

**Review Article**

# Aspects of Milk Production and Availability in Birbhum District vis-à-vis the State of West Bengal – Steps for Augmentation of the Sector

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## ABSTRACT

The production and productivity of Milk Yielding Animals is low in Birbhum District and related to this factor, the per capita availability of Milk is as low as 99 Grams / Day, whereas the corresponding figure for the State of West Bengal and India were 145 Grams / Day and 307 Grams / Day in 2013 -14 respectively. However, as 6.77 per cent of Cattles and Buffaloes of Birbhum District were breedable in 2012-13 and there was a gap of 11,29,700 MT between Dry Matter (DM) Availability and Requirement for Animals in Birbhum District in the year of 2011-12 and only 00.13 per cent of the Gross Sown Area of Birbhum District was under Green Fodder Crops in 2014-15, the potent tools to increase the production, productivity and availability of milk in Birbhum District should be based on two main strategic interventions viz. Breed Up gradation of Milk Yielding Animals through Artificial Insemination (AI) Technology and improving the nutritional status of the Animals by feeding the Green Fodder through increased Cultivation of the same along with scaled up institutional infrastructure and service availability for the all round care of the milk yielding animals of the District in concern.

**Keywords:** Birbhum District, West Bengal State, Indigenous Cattle Breed, Cross Bred Cattle, Buffalo, Artificial Insemination (AI), Green Fodder

In the Indian economy, the share of livestock has been gradually rising and at the same time, the share of crops has been declining in Gross Value Added (GVA) to agriculture over the years. The Economic Survey of India – 2018 Report shows that the share of crops declined to 60 per cent in 2015-16, from 65 per cent in 2011-12. In the same period, the share of livestock increased from 22 per cent to 26 per cent.

According to latest report of the Central Statistics Office, Ministry of Statistics and Programme Implementation, Govt. of India, livestock value output is ₹ 9,17,910 crores at current prices in

2016-17. Milk constitutes 66.93 per cent of the total livestock production value or ₹ 6,14,387 crores. The value of food grains (cereals and pulses) at current prices in 2016-17 was ₹ 6,52,787 crores. It is to be noted that, in the year 2014-15, the output value of milk surpassed the value of food grains. This vibrant growth of the Indian livestock economy is sustaining 73 million rural households through it. The Table 1 clearly shows that the value of output

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**Table 1:** Value of Output from Milk Products and Overall Livestock Sector - At Current Prices in ₹ Crore

Item	Year					
	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Milk and Its Products and Bye-Products	3,27,767	3,72,228	4,23,150	4,95,835	5,60,777	6,14,387
Total Value of Output from Overall Livestock Sector	4,87,751	5,64,937	6,46,178	7,42,807	8,35,157	9,17,910

**Source:** National Accounts Statistics 2018, Central Statistical Organisation, Govt. of India.

of milk products at current prices has significantly increased over time.

As per Govt. of India data, India's milk production increased from 165.40 MMT in 2016-17 to 176.35 MMT in 2017-18 with an annual growth rate of 6.62 per cent. The country ranks first in global milk production. According to the 'Food Outlook, 2018' published by the United Nations Food and Agriculture Organization, world milk production increased from 800.2 MMT in 2016-17 to 811.9 MMT in 2017-18 with an annual growth rate of 1.46 per cent. This shows that annual average growth rate in Indian Milk production Sector is higher than that of world average.

In the context of Milk production aspects, we should keep in mind that the World Health Organization (WHO) recommends 250 ml. (258.75 gm.) milk consumption per person per day, or approximately 90 litres per person per year. The Table 2 shows the recommended daily intake of milk as suggested by Nutrition Expert Group of Indian Council of Medical Research (ICMR).

**Table 2:** Recommended Daily Intake of Milk (In Grams)

Age Group	Vegetarians	Non-Vegetarians
3 - 6	300	200
7 - 18	250	200
19 and above	200	160

**Source:** Agriculture Commission Report (1976).

The per capita availability of milk in India during 2017-18 was 375 gm. / day and by 2023-24, it is estimated to increase to 592 gm. / day. However, there is a wide spacio-temporal variation in the per capita availability of Milk in India over the states and district. This is mainly because of a high degree of skewness in milk production among the Indian states (Table 4). This causes a wide variation in per

capita availability of milk in the States of the Union of India (see Table 5).

**Table 3:** Milk production and per capita availability of milk in India

Year	Production (Million Tonnes)	Per Capita Availability (Grams / Day)
1991-92	55.6	178
1992-93	58.0	182
1993-94	60.6	186
1994-95	63.8	192
1995-96	66.2	195
1996-97	69.1	200
1997-98	72.1	205
1998-99	75.4	210
1999-2K	78.3	214
2000-01	80.6	217
2001-02	84.4	222
2002-03	86.2	224
2003-04	88.1	225
2004-05	92.5	233
2005-06	97.1	241
2006-07	102.6	251
2007-08	107.9	260
2008-09	112.2	266
2009-10	116.4	273
2010-11	121.8	281
2011-12	127.9	290
2012-13	132.4	299
2013-14	137.7	307
2014-15	146.3	322
2015-16	155.5	337
2016-17	165.4	355
2017-18	176.3	375

**Source:** Basic Animal Husbandry Statistics, DAHD&F, Govt. of India.



Table 4: State wise Estimate of Milk Production in India ('000 Tonnes)

