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Introduction

Bihar state spread over to 9.36 million hectares of land with 2.8 percent of landmass. It supports about 8 percent of human population and 5.4 percent of livestock population of India. Bihar has predominantly an agrarian economy of Rs 180 billion which provides employment to about three-fourth of its working force and crop sector generates employment of more than 120 million labour days in a year. Agriculture of this state contributed about 37 percent to state's gross domestic product (GDP) whereas livestock sector contributed about 16 percent during the Tenth five-year plan period. The importance of livestock sector in state's economy can be understood by the fact that it contributed more than 45 percent to state agricultural GDP which is much higher than the contribution of this sector at national level (Gross National Agriculture Production) which stands at 27 percent. Agriculture in Bihar is dominated by small land holders as the average size of land holdings is small (0.37 ha.) and about 78 percent farm holdings are of less than 0.50 ha. with an average size of land holdings being 0.10 ha. only. About one-third of the farmers are still illiterate. Hardly one percent of the farmers are associated with farmers' organizations including self help groups (SHG) and about 5 percent farm households are members of co-operative societies (NSSO, 2004). The infrastructure such as electrified villages (47 %), canal irrigation (30 %), rural metal road (0.29 km / sq km) and density of agricultural markets (one for 99 thousand ha.) show that Bihar lags far behind compared with other developed states. Therefore, it is an urgent need to develop this state at a faster rate. In Bihar, about 10 percent of area is under deep water and 20 percent in low land eco-system, in addition to this about 73 percent of area is flood-prone and 40 percent is severely flood affected, and gets inundated almost every year. These ecologies adversely affect the agricultural growth, which so far, has not only been slow but unstable. During last five years, food grains production declined from 11.68 million tones in 2001-02 to 8.11 million tones in 2005-06, while milk, meat, and egg production showed an increasing trend (Table-1).

TABLE 1 - PRODUCTION OF FOOD GRAINS AND LIVESTOCK PRODUCTS IN BIHAR.

Particulars	2001 -02	2002 -03	2003 -04	2004 -05	2005 -06	2006- 07
Food grains (million tonnes)	11.68	11.09	11.21	7.71	8.11	7.81
Milk (million tonnes)	2.63	2.87	3.18	4.74	5.06	5.45
Meat (million tonnes)	0.16	0.17	0.17	0.18	0.18	0.18
Egg (million tonnes)	742	737	740	789	1000	1500
State's GDP in billion(in Rs) (At 1999-2000 Prices)	162.87	206.66	168.99	194.17	170.70	250.00

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1. Livestock scenario in Bihar

Livestock sector plays an important role in socio-economic development of rural households. During last 6 years milk production increased by two folds from 2.63 million tones in 2001-02 to 5.45 million tones in 2006-07 against the milk production at national level increasing from 84 M.T. to 100 M.T. during the period. During past three years, increase in milk production in Bihar was much higher than the increase in milk production at National level. Meat and egg production also increased but have not kept pace with milk production in the state. At present growth, livestock production is projected by the Government of Bihar for future period up to 2025 (**Appendix – IA-I to IV**).

1.1 Livestock population dynamics

Bihar has huge livestock population base with 105 lakh cattle, 58 lakh buffaloes, 96 lakh goats, 3 lakh sheep and 140 lakh poultry birds in 2003 which account for 40.06 percent, 22 percent, 36.62 percent and 1.32 percent, of total livestock population of the state, respectively. When compared at national level, Bihar has a higher proportion of buffaloes and goats in total livestock population (Table 2). The increase in buffalo population was higher (60.17%) than the corresponding increase at national level (37.46) during 1982-2003. It clearly indicates farmers' preference towards buffaloes for milk production because it can efficiently convert course fodders to milk. Moreover, buffaloes are more disease resistant and survive well under adverse water logged situations and average per day milk yield of buffaloes is almost equal to crossbred cows in Bihar (Singh 1997).

TABLE 2 - CHANGE IN NUMBER OF MAJOR LIVESTOCK IN BIHAR DURING 1982 2003. (IN LAKH)

Livestock	1982		2003		Decrease / Increase over 1982 (%)	
	India	Bihar	India	Bihar	India	Bihar
Cattle	1924	94	1789	105	(-)7.2	11.49
	(47.84)	(44.70)	(40.27)	(40.06)		
Buffalo	678	36	932	57.66	37.46	60.17
	(16.86)	(17.12)	(20.98)	(22.00)		
Goat	932	77	1146	96	22.96	24.67
	(23.17)	(36.62)	(25.80)	(36.62)		
Sheep	488	3.27	575	3.46	17.83	2.75
	(12.13)	(1.56)	(12.94)	(1.32)		
Total	4022	210.27	4442	262.12	10.44	24.66
	(100)	(100)	(100)	(100)		
Poultry	2077	58	4289	140	106.5	141.38
Figures in parentheses indicate percentage to respective total						

During the period 1982-2003, cattle population increased by 11.49 percent but declined by (-) 7.2 percent in at national level. The decline in cattle population in India was mainly due to decline in number of indigenous cattle by 15 percent and a drastic decline for male cattle (22 %) during 1992-03. In Bihar also, male cattle declined from 47.43 lakh in 1982 to 30.20 lakh in 2003, recording decline by 36.33 percent during the period. The main reason for decline in male cattle (bullock) can be attributed to increasing mechanization (increased use of tractors) in Bihar.

The goat population in Bihar increased from 77 lakh in 1982 to 96 lakh in 2003, constituting 8.26 percent and 8.38 percent respectively of total goat population in the country. Increase in goat population in 1982-2003 was marginally higher in Bihar (24.09 %) than the

corresponding increase at the national level (22.96 %). Sheep population has also increased in Bihar but the rate of increase was much lower (2.75 %) than the growth in sheep population recorded at national level (17.83 %). The slow growth in sheep population in Bihar can be attributed to increasing number of sick cottage and small wool industries in Bihar over past several years. Moreover, there were no institutional efforts to promote wool production in Bihar.

Poultry production is not an important enterprise in Bihar but the poultry population showed more than double increase, from 58 lakh to 140 lakh during 1982 to 2003. Bihar's share in total poultry population in country also increased from 2.79 percent to 3.26 percent during this period, indicating comparatively higher growth in poultry population in Bihar.

