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Livestock sector in north-eastern region of India: An appraisal of livestock production and population

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Abstract

In this article, livestock population and production trends of North Eastern states have been discussed. The production data have been taken for a period of 10 years (from 2011-12 to 2020-21) and population data from 1997 to 2019 livestock census. The data on livestock population, Production were compiled from different livestock censuses and various issues of Basic Animal Husbandry Statistics. The data showed that milk production has increased in all NE states, except Manipur and Nagaland during the period (2011-12 to 2020-21). The per capita milk availability had declined in Manipur and Nagaland as the total milk production has decreased in these two states. Three NE states, viz. Manipur, Nagaland and Sikkim registered a decline in egg production and also per capita egg availability during this period. Meat production has increased in all NE states, except Nagaland. Cattle showed positive growth rate in states like Assam, Meghalaya, Mizoram and Sikkim all other states showed negative growth rate since 1997 to 2019 census. Trends in Buffaloes population (CAGR) showed that all the NE states have negative growth rate since 1997 to 2019 census. Except Assam in all other NE states the sheep population has decreased during the said period. Goat population showed that all the NE states have positive growth rate since 1997 to 2019 census except Nagaland and Tripura.

Keywords: Livestock, census, population, production, trend

Introduction

The North East India comprises eight states, Arunachal Pradesh, Assam, Meghalaya, Manipur, Mizoram, Nagaland, Tripura (seven sister's states also known as "Paradise unexplored") and one brother state Sikkim. The region shares international border with Tibet, Myanmar, Bangladesh, Nepal and Bhutan. Livestock is an important component of mixed farming system. The north east region is known as meat consuming zone of India as people give preference for meat in their diets. There are no social taboos in taking any type of meat but the most preferred meat is pork, followed by beef, chicken and others. Consumption of milk and milk products is lower in this part in comparison to Northern states of India due to food habit and less availability of milk. In North eastern region, landholdings are small, fragmented and consist mostly of marginal mid-slopes and valley regions. The majority of farmers adopted mixed crop-livestock farming systems under different types of agro ecosystems. Due to difficult topography, less crop production, the NE region is poverty ridden and the issue of nutrition in the distant hills remains unresolved. Hence, enhancement of milk production especially in landless and marginal households may be of prime importance. About 30 per cent of landless and 48 per cent of marginal households keep livestock in the NE region (NSSO, 2003). Livestock sector plays important role in the rural economy as supplementing family incomes and generating gainful employment in the rural sector, particularly among the landless labourers, small and marginal farmers and women. Keeping the above points in view, for better understanding the potential of livestock sector, poverty alleviation, nutritional security and employment generation in hilly tracts of the NE region, it is pertinent to study the status and performance of the livestock sector in the North eastern region.

Data and Methodology

In this study, the data on livestock population (1997 to 2019 livestock census), Production

(2011-12 to 2020-21) were compiled from different livestock censuses, various issues of Basic Animal Husbandry Statistics, published by Department of Animal Husbandry and Dairying, Ministry of Agriculture, Government of India. The compounded annual growth rates (CAGR) were computed to examine the trends in livestock population of different species and production.

Results and Discussion

• Production trends

Trends in milk production have increased in all NE states, except Manipur and Nagaland (CAGR -1.12 and -3.63 percentages respectively). Arunachal Pradesh (8.01%), Mizoram (6.91%) Sikkim (5.66%) and Tripura (7.12%) have higher CAGR than at the national level (5.66%). This implies that in these states milk production has increased at a greater rate than at the national level during this period (2011-12 to 2020-21). There existed a considerable variation in growth rates (CAGR) of milk production across states in the NE. It varied from -3.63% in Nagaland to as high as 8.01% in Arunachal Pradesh in last 10 years. In Manipur and Nagaland, milk production witnessed a decline at a compounded annual rate of -1.12 and -3.63 percentage respectively. Such wide variations in milk production have implications on the trends of milk availability. The per capita milk availability had declined in Manipur and Nagaland as the total milk production has decreased in these two states. The states Arunachal Pradesh, Mizoram, Sikkim and Tripura the per capita availability of milk consumption growth rate (CAGR) was higher than national level in past 10 years. Sikkim was the only state where the people were getting 302 grams/day milk that is almost equal to the Indian Council of Medical Research (ICMR) recommended level 300 grams/day. In all other NE states the per capita availability of milk was very less as compared to the recommended level (Table 1).

