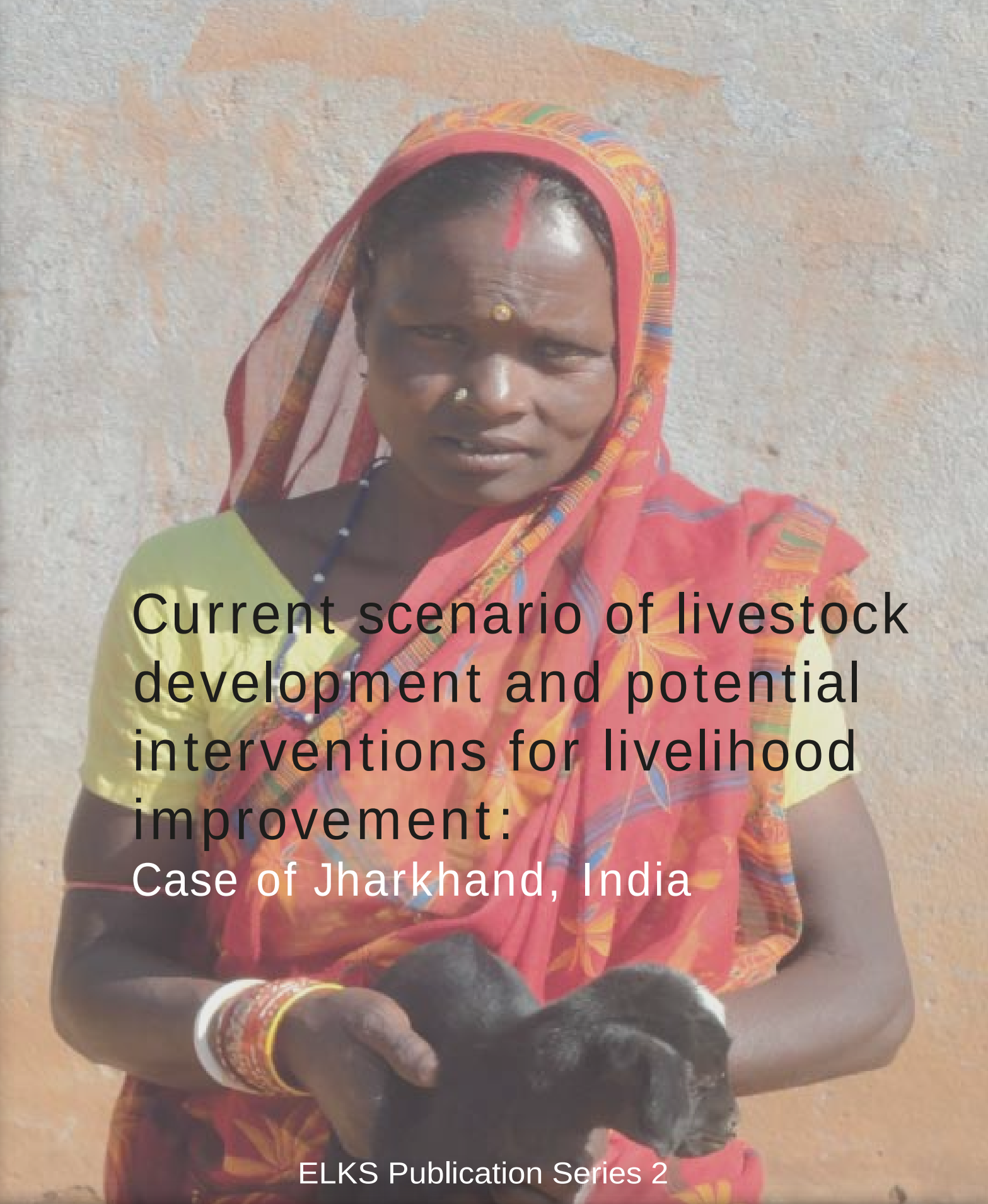


A photograph of a woman in a red and yellow sari, holding a black goat kid. She is wearing a red headscarf and a yellow top. The background is a plain, light-colored wall.

Current scenario of livestock development and potential interventions for livelihood improvement: Case of Jharkhand, India

ELKS Publication Series 2

Current scenario of livestock development and potential interventions for livelihood improvement:

Case of Jharkhand, India

Background Paper

S. Sirohi and A.K. Chauhan

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September 2010

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Executive summary

This background paper identifies the poor communities engaged in livestock husbandry in Jharkhand, problems faced by them and scope for growth of this sector.

The performance of the livestock sector has not been optimum due to lack of critical inputs and services and poor linkage with the market. As the farmers do not adopt improved breeding, feeding and management practices, the productivity of large and small ruminants is poor. Use of balanced compounded feed is negligible and health care is mainly dependent on traditional medicines and ultimately, fate of the animals. However, as the investment level and out-of-pocket expenses are almost negligible, farmers continue to rear livestock. Poor infrastructural facilities for delivery of livestock support services is another serious constraint. The small size of landholding with low production potential also limits the scope for growing green fodder on agricultural holdings. Hence, the animals depend on common property resources which are not systematically managed and the quality of feed and fodder from common lands is also inferior.

Livestock rearing can become an economic enterprise if development initiatives strengthen the entire value chain and the activity is self-sustainable. Farmers can be motivated to adopt technically sound and economically viable improved livestock farming practices only if they are assured of goat markets and quality input services. Follow up on supervision, monitoring, a system of performance-linked incentives and accountability is critical for the success of any development initiative in Jharkhand.

The livestock improvement programme in Jharkhand should focus on indigenous cattle, goat, pigs and poultry. The rural poor require a selective cattle breed improvement programme which can serve their requirement for draught animal power and increase the milk yield. In the peri-urban areas and among the resource-rich farmers, crossbred animals can become instruments of dairy development. Goat rearing needs to be promoted to provide meat and milk. Investment initiatives can also be taken up for promoting small-scale enterprises in rural areas to process the livestock produce. Based on the incidence of poverty, geographical representation of the state and demographic characteristics, the study suggests targetting a few districts for livestock development in the first phase.

1 Introduction

1.1 Background of the study

Livestock is an integral component of the farming system in India. The livestock sector is socially and economically very significant due to its multi-functional outputs and contribution to socio-cultural security. This sector is adding value to the tune of Indian rupee (INR)¹ 1310 billion (4.2%) to the national Gross Domestic Product (GDP) as per statistical data of 2007–08 at 1999–00 prices, by contributing over 25.6% to the agricultural GDP and providing employment to more than 20 million people.

However, public investment in animal husbandry and dairying (AH&D) has not been commensurate with the contribution of this sector to the national economy. Since the Fifth Five Plan, the outlay for AH&D has been less than 10% of the total allocation for agriculture. In 2008–09, the aggregate state capital expenditure on livestock was only 5.5% of the public investment in agriculture and its allied activities and only 0.19% of the capital expenditure for developmental activities.

The growth in this sector has been limited to certain regions. For example, the states of Gujarat, Punjab and Haryana have emerged as dynamic dairy regions, while poultry has shown faster development in southern India, particularly Andhra Pradesh. The focus has been less on small ruminants and pigs particularly in the eastern and northeastern parts of the country.

The eastern and northeastern states of Bihar, Jharkhand, Orissa, West Bengal, Assam, Arunachal Pradesh, Mizoram, Meghalaya, Tripura, Manipur and Nagaland are predominantly rainfed regions that have been bypassed by the agricultural revolution that the country (especially northern India) experienced till the late 1980s. These states trail behind the national averages in agricultural productivity, availability of infrastructure, per capita income etc. Apart from the poor growth in crop production, these states have also recorded slow development of the livestock sector.

Based on the potential of the livestock sector to generate income and employment, the Navajbai Ratan Tata Trust (NRTT) has taken up the challenging task of livestock development in the underprivileged states of Jharkhand, Arunachal Pradesh, Mizoram, Nagaland and Uttarakhand, with special focus on tribal and other marginalised groups to improve their livelihoods. The International Livestock Research Institute (ILRI), the technical partner in this project, will be developing a long-term proposal focusing on Enhancing Livelihoods through Livestock Knowledge Systems (ELKS) in these states.