State	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
<b>All India</b>	<b>84,406</b>	<b>86,159</b>	<b>88,082</b>	<b>92,484</b>	<b>97,066</b>	<b>1,02,580</b>	<b>1,07,934</b>	<b>1,12,183</b>	<b>1,16,425</b>	<b>1,21,848</b>	<b>1,27,904</b>	<b>1,32,431</b>	<b>1,37,685</b>	<b>1,46,314</b>	<b>1,55,491</b>	<b>1,65,404</b>	<b>1,76,347</b>
Andhra Pradesh	5,814	6,584	6,959	7,257	7,624	7,938	8,925	9,570	10,429	11,203	12,088	12,762	13,007	9,656	10,817	12,178	13,725
Arunachal Pradesh	42	46	46	48	48	49	32	24	26	28	22	23	43	46	50	53	54
Assam	682	705	727	739	747	750	752	753	756	790	796	800	815	829	843	861	872
Bihar	2,664	2,869	3,180	4,743	5,060	5,451	5,783	5,934	6,124	6,517	6,643	6,845	7,197	7,775	8,288	8,711	9,242
Goa	45	46	48	57	56	57	58	59	59	60	60	61	68	67	54	51	55
Gujarat	5,862	6,089	6,421	6,745	6,960	7,333	7,911	8,386	8,844	9,321	9,817	10,315	11,112	11,691	12,262	12,784	13,569
Haryana	4,978	5,124	5,221	5,222	5,299	5,366	5,442	5,745	6,006	6,267	6,661	7,040	7,442	7,901	8,381	8,975	9,809
Himachal Pradesh	756	773	786	870	869	933	1,007	1,026	971	1,102	1,120	1,139	1,151	1,172	1,283	1,329	1,392
J & K	1,360	1,389	1,414	1,422	1,400	1,400	1,519	1,565	1,592	1,609	1,614	1,631	1,615	1,951	2,273	2,376	2,460
Karnataka	4,797	4,539	3,857	3,917	4,022	4,124	4,244	4,538	4,822	5,114	5,447	5,718	5,997	6,121	6,344	6,562	7,137
Kerala	2,718	2,419	2,111	2,025	2,063	2,119	2,253	2,441	2,509	2,645	2,716	2,791	2,655	2,711	2,650	2,520	2,576
Madhya Pradesh	5,283	5,343	5,388	5,506	6,283	6,374	6,572	6,855	7,167	7,514	8,149	8,838	9,599	10,779	12,148	13,445	14,713
Maharashtra	6,094	6,238	6,379	6,567	6,769	6,978	7,210	7,455	7,679	8,044	8,469	8,734	9,089	9,542	10,153	10,402	11,102
Manipur	68	69	71	75	77	77	78	78	78	78	79	80	82	82	79	79	82
Meghalaya	66	68	69	71	73	74	77	77	78	79	80	81	82	83	84	84	85
Mizoram	14	15	15	16	15	16	17	17	11	11	14	14	15	20	22	24	25
Nagaland	57	58	63	69	74	67	45	53	78	76	78	79	81	76	77	79	74
Orissa	929	941	997	1,283	1,342	1,431	1,625	1,598	1,651	1,671	1,721	1,724	1,861	1,903	1,930	2,003	2,088
Punjab	7,932	8,173	8,391	8,554	8,909	9,168	9,282	9,387	9,389	9,423	9,551	9,724	10,011	10,351	10,774	11,282	11,855
Rajasthan	7,758	7,789	8,054	8,310	8,713	10,309	11,377	11,931	12,330	13,234	13,512	13,946	14,573	16,934	18,500	20,850	22,427
Sikkim	37	45	48	46	48	49	42	42	44	43	45	42	46	50	67	54	59
Tamil Nadu	4,988	4,622	4,752	4,784	5,474	6,277	6,540	6,651	6,787	6,831	6,968	7,005	7,049	7,132	7,244	7,556	7,742
Tripura	90	79	84	86	87	89	91	96	100	104	111	118	130	141	152	160	174
Uttar Pradesh	14,648	15,288	15,943	16,512	17,356	18,094	18,861	19,537	20,203	21,031	22,556	23,330	24,194	25,198	26,387	27,770	29,052
<b>West Bengal</b>	<b>3,515</b>	<b>3,600</b>	<b>3,686</b>	<b>3,790</b>	<b>3,891</b>	<b>3,983</b>	<b>4,087</b>	<b>4,176</b>	<b>4,300</b>	<b>4,471</b>	<b>4,672</b>	<b>4,859</b>	<b>4,906</b>	<b>4,961</b>	<b>5,038</b>	<b>5,183</b>	<b>5,389</b>
A&N Islands	23	26	25	24	20	23	24	26	24	25	26	21	14	16	15	16	17
Chandigarh	43	43	44	43	46	46	47	47	46	45	45	44	44	44	43	36	42
D&N Haveli	8	8	8	4	5	5	10	10	10	11	11	11	11	9	9	8	8
Daman & Diu	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Delhi	294	296	299	303	310	288	445	450	466	480	502	287	284	280	281	279	279
Lakshadweep	2	2	1	1	2	2	2	2	2	2	2	2	6	4	3	3	3
Puducherry	37	37	40	41	43	45	46	46	46	47	45	47	47	48	48	48	49
Chhattisgarh	795	804	812	831	839	849	866	908	956	1,029	1,119	1,164	1,209	1,232	1,277	1,374	1,469
Uttarakhand	1,066	1,079	1,188	1,195	1,206	1,213	1,221	1,230	1,377	1,383	1,417	1,478	1,550	1,565	1,656	1,692	1,742
Jharkhand	940	952	954	1,330	1,335	1,401	1,442	1,466	1,463	1,555	1,745	1,679	1,700	1,734	1,812	1,894	2,016
Telangana														4,207	4,442	4,681	4,965

Source: - Department Animal Husbandry, Dairying and Fisheries, Ministry of Agriculture and Farmers' Welfare, Govt. of India.

**Table 5: State wise Per Capita Availability of Milk in India (Grams / Day)**

State	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18
All India	225	230	231	233	241	251	260	266	273	281	290	299	307	322	337	355	375
Andhra Pradesh	209	231	238	250	260	268	298	316	342	364	391	409	413	436	475	522	574
Arunachal Pradesh	105	112	109	114	113	114	73	55	59	63	44	49	93	98	105	109	111
Assam	70	71	71	72	72	71	70	70	69	71	70	69	69	70	70	71	71
Bihar	88	92	100	147	154	163	170	172	175	184	175	188	195	208	219	228	239
Goa	91	91	93	110	105	104	102	99	96	93	113	92	98	94	74	68	70
Gujarat	317	321	330	344	349	372	385	402	418	435	445	476	506	527	545	563	592
Haryana	645	647	643	631	628	624	621	644	662	679	720	767	800	839	877	930	1005
Himachal Pradesh	341	339	337	378	373	393	420	424	397	446	447	460	461	466	505	521	542
Jammu & Kashmir	367	365	363	364	353	348	372	378	379	378	352	316	302	352	395	400	401
Karnataka	249	229	190	194	197	199	203	215	226	237	244	262	272	276	282	291	313
Kerala	234	203	173	169	171	174	183	197	201	210	223	216	203	206	200	189	192
Madhya Pradesh	240	236	233	233	262	260	264	271	278	287	308	327	349	386	428	468	505
Maharashtra	172	172	172	176	178	181	184	188	190	197	206	213	219	228	239	243	256
Manipur	86	85	85	90	92	91	91	90	88	88	80	80	80	80	76	75	77
Meghalaya	78	78	78	81	82	81	83	83	83	83	74	83	84	84	83	83	83
Mizoram	43	45	44	46	43	46	47	47	29	31	35	36	40	53	57	62	63
Nagaland	78	78	83	90	96	86	58	67	96	93	108	94	95	88	89	91	84
Orissa	69	68	71	92	95	100	113	110	112	113	112	114	122	124	124	128	132
Punjab	892	895	898	917	943	957	956	955	944	937	945	961	980	1003	1032	1075	1120
Rajasthan	376	368	371	376	387	449	486	501	509	538	539	555	572	655	704	785	834
Sikkim	187	222	231	221	232	231	195	194	200	194	202	186	200	215	282	228	244
Tamil Nadu	219	198	198	204	231	263	272	274	278	278	265	541	280	282	283	294	300
Tripura	77	66	68	70	70	71	72	74	77	80	83	88	95	103	109	114	123
Uttar Pradesh	241	245	250	254	262	267	274	278	283	289	310	312	318	326	335	348	359
West Bengal	120	120	120	124	126	127	129	131	133	137	140	145	145	145	145	148	153
A&N Islands	177	195	183	165	135	148	146	154	137	142	187	131	84	90	87	89	92
Chandigarh	131	127	127	115	116	112	106	101	95	87	117	103	101	97	93	76	86
Dadra & Nagar Haveli	100	97	95	45	53	50	94	91	86	83	89	101	98	74	72	62	62
Daman & Diu	17	17	16	10	11	12	15	15	15	14	11	13	10	10	10	5	9
Delhi	58	57	56	54	54	48	73	72	72	72	82	41	39	37	36	35	35
Lakshadweep	90	87	43	45	64	79	79	84	84	71	9	82	219	147	113	110	120
Puducherry	104	101	107	108	108	110	108	101	96	94	99	113	111	110	108	107	106
Chhattisgarh	105	103	102	103	103	102	103	106	110	117	120	127	130	130	133	141	149
Uttarakhand	344	339	365	364	361	357	354	351	387	383	384	403	418	416	434	440	447
Jharkhand	96	94	92	127	126	130	132	132	130	136	145	146	146	147	152	157	165

