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Trends and Pattern of Poultry Production and Development in India, Special Reference to Karnataka

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Poultry farming in India, in spite of several hurdles, has progressed considerably during the last decade. The present study has been done to investigate many areas of the country's poultry production growth and development. Until recently, poultry production in India was limited to backyards. The study examined the trends and patterns of poultry population in Karnataka and in India. Secondary data was collected from the various livestock census reports from 1997 to 2019. Compound annual growth rate (CAGR) analysis is used to achieve the objective. The results revealed that the Karnataka's total poultry population was 213.99 lakh during 1997 census increased to 594.94 lakh in 2019. Kolar district has registered highest population of poultry 86.08 lakh accounting for 14.47 per cent of state population. The overall growth rate of all the districts of Karnataka was 32.67 per cent over years, whereas Kolar district stands in first position with a highest positive growth rate of 69.90 per cent.The country's poultry population has increased

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marginally from 3476.1 lakh in 1997 to 8078.9 lakh in 2019. Among states Tamil Nadu (14.73%) has registered highest poultry population.The country's overall growth rate was 22.57 per cent during 1997 to 2019. The study conclude that poultry sector plays an important role in economy by providing gainful employment. and supplementary income to the farmers in the rural areas. Among states, Tamil Nadu, Andhra Pradesh, Karnataka and Telangana were major states have registered highest poultry population. It is suggested promote the poultry development with incentive schemes in less aspirational districts and states which increase employment and income with nutritional security.

Keywords: Growth; poultry; development; policy.

1. INTRODUCTION

Livestock sector has emerged as an important segment of expanding and diversifying agricultural sector in the Indian economy [1] and plays a vital part for the socio-economic development of our country. Mankind has been utilizingdifferent animal species from the dawn of civilization for a variety of purposes *Viz.* production of milk, meat, egg and leather, draught power, companionship, entertainment, research experimentation, sports, security etc. Livestock wealth is deemed as the oldest wealth resource for mankind and was once a symbol of economic status in the society. The sector contributes significantly to the national economy besides being a source of livelihood for approximately 20 million people, particularly women, in principal or subsidiary status. In India, during 2015-16, 25.6 per cent of the agricultural GDP and 4.11 per cent to the national GDP was contributed by this sector. Livestock sector makes multifarious contribution to overall welfare of India's rural population in terms of generating a continuous stream of income and reducing seasonality in livelihood patterns particularly of the rural poor [2].

Livestock sector plays a critical role in the welfare of India's rural population. It contributes 9 per cent to Gross Domestic Product (GDP) and employs 8 per cent of the labour force. This sector is emerging as an important growth leverage of the Indian economy. As a component of agricultural sector, its share in GDP has been rising gradually, while that of crop sector has been on the decline. In recent years, livestock output has grown at a rate of about 5 per cent per annum, higher than the growth in agricultural sector. This enterprise provides a flow of' essential food products, draught power, manure, employment, income, and export earnings. Distribution of livestock wealth is more egalitarian, compared to land. Hence, from the equity and livelihood perspective it is considered as an important component in poverty alleviation programmes [3].

The present study has the following objectives.

- To estimate growth of poultry production in Karnataka and in India.
- To study the pattern of poultry production in Karnataka and in India.

2. METHODOLOGY

The study was based on time series data obtained from various published sources *viz*, livestock census reports, Animal Husbandry and Veterinary Services department, Government of Karnataka, Bengaluru.

2.1 Analytical Techniques Employed

2.1.1 Compound growth rate analysis

In order to assess the trend in poultry population in the study area, Karnataka and India as a whole, the compound growth rate analysis was employed. Compound growth rates were computed using the exponential function of the form,

$$Y_t = ab^t u_t \quad (1)$$

Where,

Y_t = Dependent variable
t = Years which take values 1, 2, …., n
a = Intercept
b = Regression coefficient
u_t = Disturbance term for the year t

For the purpose of estimation, equation (1) was transformed into log linear form and was estimated using ordinary least square (OLS) technique. The compound growth rate (g) in

percentage was then computed from the following relationship,

g = (Antilog of ln b-1) *100

The significance of regression coefficient was tested for their significance level using, 't' test which was defined as,