Three NE states, viz. Manipur (-0.05%), Nagaland (-6.48%) and Sikkim (-4.34%) in fact registered a decline in egg production during this period (2011-12 to 2020-21). In other NE states, the compounded annual growth rate in egg production varied from 0.91% in Meghalaya to 6.99% in Tripura. Assam being the highest egg producing state in NE registered a very slow growth rate (1.23%). Manipur, Nagaland and Sikkim registered a decline in per capita egg availability during this period (2011-12 to 2020-21). In Assam and Meghalaya the per capita egg availability was almost constant. Tripura had shown the higher CAGR (5.84%) than national level (5.62%) during the said period. In all NE states the per capita availability of egg was very less as compared to the ICMR recommended level 180 eggs per head per annum (Table 2).

Trends in meat production have increased in all NE states, except Nagaland (CAGR -12.32%) during the period (2011-12 to 2020-21).

The CAGR was higher in Tripura (8.52%) as compared to the national level (5.13%), while Assam (5.30%) had almost equal CAGR as national level. There existed a considerable variation in growth rates (CAGR) of meat production across states in the NE. It varied from -12.32% in Nagaland to as high as 8.52% in Tripura during the said period. The per capita meat availability had declined in Meghalaya and Nagaland. In Tripura state the per capita availability of meat consumption growth rate (CAGR) was higher than national level during this period (2014-15 to 2020-21). Arunachal Pradesh, Meghalaya, Mizoram, Nagaland and Tripura the people were getting more meat than the Indian Council of

Medical Research (ICMR) recommended level 10.8 Kg per annum per person (Table 3).

• Livestock and Poultry population

Trends in cattle population (CAGR) showed that the population have decreased in Arunachal Pradesh (-1.36%), Manipur (-3.81%), Nagaland (-7.29%) and Tripura (-2.39%) since 1997 to 2019 census. Other NE states showed increased growth rate during the same period. Trends in Buffaloes population (CAGR) showed that all the NE states have negative growth rate since 1997 to 2019 census. The compounded annual growth rate for buffaloes population varied from -0.38% in Meghalaya to -4.49% in Manipur. At national level the cattle (-0.13%) have negative and buffaloes (0.96%) positive growth rate (CAGR) since 1997 to 2019 census (Table 4).

Trends in sheep population (CAGR) showed that except Assam (6.76%) in all other NE states the sheep population has decreased since 1997 to 2019 census. The compounded annual growth rate for sheep population varied from (-0.38%) in Meghalaya to (-6.01%) in Arunachal Pradesh. Trends in Goat population (CAGR) showed that all the NE states have positive growth rate since 1997 to 2019 census except Nagaland (-7.46%) and Tripura (-2.69%). The compounded annual growth rate for goat population varied from 0.17% in Arunachal Pradesh to 2.23% in Assam. At national level the sheep (1.23%) and goat (0.92%) have positive growth rate (CAGR) since 1997 to 2019 census (Table 5).

Trends in poultry population (CAGR) showed that all NE states have positive growth rate (CAGR) since 1997 to 2019 census. The compounded annual growth rate for poultry population varied from 0.71% in Tripura to 4.71% in Sikkim. The NE states Assam (4.59%), Meghalaya (4.46%) and Sikkim (4.71%) have higher poultry population growth rate than national level (4.36%) since 1997 to 2019 census. Trends in Pig population (CAGR) showed that the NE states Assam (3.21%), Arunachal Pradesh (0.41%), Meghalaya (3.39%), Mizoram (2.82%) and Sikkim (0.06%) showed positive growth rate since 1997 to 2019 census. The other NE states Manipur (-2.35%), Nagaland (-1.63%) and Tripura (-0.11%) showed negative growth rate during the same period. During the same period at national level the pig population has showed negative compounded growth rate of -1.81% (Table 6).