Source: - Department Animal Husbandry, Dairying and Fisheries, Ministry of Agriculture and Farmers' Welfare, Govt. of India.



From the above three tables, it is evident that in West Bengal, both milk production as well as per capita availability of milk is strikingly on lower side than that of National average. In the years of 2015-16, 2016-17 and 2017-18, the share of West Bengal in the country's total milk production were 3.24 per cent, 3.13 per cent and 3.06 per cent respectively; though 7.54 per cent of Indian population resides in West Bengal according 2011 National Census of India.

As far as the per capita availability of milk in India is concerned, the National Average were 337 grams/day, 355 grams / day and 375 grams / day in the years of 2015-16, 2016-17 and 2017-18 respectively; where in West Bengal the corresponding Figures were abysmally as low as 145 grams / day, 148 grams / day and 153 grams / day respectively.

Milk production in the West Bengal state was estimated at 13,804 TKgPD (5.04 Million MT) in 2015-16 which is about 3.2 per cent of total milk production of the country. Milk production in the state has grown at a CAGR of 2.42 per cent during the last 5 years. Paschim Medinipur (un-divided) is the highest milk producing district in the state, followed by Bardhaman (un-divided). It is evident that almost half of the total milk production of West Bengal is concentrated in mainly six districts, namely, Paschim Medinipur (un-divided),

Bardhadman (un-divided), Murshidabad, Bankura, Nadia and Hooghly.

Out of the total annual milk production of about 5.04 million tonnes in West Bengal during 2015-16, about 35 per cent is retained by the milk producers for home consumption (NFDB, 2017).

Among the Districts of West Bengal, Birbhum District is below the State average over the years as far as Total Milk Production Density and Per Capita Milk Availability are concerned (see the Table 6 and 7).

From the above Table 7 and also from the Table 3, it is amply clear that the Per Capita Availability of Milk is abysmally low in Birbhum District than both the National and State Average of the same. One of the main reasons of this may lie in the fact that the production of Milk in Birbhum District is poor both in absolute terms of production and also in terms of percentage share of the District in the whole of the State (presented in the following Table and Figure).

he Table 8 clearly finds out that the District of Birbhum produces only 3.64 per cent of the State's total Milk Production, whereas the districts like Medinipur (un-divided), Burdwan (un-divided) and Murshidabad produce 16.32 per cent, 12.25 per cent and 9.84 per cent respectively of the State's total Milk Production in the year of 2014-15.

**Table 6:** Total Milk Production Density (Kilo Gram / Day / Square Kilo Metres)

Geographical Area	Years													
	2002 - 2003	2003 - 2004	2004 - 2005	2005 - 2006	2006 - 2007	2007 - 2008	2008 - 2009	2009 - 2010	2010 - 2011	2011 - 2012	2012 - 2013	2013 - 2014	2014 - 2015	2015 - 2016
West Bengal	108	110	113	116	120	123	129	129	134	139	145	147	149	152
Birbhum	52	53	54	55	65	66	73	66	67	69	70	69	100	133

**Source:** Estimated from Integrated Sample Survey Reports, Department of Animal Resources Development, Govt. of West Bengal; Compiled by – National Dairy Development Board (2017).

**Table 7:** Per Capita Availability of Milk (Grams / Day)

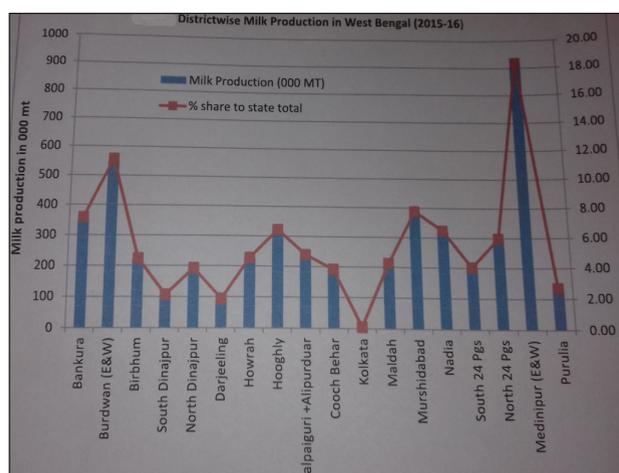
Geographical Area	Years												
	2002 - 2003	2003 - 2004	2004 - 2005	2005 - 2006	2006 - 2007	2007 - 2008	2008 - 2009	2009 - 2010	2010 - 2011	2011 - 2012	2012 - 2013	2013 - 2014	2014 - 2015
West Bengal	121	122	124	125	126	128	129	131	135	139	145	145	145
Birbhum	86	86	86	86	100	100	99	99	100	101	101	101	99

**Source:** Estimated from Integrated Sample Survey Reports, Department of Animal Resources Development, Govt. of West Bengal; Compiled by – National Dairy Development Board (2017).