Despite the increase in number of cattle and buffalo, number of bovine per 100 households declined from 35 in 1991-92 to 29 in 2003 in Bihar (Table 3), similar pattern was observed in nighbouring states of Bihar and at national level also. But the decline in number of bovine per hundred households was larger at national level (from 46 to 36 percent) than the corresponding decline in Bihar from 35 in 1991-92 to 29 in 2002-03 whereas much larger decline in bovine per hundred households was observed in Orissa (from 22 to 13) and West Bengal (34 to 25) but the comparatively less decline was noticed in Uttar Pradesh (from 58 to 48).

Population of livestock and poultry birds increased in Bihar but only 34.7 percent households own cattle, 20.6 percent buffaloes, 15.0 percent ovine and5.3 percent poultry as compared to corresponding national average of 36.1, 21.4, 15.2 and 14.3 percent, respectively. In Orissa, 47.3 percent households owned cattle and 56.8 percent households of Punjab own buffaloes. In West Bengal 21.9 percent households own ovine and 32.6 percent households own Fowl / Duck which are much higher than situation prevail regarding ownership of ovine and Fowl in Bihar (NSS Report No. 493).

TABLE 3 - CHANGES IN NUMBER OF PER 100 HOUSEHOLDS FOR SELECTED TYPES OF LIVESTOCK AND POULTRY IN THE MAJOR STATES IN INDIA DURING LAST 11 YEARS. (NUMBER PER 100 HOUSEHOLDS).

State	Year	Bovine (in milk)	Bovine	Pig	Poultry
Bihar	1991-92	35	74	8	164
	2002-03	29	45	5	79
West Bengal	1991-92	34	84	3	367
	2002-03	25	56	4	227
Uttar Pradesh	1991-92	53	71	5	28
	2002-03	48	56	3	16
Orissa	1991-92	22	51	4	218
	2002-03	13	48	2	151
India	1991-92	46	85	4	166
	2002-03	36	64	3	123
Source: Ownership across operational landholding classes in India, 2002-03, National Sample Survey Organisation, Ministry of Statistics and Programme Implementation, Govt. of India, Jan 2006, pp. 22-24.					

An analysis of agro-climatic zone-wise increase in livestock population in Bihar revealed that the comparatively high increase in cattle population was observed in zone III B (25 %) followed by Zone II (23.81 %), zone III B (3.70 %) and Zone I (2.94 %) - Table 4. The comparatively higher increase in cattle population in zone II and zone IIIA was mainly due to

large number of indigenous breed of cattle in these two zones which are required to be maintained in large number to meet even domestic requirement of milk. Price of indigenous bovine is also low which is affordable for even poor farmers. Moreover, the proportion of cross bred cows much higher in Zone I and Zone IIB (**Appendix IIA**). It clearly indicates replacement of more number by indigenous cow by less number of cross bred, resulting in slow growth in cattle population in these two zones. In zone I and Zone III B, increase in cattle was comparatively low but buffalo population increased by 84.62 percent in former and 42.86 percent in later zone during 1982-2003. The comparatively high increase in buffalo population in zone I made the zone highly buffalo populated region in the state by pushing back zone III B to second position from first position in 1982. There was increase in buffalo population in Zone II and Zone III B also but higher increase was observed only due to their lower base of buffalo number in 1982.

TABLE 4-AGRO-CLIMATIC ZONE WISE CHANGES IN LIVESTOCK AND POULTRY POPULATION DURING 1992-2003.

Agro-climatic zones	Cattle	Buffalo	Goat	Poultry
Zone-I				
1982	34	13	31	14
2003	35	24	36	44
Increase (%)	2.94	84.62	16.13	214.28
Zone-II				
1982	21	6	19	25
2003	26	9	28	49
Increase (%)	23.81	50.00	47.37	96.0
Zone-IIIA				
1982	12	3	17	6
2003	15	5	19	13
Increase (%)	25.0	66.67	11.76	116.67
Zone-IIIB				
1982	27	14	10	13
2003	28	20	13	34
Increase (%)	3.70	42.86	30.00	161.54
Bihar				
1982	94	36	77	58
2003	105	58	96	140
Increase (%)	11.70	60.17	24.67	141.38
Source: Livestock Census, Govt. of Bihar, various issues				

Hence, it may be said that the agriculturally developed region performed well in increasing number of buffalo population and poor in achieving growth in cattle population. It may be due to high rate of replacement of indigenous cow by cross breed cows in these regions. Moreover, there is still availability of comparatively large area of grazing land in agriculturally under developed zones which facilitates maintenance of indigenous cow on grazing only. On the other hand, zone-I and zone-IIIB are agriculturally developed region where grazing land declined due to higher area under irrigation. In these two zones, cattle density is lower and buffalo density is higher than the corresponding state averages (**Appendix IIB**).

Livestock and poultry population per hundred households of different categories that is, land less and sub marginal (<0.5 ha), Marginal (0.5-1.0 ha), Small (1-2 ha), Medium (2.4 ha) and large (4 ha and above) were computed which are presented in Table 5. Bovine population in

milk (both cows and buffaloes) per hundred households declined in land less and sub-marginal categories of households during 1991-2003. The decline in number of cows and buffaloes was identical on landless and sub-marginal categories of households but number of goats and poultry per hundred households increased during the period from 46 to 56 and 71 to 112, respectively on this particular category of households. It clearly indicates a further scope to promote goats and poultry on landless and sub-marginal households in Bihar who constitute more than three-fourth of rural households in Bihar. Number of bovine (both cows and buffaloes) per 100 households increased during 1991-2003 on Marginal, Small and medium sized households in Bihar; however there was decline in number of goats and poultry per hundred households under these categories.

Among the different categories of households, the increase in number of bovine in milk was much higher on medium farms (from 64 to 116 per 100 households) followed by small (from 46 to 70 per 100 households) and marginal (from 37 to 56 per 100 households). It may be pointed out that the higher decline in number of goats and poultry per 100 households was noticed on medium households who achieved higher increase in number of bovine during the period. There was higher decline in poultry birds on large households (214 to 100 households in 1991 to only 15 in 2003). Despite increase in number of bovine in Bihar, their household wise number declined in all the categories of households. It was mainly due to increase in number of households from 80 lakh in 1997 to 117 lakh in 2003 in Bihar. But goat and poultry population per household increased on landless and sub-marginal households which clearly suggest special efforts in creating production and marketing arrangement of goats and poultry to improve the socio-economic status of weaker section of society in Bihar.

TABLE 5-FARM SIZE GROUP WISE NUMBER OF BOVINE PER 100 HOUSEHOLDS IN BIHAR IN 1991 AND 2003.