$$t=\frac{bi}{SE\ (bi)}$$

Where,

bi= Regression coefficient
SE (bi)= Standard error of the regression coefficient

3. RESULTS AND DISCUSSION

3.1 Pattern of Poultry Development in Karnataka

District wise poultry population in Karnataka is presented in Table 1 and Fig.1. It can be seen from the table that there exist huge differentials in the pattern of distribution of poultry population across the districts over different period of time between 1997 to 2019. The state poultry population has increased marginally from 213.99 lakh in 1997 to 594.94 lakh in 2019. Kolar district has registered highest population of poultry 86.08 lakh accounting for 14.47 per cent of state population. Followed by Bangalore rural (12.01%), Koppal (6.74%), Mysore (5.20%), Belgaum (4.45%), Dakshina Kannada (4.36%), Kodagu, Vijayapura, Yadgir, Haveri, Gulbarga districts constituted least proportion of poultry population in the state, which accounted less as compared to other districts in the state. The population of poultry in Kolar district rose from 9.96 lakh in 1997 to 86.08 lakh in 2019, which has increased more than three times in 2019 as compared to 1997 interms of its total share in state population. Koppal district's poultry population was 7.61 lakh during 1997 census increased to 40.09 lakh during 2019 census. Themain reasons for increase in poultry population were introduction of high yielding layers and broilers in the country, urbanization,change in lifestyle, preference for white meat instead of red meat, quick returns etc.

Similar results were reported by Dhawan and Kashish [4] they revealed that the poultry population was 54.6 lakh during 1997 census increased to 188.99 lakh during 2003 census and then showed a massive increase to 167.94 lakh during 2012 census which clearly indicated that poultry population was increasing with an overall growth rate of 7.98 per cent over the years.

3.2 Trends and Growth of Poultry Population in Karnataka

The growth rate of poultry population in different districts is presented in Table 2. Majority of the districts in Karnataka have showed the increased percentage in poultry population over the previous years. The results of the study revealed that Kolar district stands in first position with a highest positive growth rate (69.90%) as compared to all other districts of Karnataka and Chikkamangaluru district stands in second position with a growth rate of (56.69%) during 1997 to 2019 in the state. Among the districts Dharwad district showed a positive growth rate (52.33%) during 1997 to 2019 in the state. Koppal district's growth rate was 46.90 per cent and it stands in fourth position while its percentage change over previous livestock census was 13.42 per cent in 2019 and Koppal is followed by Hassan, Belgaum, Bangalore rural, Chitradurga, Chamarajanagara and Davanagere with a growth rate of 43.24 percent, 37.78 per cent, 37.68 per cent, 36.42 per cent, 35.67 per cent and 34.73 percent these are the ten districts which are in the top position in Karnataka. While Haveri, Bidar, Uttarakannada, Bijapur, Kodagu and Gulbarga districts showed a negative growth rate of -0.97 per cent, -1.64 per cent, -5.63 per cent, -10.28 per cent, -13.57 per cent and -17.68 per cent respectively. Where all the five districts showed a positive percentage over previous year except Haveri district which showed a negative percentage (-56.59%) over previous year.

While the overall growth rate of all the districts of Karnataka was 32.67 per cent where percentage change over previous livestock census was11.33 per cent over the previous year and the population of livestock also increased from 534.42 lakh in 2012 to 594.94 lakh in 2019. The positive growth rate was noticed in the state. It indicated that still scope for further expansion of poultry industry consider nutritional security and increased trends in per capita income.

Table 2 revealed that there was a positive trend and growth in the state with Kolar at first place

and Koppal is at fourth place. The reasons attributed for positive trend and growth in the state were good infrastructure, veterinary health care, updated knowledge on par with global level, proper pricing mechanism, etc. Similar results were reported by Sonavale et al. [5] they analysed that the poultry population was highest accounted to be 5.84 per cent and lowest accounted to be (2.14 per cent) in the fifth and first period. The entire period growth rate of poultry was significantly increased with 3.92 per cent per annum.

3.3 Pattern of Poultry Development in India

State wise poultry population in India is presented in Table 3 and Fig. 2. It can be seen from the table that there exist huge differentials in the pattern of distribution of poultry population across the states over different period of time between 1997 to 2019. The country's poultry population has increased marginally from 3476.11 lakh in 1997 to 8078.94 lakh in 2019. Tamilnadu state has registered highest population of poultry 1190.26 lakh accounting for 14.73 per cent of India's poultry population followed by Andhra Pradesh (13.16%), Telangana (9.76%), Maharashtra (8.94%), West bengal (7.94%) and Karnataka (7.35%) respectively. The main reasons for increase in poultry population were introduction of high yielding layers and broilers in the country, urbanization, increase in per capita income, change in lifestyle, preference for white meat instead of red meat, quick returns etc. While, Pondicherry, Dadar and Nagar Haveli, Chandigarh, Delhi, Daman and Diu states/UT's has constituted least proportion of poultry population in India,which accounted less as compared to other states/UT's in India. Karnataka state saw an indefinite pattern of growth in the poultry population where it decreased in 2003 as compared to 1997 but it increased continuously in the upcoming year until 2012 where it increased from 6.48 per cent in 2007 to 7.64 per cent in 2012 and later it decreased to 7.35 per cent in 2019. Similar results were reported by Dhawan and Kashish [4] they revealed that the poultry population was 54.6 lakh during 1997 census increased to 188.99 lakh during 2003 census and then showed a massive increase to 167.94 lakh during 2012 census which clearly indicated that poultry population was increasing with an overall growth rate of 7.98 per cent over the years.