**Table 8:** District wise and Category wise Percentage Share of Milk Production in West Bengal in 2014-15

Name of the District	District wise & category wise percentage share of milk production in WB (2014-15)					
	% share of crossbred cow	% share of indigenous cow	% share of total cattle	% share of buffalo	% share of goat	% share of total milk production
Medinipur (E+W) + Jhargram	15.75	18.09	16.97	5.53	13.29	16.32
Burdwan (E&W)	10.10	13.16	11.69	23.71	11.62	12.25
Murshidabad	14.94	5.31	9.94	8.47	9.01	9.84
Nadia	12.72	4.78	8.60	2.11	3.80	8.15
Hooghly	9.58	6.23	7.84	9.46	5.22	7.84
North 24 Pgs.	8.85	4.64	6.67	25.41	4.08	7.47
Bankura	4.06	6.68	5.42	4.53	8.29	5.47
Maldah	3.79	5.96	4.92	4.34	7.03	4.95
Hawrah	1.61	7.61	4.72	2.80	1.41	4.53
Jalpaiguri + Alipurduar	3.58	4.42	4.02	1.22	3.36	3.86
Birbhum	2.71	4.15	3.46	3.23	9.86	3.64
South 24 Pgs.	1.72	4.84	3.34	2.26	3.23	3.29
Darjeeling + Kalimpong	5.07	1.82	3.38	1.01	1.49	3.21
North Dinajpur	2.12	3.76	2.97	2.46	5.68	3.03
Cooch Behar	2.11	4.02	3.10	0.31	2.39	2.95
South Dinajpur	0.70	2.95	1.87	0.07	2.77	1.81
Purulia	0.40	1.52	0.98	2.13	7.43	1.23
Kolkata	0.18	0.06	0.12	0.96	0.05	0.16
WB State	100.00	100.00	100.00	100.00	100.00	100.00

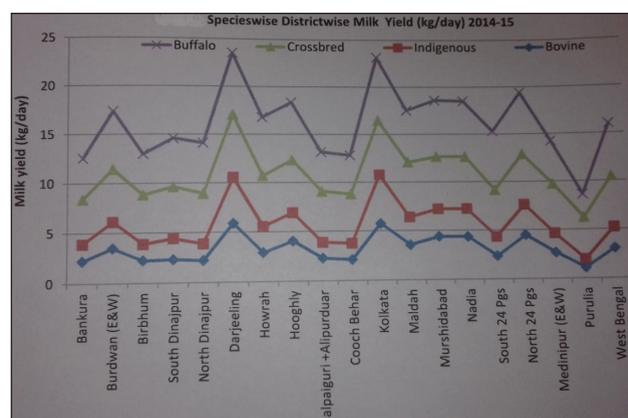
Sources: *NDDB, Kolkata.*



Source: *NDDB, Kolkata.*

**Fig. 1:** District wise Milk Production in West Bengal in 2015 - 16

The Cattle Milk production share is further lower in the District of Birbhum and stands at 3.46 per cent. However, one of the potential points to consider is of the fact that the district of Birbhum contributes 9.86 per cent of the State’s total Goat milk production, which is third highest in the whole State in 2014-15.



Source: *NDDB, Kolkata*

**Fig. 2:** Species wise District wise Milk Yield in West Bengal (Kilo Gram / Day) in 2014 - 15

In 2015-16, the percentage share of Birbhum District in relation to Milk production in the State of West Bengal slightly improved to nearly 5 percentage point along with 2,50,000 MT (approximate) production of milk (see Fig. 1).

The Fig. 2 shows us that among the Species in the Birbhum District, the Buffaloes give most milk yield,



followed by Crossbred Cattles, distantly followed by Indigenous Cattles with Bovines (combined) comes last in the year of 2014-15. However, the milk yield of all the species in Birbhum District is poorer than the corresponding State Averages.

In the above context, the present Authors will delineate into the following Objectives through observation and analysis:

1. Detailed profile of milk yielding animals of Birbhum District vis-à-vis West Bengal;
2. Detailing of infrastructures available in Dairy Sector in Birbhum District vis-à-vis West Bengal;
3. Detailing of service delivery system associated with dairy sector in Birbhum District vis-à-vis West Bengal and
4. Suggesting some strategies to improve the dairy sector in Birbhum District vis-à-vis West Bengal.

## Findings and Observations

### 1. Detailed profile of milk yielding animals of Birbhum District vis-à-vis West Bengal:

The Table 9 clearly shows us that the percentage share of Cross Bred Cattles among the Total Cattle in Birbhum District was 7.96 whereas the corresponding figure for the State of West Bengal was 15.22 in the year of 2009 – 10; however this share of Cross Bred Cattle has further increased to a figure of 8.40 per cent and 8.86 per cent whereas the corresponding figures for the State of West Bengal were 15.99 per cent and 16.79 per cent in the years of 2010-11 and 2011-12 respectively.

Table 10 focuses that though the percentage share of Cross Bred Cattle among the total Cattle in Birbhum District was in the range of 7 to 8 percentage points but the contribution share of the Cross Bred Cattle to the Total Cow Milk Production was 38.04 per cent, 38.08 per cent, 37.90 per cent, 37.91 per cent and 37.97 per cent in 2009-10, 2010-11, 2011-12, 2012-13 and 2013-14 time periods; whereas the corresponding figures for the State of West Bengal for the same time period was 46.42 per cent, 46.79 per cent, 46.97 per cent, 47.35 per cent and 47.78 per cent respectively. This clearly indicates that though the Cross Bred Cattles are playing a highly significant role in Cow Milk Production in the

District of Birbhum, especially in the light of its poor population per centage, still there is ample scope to increase its production share among Cow Milk especially in comparison to the situation of the state.

A minute study of the above Table also suggested the Per Capita Availability of Milk in Birbhum District is on lower side both of State Average and of National Average in the above mentioned Time Period (see also Table 3, 5 and 7).

Though the Birbhum District In-milk Bovine population was 4.06 per cent and 4.85 per cent of the State of West Bengal's In-milk Bovine Population in the Year of 2002-03 and 2015-16 respectively (Table 11), the Bovine Milk production of the District was 2.50 per cent of the total Bovine Milk production of the State in the Year of 2002 -2003, whereas the corresponding figure in the year of 2015 – 2016 was 4.48 per cent, which was a significant increase itself (see Table 12).

The Table 13 shows us that the District of Birbhum never touched the State Average Bovine Milk Yield in the time period of 2002-03 to 2015-16; however the Gap between the Birbhum District and West Bengal State's Bovine Milk Yield which was nearly 1 (0.976) kg. / day in 2002-03 decreased to 0.297 kg./ day (which is itself a great achievement).

The Table 15 shows that Birbhum District's share in the State's Total Indigenous Cattle Milk production was 3.38 per cent in the year of 2002 – 2003, which rose to 5.33 per cent in 2015 – 2016 [though the share of Birbhum District's In-Milk Indigenous Cattle Population was 4.64 per cent and 5.45 per cent respectively in the years of 2002-03 and 2015-16 (Table 14)] which was itself marking a significant improvement in this production aspect.