Trends in Yak population (CAGR) showed that in Arunachal Pradesh the growth rate was positive (2.98%) and negative in Sikkim (-0.11%) since 1997 to 2019 census. During the same period at national level the yak population has shown no growth. Trends in Mithun population (CAGR) showed that Arunachal Pradesh (5.07%) and Mizoram (2.03%) showed positive growth rate and Manipur (-2.86%) and Nagaland (-1.74%) negative growth rate since 1997 to 2019 census. During the same period at national level the Mithun population has showed positive compounded growth rate of -3.36% (Table 7).

Conclusion

In this paper, livestock population and production trends of North Eastern states have been discussed. Milk production has increased in all NE states, except Manipur and Nagaland during the period (2011-12 to 2020-21). The per capita milk availability had declined in Manipur and Nagaland as the total milk production has decreased in these two states. Three NE states, viz. Manipur, Nagaland and Sikkim registered a decline egg production and also per capita egg availability

during this period. Meat production has increased in all NE states, except Nagaland. Cattle showed positive growth rate in states like Assam, Meghalaya, Mizoram and Sikkim all other states showed negative growth rate since 1997 to 2019 census. Trends in Buffaloes population (CAGR) showed that all the NE states have negative growth rate since 1997 to 2019 census. Except Assam in all other NE states the sheep population has decreased during the said period. Goat population showed that all the NE states have positive growth rate since 1997 to 2019 census except Nagaland and Tripura. Trends in poultry population showed that all NE states have positive growth rate (CAGR) since 1997 to 2019 census. The pattern in Pig population (CAGR) showed that the NE states Assam, Arunachal Pradesh, Meghalaya, Mizoram and Sikkim showed positive growth rate since 1997 to 2019 census rest

NE states showed negative growth rate during the same period. Yak population (CAGR) showed Positive growth rate (CAGR) in Arunachal Pradesh and negative in Sikkim since 1997 to 2019 census. Mithun population (CAGR) showed that Arunachal Pradesh and Mizoram showed positive growth rate and Manipur and Nagaland negative growth rate during the same period. Due to increasing urbanization and income; demand of milk, eggs and meat are increasing day by day. But on the other side there is continuous decline in livestock population in many NE states. So it seems to be difficult to fulfil the demand in future. To meet the growing demand for livestock products, The NE states have to adopt competitive and sustainable livestock production technologies which not only increase the productivity, but have positive impact on environment and animal ethics.

Table 1: Milk production ('000 Tonnes) and per capita availability of milk (gram/day) in NE states

States	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	CAGR (%) during 2011-12 to 2020-21
Assam	796.0 (70)	799.67 (69)	814.52 (69)	829.47 (70)	843.46 (70)	861.27 (71)	871.89 (71)	882.27 (71)	919.94 (73)	954.07 (75)	2.03 (0.77)
Arunachal Pradesh	21.93 (44)	22.72 (49)	43.35 (93)	46.07 (88)	50.13 (95)	52.53 (99)	54.02 (100)	55.10 (101)	60.63 (110)	43.89 (79)	8.01 (6.72)
Manipur	78.61 (80)	80.03 (80)	81.70 (80)	82.17 (76)	78.97 (72)	78.82 (72)	81.66 (74)	85.75 (76)	89.65 (79)	71.05 (62)	-1.12 (-2.79)
Meghalaya	79.69 (74)	80.52 (83)	82.16 (84)	82.90 (74)	83.95 (74)	83.96 (74)	85.03 (74)	86.61 (74)	87.60 (74)	89.14 (75)	1.25 (0.15)
Mizoram	13.91 (35)	13.63 (36)	15.30 (40)	20.49 (50)	22.00 (52)	24.16 (57)	25.02 (59)	25.75 (60)	23.53 (54)	25.38 (58)	6.91 (5.77)
Nagaland	78.0 (108)	78.66 (94)	80.61 (95)	75.69 (102)	77.0 (102)	79.37 (104)	74.09 (96)	72.57 (93)	61.64 (78)	55.93 (71)	-3.63 (-4.55)
Sikkim	45.0 (202)	42.24 (186)	45.99 (200)	49.99 (217)	66.74 (286)	54.35 (231)	58.67 (247)	60.85 (254)	83.94 (345)	73.85 (302)	5.66 (4.57)
Tripura	111.0 (83)	118.04 (88)	129.70 (95)	141.23 (102)	152.23 (108)	159.59 (113)	174.26 (122)	185.27 (128)	198.60 (136)	206.17 (140)	7.12 (5.98)
All India (MT)	127.9 (289)	132.4 (296)	137.7 (303)	146.3 (319)	155.5 (333)	165.4 (351)	176.3 (370)	187.7 (390)	198.4 (406)	210.0 (427)	5.66 (4.43)