Farm size	Year	Cow in milk	Buffalo in milk	Total Bovine in milk	Goat	Poultry
Sub-marginal and landless	2003	12	07	19	56	112
	1991	15	10	25	46	71
Marginal	2003	33	23	56	39	187
	1991	26	11	37	83	198
Small	2003	29	41	70	39	191
	1991	27	19	46	59	301
Medium	2003	67	49	116	19	132
	1991	28	36	64	143	241
Large	2003	27	-	27	15	258
	1991	26	56	82	214	260

1. Proposed on the basis of data of NSS report No. 408 – Livestock and Agricultural Implements in Household operational Holding 1991-92 and
2. Report No. 493: Livestock Ownership Across operational land holding classes in India 2002-2003, Ministry of Statistics and Programme Implementation, GOI.

1.2 Public support services

1.2.1 Animal health services

An attempt has been made to analyze the animal health services available to livestock in Bihar. Number of functional hospitals declined from 904 in 1991-92 to 852 in 2003-04. Number of veterinary doctors working in the department of animal and fisheries resources also declined from 1312 in 1991-92 to 912 in the year 2003-04. During the period, number of livestock increased from 241 lakh to 270 lakh recording an annual increase of about 1 present

in livestock population but number of veterinary hospitals and veterinary doctors declined during the period 1991-92 to 2003-04. Per hospital livestock population increased from 26.66 thousand in 1991-92 to 31.69 thousand in 2003-04. Per veterinary doctor livestock population also increased from 18.37 thousand to 29.61 thousand during the periods.

Per veterinary hospital and doctor bovine population also increased during the period 1991-92 to 2003-04 (Table 11). The state is yet to achieve the standard fixed in this respect by the Royal Commission on Agriculture (1928). The National Commission on Agriculture (1976) also suggested having one veterinarian for 10 thousand livestock. In Bihar, number of veterinary hospital and veterinary doctors need to increase by two fold for proper care of animal health in the state. Bihar Government is now making sincere efforts to make available veterinary services to door of the farmers. A fortnight programme (15-31 January 2008) has been launched by the Government for vaccination of animals in whole state.

TABLE 11 - NUMBER OF ANIMAL DISPENSARIES AND VETERINARY DOCTORS IN BIHAR.

Sl. No.	Particulars	1981-82	1991-92	2003-04
1.	No. of hospitals	766	904	852
2.	No. of veterinary doctors	746	1312	912
3.	Livestock population			
(i)	Per hospital (‘000)	28.20	26.66	31.69
(ii)	Per veterinary doctor (‘000)	28.95	18.37	29.61
4.	Bovine population			
(i)	Per hospital (‘000)	16.97	16.04	19.01
(ii)	Per veterinary doctor (‘000)	17.43	11.05	17.76

But the efforts made in the past on creating animal health services has been much discouraging and the existing facilities for diagnosis and investigation of diseases will have to be greatly expanded for faster development of livestock sector in general and dairy sector in particular. The expansion of health service facilities would be much expensive and it could only be done in different phases in poor state like Bihar. The efforts of COMPFED, BAIF, J.K. Trust and some NGOs in providing animal health services are satisfactory. But activities of most of these non- Govt. organization is concentrated around Patna and other urban centers and not providing services in remote and backward areas of the state. In Bihar, *cattle vaidya* (Quacks) dominate in providing treatment to animals. They rely on naturopathy but do not hesitate in suggesting modern medicine to animals. At this juncture, it may be suggested to organize training in animal health services to rural educated youths, especially to them who are performing job of *cattle vaidya* in rural area.

1.2.2 Artificial Insemination

In Bihar, there were 462 Government artificial insemination (AI) centers in the year 1985-86 which increased to 1401 in 2004-05 but less than one-third of these centers are functional in the state. As many as 584 thousand of artificial inseminations were performed in 1985-86, covering about 12 percent of breedable bovine in Bihar but there was an increase in number of A-I from 584 thousand in 1985-86 to 951 thousand in 1991-92 but covered only 15 percent of breedable bovine population. During last 15 years, public artificial insemination system collapsed and about 400. A-I centres are operation which are short of staff and resources, making them unreliable source of A-I. As Co-operative and NGOs are operating in Bihar for providing A-I services. Presently, about 20 lakh artificial inseminations is performed by Government and non-government organization which cover about 29 percent of breedable

bovine in Bihar. Hence, it may be said that 71 percent of breedable bovine are still served by natural breeding system. In Bihar, there is no functional frozen semen bank, making all the operators in artificial insemination dependent on out side supply. If Government makes effort in establishing frozen semen bank, it will facilitate working of artificial insemination centered in Bihar.

1.3 Feed and fodder

Adequate and balance availability of feed and fodder is pre-requisite for increasing livestock production in Bihar, Crop residue and byproduct of crops are the main sources of fodder for livestock where as goats are generally maintained on tree leaves and grazing. In Bihar, about 20 lakh hectares of land is available for grazing through out the year which includes waste land, culturable waste land, posture tree and groves, fallow land and some part of forest. In addition to this funds etc. are also available for grazing. Due to low cropping intensity, there is huge land area is fallow in *Rabi* and *summer* season which is used for grazing of animals in Bihar. Hence, the theoretical demand and supply position of fodder does not match with actual fodder supply-demand scenario. Bihar State Planning Board has made an estimate of supply-demand for fodder and concentrate in late eighties and came out with conclusion that the state was deficient in concentrate by 8.37 million tonnes, dry fodder, and green fodder and 18.81 million tonnes each. But these estimates were made assuming that all the animals are stall fed in Bihar which is not true. Recently, Government of Bihar estimated the normal demand for concentrate, Greed fodder and dry fodder for livestock and poultry in Bihar which are given below (Table-12)

TABLE 12 - ESTIMATED NORMAL DEMAND FOR CONCENTRATE, GREED FODDER AND DRY FODDER FOR LIVESTOCK AND POULTRY IN BIHAR (IN MILLION TONES).

Particulars	Quantity
Concentrate	5.88
Green fodder	38.17
Dry fodder	2.48
Source: Department of Animal and Fishery Resources, Govt. of Bihar	

If these estimates are true, it would be a difficult to meet the demand for feed and fodder of animals in Bihar. A State producing 12 million tonnes of food grain can not afford to allocate nearly half of food grain for feed purposes. However, Bihar is now self sufficient in dry fodder, particularly in normal years. During last flood, dry fodder was supplied by other states but it is not normal feature. Bihar will remain deficient in green fodder because it is grown in about one lakh hectares only. Crop weeds, tops of sugarcane and tree leaves are extensively used for green fodder in Bihar. To meet the green fodder requirement, about 5 lakh hectares of land is required to be cropped by green fodder crops. There is no any specific programme of green fodder production in Bihar however COMPFED supplies fodder seeds to farmers through Dairy Co-operative Societies. Hence, there is an urgent need to decrease the number of unproductive/ uneconomic animals for improving the per capita availability of feed, fodder and concentrate in the state. An intensive research is also required to evolve the high yielding varieties of fodder so that the higher economic returns can be obtained for land, labour and capital used for fodder production in comparison to other uses of land. Government should also launch a massive programme for increasing area under green fodder in Bihar. However, Government is trying to promote private sector to establish feed factories in area where maize production is at large scale.