The Table 16 shows us that the Milk Yield of Indigenous Cattle Breed in the District of Birbhum was as low as 1.407 Kilo Gram / Day in 2002-03, however it significantly improved to 3.050 Kilo Gram / Day in 2015-16. The Gap between the Birbhum District and West Bengal State's Milk Yield of Indigenous Cattle which was nearly 1/2 (0.525) kg. / day in 2002-03 decreased to a mere 0.070 kg. / day (which is itself a great achievement).

The Table 18 shows that Birbhum District's share in the State's Total Cross Bred Cattle Milk production was a negligible 00.62 per cent in the year of 2002 – 2003, which rose to 2.92 per cent in 2015 – 2016

**Table 9: Projected Livestock Population of Birbhum District vis-à-vis West Bengal State**

Year	Total Cross Breed Cattle	Total Indigenous Cattle	Total Cattle	Total Buffalo	Total Bovine	Total Goat	Geographical Area
2009-2010	92,657	10,71,318	11,63,975	63,120	12,27,095	10,66,464	Birbhum District
	30,23,497	1,68,43,804	1,98,67,301	7,13,356	2,05,80,683	1,70,60,291	West Bengal State
2010-2011	99,119	10,80,912	11,80,031	61,002	12,41,033	11,34,740	Birbhum District
	32,34,345	1,69,94,653	2,02,28,998	6,89,417	2,09,18,441	1,81,52,509	West Bengal State
2011-2012	1,06,031	10,90,592	11,96,623	58,955	12,55,578	12,07,387	Birbhum District
	34,59,896	1,71,46,856	2,06,06,752	6,66,281	2,12,73,059	1,93,14,651	West Bengal State

Source: Annual Reports of Department of Animal Resource Development, Govt. of West Bengal.

**Table 10: Estimated Milk Production and Per Capita Availability of Milk / Day of Birbhum District vis-à-vis West Bengal State**

Year	Cow Milk			Buffalo Milk ('000 Tonnes)	Bovine (Cow + Buffalo) Milk ('000 Tonnes)	Goat Milk ('000 Tonnes)	Total Milk Production ('000 Tonnes)	Per Capita Availability of Milk / Day (Grams)	Geographical Area
	Indigenous ('000 Tonnes)	Crossbred ('000 Tonnes)	Total Cow ('000 Tonnes)						
2009 - 10	64.611	39.658	104.269	5.982	110.251	11.534	121.785	99.3	Birbhum District
	2,117.001	1,833.755	3,950.756	214.996	4,165.752	134.412	4,300.164	131.4	West Bengal State
2010 - 11	65.505	40.277	105.782	6.051	111.833	11.772	123.605	99.6	Birbhum District
	2,186.94	1,923.17	4,110.11	222.182	4,332.29	139.913	4,472.20	135.1	West Bengal State
2011 - 12	67.149	40.978	108.27	5.963	114.09	12.049	126.139	100.6	Birbhum District
	2,275.86	2,016.07	4,291.93	223.14	4,515.07	145.158	4,660.23	139.3	West Bengal State
2012 - 13	68.403	41.763	110.166	6.048	116.214	12.304	128.518	101.35	Birbhum District
	2,358.00	2,120.50	4,478.50	230.838	4,709.34	150.684	4,860.02	143.62	West Bengal State
2013 - 14	67.195	41.13	108.325	6.039	114.364	12.136	126.50	98.65	Birbhum District
	2,360.06	2,159.234	4,519.294	235.381	4,754.675	151.537	4,906.212	143.33	West Bengal State

Source: Annual Reports of Department of Animal Resource Development, Govt. of West Bengal.

**Table 11: In-milk Bovine Population ('000 Numbers)**

Geographical Area	Years					
	2002 - 2003	2003 - 2004	2004 - 2005	2005 - 2006	2014 - 2015	2015 - 2016
West Bengal	3,769	3,848	3,940	4,029	4,284	3,569
Birbhum	153	155	159	162	203	173

Source: Department of Animal Resources Development, Govt. of West Bengal.

**Table 12: Production Performance of Bovine Milk ('000 MT)**

Geographical Area	Years													
	2002 - 2003	2003 - 2004	2004 - 2005	2005 - 2006	2006 - 2007	2007 - 2008	2008 - 2009	2009 - 2010	2010 - 2011	2011 - 2012	2012 - 2013	2013 - 2014	2014 - 2015	2015 - 2016
West Bengal	3,484	3,569	3,670	3,770	3,877	3,969	4,065	4,166	4,332	4,515	4,710	4,754	4,809	4,908
Birbhum	87	87	90	91	109	109	110	111	112	114	116	114	167	220

Source: Department of Animal Resources Development, Govt. of West Bengal.

**Table 13:** Bovine Milk Yield (Kilo Grams / Day)

Geographical Area	Years					
	2002 - 2003	2003 - 2004	2004 - 2005	2005 - 2006	2014 - 2015	2015 - 2016
West Bengal	2.532	2.540	2.550	2.563	3.075	3.768
Birbhum	1.556	1.547	1.538	1.538	2.254	3.471

Source: Department of Animal Resources Development, Govt. of West Bengal.

**Table 14:** In-milk Indigenous Cattle Population ('000 Numbers)

Geographical Area	Years					
	2002 - 2003	2003 - 2004	2004 - 2005	2005 - 2006	2014 - 2015	2015 - 2016
West Bengal	3,149	3,199	3,262	3,319	3,023	2,680
Birbhum	146	148	151	154	165	146

Source: Department of Animal Resources Development, Govt. of West Bengal.

**Table 15:** Production Performance of Indigenous Cattle Milk ('000 MT)

Geographical Area	Years													
	2002 - 2003	2003 - 2004	2004 - 2005	2005 - 2006	2006 - 2007	2007 - 2008	2008 - 2009	2009 - 2010	2010 - 2011	2011 - 2012	2012 - 2013	2013 - 2014	2014 - 2015	2015 - 2016
West Bengal	2,222	2,262	2,321	2,377	2,191	2,238	2,282	2,117	2,187	2,276	2,358	2,360	2,376	3,058
Birbhum	75	75	77	78	76	76	77	65	66	67	68	67	99	163

Source: Department of Animal Resources Development, Govt. of West Bengal.

**Table 16:** Indigenous Cattle Milk Yield (Kilo Grams / Day)

Geographical Area	Years					
	2002 - 2003	2003 - 2004	2004 - 2005	2005 - 2006	2014 - 2015	2015 - 2016
West Bengal	1.932	1.932	1.949	1.962	2.154	3.120
Birbhum	1.407	1.392	1.392	1.392	1.637	3.050

Source: Department of Animal Resources Development, Govt. of West Bengal.

**Table 17:** In-milk Cross Bred Cattle Population ('000 Numbers)

Geographical Area	Years					
	2002 - 2003	2003 - 2004	2004 - 2005	2005 - 2006	2014 - 2015	2015 - 2016
West Bengal	465	494	524	556	1,145	768
Birbhum	3	3	4	4	33	22

Source: Department of Animal Resources Development, Govt. of West Bengal.