CAGR-Compounded Annual Growth Rate (%), MT= Million tonnes.

Figures in parentheses indicate Per Capita availability of milk (gram/day) of NE region.

Source: Basic Animal Husbandry Statistics (Year wise records from 2011 to 2021)

Table 2: Egg production (figures in lakh Nos.) and per capita availability of eggs in NE states (figures in number/annum)

States	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	CAGR (%) during 2011-12 to 2020-21
Assam	4705.0 (15)	4709.58 (15)	4717.34 (15)	4727.94 (15)	4740.48 (14)	4770.75 (14)	4951.84 (15)	5014.61 (15)	5148.75 (15)	5253.04 (15)	1.23 (0.00)
Arunachal Pradesh	419.0 (30)	438.68 (35)	400.02 (31)	417.26 (29)	427.31 (30)	495.21 (34)	550.08 (37)	594.64 (40)	604.92 (40)	638.51 (42)	4.79 (3.81)
Manipur	1149.17 (42)	1162.19 (42)	1163.81 (42)	1129.37 (38)	1037.40 (35)	992.00 (33)	1017.84 (33)	1053.24 (34)	1081.81 (35)	1141.63 (36)	-0.05 (-1.70)
Meghalaya	1021.14 (34)	1028.18 (39)	1049.36 (39)	1056.99 (34)	1063.66 (34)	1063.90 (34)	1073.71 (34)	1090.36 (34)	1102.02 (34)	1107.85 (34)	0.91 (0.00)
Mizoram	349.33 (32)	352.02 (34)	362.31 (35)	377.33 (33)	391.13 (34)	408.07 (35)	409.95 (35)	415.19 (35)	433.11 (36)	434.06 (36)	2.44 (1.32)
Nagaland	703.65 (36)	617.98 (27)	223.34 (10)	352.77 (17)	464.52 (22)	397.35 (19)	401.42 (19)	374.74 (18)	381.64 (18)	384.87 (18)	-6.48 (-7.41)
Sikkim	146.24 (24)	146.0 (23)	99.35 (16)	57.53 (9)	101.57 (16)	68.49 (11)	63.28 (10)	54.56 (08)	48.27 (07)	98.13 (15)	-4.34 (-5.09)
Tripura	1650.0 (45)	1565.17 (43)	1794.28 (48)	1979.49 (52)	2160.84 (56)	2294.26 (59)	2621.09 (67)	2759.56 (70)	2949.81 (74)	3031.68 (75)	6.99 (5.84)
All India (Million nos.)	66450 (55)	69731 (57)	74752 (60)	78484 (62)	82929 (65)	88137 (68)	95217 (73)	103804 (79)	114383 (86)	122049 (90)	6.99 (5.62)

Figures in parentheses indicate Per Capita availability of eggs (number/annum)

Table 3: Meat production (figures in '000 Tonnes) and per capita availability of meat in NE states (figures in Kg/Annum)