3.4 Trends and growth of poultry population in India

Majority of the states in India have showed the increased percentage in poultry population over the previous years. The growth rate of poultry population in different states/UT's is presented in Table 4. The results of the study revealed that Uttaranchal state stands in first position with a highest positive growth rate (79.48%) as compared to all other states/UT in India and Haryana state stands in second position with a growth rate of (54.15%) during 1997 to 2019 in the country. Among states Chattisgarh state showed a positive growth rate (33.08%) during 1997 to 2019 in the country. Karnataka state'sgrowth rate was 31.89 per cent and it stands in fourth position while its percentage change over previous livestock census was 12.31 per cent in 2019 and Karnataka was followed by Gujrat, Tamilnadu, Rajasthan, Sikkim, Maharashtra and Lakshadweep with a growth rate of 31.11 percent, 30.07 per cent, 29.67 per cent, 25.35 per cent, 23.67 per cent and 23.18 percent these are the ten states which are in the top position in India. Whereas, Tripura, Arunachal Pradesh, Nagaland, Bihar, Daman and Diu shown a negative growth rate of -0.65 per cent, -1.03 per cent, -1.35 per cent, -5.87 per cent, -6.26 per cent respectively. Where all the four states showed a positive percentage over previous year except Daman and Diu UT which showed a negative percentage (-33.33) over previous year.

While the total growth rate of state/UT of India was 22.57 per cent where percentage change over previous livestock census was 16.67 per cent and the population of livestock also increased from 6926.5 lakh in 2012 to 8078.9 lakh in 2019.The positive growth rate was noticed in the country.

Table 4. revealed that there was a positive trend and growth in the country with Uttaranchal at first place and Karnataka at fourth place. The reasons attributed for positive trend and growth in the country were introduction of high yielding layers and broilers in the country, government support for financing by the banks, introduction of poultry insurance scheme under Indian Rural Development Programme (IRDP), change in lifestyle, etc. The findings of the study are inline with Dubey et al. [6] in the study they revealed that the population of poultry increased with substantial growth rates in most of the divisions of Uttar Pradesh and in state as a whole [7-14].

Table 1. Pattern of poultry development in Karnataka (Poultry population in Lakhs)

Sl.No.	Districts	1997	%	2003	%	2007	%	2012	%	2019	%
1	Bangalore U	14.30	6.68	6.41	2.62	14.54	3.43	24.21	4.53	13.02	2.19
2	Bangalore R	23.62	11.04	30.52	12.48	41.11	9.69	81.66	15.28	71.45	12.01
3	Belgaum	9.56	4.47	8.52	3.49	13.41	3.16	27.38	5.12	26.49	4.45
4	Bellary	16.10	7.52	20.79	8.50	36.47	8.59	27.24	5.10	18.44	3.10
5	Bidar	6.59	3.08	5.90	2.41	7.53	1.77	4.03	0.75	7.34	1.23
6	Bijapur	4.28	2.00	3.63	1.48	3.46	0.82	3.00	0.56	2.73	0.46
7	Chikkamangaluru	4.05	1.89	4.41	1.80	14.77	3.48	11.78	2.20	23.37	3.93
8	Chitradurga	6.03	2.82	9.00	3.68	17.74	4.18	24.12	4.51	17.42	2.93
9	Dakshina Kannada	10.79	5.04	8.91	3.64	13.23	3.12	17.22	3.22	25.96	4.36
10	Dharwad	3.04	1.42	3.10	1.27	4.38	1.03	9.04	1.69	14.60	2.45
11	Gulbarga	7.11	3.32	7.36	3.01	4.87	1.15	3.63	0.68	3.83	0.64
12	Hassan	7.16	3.34	7.67	3.14	12.43	2.93	25.79	4.83	23.53	3.96
13	Kodagu	3.36	1.57	2.70	1.10	3.20	0.75	2.08	0.39	1.85	0.31
14	Kolar	9.96	4.66	15.93	6.51	34.37	8.10	42.76	8.00	86.08	14.47
15	Mandya	9.33	4.36	7.36	3.01	16.26	3.83	12.94	2.42	21.85	3.67
16	Mysore	10.49	4.90	17.91	7.32	32.93	7.76	30.65	5.74	30.96	5.20
17	Raichur	2.78	1.30	5.35	2.19	3.74	0.88	3.73	0.70	3.98	0.67
18	Shivamogga	9.69	4.53	5.76	2.35	17.21	4.06	17.39	3.25	20.66	3.47
19	Tumkur	8.00	3.74	6.42	2.63	12.66	2.98	21.08	3.94	16.28	2.74
20	Uttara Kannada	7.20	3.36	5.75	2.35	6.82	1.61	5.37	1.00	5.57	0.94
21	Bagalkote	5.83	2.73	8.41	3.44	11.22	2.64	13.72	2.57	17.03	2.86
22	Chamarajnagar	2.03	0.95	2.28	0.93	2.79	0.66	3.77	0.71	7.26	1.22
23	Davanagere	8.16	3.81	15.28	6.25	20.54	4.84	31.93	5.98	25.06	4.21
24	Gadag	1.91	0.89	1.40	0.57	1.78	0.42	1.56	0.29	4.16	0.70
25	Haveri	5.29	2.47	5.16	2.11	6.45	1.52	8.85	1.66	3.84	0.65
26	Koppal	7.61	3.55	20.98	8.58	35.42	8.35	35.34	6.61	40.09	6.74
27	Udupi	9.70	4.53	7.62	3.12	11.01	2.60	11.94	2.23	11.43	1.92
28	Ramanagara	-	-	-	-	8.77	2.07	12.85	2.40	23.57	3.96
29	Chikkaballapur	-	-	-	-	10.96	2.58	16.61	3.11	23.83	4.00
30	Yadgir	-	-	-	-	4.27	1.01	2.75	0.52	3.26	0.55
	Total	213.99	100.00	244.51	100.00	424.34	100.00	534.42	100.00	594.94	100.00