This background paper provides empirical inputs for formulating a suitable livestock investment strategy for the state of Jharkhand based on the existing situation in the state.

1. In February 2011, 1 USD = 45.3851 INR.

1.2 Objectives and approach

The specific objectives of the study are to

- assess the livestock development situation in the states
- identify the target (poor) livestock communities
- delineate the constraints in livestock development and outline the threats faced by the poor livestock holders
- assess the opportunities for growth
- review the success and failures of past interventions in the area
- suggest technical, institutional and policy interventions to improve the livelihoods

This study conducted in Jharkhand is based on secondary information collected from various published and unpublished sources, apart from data analyzed from a field survey.

2 Jharkhand—livestock and opportunities for livelihood importance

2.1 Geographical profile of Jharkhand

The State of Jharkhand (Figure 1) was carved out from southern Bihar as the 28th state of India in November 2000. The state has a total geographical area of 74,677 km² and shares its border with Bihar in the north, Uttar Pradesh and Chhattisgarh in the west, Orissa in the south and West Bengal in the east. The topography is undulating. The soil is mostly red, laterite and sandy. The climate is generally tropical with hot summers and cold winters.



Figure 1. Map of Jharkhand.

It is the leading producer of iron ore, coal, copper ore, mica, bauxite, graphite, limestone, and uranium. It is also known for its vast forest resources. Despite the abundance of natural resources, economic development has been slow.

2.2 Demographic profile

The population is 26.9 million (2001 Census) and the average population density is 338 persons/km². It is home to about 31 tribal groups who make up about 28% of the total population and 8% of the Scheduled Tribe (ST) population in the country. The Santhals are the largest tribe, followed by Oraons, Mundas and Hos. These four tribes account for nearly 75% of the tribal population in the state. The major tribal districts are Simdega, Gumla, West Singhbhum, Lohardaga, Latehar, Ranchi, Saraikela-Kharsawan and East Singhbhum in the south and southwestern parts and Dumka, Pakur, Jamatra and Sahibganj in the northeastern parts. The proportion of tribal population in these districts ranges from 28% in E. Singhbhum to 70% in Simdega.

It also has a sizeable population (12%) of the Scheduled Castes (SCs) who are largely concentrated in the northern and central districts of Chatra, Palamu, Garwa, Dhanbad, Hazaribagh, Koderma, Bokaro, Giridih and Deoghar. The tribal district of Latehar has a ST population of 45% and SC population of 21%.

The rural–urban distribution of population shows that a higher proportion of people live in rural areas (78%) as compared to the all-India average rural population of 72%. The density of population is also marginally higher than the all-India average density of 324 persons/km². Dhanbad is the most populous district with a very high density of population of 1167 persons/km². Deoghar, Godda, Sahibganj, Bokaro and E. Singhbhum are the other districts where the density of population is higher than the state average.

The sex-ratio (female per 1000 male) in the state is somewhat more favourable for females (941) in comparison to the all-India (933) situation. The female–male differentials are less in Lohardaga, Giridih, Gumla and W. Singhbhum districts with a sex ratio ranging from 976 to 992. In Koderma and Simdega districts, the number of females is marginally more than the males.

The literacy levels are quite low (53.6%), especially among females (38.9%) indicating that the available human resources are poorly equipped to undertake high skill intensive employment. The literacy rate among females is particularly low in Pakur, Sahibganj, Garhwa, Latehar, Godda, Chatra and Giridih districts.

2.3 Economic profile

In a survey conducted in the year 2004, of 20 states based on 8 economic parameters (investment scenario, budget and prosperity, infrastructure, health, education, law and order, agriculture and size of the consumer market), Jharkhand was ranked 19th after Bihar.

The real Gross State Domestic Product (GSDP) increased at an impressive compound rate of 9% per annum during 2000–01 – 2007–08. However, the real per capita income (at 1999–00 prices) was only INR 15,904 in 2006–07, about 30% lower than the national average real per capita income. Due to the low per capita income, the average monthly per capita consumption expenditure (MPCE) is a meagre INR 425 in rural and INR 985 in urban areas (2004–05). About 10.3 million rural and 1.3 million urban persons are unable to meet the daily per capita expenses of INR 12 (rural) and INR 15 (urban), respectively. The dimensions of poverty with overall Head Count Ratio (HCR) of 40% are amongst the bottom of four states.

The agricultural sector (including livestock) contributes 12% of the state GDP (2005–06). As the proportion of barren, waste and fallow land is very high, the net sown area (NSA) is only 22% of the total geographical area (Figure 2). The cropping intensity is very low as only 3% is sown more than once a year with the remaining area used only for mono-cropping. Agricultural production is carried out predominantly under rainfed conditions as irrigation is limited to only about 9% of the NSA.

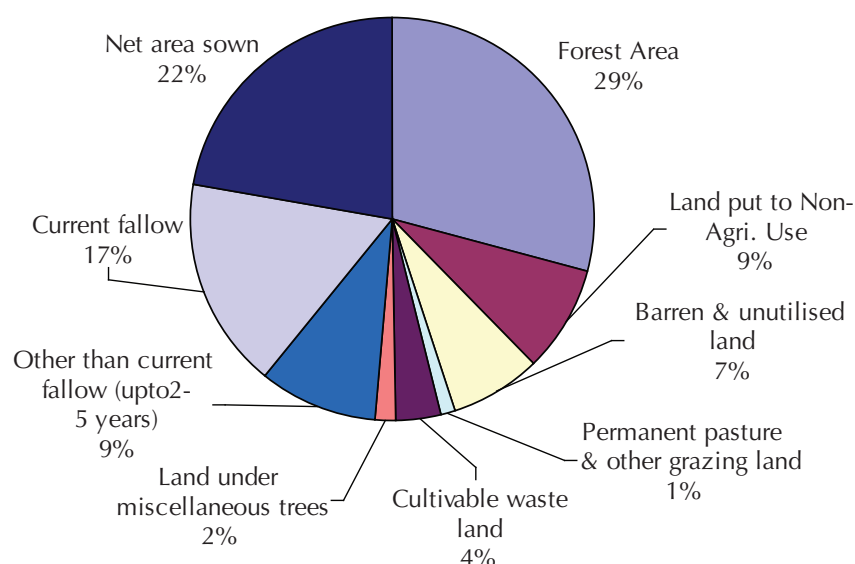


Figure 2. Land utilization pattern: 2004–05.

Paddy occupies almost 72% of the sown area followed by pulses (7%), maize (6%), wheat (3%) and oil seeds (3%). The productivity of all the crops except pulses trails behind the levels of the highest yielding states and the all-India average yield levels (Table 1).

Table 1. Productivity (kg/ha) of selected crops: 2007–08

Crops	Jharkhand	All-India	Top-ranking state
Paddy	2018	2202	4019 (Punjab)
Pulses	736	625	1062 (Himachal Pradesh)
Maize	1509	2335	4607 (Andhra Pradesh)
Wheat	1621	2802	4507 (Punjab)
Oilseeds	553	1115	1739 (Tamil Nadu)

Source: Directorate of Economics and Statistics, Ministry of Agriculture.

The high incidence of poverty has its roots in low agricultural income due to poor productivity levels but very high dependence of the workforce on the agricultural sector. 78% of the rural workforce is dependent on the agricultural sector for employment and within this sector, about 42% are working as agricultural labourers with limited opportunities for income (Table 2).

The land resource available with the cultivators is also very limited. Nearly 80% of the agricultural holdings are below 1 ha and another 15% are small holdings (1–2 ha). This implies that a majority of the rural workforce has to be provided with non-crop income generating opportunities to improve their livelihoods (Table 3).

Infrastructural facilities which are the basic foundation for economic development, are lacking (Table 4). The connectivity by roads is very poor and there is acute shortage of power in rural areas. The state ranks last in terms of Pro-poor Infrastructure Index (PPII) which has been calculated based on recent data (2001–08) on eight indicators of seven infrastructural facilities. Jharkhand emerged as the only state where the values of all the eight indicators were far below the all-India average figures.