**Table 18:** Production Performance of Cross Bred Cattle Milk ('000 MT)

Geographical Area	Years													
	2002 - 2003	2003 - 2004	2004 - 2005	2005 - 2006	2006 - 2007	2007 - 2008	2008 - 2009	2009 - 2010	2010 - 2011	2011 - 2012	2012 - 2013	2013 - 2014	2014 - 2015	2015 - 2016
West Bengal	965	1,005	1,056	1,091	1,436	1,491	1,537	1,834	1,923	2,016	2,121	2,159	2,200	1,610
Birbhum	6	6	7	7	25	26	26	40	40	41	42	41	60	47

Source: Department of Animal Resources Development, Govt. of West Bengal.

**Table 19:** Cross Bred Cattle Milk Yield (Kilo Grams / Day)

Geographical Area	Years					
	2002 - 2003	2003 - 2004	2004 - 2005	2005 - 2006	2014 - 2015	2015 - 2016
West Bengal	5.684	5.552	5.515	5.373	5.264	5.730
Birbhum	5.225	5.079	4.994	4.806	4.935	5.810

**Source:** Department of Animal Resources Development, Govt. of West Bengal.

which was itself marking a significant improvement in this production aspect (however, according to Table 17, the Birbhum District had a percentage share of negligible 00.65 per cent of the State's Total In-Milk Cross Bred Cattle Population in the year of 2002-03, which rose to a percentage share of 2.86% point in 2015-16).

The Table 19 shows us that the Milk Yield of Cross Bred Cattle in the District of Birbhum was 5.225 Kilo Grams / Day in 2002-03 which increased to 5.810 Kilo Gram / Day in 2015-16, marking an increase of yield of 11.20 per cent in 14 years. However, the point to be noted that the Cross Bred Cattle Milk Yield of Birbhum District surpassed that of the State Average Yield in 2015-16 by 0.080 Kilo Grams/Day reversing the decades long negative gap for Birbhum [the Gap between the Birbhum District and West Bengal State's Milk Yield of Cross Bred Cattle was nearly 1/2 (0.459) kg. / day in 2002-03]. *This is one of the success stories of Milk Production Sector of Birbhum District.*

The Table 20 showed us that in the year of 2002-03, the In-Milk Buffalo Population of Birbhum District was only 2.58 per cent of the total In-Milk Buffalo Population of the State, however, the corresponding figure significantly rose to 4.13 per cent in the Year of 2015-16.

The Table 21 shows that in Buffalo Milk Production, Birbhum District is a back-bencher district having only a production share of the whole State as low as 2.02 per cent in 2002 – 2003, which rose to only 4.17 per cent in 2015-16 (though volume of production increased substantially from 6000 MT in 2002 – 03 to 10000 MT in 2015 – 16, an increase of about 66.67 per cent).

The Table 22 shows us that the Milk Yield of Buffalo in the District of Birbhum was 4.058 Kilo Grams / Day in 2002-03 which increased to 5.330 Kilo Gram / Day in 2015-16, marking an increase of yield of 31.35 per cent in 14 years. However, the point to be noted that the Buffalo Milk Yield of Birbhum

District nearly caught up that of the State Average Yield in 2015-16 by reducing the gap to only 0.11 Kilo Gram / Day. This is a significant achievement of Milk Production Sector of Birbhum District.

## 2. Detailing of infrastructures available in Dairy Sector in Birbhum District vis-à-vis West Bengal

The state of West Bengal has a Departmental Network of Animal Resource Development Department, Govt. of West Bengal through a network of 12 numbers of District Veterinary Hospitals, 2,652 numbers of Animal Development Aid Centers (ADAC), 271 numbers of Additional Block Animal Health Centers (ABAHC), 339 numbers of Block Animal Health Centers (BAHC) and 92 State Animal Health Centers (SAHC) to provide Animal Health Care facilities up to Gram Panchayat level. For bringing more numbers of breedable bovines under Artificial Insemination (AI) Programme, "Pranibandhus", Self-employed Animal Health Workers or Para-Vets have been engaged at each Gram Panchayat level keeping in view the economic viability and self-sustainability of the AI Technology. Moreover, the Govt. of West Bengal has 3 Frozen Semen Stations at Haringhata in Nadia District, Salboni in Jhargram District and Beldanga in Murshidabad District which are classified as 'A' category by the Central Monitoring Unit (CMU) of the Government of India, 3 Bull Mother Farms located at Haringhata, Kalyani (in Nadia District) and Salboni as well as 2 Frozen Embryo Transfer Laboratories at Salboni and Haringhata.

However, the infrastructure available in Dairy Sector in Birbhum District is of potentiality in comparison with other Districts of the State. Though the District of Birbhum has a percentage share of 5.45 per cent of In-Milk Indigenous Cattle, 2.86 per cent of In-Milk Cross Bred Cattle and 4.13 per cent of In-Milk Buffalo Population respectively in the State of West Bengal in 2015-16 (Table 23), the District has 6.52

**Table 20:** In-milk Buffalo Population ('000 Numbers)

Geographical Area	Years					
	2002 - 2003	2003 - 2004	2004 - 2005	2005 - 2006	2014 - 2015	2015 - 2016
West Bengal	155	155	154	154	116	121
Birbhum	4	4	4	4	5	5

Source: Department of Animal Resources Development, Govt. of West Bengal.

**Table 21:** Production Performance of Buffalo Milk ('000 MT)

Geographical Area	Years													
	2002 - 2003	2003 - 2004	2004 - 2005	2005 - 2006	2006 - 2007	2007 - 2008	2008 - 2009	2009 - 2010	2010 - 2011	2011 - 2012	2012 - 2013	2013 - 2014	2014 - 2015	2015 - 2016
West Bengal	297	302	293	302	250	240	246	215	222	223	231	235	233	240
Birbhum	6	6	6	6	8	7	7	6	6	6	6	6	8	10

Source: Department of Animal Resources Development, Govt. of West Bengal.

**Table 22:** Buffalo Milk Yield (Kilo Grams / Day)

Geographical Area	Years					
	2002 - 2003	2003 - 2004	2004 - 2005	2005 - 2006	2014 - 2015	2015 - 2016
West Bengal	5.272	5.325	5.217	5.371	5.508	5.440
Birbhum	4.058	4.079	3.946	4.029	4.172	5.330

Source: Department of Animal Resources Development, Govt. of West Bengal.