Source: Various Livestock census reports, Department of AH and VS, GOK, 2019

Table 2. Trends and growth of poultry population in Karnataka

Sl.No.	Districts	Population (in Lakhs)					% Change over previous livestock census				CAGR (%)
		1997	2003	2007	2012	2019	2003	2007	2012	2019	1997-2019
1	Bangalore U	14.30	6.41	14.54	24.21	13.02	-55.20	126.82	66.57	-46.22	12.09
2	Bangalore R	23.62	30.52	41.11	81.66	71.45	29.20	34.69	98.65	-12.50	37.68
3	Belgaum	9.56	8.52	13.41	27.38	26.49	-10.85	57.37	104.12	-3.27	37.78
4	Bellary	16.10	20.79	36.47	27.24	18.44	29.13	75.40	-25.31	-32.30	5.56
5	Bidar	6.59	5.90	7.53	4.03	7.34	-10.42	27.55	-46.50	82.31	-1.64
6	Bijapur	4.28	3.63	3.46	3.00	2.73	-15.28	-4.45	-13.39	-8.87	-10.28
7	Chikkamangaluru	4.05	4.41	14.77	11.78	23.37	8.99	235.00	-20.21	98.30	**56.69**
8	Chitradurga	6.03	9.00	17.74	24.12	17.42	49.27	97.05	35.93	-27.79	36.42
9	Dakshina Kannada	10.79	8.91	13.23	17.22	25.96	-17.42	48.44	30.16	50.74	27.30
10	Dharwad	3.04	3.10	4.38	9.04	14.60	1.77	41.32	106.65	61.46	52.33
11	Gulbarga	7.11	7.36	4.87	3.63	3.83	3.43	-33.75	-25.58	5.56	-17.68
12	Hassan	7.16	7.67	12.43	25.79	23.53	7.18	62.07	107.45	-8.74	43.24
13	Kodagu	3.36	2.70	3.20	2.08	1.85	-19.69	18.65	-35.06	-11.20	-13.57
14	Kolar	9.96	15.93	34.37	42.76	86.08	59.84	115.82	24.39	101.33	**69.90**
15	Mandya	9.33	7.36	16.26	12.94	21.85	-21.15	120.98	-20.42	68.92	25.44
16	Mysore	10.49	17.91	32.93	30.65	30.96	70.65	83.87	-6.90	1.00	31.01
17	Raichur	2.78	5.35	3.74	3.73	3.98	92.38	-29.96	-0.47	6.79	3.64
18	Shivamogga	9.69	5.76	17.21	17.39	20.66	-40.60	199.02	1.04	18.79	29.95
19	Tumkur	8.00	6.42	12.66	21.08	16.28	-19.71	97.08	66.50	-22.75	29.81
20	Uttara Kannada	7.20	5.75	6.82	5.37	5.57	-20.13	18.57	-21.22	3.80	-5.63
21	Bagalkote	5.83	8.41	11.22	13.72	17.03	44.11	33.46	22.31	24.13	30.12
22	Chamarajnagar	2.03	2.28	2.79	3.77	7.26	12.31	22.13	35.44	92.36	35.67
23	Davanagere	8.16	15.28	20.54	31.93	25.06	87.18	34.47	55.47	-21.53	34.73
24	Gadag	1.91	1.40	1.78	1.56	4.16	-26.64	26.78	-12.18	166.29	18.07
25	Haveri	5.29	5.16	6.45	8.85	3.84	-2.42	25.08	37.22	-56.59	-0.97
26	Koppal	7.61	20.98	35.42	35.34	40.09	175.89	68.82	-0.22	13.42	46.90
27	Udupi	9.70	7.62	11.01	11.94	11.43	-21.47	44.54	8.41	-4.25	8.08
28	Ramanagara	-	-	8.77	12.85	23.57	-	-	46.52	83.48	-
29	Chikkaballapur	-	-	10.96	16.61	23.83	-	-	51.53	43.47	-
30	Yadgir	-	-	4.27	2.75	3.26	-	-	-35.55	18.46	-
	TOTAL	213.99	244.51	424.34	534.42	594.94	14.26	73.55	25.94	11.33	32.67