Table 2. Occupational distribution of workforce

	Ratio of workers: non workers	% Main Workers	% Marginal workers	Percentage of workforce working as				
				Cultivators	Agri. labourers	Total agri. workers	HH industry workers	Other workers
Overall				Total				
Persons	0.6	63.8	36.2	38.6	28.3	66.8	4.1	29.0
Males	0.9	77.2	22.8	36.4	22.3	58.7	3.4	37.9
Females	0.4	37.9	62.1	42.9	39.8	82.7	5.5	11.8
Rural								
Persons	0.7	59.6	40.4	45.1	32.9	78.0	4.4	17.7
Males	1.0	74.0	26.0	45.2	27.6	72.8	3.7	23.5
Females	0.5	36.1	63.9	45.0	41.5	86.4	5.4	8.1
Urban								
Persons	0.3	87.4	12.6	2.1	2.6	4.7	3.0	92.3
Males	0.7	89.5	10.5	1.8	1.9	3.7	2.4	93.9
Females	0.1	70.8	29.2	4.6	7.8	12.4	7.3	80.3

Source: Population Census (2001).

Table 3. Distribution of operational holdings according to land-size category: 2002–03

Category	% of operational holdings
Marginal (≤ 1.000 ha)	79.9
Small (1.001–2.000)	14.6
Semi-medium (2.001–4.000)	4.1
Medium (4.001–10.000)	1.3
Large (≥ 10.001)	0.1

Source: NSSO, Report No. 492.

Table 4. Status of infrastructural availability

Infrastructure	Jharkhand	All-India
Percentage of unconnected habitations: 2000	58.81	38.93
Percentage of unconnected habitations provided connectivity under PMGSY during 2000–08 (August)	8.93	21.74
Percentage of surfaced roads	24.73	57.82
Percentage of villages electrified: September 2008	31.1	82.3
Percentage of rural HH with access to electricity: 2005	10	43.5
Av. No. of villages served by rural market	49	28
% of households not accessing any information	72	60
Pro-poor Infrastructure Index*	1.23	2.43

Computed using following variables: % of connected habitations, % of surfaced roads in total road length, % of rural households with access to electricity, % of gross irrigated area to gross cropped area on marginal and small holdings, % of marginal and small holdings accessing credit from institutional sources, No. of wholesale and rural markets per 10 villages, % of small and marginal farmers accessing agricultural extension services, No. of veterinary institutions per lakh livestock population.

Source: Sirohi and Mittal (2009).

2.4 Profile of the poor

The incidence of poverty across social groups reveals that the SCs are the most disadvantaged group, followed by STs and Other Backward Castes (OBCs). The inter-social group disparities are high in both rural and urban areas. The poor income status of a majority of the population is evident from Table 5 which shows that 62–63% of the population has MPCE which is below the state average. In the rural areas, the disparity between the two Scheduled social groups and Non SC/STs is less than in the urban areas. In urban areas, the economic conditions of ST, SC and OBCs is dismal. The average MPCE of the STs and SCs is below the state average in rural and urban areas.

Table 5. *Poverty and household consumption expenditure across social groups: 2004–05*

Social group	Poverty Head Count Ratio (percent)	
	Rural	Urban
ST	54.2	45.1
SC	57.9	47.2
OBC	40.2	19.1
Others	37.1	9.2
All	46.2	20.3
Percentage of population having MPCE below the average MPCE		
ST	71.0	78.2
SC	68.9	80.4
OBC	57.9	72.5
Others	54.0	40.0
All	62.8	62.0
Average MPCE (INR)		
ST	389	654
SC	383	718
OBC	442	808
Others	504	1358
All	425	985

Source: (1) Planning Commission (2) NSSO Consumption Expenditure Survey.

Across the occupational categories in rural areas, the MPCE is lowest among the agricultural labour households followed by other labour households. For nearly 75% of the agricultural labourer households, the MPCE is below the poverty line of INR 367 (Table 6). In urban areas also, the casual labour households are the most disadvantaged.

Across social groups in rural areas, the conditions of agricultural and other labour are more or less similar. But the self-employed ST and SC households in non-agricultural and agricultural activities are worse than the social group 'Others' which comprises high caste households (Table 7). The inter-social group disparities in urban areas adversely affect the lower caste households (particularly STs and SCs) among the self-employed and casual labour households. The average MPCE for urban ST households is nearly three times lower than that for the social group 'Others.'

Table 6. *Percentage distribution of households by MPCE class and household type*

MPCE class (INR)	Rural					All
	Self-employed in non-agriculture	Agricultural labour	Other labour	Self-employed in agriculture	Others	
0–365	41.6	74.9	59.0	43.9	16.3	45.8
365–510	33.4	18.3	31.8	34.8	29.6	32.0
510–1155	22.8	6.7	9.1	21.0	50.5	21.1
1155 and more	2.2	0.2	0.0	0.4	3.6	0.9
	Urban					All
	Self-employed	Regular wage/salaried earnings	Casual labour	Other labour		
0–485	14.5	6.5	39.5	7.6	–	14.2
485–1100	57.9	40.4	33.8	53.1	–	46.7
1100–2540	15.1	39	0.4	36.8	–	25.1
2540 and more	2.7	8.2	0	1.7	–	4.3

Source: NSSO, Consumption Expenditure Survey: 2004–05.

Table 7. *Average MPCE (INR) by household type and social group*

Household type	Rural MPCE in INR				
	ST	SC	OBC	Others	All
Self-employed in non-agriculture	366	343	452	680	462
Agricultural labour	325	311	333	319	323
Other labour	397	349	362	356	367
Self-employed in agriculture	382	400	441	480	417
Other	555	611	586	593	585
	Urban MPCE in INR				
	ST	SC	OBC	Others	All
Self-employed	427	512	675	1286	842
Regular wage/salaried	806	1092	1044	1576	1265
Casual labour	422	395	529	712	509
Other households	973	794	944	1170	1053

Source: NSSO Report No. 492.

Among the rural households that are self-employed in agriculture, the MPCE increases with the size of landholding (Table 8). However, for the ST households the consumption expenditure does not vary much across landholding categories, thereby indicating that land resource does not provide substantial income to them.

Table 8. *Average MPCE (INR) by size of landholding of rural household self-employed in agriculture*

Land-size of ownership holding (ha)	ST	SC	OBC	Others	All
Up to 0.40	346	426	432	442	388
0.41–1.00	371	360	417	459	396
1.01–2.00	376	491	491	458	434
2.01–4.00	475	709	449	544	479
4.01+	442	791	495	802	528

Source: NSSO Report No. 492.

The district-wise estimates of rural poverty (Table 9) show that Dhanbad is the best performing district with an average MPCE of INR 540 and less than 20% incidence of poverty. The worst

performing district is Lohardagga followed by Pakur. The percentage of poor (below the poverty line) is 76–82% in these districts.

Table 9. District-wise estimates of rural and urban poverty

District Name	Percentage of Poor		Av. MPCE (INR)	
	Rural	Urban	Rural	Urban
Lohardaga	81.6	30.2	310	816
Pakur	75.6	6.7	319	902
Gumla	68.6	45.2	328	616
Sahibganj	63.7	29.9	382	808
Deoghar	58.7	38.8	417	722
E. Singhbhum	58.4	12.2	394	1,212
Dumka	55.4	4.2	373	1,204
Chatra	55.2	28.9	398	989
Palamau	54.3	29.2	379	852
W. Singhbhum	53.8	51.3	406	555
Bokaro	52.4	9.2	414	943
Jharkhand	46.2	20.3	425	985
Godda	41.3	37.8	516	625
Garhwa	38.6	38.3	404	596
Kodarma	38.1	30.7	403	988
Giridih	30.5	1.9	467	851
Hazaribagh	28.3	15.9	486	1,286
Ranchi	23.2	18.6	494	799
Dhanbad	19.3	21.6	540	1,065

Source: Chaudhuri and Gupta (2009).

In the urban areas, the MPCE is highest for Hazaribagh but Giridih has lower urban HCR. The tribal district of West Singhbhum with half of its urban population below the poverty line, has the highest level of urban poverty.

2.5 Livestock scenario

As per the estimates of the 17th Livestock Census (2003), the state accounted for 5.3% cattle, 1.4% buffaloes, 1.1% sheep, 4.0% goats and 8.2% pig population of the country. The poultry population was 3% of the total population in the country (Table 10).