**Table 23:** Animal Health Care Service Providing Veterinary Institutes in Birbhum District and West Bengal

Geographical Area	Years															
	2006	2009	2012	2015	2006	2009	2012	2015	2006	2009	2012	2015	2006	2009	2012	2015
	State Animal Health Centre (SAHC)				District Veterinary Hospitals / Polyclinics				Block Animal Health Centre (BAHC)				Additional Block Animal Health Centre (ABAHC)			
Birbhum District	06	06	06	06	01	01	01	01	19	19	19	19	17	17	17	17
West Bengal State	91	91	91	92	19	19	19	20	341	341	341	339	271	271	271	271

Source: Bureau of Applied Economics and Statistics, Govt. of West Bengal.

per cent of State Animal Health Centre (SAHC), 5.00 per cent of District Veterinary Hospitals / Polyclinics, 5.61 per cent of Block Animal Health Centre (BAHC) and 6.27 per cent of Additional Block Animal Health Centre (ABAHC) as the Animal Health Care Service Providing Veterinary Institutes and 4.86 per cent of Artificial Insemination (AI) Centres of Government Agencies, 4.67 per cent of AI Centres of Pranibandhus, 4.41 per cent of AI Centres of Co-operatives and a Total of 4.68 per cent of all the AI Centres of different types of Agencies in the State of West Bengal respectively in the Year of 2015-16 (Table 24).

The Table 23&24 points out that though Birbhum

District is a laggard position as far as Crossbred and indigenous Breeds and Buffalo Breeds are concerned, the State is one of the leading producer of Goat Milk supplying nearly 10.00 per cent of the State's Goat Milk production.

### 3. Detailing of service delivery system associated with dairy sector in Birbhum District vis-à-vis West Bengal

Though the District of Birbhum had a breedable Bovine Population of 4.95 per cent of the State of West Bengal's total breedable Bovine Population in the Year of 2012-13 (Table 30), different types of Agencies (Government, Co-operatives and

**Table 24:** Numbers of Artificial Insemination Centres (Type of Agencies) in Birbhum District and West Bengal in 2015-16

Geographical Area	Types of Agencies				Total
	Government	Pranibandhu	Co-operative	Others	
Birbhum District	78	165	23	00	266
West Bengal State	1,604	3,533	522	28	5,687

Source: *Paschim Banga Go-Sampad Bikash Sanstha, Govt. of West Bengal.*

**Table 25:** Numbers of AI Performed on Bovines by Different Agencies ('000 Numbers)

Geographical Area	Years						Types of Agencies
	2009 - 10	2010 - 11	2011 - 12	2012 - 13	2013 - 14	2014 - 15	
Birbhum District	23.0	23.7	23.1	25.9	30.1	25.9	Government
West Bengal State	636.3	647.5	643.5	682.9	743.4	679.9	
Birbhum District	8.3	11.6	9.7	12.3	17.3	18.8	Co-operatives
West Bengal State	335.0	383.1	496.5	357.0	371.5	345.8	
Birbhum District	82.9	109.6	118.3	148.7	141.4	160.6	Pranibandhus
West Bengal State	1,804.6	2,258.8	2,401.0	2,780.9	2,703.7	3,053.3	

Source: *Department of Animal Resources Development, Govt. of West Bengal.*

Pranibandhus) altogether had performed only 4.89 per cent of the Total Numbers of AI performed in the State of West Bengal for the corresponding time period (Table 25).

The share of vaccination against the Foot and Mouth Disease in Birbhum District was 9.76 per cent in the year of 2008-09 in the State of West Bengal and this significantly decreased to 5.25 per cent in the year of 2014-15 (Table 26).

In the case of vaccination against Haemorrhagic Septicaemia, the Birbhum District's share in the State was 3.66 per cent in the year of 2008-09, significantly increased to 18.03 per cent in the year of 2014-15 (see Table 26).

As far as Vaccination against Black Quarter is concerned, the Birbhum District's share in the Total number of cases of vaccination in the State of West Bengal was a mere 3.34 per cent in the year of 2008-09, which significantly increased to 14.98 per cent in the year of 2014-15 (Table 26).

The Table 27 showed us that while in the year of 2000 – 01, in the State of West Bengal, the Birbhum District's share of number of Animal Health Cases treated was 8.39 per cent which was significantly decreased to 5.45 per cent in the Year of 2015-16.

*Animal Feed both Green Fodder and Dry Feed* is one

of the most important factors in raising the animal health status as well as milk production capacity. However in Birbhum District both the Green Fodder and Dry Feed are deficient in supply (see Table 28 and Table 29). The following Table shows that out of the Gross Sown Area in West Bengal State only 0.04 percent and again 0.04 percent was under Fodder Cultivation in the years of 2013 – 2014 and 2014 – 2015 respectively; whereas the corresponding figures for the District of Birbhum were 0.13 per cent and 0.13 per cent respectively. A concerted effort should be launched involving various Agencies like Krishi Vigyan Kendra, Department of Animal resource Development, Govt. of West Bengal, Department of Agriculture, Govt. of west Bengal, so that this situation can be improved upon.

As far as Feed Resources of Birbhum District (Availability vs. Requirement) is concerned; there was a huge gap throughout the last two decades (of which the rate of gap increased in the last several years of the last decade viz. 2010 and 2011).

#### 4. Strategies to improve the Dairy Sector in Birbhum District vis-à-vis West Bengal State

(A) The following Table of Table – 30 points out that though the Birbhum District is in a back bencher position as far as Milk Production from Crossbred

**Table 26:** Numbers of Vaccinations Performed against Different Diseases ('000 Numbers)

Geographical Area	Years				Disease
	2008 - 09	2009 - 10	2013 - 14	2014 - 15	
Birbhum District	146.4	148.6	203.9	224.1	Foot and Mouth Disease
West Bengal State	1,499.4	1,965.7	3,976.5	4,265.7	
Birbhum District	5.4	41.5	15.9	46.0	Haemorrhagic Septicaemia
West Bengal State	147.7	400.0	494.9	255.2	
Birbhum District	7.0	42.7	18.9	35.4	Black Quarter
West Bengal State	209.5	400.0	444.9	236.4	

Source: Department of Animal Resources Development, Govt. of West Bengal.

**Table 27:** Numbers of Animal Health Cases Treated ('000 Numbers)

Geographical Area	Years					
	2000 - 01	2007 - 08	2009 - 10	2010 - 11	2013 - 14	2014 - 15
Birbhum District	9.8	5.6	6.5	7.0	7.7	9.1
West Bengal State	116.8	81.6	90.4	116.7	152.1	166.9

Source: Department of Animal resources Development, Govt. of West Bengal.

**Table 28:** Area under Fodder Crops and Gross Sown Area

Geographical Area	Years															
	Area under Fodder Crops ('000 ha)								Gross Sown Area ('000 ha)							
	2000 - 2001	2003 - 2004	2007 - 2008	2010 - 2011	2012 - 2012	2013 - 2013	2014 - 2014	2015 - 2015	2000 - 2001	2003 - 2004	2007 - 2008	2010 - 2011	2011 - 2012	2012 - 2013	2013 - 2014	2014 - 2015
West Bengal	7.5	3.6	3.6	4.0	3.4	3.4	3.5	3.5	9,117	9,661	9,752	8,832	9,353	9,459	9,618	9,690
Birbhum	0.2	0.3	0.3	0.4	0.7	0.7	0.7	0.7	459	517	561	421	556	539	557	556

Source: Directorate of Economics and Statistics, Department of Agriculture and Cooperation, Ministry of Agriculture and Farmers' Welfare, Govt. of India.