States	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	CAGR (%) during 2011-12 to 2020-21
Assam	34.20	36.60	38.30	42.58 (1.31)	44.76 (1.37)	46.86 (1.41)	48.35 (1.44)	50.40 (1.49)	52.96 (1.54)	54.42 (1.57)	5.30 (3.06)
Arunachal Pradesh	19.17	17.64	18.04	18.72 (13.10)	19.38 (13.42)	20.47 (14.03)	21.39 (14.51)	21.87 (14.69)	22.67 (15.08)	22.34 (14.70)	1.71 (1.94)
Manipur	24.43	25.02	25.01	26.56 (9.01)	26.27 (8.82)	27.47 (9.12)	27.70 (9.11)	28.05 (9.13)	28.70 (9.25)	29.30 (9.35)	2.04 (0.62)
Meghalaya	38.24	38.52	40.34	41.32 (13.49)	41.13 (13.28)	41.0 (13.10)	43.09 (13.63)	45.25 (14.17)	46.35 (14.38)	39.36 (12.09)	0.32 (-1.81)
Mizoram	13.16	12.08	12.19	12.56 (11.09)	13.55 (11.83)	14.79 (12.78)	15.68 (13.41)	16.11 (13.64)	16.41 (13.77)	15.06 (12.51)	1.51 (2.03)
Nagaland	77.90	70.64	67.48	66.98 (32.79)	35.93 (17.40)	31.37 (15.04)	32.40 (15.37)	32.28 (15.16)	32.09 (14.93)	23.87 (11.0)	-12.32 (-16.64)
Sikkim	3.0	3.0	3.0	3.0 (4.75)	5.84 (9.17)	4.40 (6.83)	4.40 (6.77)	3.72 (5.66)	3.76 (5.67)	3.12 (4.66)	0.44 (0.70)
Tripura	25.0	31.79	32.39	34.25 (9.03)	37.35 (9.74)	39.69 (10.25)	45.26 (11.56)	47.82 (12.10)	50.57 (12.67)	52.18 (12.94)	8.52 (6.18)
All India	5514.25	5948.17	6235.48	6691.08 (5.32)	7019.96 (5.51)	7385.61 (5.72)	7655.63 (5.86)	8114.45 (6.15)	8599.97 (6.45)	8787.91 (6.52)	5.31 (3.45)

Figures in parentheses indicate per capita availability of meat (Kg /Annum)

Table 4: Census wise cattle & buffalo population in north eastern states (figures in thousands)

States	1997		2003		2007		2012		2019		CAGR (%) during 1997 to 2019	
	Cattle	Buffalo	Cattle	Buffalo	Cattle	Buffalo	Cattle	Buffalo	Cattle	Buffalo	Cattle	Buffalo
Assam	8096	728	8439	678	10041.27	499.91	10307.60	435.27	10909.24	421.72	1.43	-2.57
Arunachal Pradesh	452	12	458	11	503.12	3.21	463.76	5.97	339.22	6.38	-1.36	-2.96
Manipur	508	95	418	77	341.96	62.17	263.84	66.37	224.47	36.23	-3.81	-4.49
Meghalaya	755	17	767	18	887.24	22.63	896.00	22.06	903.57	15.71	0.86	-0.38
Mizoram	34	5	36	6	34.93	5.83	34.57	5.17	45.70	2.11	1.42	-4.03
Nagaland	384	36	451	34	469.82	35.02	234.97	32.72	78.30	15.65	-7.29	-3.89
Sikkim	143	2	159	2	134.87	0.24	140.47	0.70	148.01	1.14	0.16	-2.64
Tripura	1228	18	759	14	954.39	14.26	948.79	10.81	739.03	7.13	-2.39	-4.31
All India (Million numbers)	198.88	89.92	185.18	97.92	199.08	105.34	190.90	108.70	193.46	109.85	-0.13	0.96

Table 5: Census wise sheep & goat population in north eastern states (figures in thousands)