Table 10. Livestock population: 2003 (No. in '000)

Livestock species	Jharkhand	All-India
Crossbred cattle	145	24,686
Indigenous cattle	7513	160,495
Buffaloes	1343	97,922
Sheep	680	61,469
Goats	5031	124,358
Pigs	1108	13,519
Poultry	14,429	489,012

Source: 17th Livestock Census (2003).

The livestock sector contributes 27% of the value of output from agriculture and its allied activities. The total value of output from livestock during 2002–03 was INR 15.66 billion as per the prices of 1998–00 which increased to INR 17.45 billion during the year 2005–06. Out of this, INR 9.67 billion, INR 1.1 billion, INR 1.38 billion, INR 4.62 billion, INR 0.13 billion

and INR 0.04 billion were contributed by milk, egg, meat, dung, silkworm, honey and wool respectively. Over these four years, there has been significant increase in the production of meat, silkworm, honey and dung.

Composition of livestock: The composition of livestock population brings out several notable features that have implications for the type of livestock development programs to be initiated.

- Indigenous cattle, goats and pigs are three important species in the state.
- Draught cattle (adult male used for work) comprise 42% of the indigenous cattle stock, which is much higher than the corresponding 32% at the all-India level.
- 4.3% of the adult bovine (cattle and buffaloes) stock is unproductive (it comprises adult males not used for breeding, agricultural activity and non-calved and non-breedable adult females).
- Wet-dry ratio of crossbred milch animals is highest (6.8:1) followed by buffaloes (2.5:1). For the predominant female cattle breed of indigenous animals, the wet dry ratio is lower, 2:1.
- The adoption rates of improved breeds for various livestock species is very low.

The percentage of improved/crossbreds of female cattle is 3.4 in the state and 19.2 in the country; that of sheep is 2.4 and 9.3 respectively; 1.6 in the state and 16.1 in the country for pigs and 8.2 in the state and 47.9 in the country for poultry (fowls).

Spatial pattern: The main features of species-wise spatial pattern of livestock distribution that emerge from the district-level analysis of livestock population are as follows:

- As mentioned earlier, the state has a small population of crossbred (CB) female cattle largely concentrated in districts of Ranchi, Dhanbad and Bokaro which account for about 40% of the CB milch animal population with density ranging from **18 to 65 per 1000 km²** in Dhanbad and Bokaro (Table 11).
- In the districts of Jamatra, Deoghar, Dhanbad, Dumka, Giridih, Saraikela, Pakur, Godda and Lohardaga, the density of adult male indigenous cattle is very high (>450). This implies the relevance of draught animal power for agricultural activities in these regions.
- Indigenous milch cows are a major source of milk production in all the districts.
- The density of adult male buffaloes is greater than 100/1000 ha² of the geographical area in Bokaro, Giridih, Hazaribagh, Koderma and Ranchi, although the density of milch buffaloes is lower. Depending on the use of adult male buffaloes (draught and/or meat), a suitable investment strategy can be formulated.
- The leading four districts in terms of female buffalo density as evident from Table 13, are Dhanbad (134/1000 ha² of the geographical area), Godda (113), Palamu (91) and Sahibganj (89).
- After indigenous cattle, goats are the next important species in most of the districts. In the districts of Dhanbad, Deoghar, and Jamatra the density of female goat is >600 per 1000 ha. Due to its therapeutic properties, goat milk is increasingly becoming a niche product

and has potential for growth in urban markets.

- The sheep-dominant areas are Jamatra and Saraikela districts with a density >250/1000 ha of geographical area. The crossbred sheep population is very low and about 66% is concentrated in Palamu and Bokaro districts.
- In Pakur, Dumka, Dhanbad and Sahibganj districts where the population of pigs is high, there is scope to take it up as a commercial enterprise by improving the existing pig stock which is largely indigenous.
- The density of poultry is high in W. Singhbhum, Saraikela, Sahibganj, Ranchi and Pakur (Table 12). With suitable interventions to support adoption of improved poultry breeds, timely availability of quality inputs and marketing facilities, these districts could become leaders in poultry production in the state.

Table 11. Density of livestock population (No. per '000 ha of geographical area)

Districts	Adult CB cattle		Adult indig. cattle		Adult buffaloes		Goats		Sheep		Pigs	
	Male	Milch	Male	Milch	Male	Milch	Male	Female	Crossbred	Indigo.	Crossbred	Indigo.
Bokaro	2	18	435	293	128	40	210	507	16	104	2	147
Chatra	0	1	327	247	87	78	157	409	1	2	1	124
Deoghar	0	13	616	424	66	79	190	617	1	148	0	116
Dhanbad	4	65	578	385	76	134	274	776	1	210	10	288
Dumka	1	14	519	298	34	46	187	376	2	130	1	286
E. Singhbhum	0	13	221	108	35	19	147	267	2	98	2	43
Garhwa	0	0	373	207	11	62	83	242	0	85	1	63
Giridih	1	6	503	314	135	52	210	545	0	45	2	102
Godda	0	3	465	408	39	113	240	559	1	18	1	205
Gumla	0	1	357	111	54	28	199	327	0	19	1	136
Hazaribagh	4	11	326	206	161	39	212	377	0	16	2	116
Jamtara	0	8	651	406	77	36	217	650	2	283	1	281
Koderma	1	8	429	303	173	60	155	543	0	6	0	48
Latehar	0	2	398	183	35	39	147	387	0	0	4	134
Lohardaga	1	5	459	158	41	19	159	404	0	10	1	64
Pakur	0	1	489	345	43	63	255	497	1	94	0	380
Palamau	1	2	394	252	9	91	108	333	11	83	0	106
Ranchi	3	20	42	154	122	41	305	543	1	106	9	159
Sahebganj	1	4	253	330	52	89	284	569	0	17	0	285
Saraikela	0	0	492	191	99	11	284	525	1	262	1	40
Simdega	0	1	426	186	30	13	236	422	0	28	1	162
W. Singhbhum	0	2	346	153	47	21	188	334	2	172	2	55
Total of Jharkhand	1	9	408	230	72	49	199	432	2	83	2	137

Source: NSSO land and livestock holding survey (2003) NSSO.

Distribution across landholding and social groups: The main features of livestock distribution across land-holding categories based on the NSSO land and livestock holding survey (Table 13) are:

- Higher stocking rate of male draught cattle on larger holdings (>2 ha).

- Indigenous milch cows are reared by all the categories of farmers.
- Stocking rate of milch animals (cows + buffaloes) ranges from 1000–2500 per 1000 small and marginal farmers indicating the importance of dairying for these farmers.

Small ruminant and poultry dominate the composition of livestock on holdings of landless, near landless, marginal and small farmers.

Table 12. *Density of poultry (No. per '000 ha of geographical area)*

Districts	Desi birds			Improved birds		
	For eggs	For meat	Total	For eggs	For meat	Total
Bokaro	298	438	737	12	108	120
Chatra	134	175	309	5	20	25
Deoghar	252	343	595	7	18	25
Dhanbad	51	667	718	24	568	592
Dumka	277	316	592	11	25	35
E. Singhbhum	262	475	737	11	55	66
Garhwa	118	196	314	4	26	30
Giridih	121	196	317	3	55	58
Godda	336	528	864	7	43	50
Gumla	192	421	613	2	12	15
Hazaribagh	211	282	492	12	299	311
Jamtara	452	488	940	5	21	25
Koderma	83	146	230	8	73	81
Latehar	441	267	708	5	11	17
Lohardaga	240	486	726	2	103	105
Pakur	571	820	1391	3	7	9
Palamau	190	148	338	13	33	46
Ranchi	376	874	1250	15	82	97
Sahebganj	456	729	1185	3	22	25
Saraikela	566	1231	1796	10	123	133
Simdega	151	582	734	1	10	10
W. Singhbhum	674	991	1665	13	19	32
Total of Jharkhand	288	485	774	9	75	83

Source: NSSO land and livestock holding survey (2003), NSSO.