2. Milk Production Scenario

In Bihar, Milk contributes about 48 percent of income generated through livestock sector. Milk Production was estimated to be 1.57 million tonnes in 1951 which contributed 9.24

percent of total milk production in the country and per capita per day milk availability was higher in Bihar (153 gm) than national level (124 gm). During 1951-81, milk production experienced slow growth in India and it could reach to 31.6 million tonnes. But per capita per day milk availability increased to 128 gm in 1981 from 124 gm in 1951. Despite continuous increase in milk production in India during 1951-81, per capita per day milk availability was stagnant up to 1961 and it declined to 112 gm in 1971 (Table 6). In Bihar, milk production declined from 1.66 million tonnes in 1961 to 1.37 million tonnes in 1971 but increased to 2.15 million tonnes in 1981. Bihar's share in national level milk production continuously declined from 9.24 percent in 1951 to 3.12 percent in 2002. Milk production scenario dramatically changed in India in 1991 from 31.6 million tonnes in 1981 to 80.6 million tonnes in 1991 and per capita per day milk availability also increased from 128 gm to 176 gm during the period. But milk production had very slow growth in Bihar up to 2002 and Bihar contributed about 3 percent to national milk production but per capita per day milk availability increased marginally from 118 gm in 1981 to 126 gm in 1991 but declined to 89 gm in 2002, mainly due to decline in milk production from 2.82 million tonnes to 2.63 million tonnes during the period.

TABLE 6 - MILK PRODUCTION IN BIHAR VS INDIA DURING 1951-07.

Year	Milk production (million tones)			Per capita per day milk availability (gm/day)	
	Bihar	India	% of milk production in Bihar	Bihar	India
1951	1.57	17.0	9.24	153	124
1961	1.66	20.0	18.30	131	124
1971	1.37	22	6.23	90	112
1981	2.15	31.6	6.80	118	128
1991	2.82	80.6	3.50	126	176
2002	2.63	84.4	3.12	89	225
2004	3.18	88.1	3.60	98	231
2005	4.74	92.5	5.12	144	233
2006	5.06	97.1	5.21	151	241
2007	5.45	100.00	5.45	459	245

In Bihar, there has been spectacular increase in milk production during last five years from 2.63 million tonnes in 2002 to 5.45 million tonnes in 2007, recording more than 100 percent increase but per capita per day milk availability is worked out to be 159 gms which is about 86 gms less than the corresponding national availability in 2007. Bihar contribution to national milk production also increased to 5.45 percent but it is still much lower than the Bihar's contribution to national milk production in 1951(9.24 %).

Among the major states, Bihar emerged as 5th largest milk producer in the country after Utter Pradesh, Punjab, Andhra Pradesh and Madhya Pradesh (Table 7). But it is still to regain position held in 1951 in the country when the state produced 9.24 percent of total milk produced in the country. Bihar lagged much behind in milk production due to weak arrangement for breed improvement, deficient in supply of fodder and concentrate and collapse of veterinary health services in Bihar.

Per day per milk animal milk production was also low in Bihar. It was 1.03 kgs in North Bihar and 0.97 kg in sough Bihar in 1951 and declined to 0.91 kg and 0.93 respectively in 1972 (Appendix IIIA). A comparatively high increase in per day per milch animal milk production was observed in south Bihar from 1.41 kgs in 1982 to 2.71 kgs in 2004-05, recording an increase of 92 percent during last 23 years however the corresponding increase

was 84 percent in North Bihar. Hence, it may be said that the increase in per day per milch animal milk production also contributed significantly to increasing milk production in Bihar. An analysis has been undertaken to have an idea about sources of milk production in Bihar vis-à-vis India during last 20 years. The contribution of buffalo milk varied from 57 to 58 percent in Bihar during the period whereas the corresponding proportion varied from 53 to 56 percent at national level (Table 8). The contribution of cow milk to respective total milk production varied from 42 to 43 percent at national level but the corresponding proportion declined from 37 percent in 1980-82 to 32 percent in 2001-03 in Bihar.

Table 7 - SHARE OF DIFFERENT MAJOR STATES IN NATIONAL LIVESTOCK AND POULTRY PRODUCTION IN INDIA (2005-06).

State	Milk production in '000 tonnes	Egg production (in Lakh)	Meat Production (in '000 tonnes)
Bihar	5060 (5.21)	10012 (2.13)	176 (9.98)
Andhra Pradesh	7624 (7.85)	164534 (35.03)	457 (25.92)
Karnataka	4022 (4.14)	18348 (3.91)	100 (5.67)
Madhya Pradesh	6283 (6.47)	9414 (2.00)	19 (1.08)
Orissa	1342 (1.38)	12787 (2.72)	52 (2.95)
Punjab	8909 (9.18)	35200 (7.49)	4 (2.67)
Uttar Pradesh	17356 (17.87)	18150 (3.86)	198 (11.23)
West Bengal	3891 (4.01)	29637 (6.31)	NA
India	97100 (100.00)	469717 (100.00)	1763 (100.00)

Figures in parentheses indicate percentage to respective total

TABLE 8 - COMPOSITION OF MILK PRODUCED IN BIHAR (%)

Particulars	1980-82		1990-92		2001-03	
	Bihar	India	Bihar	India	Bihar	India
Cow Milk	37	42	33	42	32	43
Buffalo milk	58	55	57	53	57	56
Goat milk	05	03	10	05	11	02
Total milk production	100.00	100.00	100.00	100.00	100.00	100.00

Source: 1 - Jabir Ali (2006). Livestock sector development and implications for rural and poverty alleviation in India IIM, Lucknow (UP) (Unpublished paper).
2. Govt. of Bihar (2004-05) Animal Husbandry Report on Integrated Sample survey for estimation of major Livestock Products for the year 2004-05.