Source: Various Livestock census reports, Department of AH and VS, GOK, 2019

Table 3. Pattern of poultry development in India(Poultry population in Lakhs)

Sl.No.	States/UT's	1997	% share	2003	% share	2007	% share	2012	% share	2019	% share
1	Andhra Pradesh	633.96	18.24	1022.78	20.92	1239.81	19.11	1603.1	23.14	1063.55	13.16
2	Arunachal Pradesh	12.92	0.37	17.43	0.36	13.48	0.21	12.07	0.17	14.74	0.18
3	Assam	182.1	5.24	216.64	4.43	290.6	4.48	197.33	2.85	337.66	4.18
4	Bihar	198.9	5.72	139.11	2.84	114.2	1.76	122.36	1.77	156.72	1.94
5	Chhatisgarh	67.71	1.95	81.81	1.67	142.46	2.20	190.62	2.75	185.13	2.29
6	Goa	7.90	0.23	5.66	0.12	5.05	0.08	2.91	0.04	3.48	0.04
7	Gujarat	72.36	2.08	81.53	1.67	133.52	2.06	135.6	1.96	217.4	2.69
8	Haryana	92.25	2.65	136.19	2.79	287.85	4.44	420.05	6.06	457.2	5.66
9	Himachal Pradesh	8.65	0.25	7.67	0.16	8.1	0.12	9.69	0.14	13.02	0.16
10	Jammu and Kashmir	55.57	1.60	55.68	1.14	66.83	1.03	81.34	1.17	72.88	0.90
11	Jharkhand	-	-	144.29	2.95	112.31	1.73	128.87	1.86	230.05	2.85
12	Karnataka	213.99	6.16	255.93	5.23	420.68	6.48	528.89	7.64	594.01	7.35
13	Kerala	183.97	5.29	122.16	2.50	156.86	2.42	217.11	3.13	271.66	3.36
14	Madhya Pradesh	72.61	2.09	117.05	2.39	73.84	1.14	118.72	1.71	165.85	2.05
15	Maharashtra	353.92	10.18	379.68	7.76	647.56	9.98	763.2	11.02	722.24	8.94
16	Manipur	30.55	0.88	29.41	0.60	24.03	0.37	19.28	0.28	41.29	0.51
17	Meghalaya	21.52	0.62	28.21	0.58	30.93	0.48	33.39	0.48	53.19	0.66
18	Mizoram	13.07	0.38	11.25	0.23	12.39	0.19	12.60	0.18	20.34	0.25
19	Nagaland	24.44	0.70	27.89	0.57	31.56	0.49	20.45	0.30	26.67	0.33
20	Orissa	184.35	5.30	176.11	3.60	206.00	3.18	194.23	2.80	269.76	3.34
21	Punjab	110.22	3.17	107.79	2.20	106.85	1.65	160.69	2.32	175.8	2.18
22	Rajasthan	44.06	1.27	61.92	1.27	49.94	0.77	79.12	1.14	142.91	1.77
23	Sikkim	2.21	0.06	3.22	0.07	1.57	0.02	4.51	0.07	5.78	0.07
24	Tamilnadu	365.11	10.50	865.91	17.71	1281.08	19.75	1129.54	16.31	1190.26	14.73
25	Telangana	-	-	-	-	-	-	-	-	788.42	9.76
26	Tripura	35.95	1.03	30.57	0.63	37.01	0.57	34.64	0.50	32.69	0.40
27	Uttar Pradesh	121.16	3.49	117.18	2.40	87.54	1.35	181.52	2.62	48.76	0.60
28	Uttaranchal	9.71	0.28	19.84	0.41	26.02	0.40	46.1	0.67	118.64	1.47
29	West Bengal	333.09	9.58	606.56	12.40	862.1	13.29	462.16	6.67	641.4	7.94
30	Andaman and Nicobar Islands	8.01	0.23	9.31	0.19	9.79	0.15	10.61	0.15	11.49	0.14
31	Chandigarh	3.04	0.09	1.52	0.03	1.29	0.02	1.08	0.02	0.43	0.01
32	Dada and Nagar Haveli	4.11	0.12	1.06	0.02	1.70	0.03	0.80	0.01	0.88	0.01
33	Daman and Diu	0.24	0.01	0.29	0.01	0.26	0.00	0.27	0.00	0.18	0.00
34	Delhi	6.47	0.19	4.59	0.09	0.02	0.00	0.41	0.01	0.41	0.01
35	Lakshadweep	0.79	0.02	1.46	0.03	1.67	0.03	1.63	0.02	2.12	0.03
36	Pondicherry	1.21	0.03	2.44	0.05	2.09	0.03	1.56	0.02	1.95	0.02
	Total	3476.11	100.00	4890.12	100.00	6487.00	100.00	6926.46	100.00	8078.94	100.00