Table 13. *No. of livestock according to land-size category*

Land-size category	No. per 1000 households							
	Adult male cattle	CB milch cows	Indig. ilch cows	Adult male buffalo	Milch buffalo	Small ruminants	Pigs	Poultry
Landless and near landless	0	0	136	0	0	1690	0	2069
Marginal	2783	19	1888	190	834	4194	566	9162
Small	1651	18	947	166	63	1251	112	3567
Semi-medium	4322	28	2246	151	244	2356	41	4701
Medium	4826	0	2238	1224	0	3695	1516	8499
Large	4000	0	1000	0	0	4000	0	0

Source: Land and livestock holding Survey (2003), NSSO.

The composition of livestock and poultry across social groups shows that ST, SC and OBC have higher proportion of small ruminants and pigs (23–27%) in their stock than the higher castes (Social group and others). Overall, about 37% of the small ruminants and pigs are owned by ST and SC households and another 48% by other backward castes (Table 14).

Table 14. *Composition and distribution of livestock across social groups (percent)*

Social group	Composition of livestock in each social group				Total
	Cattle	Buffaloes	Small ruminants and pigs	Poultry	
ST	32.0	7.4	23.4	37.2	100.0
SC	34.3	15.7	27.5	22.5	100.0
OBC	35.3	22.5	27.1	15.1	100.0
Others	27.9	16.5	9.2	46.3	100.0
Distribution of livestock across social groups					
ST	18.2	8.0	20.6	22.4	
SC	13.2	11.5	16.6	9.2	
OBC	40.3	48.7	48.2	18.3	
Others	28.3	31.9	14.6	50.0	
Total	100.0	100.0	100.0	100.0	

Source: Extracted from unit record data of NSSO survey on situation assessment of farmers: 59th round.

The results based on secondary information on the distribution pattern of livestock wealth, have also been substantiated by other studies. In a field survey, Deka and Wright (2009) found that almost 85–90% of the rural households irrespective of tribe or ethnicity, rear indigenous cattle which provides draught power for the preparation of cropping land. The crossbred cattle population is mainly concentrated in urban and peri-urban areas and reared by selected castes (Table 15).

Table 15. *Estimated percentage of households and their ethnic groups with livestock in rural areas of four districts*

Livestock type	District				Ethnic groups
	Ranchi	East Singhbhum	Godda	Palamu	
One or more	95	90	90	90	
Cattle—indigenous	90	85	85	90	All ethnic groups
Cattle—crossbred	3	5	2	2	Yadav, Mahato, Manjhi, Teli, Koiri, Ghatwar, upper caste Hindu
Buffalo	25	15	10	10	Mahato, Yadav, Kurmi (only R and ES), Ghatwar (only R), Muslim
Chicken—indigenous	80	70	70	70	All ethnic groups, especially Muslims
Goats	70	60	60	65	All ethnic groups
Pigs	50	30	25	15	Adivasi, Horizon, Santhal, Sahish

Source: Focus Group discussion and district key informants, Deka and Wright (2009).

Goat rearing is very popular in rural areas among all the ethnic groups but pigs are maintained by tribal communities such as Santhal and Scheduled Castes. There is also religious taboo associated with pig rearing among some communities and hence, Muslims and higher caste Hindu communities never rear pigs. Poultry rearing is very common among the Muslims and tribal communities.

Herd/flock size: The average herd size of cattle and buffaloes ranges from 2–5, comprising of a pair of bullocks, 1 or 2 cows and their progeny. In some cases, the size of stall fed herd (*khatahs*) is larger (about 10 animals). A few dairy farms also rear 20 or more animals. The flock size of goats, pigs and poultry is also small. The broiler farms comprise of 200–500 birds (Table 16).

Table 16. Common herd/flock sizes (No. of animals per household)

Species	Ranchi	East Singhbhum	Godda	Palamu
Cattle (stall-fed/ Khatal)	2–7	2–8	2–5	2–5
Cattle (semi-scavenging)	2–5	2–5	3–6	3–6
Buffalo	1–3	1–3	1–3	1–4
Goats	2–4	2–5	3–6	3–8
Chickens (indigenous)	3–5	3–7	5–7	5–8
Pigs	1–3	1–3	1–3	1–3
Broilers	300–500	300–500	200–300	200–300

Source: Land and livestock holding Survey (2003), NSSO.

2.6 Livestock farming practices

The breeding, feeding, health care and management practices followed by the livestock keepers have important bearing on the production performance of the animals. Field studies conducted in various parts of the state indicate that by and large, there is low adoption of improved livestock farming practices due to constraints faced by the farmers which result in poor production performance of the animals.

2.6.1 Dairy animals

The breeding, feeding and management practices followed by the dairy farmers are broadly the same for both cows and buffaloes and have little regional variation.

Breeding practices: The study carried out by Singh (2004) as part of the National Agricultural Technology Project (NATP study) reported that in 2001–02, in the sample districts of Palamu, Dumka and Saraikela, none of the dairy farmers (sample size 150 in each district) were adopting Artificial Insemination (AI) technology for breeding. According to a more recent study conducted by Deka and Wright (2009) hereafter referred to as the ILRI study, although natural service continues to be the predominant breeding practice in the state, in about 5% cases AI was practised for cows. This marginal change has occurred due to efforts made by the state government in the breed improvement program, particularly in partnership with BAIF Development Research Foundation (BAIF). The semen of Jersey and Holstein–Friesian breeds is the most popular in the state. In case of buffalo, only semen from Murrah buffalo is used.

In breeding their cows and buffaloes through natural service, the farmers use the services of community bulls, which are not progeny tested. There is a popular practice in Jharkhand as in other parts of India, where some rural households let loose an uncastrated bull in the name of the Hindu God *Shiva*, which is later recognised as a community bull and which roams around freely in a larger area (3–4 km radius); locally, this bull is known as *Shar*.

The commercial dairy farmers in urban and peri-urban areas and some farmers in rural areas who expect higher milk production, prefer to mate their cows with their own graded bull and offer breeding services to others. The private natural breeding service by the commercial farmers

is available at INR 200–300 per service. For buffalo breeding, the mating system based on a fee, also exists in rural areas (mostly in Palamu district) as the number of uncastrated male buffaloes is low and therefore, the owners of such buffaloes charge INR 200–300 per natural service.

The NATP study revealed that the farmers were usually mating their animals in mid heat and the time gap between calving and subsequent service was about 90 days (Table 17). Both these practices are in conformity with the scientific recommendations. However, pregnancy diagnosis was usually undertaken after 90 days instead of the recommended 60 day period. Infertility and repeat breeding is understood to be a major problem in case of cattle and buffaloes although the incidence is less in buffaloes as reported by the ILRI study.

Table 17. *Breeding practices followed by livestock farmers*

Particulars	Percentage of sample farmers following the practice			
	NATP study (2001–02)		ILRI study (2009)	
	Cow	Buffalo	Cow	Buffalo
Natural service	100	100	95	89
Community and Neighbours' male animal	–	–	80	88
Own male animal	–	–	5	6
Private natural breeding service	–	–	10	5
Mating of animals during mid-heat period	95–99	94	–	–
Service after 90 days of calving	85–100	–	–	–
Pregnancy diagnosis after 90 days	70–80	90	–	–

Note: '–' indicates information was not collected.

Feeding practices: As in most parts of the country, the animals usually subsist on crop residues and locally available inferior quality feed and fodder. Almost all indigenous cattle and buffalo are dependent on grazing (Table 18). Grazing is permitted on fallow, barren and forest land throughout the year while in cropped fields, it is allowed only in the off-season. Since paddy is the major crop and mono-cropping is practised, the paddy fields remain barren and cattle are allowed to graze on them from November to June, whereas during the cropping season, livestock are restricted by tethering to the home premises or common property resources such as road sides, play grounds and barren land.

Table 18. *Nature of feeding of cattle and buffaloes*

Particulars	Percentage of sample farmers following the practice						
	NATP study				ILRI study		
	Dumka	Palamu	Saraikeela	Ranchi	E. Singhbhum	Godda	Palamu
Grazing	100	53	80	0	0	1	2
Stall-fed	–	5	19	10	10	5	8
Both	–	42	1	90	90	94	90

Source: NATP study and ILRI study.