**Table 29:** Dry Matter (DM) Availability, Requirement and Balance in Birbhum District ('000 MT)

Available / Required / Balance	Years						
	1997	2003	2007	2008	2009	2010	2011
Available	1,893.8	1,843.2	1,944.4	1,975.9	1,975.9	1,646.7	1,811.3
Requirement	2,329.1	2,479.4	2,607.4	2,658.8	2,729.2	2,821.9	2,941.0
Balance	- 435.3	- 636.2	- 662.9	- 682.9	- 753.3	- 1,175.2	-1,129.7

Source: Feedbase 2012, National Institute of Animal Nutrition and Physiology, Bangalore (Dairying in West Bengal – A Statistical Profile, 2017, National Dairy Development Board, pp. 97 – 98).

and Indigenous Cattle Breeds and Buffalo Breeds are concerned, the District is one of the leading producer of Goat milk supplying nearly 10.00 per cent of the State's total Goat Milk production (also see Figure 1 and Table 8). So, one of the key strategic points for furthering the improvement of the Dairy Sector of Birbhum District should have a more focussed approach to strengthen the Goat

milk production and marketing infrastructures and activities.

(B) A vast tract of Birbhum district is of the Undulating Red Lateritic Agro-Climatic Region where the average temperature in summer goes more than 40°C and the region experiences reduced productive and reproductive capacity of the milk producing livestock population. This region is known as drought prone area of the state where

pasture and grazing land are comparatively very low. Especially in summer months, the availability of green fodder for feeding the cattle is less; the animal health condition deteriorates with compounding effects of less feed availability along with high atmospheric temperatures prevailing. This causes a major drop in production and productivity of milk. In general, availability of fodder crops is also poor here because of infertile soil, low rainfall and poor irrigation facility. This agro-climatic region is very much drought prone and there is inadequate rainwater harvesting infrastructure and also does not have adequate canal water supply system. So, green fodder productions are usually minimal.

(C) The Table 31 shows us that the District of Birbhum had a breedable population of 3,66,100 Numbers of Cattles and 9400 Numbers of breedable Buffaloes in the year 2012. This points to the fact that there is a huge prospect and potential for breed up gradation through Artificial Insemination Technology.

To increase the milk production and productivity the breed up-gradation of indigenous breeds through Artificial Insemination (AI) Technology is a major potent tool. The process involves taking semen collection from an improved bull and depositing it in a indigenous milch cow. Artificial Insemination (AI) involves cross-breeding which is easier than

natural breeding in terms of economy and time requirement. The main advantage of Artificial Insemination (AI) Technology is the genetic up-gradation of livestock population and successes of pregnancy are also higher than the natural breeding. AI makes the number of cows exposed to top bulls virtually limitless. A wider variety of genes can be made available to breeders through AI. The biggest advantage of AI is that semen can be stored, shipped and used over great distances. However, specialized knowledge is very important for AI.

The district of Birbhum has huge number of livestock population, but most of them are indigenous in nature (see Table 9) which is one of the important constraints to boost up the productivity. Frozen Semen Technology (FST) one of the methods of AI is the only technology that can be used uniformly down to the grass root level in the different Agro Ecological Situations (AESs) of the District which can augment the share of cross-bred cattle and buffalo. However, the District never reached the goal due to lack of infrastructure facilities, deficiency of skilled manpower and inadequate transport facilities. In the District, most of the Government AI Centres are still stationary. Semi-Public and Private Para-Vets, known as 'Pranibandhu' usually provide door-step AI services which are insufficient as per requirement, particularly in the

**Table 30:** Birbhum District wise and Category wise Percentage Share of Milk Production in West Bengal in 2014 - 15

	Per Cent Share of Crossbred Cow	Per Cent Share of Indigenous Cow	Per Cent Share of Total Cattle	Per Cent Share of Buffalo	Per Cent Share of Goat	Per Cent Share of Total Milk Production
Birbhum	2.71	4.15	3.46	3.23	9.86	3.64
West Bengal	100.00	100.00	100.00	100.00	100.00	100.00

Source: NDDB, Kolkata.

**Table 31:** Breedable Population of Cattles and Buffaloes ('000 Numbers)

Geographical Area	Years											
	1997	2003	2007	2012	1997	2003	2007	2012	1997	2003	2007	2012
	Indigenous Cattle				Cross Bred Cattle				Buffalo			
Birbhum District	327.3	378.6	340.0	321.6	6.5	12.2	39.3	44.5	15.2	10.3	10.3	9.4
West Bengal State	6,437.1	7,040.6	6,995.4	6,059.7	537.5	633.1	1,401.3	1,514.9	500.7	299.5	205.0	190.1

Source: 16<sup>th</sup>, 17<sup>th</sup>, 18<sup>th</sup>, and 19<sup>th</sup>. Livestock Census, Department of Animal Husbandry, Dairying and Fisheries, Ministry of Agriculture and Farmers Welfare, Govt. of India.



backward rural areas of the District. Most of the Government AI Centres are located at distant places from the villages.

The intensity of artificial insemination was comparatively low (T Score Value <41.3) in the whole of Birbhum District in all the three AEs of the District viz. Undulated Red Lateritic Region, Vindhayan Alluvial Region and Gangetic Alluvial Region of Birbhum District (Majumder *et al.* 2017).

## CONCLUSION

There are several factors including the factors such as Pregnancy, Parity and Stage of Lactation (Sahib *et al.* 2019), Shelter Management (Mulgu *et al.* 2018; Patil *et al.* 2014) etc. affect the milk yield and production. Due to various bio-physical and socio-economic constraints, the Milk Yield of all the different types of Bovines viz. Indigenous Cattle, Cross Bred Cattle and Buffalo are well below the State Average (see Fig. 2) and the per capita availability of milk in Birbhum District was far below the National Average as well as below the State Average over the years also (Table 3, Table 5 and Table 7).

To improve the situation, three critical interventions – (i) Breed up-gradation of breedable Milk Yielding Animals through Artificial Insemination (AI) Technology, (ii) improving nutritional status of the Animals by feeding the Green Fodder through increased cultivation of the same and (iii) overall improvement in management of health of the Milk Yielding Animals through more extensive and focussed Vaccination and Treatment of Animal Health Cases involving the Governmental, Co-operative and Para-Vet Sectors in a more inclusive and synchronous mechanism are being suggested by the present Authors.

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