Source: Various Livestock census reports, Department of AH and VS, GOK, 2019

Table 4. Trends and growth of poultry population in India

Sl.No.	States/UT's	Poultry population (in Lakhs)					% Change over previous livestock census				CAGR (%)
		1997	2003	2007	2012	2019	2003	2007	2012	2019	1997-2019
1	Andhra Pradesh	633.96	1022.8	1239.8	1603.1	1063.6	61.33	21.22	29.30	-33.66	16.00
2	Arunachal Pradesh	12.92	17.43	13.48	12.07	14.74	34.91	-22.66	-10.46	22.12	-1.03
3	Assam	182.1	216.64	290.6	197.33	337.66	18.97	34.14	-32.10	71.11	12.09
4	Bihar	198.9	139.11	114.2	122.36	156.72	-30.06	-17.91	7.15	28.08	-5.87
5	Chhatisgarh	67.71	81.81	142.46	190.62	185.13	20.82	74.14	33.81	-2.88	33.08
6	Goa	7.90	5.66	5.05	2.91	3.48	-28.35	-10.78	-42.38	19.59	-20.59
7	Gujarat	72.36	81.53	133.52	135.6	217.4	12.67	63.77	1.56	60.32	31.11
8	Haryana	92.25	136.19	287.85	420.05	457.2	47.63	111.36	45.93	8.84	54.15
9	Himachal Pradesh	8.65	7.67	8.10	9.69	13.02	-11.33	5.61	19.63	34.37	11.09
10	Jammu and Kashmir	55.57	55.68	66.83	81.34	72.88	0.20	20.03	21.71	-10.40	9.65
11	Jharkhand	-	144.29	112.31	128.87	230.05	-	-22.16	14.74	78.51	-
12	Karnataka	213.99	255.93	420.68	528.89	594.01	19.60	64.37	25.72	12.31	31.89
13	Kerala	183.97	122.16	156.86	217.11	271.66	-33.60	28.41	38.41	25.13	14.51
14	Madhya Pradesh	72.61	117.05	73.84	118.72	165.85	61.20	-36.92	60.78	39.70	18.13
15	Maharashtra	353.92	379.68	647.56	763.2	722.24	7.28	70.55	17.86	-5.37	23.67
16	Manipur	30.55	29.41	24.03	19.28	41.29	-3.73	-18.29	-19.77	114.16	1.82
17	Meghalaya	21.52	28.21	30.93	33.39	53.19	31.09	9.64	7.95	59.30	21.88
18	Mizoram	13.07	11.25	12.39	12.60	20.34	-13.93	10.13	1.69	61.43	10.49
19	Nagaland	24.44	27.89	31.56	20.45	26.67	14.12	13.16	-35.20	30.42	-1.35
20	Orissa	184.35	176.11	206.00	194.23	269.76	-4.47	16.97	-5.71	38.89	8.97
21	Punjab	110.22	107.79	106.85	160.69	175.8	-2.20	-0.87	50.39	9.40	14.26
22	Rajasthan	44.06	61.92	49.94	79.12	142.91	40.54	-19.35	58.43	80.62	29.67
23	Sikkim	2.21	3.22	1.57	4.51	5.78	45.70	-51.24	187.26	28.16	25.35
24	Tamilnadu	365.11	865.91	1281.1	1129.5	1190.3	137.16	47.95	-11.83	5.38	30.07
25	Telangana	-	-	-	-	788.42	-	-	-	-	-
26	Tripura	35.95	30.57	37.01	34.64	32.69	-14.97	21.07	-6.40	-5.63	-0.65
27	Uttar Pradesh	121.16	117.18	87.54	181.52	48.76	-3.28	-25.29	107.36	-73.14	-12.91
28	Uttaranchal	9.71	19.84	26.02	46.1	118.64	104.33	31.15	77.17	157.35	79.48
29	West Bengal	333.09	606.56	862.1	462.16	641.4	82.10	42.13	-46.39	38.78	10.94
30	Andaman and Nicobar Islands	8.01	9.31	9.79	10.61	11.49	16.23	5.16	8.38	8.29	8.90
31	Chandigarh	3.04	1.52	1.29	1.08	0.43	-50.00	-15.13	-16.28	-60.19	-34.65
32	Dada and Nagar Haveli	4.11	1.06	1.70	0.80	0.88	-74.21	60.38	-52.94	10.00	-28.57
33	Daman and Diu	0.24	0.29	0.26	0.27	0.18	20.83	-10.34	3.85	-33.33	-6.26
34	Delhi	6.47	4.59	0.02	0.41	0.41	-29.06	-99.56	1950.00	0.00	-54.77
35	Lakshadweep	0.79	1.46	1.67	1.63	2.12	84.81	14.38	-2.40	30.06	23.18
36	Pondicherry	1.21	2.44	2.09	1.56	1.95	101.65	-14.34	-25.36	25.00	5.20
	Total	3476.11	4890.12	6487.00	6926.46	8078.94	40.68	32.66	6.77	16.64	22.57