The dry fodder fed to the animals is normally paddy straw with or without chaffing. There is shortage of green fodder in the region as fodder cultivation is not common. Despite some efforts made by the government and other agencies, adoption of planted fodders has been low. Due to small land holdings with low crop productivity, the farmers prefer to grow subsistence food crops. Many owners also feed rice polish and rice bran mixed with water, cooked or uncooked. Bovine owners cultivate wheat, maize and/or mustard oil, feed wheat bran (*Bhusa*), crushed maize

(locally known as *Dara*), and oil cakes (*Khalihoi*). Only households having CB or high-yielding cattle or buffalo, buy rice polish/rice bran (INR 8/kg). Purchased concentrate feeds mainly include milling by-products such as rice polish, wheat bran, oil cakes, maize crush etc. and balanced concentrate feed prepared by some feed mills like *Sona dana*, *Sudha dana* and *Kopila pashu aahar*. Except for a small number of commercial livestock farms, the use of balanced concentrate feed is negligible. Some commercial livestock farmers purchase individual feed ingredients which are mixed with other household feed resources based on knowledge and experience.

Management practices: The animals are generally housed in separate *kachcha* sheds, but in some cases, they are kept inside the house (NATP study). Although the sheds are cleaned regularly, due to low adoption of preventive vaccination of calves and adult animals, the animals suffer from various diseases such as FMD, HSBQ etc. The calves are not dewormed and health care is largely dependent on traditional medicines and herbs and ultimately, fate of the animals (Table 19).

Table 19. Selected management practices for cows and buffaloes

Particulars	Percentage of sample household adopting the practice		
	Dumka	Palamu	Saraikela
Housing			
Kachcha stall	100	100	97
Separate stall	60	50	85
Stall is part of the house	40	50	15
Animal health			
Vaccination for preventive diseases	Nil	Nil	27
Deworming of calves	Nil	Nil	Nil
Vaccination of calves	15	37	Nil

Source: NATP study.

2.6.2 Goats

Goats are generally reared under semi-scavenging system except for a very small number of Beetel and Jamunapari breeds which are kept under intensive conditions.

Breeding practices: Black Bengal and its strains are the most predominant goat breeds in the region. In rural areas, indiscriminate breeding practices are followed. Just as in the case of cattle, bucks are also let loose in the village and roam around freely. This buck locally known as *Patha* is considered common property and bred with a female, free of charge. Some households with large numbers of goats, have their own buck for breeding purpose. Maximum kidding occurs during winter (47%) followed by monsoon (32%) and summer (21%).

Feeding practices: Nearly all goats graze during day time. In the evening, they are provided with kitchen wastes such as leftover rice, vegetables, starch etc. Concentrates are not fed although some households feed locally available crop by-products such as rice polish and damaged maize. Households also collect leaves of trees which serve as feed. During the

cultivation period and rainy season, the movement of goats is restricted to the home premises or common property resources especially in areas where there is shortage of grazing land. Management practices: Goats are not penned in any shed. Rather, they are tethered in the home premises in the evening and are often taken for grazing by children.

The mortality rates are high ranging from about 10–25% in kids up to 3 months of age and about 3–6% thereafter. Pneumonia, diarrhoea and anorexia are the common diseases in the region. Higher mortality is attributed to low birth weight and milk yield of dam which is often not sufficient to nurse multiple born kids. In the districts surveyed under the ILRI study, goat rearers and key veterinary informants reported *Peste de petite ruminants* (PPR caused by PPR virus) as the most critical and contagious disease that has resulted in nearly 100% morbidity.

2.6.3 Pigs

Pigs are often confined to home premises in enclosures made out of locally available material particularly in urban or peri-urban areas or areas having intensive agriculture. In rural areas where cropping land is not in the vicinity, pigs are let loose to scavenge in and around the home premises or on the road side.

Breeding practices: Pigs are bred by natural service, either with an indigenous boar or a CB. Due to unsystematic breeding practices, crossbred pigs are not of any particular breed. Instead, they have characteristics of two or more breeds such as Large Black cross or Large White cross. Generally, only about 8% of the households that keep pigs have breeding sows to produce piglets, while the others purchase 2–3 month old piglets and rear them for meat. Of the breeding households, one or more households keep one boar, especially the well-off households having more than two or three sows or having sufficient feed resources to rear a boar. Sows are reportedly served by the boar available with a neighbour without attention paid to its breed. There is no system of organized selection of breeding boar or efforts made to maintain specific male:female ratios of breeding stock in a village. Based on the availability of boars in the village and the breed, mating may be free or paid. Breeding of nondescript boars is generally free, while mating of a crossbred boar usually costs INR 50–150 per service due to shortage. Intensity of services is almost the same throughout the year although producers prefer to have their sows mated during June to September so that litters are born during October to January and piglets are ready for sale from December to March when they fetch higher prices.

Feeding practices: Pigs are mainly fed with kitchen waste and scavenge on tubers of *colocasia*, tapioca and grasses collected from the jungles. Purchased feed is not popular. The ingredients are rarely purchased either due to financial constraints or lack of availability in the market. A large section of the tribal households prepare country liquor with rice locally known as *Haria* and feed the residue to pigs. Since pigs are mainly reared by resource-poor tribal families, collection of adequate feed is a challenging task and explains the reason behind maintaining small herds of 1–3 pigs. In the peri-urban areas, hotel waste is used as feed.

Management practices: The management and health care of pigs is as unsystematic as their breeding and feeding practices. Like in other parts of the India, swine fever is the major disease reported in the state, for which vaccination is not easily available. Piglets are highly susceptible to diarrhoea and pneumonia. Infestation by internal worms and external parasites are also reported. Feeding of deworming drugs is not a common practice and a majority of the pig keepers lack awareness.

2.6.4 Poultry

The indigenous breeds are reared as backyard poultry, while the improved breeds of broiler and layer birds are kept under intensive conditions.

Breeding practices: In local backyard poultry, almost every household has a mixed herd of cocks and hens which breed freely (flock mating) without any controlled breeding management.

Feeding practices: Indigenous birds scavenge throughout the day in and around the homestead, feeding on broken rice, broken maize, other crop residues and kitchen waste. Feeds are generally not purchased. Commercial birds are reared on balanced concentrate feed which is purchased.

Management practices: Due to poor management and health care, the incidence of *Ranikhet* disease is high in indigenous birds. Commercial farmers vaccinate the birds regularly resulting in lower mortality.

2.7 Production performance of livestock

The production performance of all the species is below the average national yield levels (Table 20), probably due to unimproved farming practices.

Table 20. Yield of livestock and poultry: 2005–06

Product	Species	Unit	Jharkhand	India
Milk	Crossbred cow	Kg/day	5.57	6.44
	Local cow		1.57	1.97
	Buffalo		4.3	5.58
	Goat		0.13	0.35
Eggs	Desi fowl	No./annum	112	200
	Improved fowl		201	258
Meat	Sheep	Kg/animal	8.95	12.59
	Goat		8.41	9.63
	Pig		24.54	32.23

The low yield levels result in very low income generation or in net losses from livestock rearing (Table 21). However, as the investment level and out-of-pocket expenses are almost negligible for livestock production in rural areas, the farmers continue to rear livestock for whatever small returns they can receive. By and large, livestock production absorbs family labour and in the absence of alternate livelihood opportunities, provides employment to the rural households who may actually be under employed in a low income generating subsistence type of production system.

Table 21. *Income and employment generation from livestock (INR/animal per annum)*

Particulars		Dumka	Palamu	Saraikela
Local cow	Gross income	5079.90	2791.87	2611.55
	Net income	–1928.30	–2350.74	–1618.11
	Family labour income	2862.32	756.96	1021.89
	Employment (man days/annum)	120.00	78.00	66.00
Buffalo	Gross income	–	9445.90	–
	Net income	–	3513.07	–
	Family labour income	–	6714.32	–
	Employment (man days/annum)	–	91.50	–
Goat	Gross income	2109.59	1230.00	1477.82
	Net income	–428.80	–155.64	–1.02
	Family labour income	1264.07	876.36	1272.22
	Employment (man days/annum)	42.22	29.00	32.00
Pigs	Gross income	2253.32	–	–
	Net income	908.37	–	–
	Family labour income	1748.06	–	–
	Employment (man days/annum)	21.00	–	–

Source: Singh (2004), NATP Project.