In Bihar, the proportion of Goat milk production increased from 5 percent in 1980-82 to 10 percent in 1990-92 and 11 percent 2001-03. At national level also goat milk production also increased from 5 percent in 1980-02 to 5 percent in 1990-92 but declined to 2 percent in 2001-02. In India, the proportion of goat milk production to total milk production varied from

0.2 to 05 percent during last 20 years. Hence, it may be said that the milk production of cow, buffalo and goat has increased in Bihar however the proportion of buffalo milk to total milk production has been constant but proportion cow milk declining whereas proportion of goat milk showed increasing trend in Bihar.

2.1 Dairy Co-operatives

Dairy development in Bihar was initiated during the First Five Year Plan but the first sincere effort to organize dairy co-operatives was made much later during the fourth five year plan. The Bihar State Dairy Development Corporation was established in 1972 to accelerate the process of dairy development in general and organization of dairy co-operatives in particular. The process of replicating the 'AMUL Pattern' of dairy co-operatives, got momentum in the state only during the mid 80s after the establishment of the Bihar State Co-operative Milk Producers Federation Ltd. (COMPFED) in 1983. During last 20 years (1985-86 to 2005-06) 12 DCS were organized per week and per day 34 new farmers were registered as members of DCS in Bihar. Membership per DCS also increased from 20 in 1985-86 to 51 in 1996-97 but declined to 49 in 2006-07. Milk procurement per day increased from 0.75 lakh kilograms in 1985-86 to 6.09 lakh kilograms in 2006-07 which is only 7.98 percent of available marketable surplus of milk and 4.4 percent of milk produced in the state. While, milk collection per DCS increased but the rate of increase slowed down during last five years and a marginal decline was observed in 2006-07 over 2005-06 (Table 9). Hence, the deterioration in performance of DCS in Bihar needs in depth analysis if this model is to be further expanded in Bihar. However, per member / per day milk procurement declined from 3.6 kg in 1985-86 to 1.4 kg in 1996-97 but increased to 2.1kg in 2005-06 and remained the same in 2006-07. The substantial increase in milk production and increase in price of milk during last three years could not reflect in per DCS/per member milk collection by dairy co-operatives in Bihar.

TABLE 9- PERFORMANCE OF DAIRY CO-OPERATIVE SYSTEM IN BIHAR.

Particulars	**1985-86**	**1996-97**	**2005-06**	**2006-07**
No. of DCS	1030	2728	5243	5819
No. of Members (in 000)	21	138	267	284
Per DCS Members	20	51	51	49
Milk Procurement	77	196	558	609
Per DCS/Per Day Milk Procurement (kg)	75	72	106	105
Per Member/Per Day Milk Procurement	3.6	1.4	2.1	2.1

The main reason for almost stagnant per DCS and per member milk collection by co-operative is their concentration in limited area. Moreover establishment of private dairy in Patna, Chhapra and Begusarai has also adversely affected the milk collection through DCS. The higher price paid by venders has also affecting adversely the DCS business.

2.2 Co-operative Support Services

COMPFED supports member farmers by providing A.I. and vaccination facilities and making available cattle feed and fodder seeds. About 18 percent of DCS are provided with artificial insemination centre which are engaged in providing A.I. facilities to member and non-member farmers on payment basis. Despite the collapse of artificial insemination centres of Bihar Government, the A.I. centre of DCS could be able to done 7 lakh artificial insemination (Table 10).

TABLE 10- SUPPORT SERVICES PROVIDED THROUGH DCS IN BIHAR.

Sl. No.	Particulars	1986-87	1996-97	2006-07
1	Establishments of A-I centres	181	448	1050
2	Total Number of A-I (in 000)	14	249	700
3	A.I. centre	77	91	120
4	Vaccination (in 000)	40	230	476
5	Per DCS/Vaccination	32	84	83
6	Sale of Cattle Feed (in 000 MT)	4	19	46
7	Cattle Feed Per Member (kg)	89	138	162

There has been increase in number of vaccination done through COMPFED in Bihar but per DCS number of vaccination is still lower (83). All the member farmers must have one-adult and one Calf (568 thousand), then 16 percent of additional animals of DCS members will have to be covered for cent-percent coverage under vaccination. If COMPFED is able to cover all the animals of their members, it will cover less than 5 percent of animal of state. The state Govt. started a campaign of vaccination for two-weeks in Jan 08 which may be symbolic for their sincerely to livestock sector but it is appreciable effort in improving the livestock production in Bihar. The COMPFED has a feed plant and makes available feed to member farmers through DCS. During last 20 years per member annual supply of feed has increased from 89 kg in 1986-87 to 162 kg in 2006-07 but still it is not adequate for maintaining a bovine. The COMPFED launched fodder development Programme and distributed fodder seeds at 254M.T in 2007 to DCS members in Bihar. (**Appendix IVA**). Despite the improvement in support system, per member milk procurement declined from 3.6 kg in 1985-86 to 1.4 kg in 1995-96 but increased to 2.1 kg in 2006-07 which lower than the per day per member milk procured in 1985-86.

3. Proposed livestock development activities

Animal husbandry and its allied activities, if developed appropriately, have the potential to significantly enhance the rural economy. Even at the present slow pace of development and underutilization of available resources livestock sector contributes 16 percent to the GSDP (despite its low share of 0.75 percent of total state budgetary allocation), a situation which is mirrored in the livestock sector. Despite this contribution, the state is still not self- sufficient in milk, meat, eggs and fish production. These sectors have the capacity to provide opportunities for livelihood, particularly the weaker section of society.

3.1 Vision for the Eleventh five-year plan

Given the potential these sectors have to impact on rural poverty, incomes and livelihoods, animal husbandry and the dairy sector will be promoted so that the state becomes self sufficient in these products. As major inputs for agro processing, dairy can become an important source for value addition within the state itself, which in turn opens up income and employment opportunities.

3.1.1 Animal Healthcare

- Upgrading veterinary healthcare services by opening new veterinary hospitals, dispensaries and polyclinics, so that the state eventually meets the norm of one veterinary hospital for every 5,000 livestock (at present there is one hospital for more than 25000 livestock). The target is to set up 1,000 new hospitals so as to every 10,000 livestock and strengthening the Institute of Animal Health and Production, Patna to improve the quality of bacterial and viral vaccines produced, set up facilities for producing new vaccines, implement national immunization programmes and provide comprehensive disease diagnostic, and disease infertility control programme support.