Source: Various Livestock census reports, Department of AH and VS, GOK, 2019
**CAGR- Compound Annual Growth Rate*

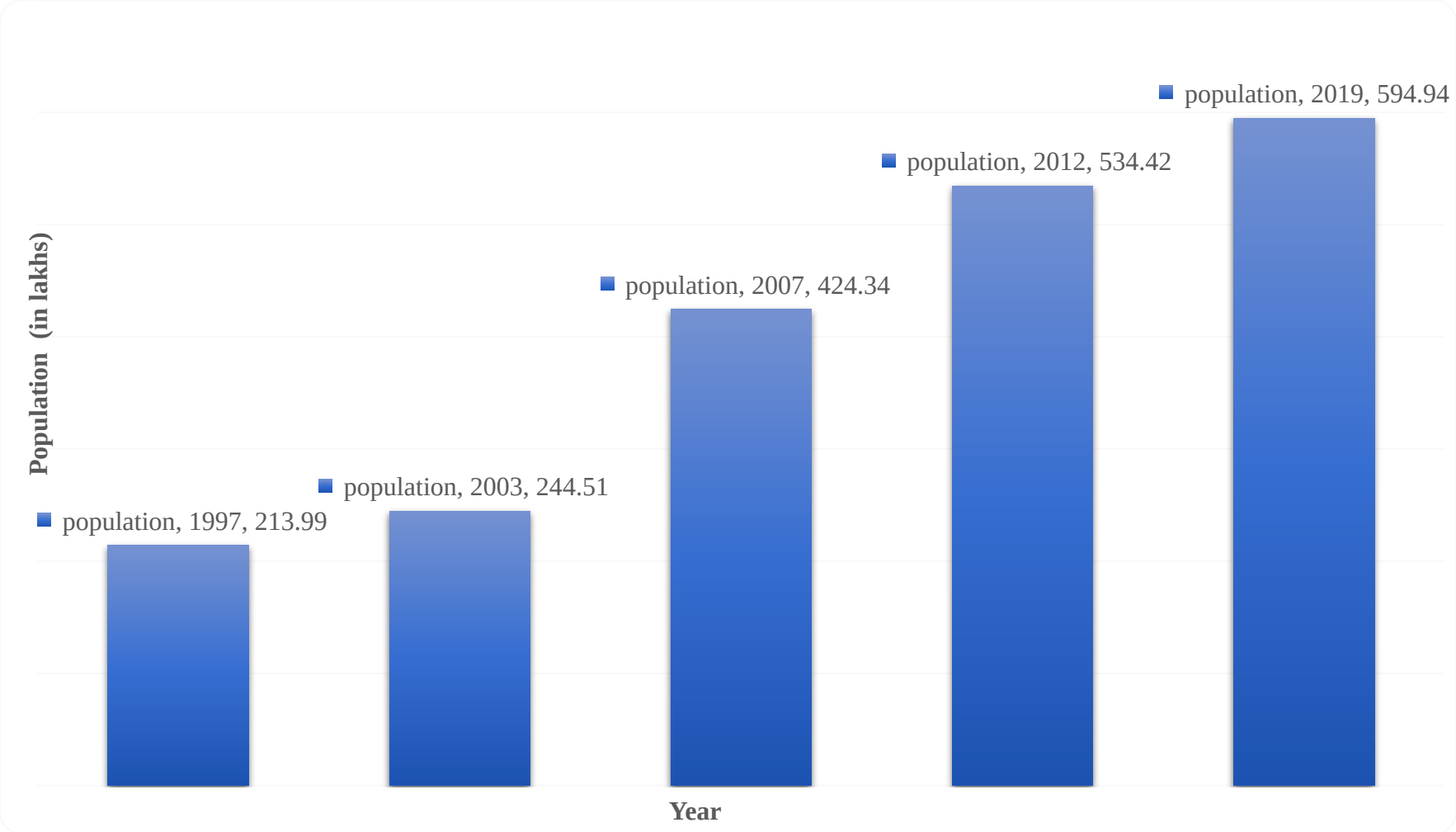

Fig. 1. Pattern of poultry development in Karnataka

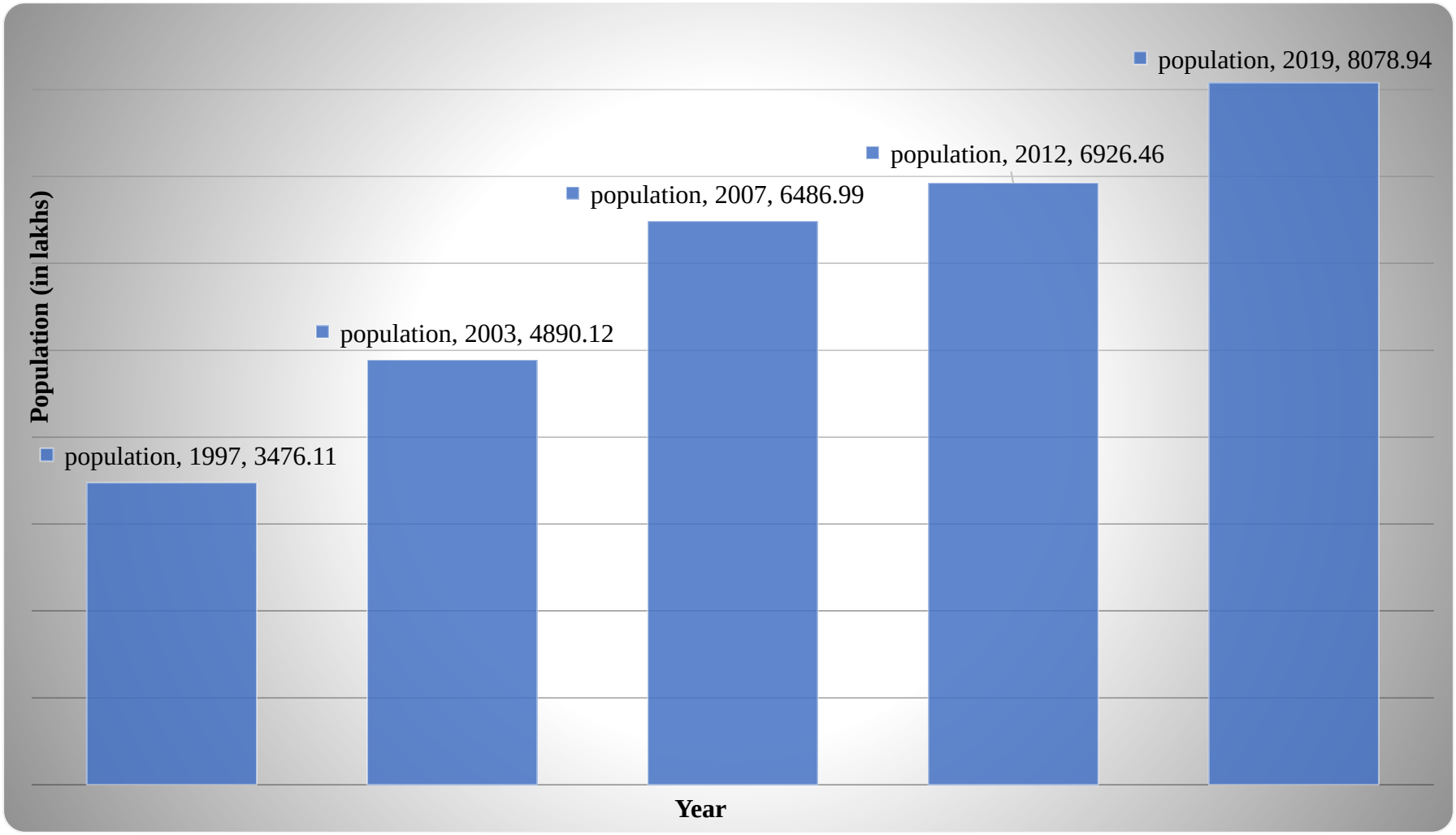

Fig. 2. Pattern of poultry development in India

4. CONCLUSION AND POLICY IMPLICATIONS

Poultry sector plays an important role in economy by providing gainful employment. and supplementary income to the farmers in the rural areas. Among states, Tamil Nadu, Andhra Pradesh, Karnataka and Telangana were major states have registered highest poultry population. It is suggested promote the poultry development with incentive schemes in aspirational districts and states of the country to increase employment and income along with nutritional security of people. There is a need for promotion with incentives for on farm construction of proper storage and processing of eggs and broilers to handle the price fluctuations and gets benefited from higher prices during peak demand.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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