2.8 Constraints/gaps in livestock production

The low productivity and income level in livestock production system are due to various financial, infrastructural and institutional constraints faced by the livestock farmers.

Financial constraints: The farmers particularly those belonging to SC, ST and OBC social groups lack resources. They lack capital to undertake intensive crop–livestock production. The bank credit facilities in the country are largely confined to supporting commercial livestock enterprises. Under specific government schemes and programmes in which the economically weaker sections are the target groups for credit advancement, financial assistance is usually provided for purchase of animals. In the absence of working capital and due to technical and infrastructural gaps, the income accruing to the farmers for borrowing from banks is often low and responsible for high default rate in repayment. In addition, the empirical evidence from Ranchi district (Sinha, 2001) indicates that the amount of loan is often inadequate for the farmers to meet the cost of the animal and about 10–11% of the loan amount is spent in meeting non-interest credit costs.

Infrastructural constraints: Another important constraint is the poor availability of infrastructural facilities for delivery of livestock support services. The Department of Animal Husbandry and Fisheries is the major development and service delivery agency responsible for the livestock sector with a network of 424 hospitals, 651 AI centres and 6 livestock breeding farms (Table 22). Although the office is established in almost all the development blocks and districts, due to acute shortage of financial and human resources, they are either dysfunctional or render a few veterinary services sporadically.

Table 22. *Government infrastructure and support services*

Infrastructure	Ranchi	East Singhbhum	Godda	Palamu	Jharkhand state
Veterinary hospitals	49	21	16	19	424
Government operated AI centres	143	51	24	101	651
BAIF operated AI centres	15	10	10	5	160
Livestock breeding farms	1 (Pig)				6
Chilling plants	2			1	8
Dairy plants	1				8
Bulk milk coolers	3		1	1	14

Source: Report for 2007–08, Department of Animal Husbandry and Fisheries.

There are three cattle breeding farms in the state, one each for Red Sindhi and Haryana breeds and one bull mother farm. There is one goat breeding farm at Chatra, one pig breeding farm at Kanke and one buffalo breeding farm at Hotwav. These farms have been reported to have about 123 Red Sindhi cattle, 140 Murrah buffalo, 96 Haryana cattle, 418 goats and 2164 pigs, but the distribution of progeny to producers from these farms every year is not known. Government sources revealed that there is a requirement for about 1236 veterinary hospitals in the state, but currently there are only 424 (and even these are largely dysfunctional), leaving a gap of 812 hospitals.

As per the State budgets, in the past three years (from 2006–07 to 2008–09), there has been no capital expenditure on animal husbandry and dairying in the state which highlights the precarious situation of funds for livestock development and the need for developmental organisations to come forward to improve the livelihood of livestock farmers.

The post-production infrastructural facilities are also poor. The Dairy Development wing of the Department has 8 chilling plants, 8 dairy plants and 14 bulk coolers, but most of them are non-functioning or functioning far below their capacity.

3 Opportunities for growth

Good opportunities for growth of this sector are evident from the rapidly rising demand for food of animal origin in the country which on an average, accounts for about 11–12% of the total consumption expenditure. Milk is the most preferred item, accounting for 70% of the expenditure on livestock-based foods. Meat comes next with a share of 17%, followed by fish and eggs. Livestock food products contribute 18.4% to the total protein available per person. Since the beginning of the previous decade, while the per capita consumption of foodgrains was almost stagnant, consumption of animal products, fruits and vegetables increased rapidly in the country. The total consumption of various livestock products increased at a growth rate ranging from 2.22% per annum for goat and sheep meat to 9.66% per annum for poultry meat. Consumption of eggs recorded the second highest growth rate (6.13%) and milk consumption increased by 4.44% during 1990–03. In absolute terms of quantity, the per capita consumption increased from 43–80 kg for milk, 2.4–3.1 kg for meat, 2.4–3.5 kg for fish and 9.2–19.5 kg for eggs. The projections indicate further increase in domestic demand for these products. For instance, the demand for milk is expected to increase to 180 million tons by 2021–22 (Figure 3) in India.

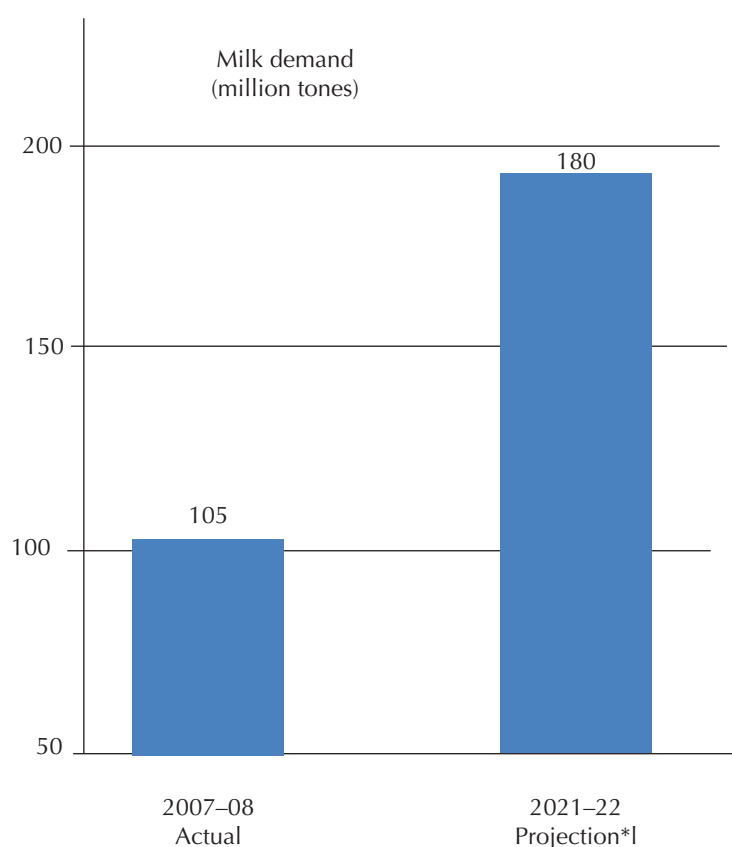


Figure 3. *Projected demand for milk in India.*

*Based on Planning Commission study projecting demand in 2020 and extrapolated to 21–22 to make it co-terminus with 13th FYP.

Apart from the possibility of tapping the growing markets at the national level, the demand within the state would also be an important element leading to improved income of the

livestock producers. The population is predominantly non-vegetarian. In fact, the percentage of households reporting consumption of animal products is higher than the all-India average (Table 23). Interestingly, although the incidence of poverty is high in the state, the average MPCE on eggs, meat and fish in all the expenditure classes is almost equal or higher in the state than the MPCE at the national level. This implies that with the increase in population, income and urbanization, the demand for these products is slated to rise rapidly in the state. Similarly, the demand for milk and milk products is expected to go up as the average MPCE of the higher expenditure groups is greater than that of the lower expenditure classes. Hence, increase in income would increase the demand for milk and milk products in the state.

Table 23. Average rural MPCE on animal food-products (INR)

MPCE classes	Jharkhand		India	
	Milk and milk products	Eggs, meat and fish	Milk and milk products	Eggs, meat and fish
0 –235	1.7	6.4	4.4	5.0
235 –270	3.6	8.0	9.3	6.5
270 –320	5.9	9.9	13.7	9.1
320 –365	7.4	11.9	20.3	10.6
365 –410	15.6	13.7	27.9	12.5
410 –455	21.1	13.3	33.8	14.8
455 –510	32.0	18.5	44.3	16.9
510 –580	33.9	20.2	53.1	20.0
580 –690	42.4	26.1	63.9	24.8
690 –890	48.4	31.4	84.3	27.9
890 –1155	68.8	29.5	113.6	33.4
1155&more	93.2	80.8	137.9	54.2
% of households reporting consumption	38.9	65.8	74.9	58.5

Source: NSSO Consumption expenditure Survey 61st round (2004–05).