- Establishing a veterinary public health service to regulate and monitor the production, processing, storage, transport, marketing and quality control of animal protein and animal feed.
- Establishing the newly constituted Bihar Livestock Development Agency.
- Developing human resources by strengthening facilities in the Bihar Veterinary College and upgrading the skills of government veterinarians.
- Improving the health of small ruminants (sheep and goats).
- Promoting small units in poultry (with 20 birds per family), piggery (8 piglets per family) and dairy (2 milch animals per family) for rural families of below the poverty line.
- Increasing interactions between the Animal Husbandry Department and national level veterinary research institutions like IVRI, NDRI and other institutions for research on cattle, buffalo, equines, goat, sheep, wild and zoo animals.
- Building and developing infrastructure for the Animal Husbandry extension network.
- Establishing infrastructure for mastitis control and training farmers for milk production with a lower somatic cells count and low residual antibiotics levels in keeping with international standards.
- Setting up systems for monitoring and evaluating animal husbandry programmes.
- Implementing the activities of the activities of the Assistance for Control of Animal Diseases (ACAD) scheme, and the Animal Diseases Monitoring and Surveillance (ADMAS) scheme as well as zone-wise surveillance to assess the situation of animal diseases.

3.1.2 Dairy Production

Making dairying a more lucrative and income generating occupation for farmers will require an increase in the productivity of milch animals and reduction in the cost of production of milk. This will be done by providing better breeding, animal health and feeding inputs to milk producers. The overall strategy will be to increase the production of clean milk, strengthen the cooperatives, enhance the skills of milk producers for better management of stock, increase the capacity to process milk and set up a marketing chain for the output. The Eleventh plan will focus on:

- **Increasing milk production:** Through improved breeds, and better health care and management of milch animals. This will reduce operating costs for milk producers, thereby increasing income levels. So far, milch animals have been procured from surplus, neighboring states and distributed to the farmers, but little effort has been made to become self-sufficient in goof crossbreeds for distribution. The Government will provide inputs and subsidies to farmers to set up breeding units in milk-sheds. Institutional finance will play a crucial role in this.
- **Improving animal feed:** Around 80 percent of the cost of milk production depends upon the cost of feeding the animals besides the labour and management costs. The state has three cattle-feed plants in the cooperative sector with total installed capacity of 260 MTs per day. The plant at Patna is working at almost full capacity, so would need to be expanded to meet the growing demand of balanced cattle feed and protein- enriched feed. The capacity of this plant is proposed to be augmented from 100 to 200 MTs per day.
- **Building skills of milk producers:** To improve feeding and stock management.
- **Expanding the cooperatives network to cover more farmers:** The dairy cooperative societies (DCS) which at present cover 6,750 villages in 28 districts will be expanded to cover more districts. The dairy sector in the state is presently being served by 5,123 dairy co-operative societies with 2.54 lakh farmer members, the largest among the eastern states. The thrust on dairy development in the state during the Eleventh Plan will leverage the existing co-operative network, as well as focus on expanding and strengthening its coverage in terms of area and processing infrastructure.

- **Conducting milk production and demand surveys:** Data on milk production, local consumption and marketable surplus for all villages and districts is not available. This information is important for dairy development in the state.
- **Promoting clean milk production:** At the village level, as the quality of finished products depends on the quality of raw materials, apart from processing, packing and handling. Quality with cost control will be the key challenges for the dairy plants in the next plan. Farmers will be encouraged to produce clean milk by maintaining hygiene at their doorsteps. Incentives will be given to them through dairy cooperatives for hygienically better quality milk.
- **Creating adequate plant capacity:** By expanding the capacities of existing plants and setting up new plants at strategic locations. Existing plant capacities will be increased from 650 thousand litres per day (TLPD) to 1,250 (TLPD) to process the increased milk supply to dairy cooperatives by milk producers. Four new dairy plants with 2 lakh liters capacities will be set up at Biharsharif, Purnia, Chhapra and Mohania. The plant capacities will finally depend upon the field survey and DPRs prepared by NDDB.
- **Additional processing capacities:** Also proposed are a 30 MT per day powder plant, ultra-heat treatment (URT) plant with aseptic packaging facilities to conserve the surplus milk solids during flush seasons for use when milk is low. The aim is also to supply packaged milk to milk deficit areas like Madhubani and Darbhanga within the state and the north-eastern states.
- **Marketing:** This will be another thrust area during the coming Plan. With increased production and processing of milk in the state, avenues for evacuation of this output (forward linkages) are needed. Unlike other states, towns in Bihar are small and there is no metro city, so there is little or very limited infrastructure for marketing.
- **Private investment:** This will be required to supplement government efforts in achieving the Eleventh Plan goals. Private parties will be encouraged to invest in dairy equipment and fodder-block making units, and to set up processing infrastructure (for milk power, packaging material), and marketing infrastructure.

Conclusions

Suggested Development Strategy

In Bihar, breed replacement rate has been slow mainly due to collapse of Public Artificial Insemination Centres. A private organization namely Patna Animal Development Limited came into existence in mid-eighties but operating mainly around Patna in the field of .A.I and animal health. COMPFED is also providing AI and animal health services to members of Dairy Co-operative societies. BAIF and J.K. Trust are also operating in Bihar but in limited area. Despite Public and private efforts in A.I. and animal health, about 50 percent of breedable bovine could come under the artificial insemination system and remaining 50 percent bovine is still served by natural breeding. Hence, there is a need to revive the public artificial insemination centres and promote private organization to establish A.I. and animal health centres in Bihar. Quacks still dominate in the field of animal health in Bihar and some of them are providing emergency services to dairy farmers. A crash programme may be started to train some of quacks in animal health to enable them to provide scientific treatment within a short period of time.

Dairy co-operative is only successful organization in Bihar but covers less than 15 percent of villages during 24 years. The dairy co-operative system has lost its steam in Bihar. Moreover, it should not be allowed to monopolize the milk marketing system. During survey, several farmers showed concern about low prices paid by co-operative. Milk marketing needs more emphasis but private milk processing and marketing organizations are not getting institutional support in Bihar which could be done by promoting private entrepreneurs through

institutional financing and government support. Price of milch animal is higher in Bihar than most of major states in India. It is only due to unavailability of good quality animals. All the animal breeding farms established to multiply good quality breeds under public sector have already been closed. There is no any private organization engaged in multiplication of good quality breed of animals in Bihar. Hence, arrangement should be made in public-private partnership to establish animal breeding farms for the purpose so that the good quality breed of livestock (including goats) are made available to farmers at reasonable price. Goatry is a practiced mainly on landless and sub-marginal households in Bihar. Hence, the promotion of goatry will help improving socio-economic status of weaker section of societies. Hence, the marketing arrangement for replacement of breed and training of farmers should be developed for promoting goatry in Bihar. At first phase, all the existing artificial insemination centres, animal breeding farms, hospitals and dispensaries and extension system should be revived and arrangement should be made to utilize properly the fund allocated to Bihar under centrally sponsored programmes including Rashtriya Krishi Vikas Yojana.