States	1997		2003		2007		2012		2019		CAGR (%) during 1997 to 2019	
	Sheep	Goat	Sheep	Goat	Sheep	Goat	Sheep	Goat	Sheep	Goat	Sheep	Goat
Assam	84	2717	170	2987	353.80	4319.77	518.07	6169.19	332.10	4315.17	6.76	2.23
Arunachal Pradesh	27	154	19	231	19.88	292.12	13.55	305.54	7.35	159.74	-6.01	0.17
Manipur	8	33	6	33	8.70	50.58	11.46	65.16	5.92	38.69	-1.42	0.76
Meghalaya	17	280	18	327	21.04	365.48	20.09	473.07	15.68	397.50	-0.38	1.68
Mizoram	1	14	1	17	0.97	15.71	0.65	22.21	0.49	14.82	-3.34	0.27
Nagaland	2	161	4	175	3.65	178.07	3.84	99.35	0.36	31.60	-7.84	-7.46
Sikkim	5	86	6	124	2.54	92.0	2.63	113.36	2.02	90.51	-4.22	0.24
Tripura	6	639	3	472	3.69	633.05	3.11	610.92	5.46	360.20	-0.45	-2.69
All India (Million numbers)	57.49	122.72	61.47	124.36	71.56	140.54	65.07	135.17	74.26	148.88	1.23	0.92

Table 6: census wise poultry & pig population in north eastern states (figures in thousands)

States	1997		2003		2007		2012		2019		CAGR (%) during 1997 to 2019	
	Poultry	Pig	Poultry	Pig	Poultry	Pig	Poultry	Pig	Poultry	Pig	Poultry	Pig
Assam	18210	1082	21664	1543	29060.25	2000.43	27216.17	1636.02	46712.34	2099.00	4.59	3.21
Arunachal Pradesh	1292	249	1743	330	1348.43	355.58	2244.23	356.35	1599.58	271.46	1.02	0.41
Manipur	3055	388	2941	415	2304.24	313.88	2499.52	277.22	5897.64	235.26	3.18	-2.35
Meghalaya	2152	351	2821	419	3092.90	524.36	3400.03	543.38	5379.53	706.36	4.46	3.39
Mizoram	1306	163	1125	218	1239.19	267.36	1271.35	245.24	2047.81	292.47	2.17	2.82
Nagaland	2444	571	2788	644	2866.74	697.79	2178.47	503.69	2838.94	404.70	0.72	-1.63
Sikkim	221	27	322	38	117.50	35.25	451.97	29.91	580.86	27.32	4.71	0.06
Tripura	3595	211	3057	209	3277.35	263.69	4272.73	362.53	4168.25	206.04	0.71	-0.11
All India (Million numbers)	347.61	13.29	489.01	13.52	648.83	11.13	729.21	10.29	851.81	9.06	4.36	-1.81

Table 7: Census wise yak & mithun population in north eastern states (figures in thousands)

States	1997		2003		2007		2012		2019		CAGR (%) during 1997 to 2019	
	Yak	Mithun	Yak	Mithun	Yak	Mithun	Yak	Mithun	Yak	Mithun	Yak	Mithun
Arunachal Pradesh	13.0	124	9.0	192	14.25	218.93	14.06	249.0	24.075	350.15	2.98	5.07
Manipur	0	16.66	0	20	0	10.02	0	10.13	0	9.06	-	-2.86
Mizoram	0	2.594	0	2	0	1.94	0	3.29	0	3.98	-	2.03
Nagaland	0	33.45	0	40	0	33.39	0	34.87	0	23.12	-	-1.74
Sikkim	5.346	0	7	0	5.23	0	4.04	0	5.219	0	-0.11	-
All India (Million numbers)	0.06	0.2	0.06	0.3	0.08	0.3	0.08	0.3	0.06	0.4	0.0	3.36

Note: The Yak and Mithun population have not been found in Assam, Meghalaya and Tripura

Conflict of Interest

Not available

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