4 Strategy for livestock development

Some of the ongoing initiatives for livestock development in Jharkhand are explained in Annexure 1. The essential elements of livestock development strategy in the state should be as follows:

Providing quality services: The livestock farmers will be motivated to adopt improved livestock farming practices only if they are assured of the quality of service. This is evident from the fact that the crossbreeding program of the state Department of AHD had few takers till their tie-up with BAIF. The number of AI increased substantially after BAIF came forward to provide the service mainly due to delivery of breeding services at the doorsteps of farmers and high conception rate of cattle and buffaloes (see Box 1, Annexure 1).

Self-sustainability: The design and approach of the development intervention should be such that the activity is self-sustainable. Lessons can be drawn from the intervention provided by TSRD (Box 2) for improving the goat breed in East Singhbhum district. The mating fee of the subsidised Jamunapari buck provided by the NGO was so low that after the death of the supplied buck, no one came forward to purchase and rear another buck because of poor profitability.

Similarly, the initiative of PRADAN for promoting dairying in tribal areas of Godda district may not be sustainable in the long run as the BMCs provided in the project area are not being put to optimum use and are also faced with erratic power supply.

Value chain approach: Livestock rearing can become an economic enterprise for the poor and marginalized to improve their livelihoods only if the development initiative strengthens the entire value chain. Focus on a few components of the chain from production to marketing is not sufficient for success of the enterprise. For instance, breed improvement without adequate technical support for feeding and health care will not result in the desired production increase. Similarly, higher production will not be sustainable without marketing facilities. Hence, each and every component of the value chain, inbound and outbound logistics, marketing, human resource development etc. have to be included in the development program.

The encouraging performance of PRADAN's poultry model, *Potka Gramin Poultry Sahayak Samiti Ltd.* with a reported turnover of INR 30 million in 2007–08 and profits of INR 1.5 million (ILRI study, 2008), is an example of successful value chain management (Box 4, Annexure 1)

Supervision and monitoring: The follow up on supervision, monitoring, a system of performance-linked incentives and accountability is crucial for the success of any development initiative in the state.

5 Conclusions

Based on the incidence of poverty, geographical representation of the state and demographic characteristics, the study suggests targetting the following districts (Table 24). The community to be focused in various districts and the relevant livestock species are also indicated in Table 24.

Table 24. *Preference of target communities for different livestock species*

Target district	Target community	Target species
High rural poverty (>50%) High urban poverty (>30%)		
Gumla	ST households, irrespective of land ownership and farm-size categories	Pigs and poultry
Deoghar	ST and SC landless, near landless, marginal and small farmers	Indigenous cows and goats
High rural poverty (>50%) Moderate urban poverty (20–30%)		
Lohardagga	ST households, irrespective of land ownership and farm-size categories	Indigenous cows and goats
Palamu	SC landless, near landless, marginal and small farmers	Buffaloes and sheep
High rural poverty (>50%) Low urban poverty (<20%)		
Pakur	ST households, irrespective of land ownership and farm-size categories	Pigs and poultry
E. Singhbhum	ST rural and urban labour households	Poultry, indigenous cows and crossbred cows
Bokaro	ST and SC labourers, marginal and small farmers	Crossbred cows and sheep

The livestock improvement program in Jharkhand should focus on indigenous cattle, goat, pigs and poultry. The rural poor require a selective cattle breed improvement programme which can serve their requirement for draught animal power and increase the milk yield. In the peri-urban areas and among the resource-rich farmers, crossbred animals can become instruments of dairy development. Goat rearing needs to be promoted with the dual objective of providing meat and milk as goat can serve as a poor man's cow, given its lower feed requirement as compared to the cow. Investment initiatives may also be taken up for promoting small-scale enterprises in the vicinity of rural areas to process the livestock produce. The interventions which include key elements which have been developed through a participatory process involving several stakeholders, are likely to have a high success rate in terms of improved livelihood status of the poor livestock farmers.

Annexure 1. Ongoing livestock development initiatives in Jharkhand

Box 1: BAIF

The state government has undertaken a major cattle and buffalo breed improvement program with the involvement of BAIF. Currently, BAIF is operating about 160 AI centres in 23 districts which have performed almost 55,000 AI in contrast to 38,000 AI performed by the 651 AI centres operated by the government department in 2007–08. The conception rate of BAIF's program is reported to be about 62% as against 40% of the government operated AI centres (ILRI, 2009). Along with AI, BAIF also provides 2 kg of mineral mixture free of cost with government support, as an incentive for availing breeding services

Box 2: TSRD

For breeding of goats, an NGO known as Tagore Society for Rural Development (TSRD) worked in Patamda block of East Singhbhum district. This NGO distributed a Jamunapari buck to one individual in every village with 75% subsidy, who then charged INR 10 per service. In one month, each goat serviced about 7–8 goats resulting in good progeny

Box 3: BAU

Under the All India Coordinated Research Project on Pigs (AICRP), a new breed of pig called T and D has been developed by the College of Veterinary Sciences and Animal Husbandry, Birsa Agricultural University, Kanke by crossing the Tamworth with an indigenous breed (desi). In contrast to the desi pigs, the T and D is reported to have better growth performance, higher resistance to disease, larger litter size and suitable for local climatic conditions. The College is promoting the breed through Krishi Vigyan Kendras (KVKs) under the university, offering both male and female piglets (1+4 unit) to the villagers on condition that they deliver the same number of piglets (1+4 unit) to another villager free of cost. It is reported that the breed is becoming popular.

Box 4: PRADAN

Professional Assistance for Development Action (PRADAN) is involved in the promotion of broiler and dairy farming. Currently, PRADAN has seven poultry cooperatives (at Khunti, East Singhbhum, Bokaro, Lohardaga and Kodarma) and two dairy cooperatives (Lohardaga and Godda), registered under the Jharkhand Cooperative Act. They also have a poultry producers' company at Hazaribagh, a central hatchery at Lohardaga and a feed plant. Poultry development has been implemented with financial support from Special Central Assistance under the Tribal Welfare Commission (TWC) and the Sir Ratan Tata Trust (SRTT) under the Central India Initiative (CInI). The cooperative supplies critical farm inputs and takes the responsibility of marketing the outputs, including market risks. A strong monitoring and supervision system is built with IT-based information systems and peer pressure is used to prevent any irregularity amongst the group members. PRADAN is also promoting dairying in tribal areas with financial assistance from the Tribal Welfare Commission (TWC). For e.g. in Godda district, they have 101 producer members with an expected target of 150 members. All the members are offered one dairy unit comprising of two crossbred cows with an unit cost of INR 50,000 including minor expenses for construction of cattle shed, feed and cost of transportation. The tribal families are organised into Self Help Groups (SHGs) of 10–15 members and 2 or 3 SHGs are organised into a Milk Producers' Group (MPG) in a village. As per the plan, 2 or 3 MPGs will own a Bulk Milk Cooler (BMC). Presently, all the producers in the project area are using a single BMC of 1000 litres capacity which handles 600–700 litres of milk per day

Box 5: BASIX

BASIX, a livelihood promotion institution, is extending agribusiness services, finance and insurance to producers for commercial dairy farming in peri-urban areas of Ranchi, East Singhbhum, Godda and a few other districts. The project is partly sponsored by SRTT under CInI. The identified beneficiaries are offered micro credit of INR 15,000 for purchasing a crossbred cow with an interest rate of 2% per month and a repayment period of 2 years. Recipients provide a cash security of 10% which is refundable in addition to 3% processing fee. Loan recovery rate is almost 95%.

Box 6: AMRIT

Amrit, a Kolkata-based poultry company, has been implementing contract farming of broilers in a few areas sporadically. In East Singhbhum district, they are implementing this project in Sarjondih and Sonari blocks by supporting farmers to establish broiler farms with 1000 to 1700 birds. Based on an agreement, Amrit supplies all the required chicks, feed, medicine and vaccines while the producers bear the cost of construction of the house, labour and bedding material (paddy husk). The company collects broilers of 2 kg of weight and the farmers are paid INR 2.70/kg against their labour and other investments. The price for farmers is fixed in advance and remains the same throughout the year (irrespective of the season). Hence, the market risks are borne by the integrator.

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