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APPENDIX- I A-I

MILK PRODUCTION STATISTICS OF BIHAR-PRESENT STATUS, AND FUTURE PROJECTIONS WITH PREVAILING GROWTH RATES[1]

Particulars	**2003**	**2010**	**2015**	**2020**	**2025**
Population					
XB Cattle	1274252	7900364	12633301	17366240	22099177
Desi Cattle	9454865	9557582	9630953	9704322	9777693
Buffaloes	5743047	6934634	7785767	8636901	9488037
Goats	9489830	10267245	11022542	11377839	11933136
Population GR (%)					
XB Cattle	57.979	74.286	74.286	74.286	74.286
Desi Cattle	0.08	0.155	0.155	0.155	0.155
Buffaloes	2.937	2.964	2.964	2.964	2.964
Goats	1.076	1.170	1.170	1.170	1.170
Animals in milk (%)					
XB Cattle	30.69	30.69	30.69	30.69	30.69
Desi Cattle	18.27	18.27	18.27	18.27	18.27
Buffaloes	30.48	30.48	30.48	30.48	30.48
Goats	25.15	25.15	25.15	25.15	25.15
Daily milk yield					
XB Cattle	2.65	2.65	2.65	2.65	2.65
Desi Cattle	1.35	1.35	1.35	1.35	1.35
Buffaloes	2.86	2.86	2.86	2.86	2.86
Goats	0.142	0.142	0.142	0.142	0.142
No. of animals in milk					
XB Cattle	391014	2424622	3877160	5329699	6782237
Desi Cattle	1727763	1746170	1759575	1772980	1786385
Buffaloes	1750430	2113676	2373102	2632527	2891954
Goats	2386431	2582212	2772169	2861526	3001185
Share of milk (Tonnes)					

XB Cattle	378311	2177068	3750183	4785537	6089771
Desi Cattle	854000	860425	867031	873636	880241
Buffaloes	1824000	2206466	2477281	2748095	3018911
Goats	123689	133836	143682	148313	155551
Total milk production (Tonnes)	3180000	5377795	7238177	8555581	10144474
Human population	82880000	99360000	111130000	12890000	134660000
Per capita availability (gm/day)	105	148	178	190	206
Requirement (ICMR norms)	7562800	9066600	10140610	11213710	12287730
Shortage	4382800	3688805	2902433	2658129	2143256
Shortage (%)	137.82	68.59	40.1	31.07	21.11
[1]Projections with prevailing growth rate					

APPENDIX I -A-II

EGG PRODUCTION STATISTICS OF BIHAR-PRESENT STATUS & FUTURE PROJECTIONS.

Particulars	**2003**	**2010**	**2015**	**2020**	**2025**
Population (no.)	**13911379**				
Fowl desi	10148401	12829771	18217371	23604970	29009599
Fowl improved	261879	6586590	8926515	11566440	14214710
Ducks	955857	1710629	2428991	3147334	386943
Other poultry	135242				
Growth rate (1982-2003)					
Fowl desi	- 2.120	3.775	8.21	5.91	4.58
Fowl improved	+ 5.211	20.93	7.11	5.91	4.58
Ducks	- 1.758	11.28	8.40	5.91	4.58
No. of layers					
Hens desi	3420940 (33.71)	4490420	6376080	826170	10153360
Hens improved	2129700 (79.71)	5029272	7141212	9253152	11371768
Ducks	304530 (31.86)	598720	850147	1101567	135780
Av. No. of eggs laid / Yr.[2]					
Hens desi	89.94	100	100	100	100
Hens improved	183.71	250	250	250	250
Ducks	135.55	150	150	150	150
Ratio of Desi to Improved					
Hens (Improved : Desi)	1: 1.16	1.12: 1	1.12: 1	1.12: 1	1.12: 1
Egg Production (in lakhs with % shares)					
Hens desi	3077 (41.57)	4490.42	6376.08	8261.74	10153.36
Hens improved	3912 (52.85)	12573.18	17853.03	2312.88	28429.42

Ducks	413 (5.58)	898.08	1275.22	1652.35	2030.67
Total egg production (in lakh)	**7402**	**17961.69**	**25504.33**	**33046.97**	**40613.45**
Human population (in Lakh)	828.8	993.6	111.3	1228.9	1346.6
Per capita availability of Eggs/Yr.	9	31.17	39.57	46.36	52.0
Requirement of eggs (in lakh)	24996.61	29966.97	33516.81	37063.62	40613.45
Shortage (in Lakh)	17594.61	12005.28	8012.48	4016.65	Nil
Shortage (%)	237.7	66.84	31.42	12.15	Nil

Values in parentheses are percentages
"Population based on Livestock Census Report 2003 (Provisional), Govt. of Bihar
[1]Projections made with the objective of making Bihar an egg surplus state by 2025
[2] Source: Basic Animal Husbandry Statistics-2004, ministry of Agriculture, Govt. of India.
The eggs from other birds of poultry group will be over and above the target to be achieved.

APPENDIX I - A-III

MEAT PRODUCTION STATISTICS IN BIHAR-PRESENT STATUS AND FUTURE PROJECTIONS.

Particulars	**2003**	**2010**	**2015**	**2020**	**2025**
Population (Numbers)					
XB Cattle	1274252	7900364	12633301	17366240	22099177
Desi Cattle	9454865	9557582	9557582	9704322	9777693
Buffaloes	5743047	6934634	7785767	8636901	9488037
Goats	9489830	19454152	26571524	33688897	40806269
Sheep	382236	1051149	1528944	2006739	2484535
Pigs	672381	3025715	4706667	6387620	8068572
Poultry	13911379	20852152	25809846	30767541	35725236
Animals slaughtered (%)					
XB Cattle	509701	6.15	6.15	6.15	6.15
Desi Cattle	472743	7.83	7.83	7.83	7.83
Buffaloes	1435762	19.84	19.84	19.84	19.84
Goats	4744915	50.00	50.00	50.00	50.00
Sheep	95559	40.00	40.00	40.00	40.00
Pigs	336191	60.00	60.00	60.00	60.00
Poultry	6955690	60.00	60.00	60.00	60.00
Av. Meat yield(Kg/animal/bird)					
XB Cattle	41.23	45.00	45.00	45.00	45.00
Desi Cattle	41.23	40.00	40.00	40.00	40.00
Buffaloes	61.23	65.00	65.00	65.00	65.00
Goats	7.88	9.00	9.00	9.00	9.00
Sheep	8.98	12.00	12.00	12.00	12.00
Pigs	25.54	30.00	30.00	30.00	30.00
Poultry	1.00	1.75	1.75	1.75	1.75
Share of meat (Tonnes)					
XB Cattle	26800	21864.26	34962.66	48061.07	61159.47
Desi Cattle		29934.35	30182.94	30393.94	30623.73
Buffaloes	35850	89429.04	100405.25	111381.48	122357.73
Goats	56790	87543.68	119571.86	151600.04	183628.21
Sheep	2070	5045.52	7338.93	9632.35	11925.77
Pigs	52030	54462.87	84720.01	114977.16	145234.30
Poultry	8670	21894.76	27100.34	32305.92	37511.50

Total Meat production (Tonnes)	**182210**	**310174**	**404282**	**498352**	**592441**
Human population (lakh)	828.80	993.60	1111.30	1228.90	1346.60
Per capita availability of meat (gm/week)	105.70	150.08	174.89	195.96	211.52
Requirement (Tonnes)*	310303	372004	416071	460100	504167
Shortage / Surplus (Tonnes)	- 128095	- 61830	- 11789	38252	88274
Shortage / Surplus (%)	- 70.30	- 16.62	- 2.83	8.31	17.51

[1]Requirement of meat has been estimated as per ICMR norms of 90 gms meat per capita twice a week for about 40% of the human population under the assumption that 58% of the population is non-vegetarian out of which 15% consume eggs only.
[2]About 3% of the non-vegetarian population becomes vegetarian, due to various religious reasons during different months of the year, thus bringing down the Total Meat consumption.
[3]Projections made with objective to make Bihar a meat surplus state by 2015.
[4]Figures in italics denote percentages under respective groups.

APPENDIX I - A-IV

ACTUAL & PROJECTED ESTIMATE OF WOOL PRODUCTION IN DIFFERENT A.H. ZONES OF BIHAR[1]

Zone and Particulars	**2003**	**2010**	**2015**	**2020**	**2025**
Zone-I					
Population of sheep	94759	100160	113663	140670	154173
Total greasy wool production (Kg)	90.50	95.64	108.54	134.30	147.20
Zone-II					
Population of sheep	16168	16056	15777	15220	14940
Total greasy wool production (Kg)	15.40	15.34	15.06	14.50	14.30
Zone-III					
Population of sheep	271309	274912	283919	301934	310942
Total greasy wool production (Kg)	259.10	262.52	271.00	288.20	296.90
State Total					
Population of sheep	382236	390033	409528	448516	468010
Total greasy wool production (Kg)	365.00	373.00	391.00	428.00	447.00

[1]Average greasy wool production has been reported to be @ 359 gm per shearing per animal with two shearing in year in Desi (local) % 596 gm in crossbreds with an average of 477.45 gm.

APPENDIX I-B

GROSS DOMESTIC PRODUCT AND AGRICULTURAL DOMESTIC PRODUCT IN BIHAR V/S INDIA (AT CONSTANT PRICE 1999-2000) (IN RS. BILLION).

Year	**Bihar**			**India**		
	State GDP	State [a] Agriculture GDP	% of Agriculture GDP to Total State GDP	National GDP	National* Agriculture GDP	% Agriculture GDP to National GDP
1999-00	501	168	33.53	17865	4465	25.0
2000-01	583	226	38.76	18648	4456	23.9
2001-02	554	183	33.03	19729	4735	24.0
2002-03	620	228	36.77	20477	4393	21.5
2003-04	594	191	32.15	22226	4833	21.7

2004-05	659	216	32.78	23897	4831	20.2
2005-06	659	194	29.44	26045	5121	19.7
2006-07	765	253	33.07	28482	5259	18.5
Annual Growth (1999-07)	5.78	2.99	-	6.5	2.61	-

[a] Including Animal Production. **Source:** [1] Department of Statistics and Evaluation, Govt. of Bihar, Patna.
[2] Agriculture at A Glance, Ministry of Agriculture and Co-operative Govt. of India, 2007

APPENDIX II A-

ZONE WISE BOVINE POPULATION IN BIHAR (2003) (IN LAKH).

Zone	**Cow**				**Buffaloes**
	Cross Breed	**Improved**	**Desi**	**Total**	
Zone I	5.97 (29.64)	0.80 (3.97)	13.37 (66.39)	20.14 (100.00)	18.84
Zone II	0.48 (3.26)	0.17 (1.15)	14.07 (95.59)	14.72 (100.00)	6.84
Zone IIIA	0.72 (8.14)	0.12 (1.35)	8.00 (90.49)	8.84 (100.00)	3.60
Zone IIIB	2.55 (15.58)	0.42 (2.57)	13.40 (81.85)	16.3 (100.00)	17.83
Bihar	9.72 (16.18)	1.51 (2.51)	48.84 (81.31)	60.07 (100.00)	47.11

APPENDIX - II B

AGRO-CLIMATIC ZONE WISE DENSITY OF MAJOR LIVESTOCK IN BIHAR (PER SQ.KMS.)

Agro-climatic zone	**Cattle**	**Buffalo**	**Goat**	**Total livestock**
Zone I	101	69	104	274
Zone II	145	50	156	351
Zone III A	125	42	159	326
Zone III B	96	69	45	210
Bihar	111	62	102	275

APPENDIX III

PER ANIMAL IN MILK PER DAY MILK PRODUCTION IN BIHAR (IN KG.).

Year	**North Bihar (Zone I+ Zone II)**	**South Bihar (Zone IIIA + Zone IIIB)**
1951	1.03	0.97
1961	1.09	1.12
1972	0.91	0.93
1982	1.35	1.41
1992	1.64	1.72
2004-05	2.48	2.71

APPENDIX IV -

ACHIEVEMENTS OF FODDER DEVELOPMENT PROGRAMME TAKEN UP BY COMPFED / MILK UNIONS IN BIHAR (QTY. IN MTS.).

Sl. No	Programme	2004-05	2005-06	2006-07	2007-08[1]	Remarks
1.	Sale of fodder seeds to farmers	274.15	289.07	158.74	254.60	Oats, Chinese cabbage, Maize (AT), Sorghum Sudan
2.	Production of fodder seeds	76.00	64.34	38.16	44.00	Oats (Kent)
3.	Treatment of straw with urea	3432	3559	5190	5689	

[1] up to Oct 2007