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Livestock production and growth in Telangana: A district wise analysis

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Abstract
India has the world's largest livestock population and Telangana is the eighth largest state in livestock population in the country. Telangana state also exhibited second highest population growth rate over the previous livestock census. Considering the substantial share in state Gross Domestic Product (4.86%) and sub sectoral contribution (49.73% in primary sector) of livestock sector, the objective of study was to analyse the species wise trends of livestock across districts of Telangana state. The district wise secondary data of population of cattle, buffalo, goat and sheep extracted from the livestock censuses from 2003 to 2019 were used in the study. The relative importance of different livestock species among the major livestock producing districts of Telangana were elicited. Compound Annual Growth Rate (CAGR) was utilised to investigate the growth and performance of livestock production in Telangana. Mahabubnagar district ranked first in total livestock population as well as in sheep population and second in buffalo population. A positive percentage growth was observed for buffalo, sheep and goat whereas, cattle population showed a negative growth rate over the previous livestock census. The CAGR for buffalo, sheep and goat population was observed to be positive (1.61%, 16.09% and 12.94% respectively) whereas cattle population exhibited negative CAGR (-5.68%). In regard of the declining population of cattle during the study period, specific policy intervention should be made for supporting the cattle farmers. Promotional and extension activities may be stimulated for the export of meat, as the small ruminant production registered a positive growth in the study period.

Keywords: Livestock, cattle, buffalo, sheep, goat, growth, Telangana

1. Introduction
Livestock sector plays an irreplaceable role in the world agriculture. It is the backbone of global food system and contributes to poverty reduction, food security and agricultural development. According to the FAO, 40 per cent of the global value of agricultural output is contributed by livestock. It supports the livelihoods as well as the food and nutrition security of almost 1.3 billion people around the world (World bank, 2021). In developing countries, livestock contribute up to 80 per cent of agricultural GDP and 600 million rural poor people depend on livestock for their livelihoods (ILRI, 2023). The rapid increase in demand for livestock products, increased population growth, urbanization and increasing incomes in developing countries are fastening the global livestock sector.

In India's agricultural sector also, livestock is the major contributor and acts as a catalyst in helping rural households to achieve their livelihood goals. It enhances the human capital by providing access to food, continued good health, and labour for the pursuit of living. Livestock also build the social capital by strengthening the cultural diversity and heritage of several ethnic groups and populations. They contribute to the stock of the natural capital that provides the resources and services needed to maintain and improve livelihoods. During the year 2021-22, the Gross Value Added at basic prices (2011-12) by livestock sector alone contributed 65,49,370 crores. (DES, 2022)

Telangana, the youngest state in India was formed in 2014 occupying geographical area of 112,077 Sq. Kms with 33 districts. The state comprises of 83.04 lakhs households with a population of 350.04 lakhs. The state has 27 important crops cultivated in Kharif and Rabi seasons put together, with a gross cropped area of 56.90 lakh ha.

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The major crops grown are rice (14.19 lakh ha), maize (6.63 lakh ha), pulses (6.11 lakh ha), groundnut (1.89 lakh ha), cotton (18.13 lakh ha), chillies (0.83 lakh ha) and sugarcane (0.41 lakh ha).

Livestock plays a pivotal role in the economy of Telangana. Livestock contributes 4.86 per cent to the State GDP. Considering the sub sector shares, currently livestock accounts for 49.73 per cent of the overall primary sector, followed by crops at 44.66 per cent. Gross Value Added (GVA) at current prices in Agriculture, forestry, livestock and fisheries has shown a CAGR of 13.94 per cent in Telangana between 2014-15 to 2021-22. Livestock sector was a major driver of this growth with a CAGR of 18.2 per cent. (Telangana socio economic outlook, 2022). Percentage contribution of Livestock in GVA of agriculture and allied sector as well as in total GVA at basic prices is also found to be increasing over the years in Telangana's economy. Livestock sector is emerging as one of the most potential and income generating sectors of agriculture in Telangana state.

Among all the states of India, Telangana ranks eight in total livestock population. Telangana holds a major share in the small ruminant population, and has the highest sheep population in the country. About 29 lakh families in Telangana state are engaged in livestock activities for their livelihood and livestock sector provides employment opportunities in the rural and semi urban areas. In the state-wise share of different livestock products in India, 2.81 per cent of milk production, 13.31 per cent of egg production, 8.42 per cent of meat production and 9.11 per cent in wool production is accounted by Telangana. The value of output from livestock at constant prices (2011-12) from 2011-12 to 2019-20 shows a CAGR of 7.07 per cent in Telangana (Kumar, 2019; 2022) [10, 11]. As the economy progresses, the consumption pattern shifts from a cereal based consumption to protein-based consumption, implying scope for the growth and export potential of livestock sector.

Telangana is predominantly characterised by dryland areas with frequent occurrence of droughts. The annual rainfall is 906 mm with 30.3 per cent deviation from the normal annual rainfall of 1180 mm (DES, 2022). Even though the crop sector contribution drastically reduced during the drought years (2014-15 and 2015-16), livestock sector contribution was stable and exhibited increasing trend. It provides additional income and employment to the farmers as well as acts as important buffer against external shocks by providing a safety net against drought and minimizing the risks due to crop failure (Samuel *et al*, 2021; Reddy, 2020; Abed and Acosta, 2018) [14, 13, 1]. Also, in integrated farming systems, livestock component substantially added the income of farmers (Archana *et al*, 2022) [2]. Therefore, the present study has been undertaken with the objective to analyse the trends in different species of livestock across the districts of Telangana state.

2. Materials and Methods
Secondary data was used to study the growth and performance of livestock in Telangana. It was sourced from Livestock Census, Telangana Socio Economic Outlook 2022, Telangana State at a Glance 2022, Basic Animal Husbandry and Fisheries Statistics etc. The species wise composition and changes over the years were derived by studying the population of large ruminants (cattle & buffalo) and small ruminants (sheep and goat) individually.

The data was compiled and analysed using descriptive statistics and Compound Annual Growth Rate (CAGR). The logarithmic form of the compound growth function is,

$\log Y_t = \log a + t\log b + u$

where,

Y_t = Population in the year t

t = time period

a = intercept value

u = error term

log a and log b are obtained by application of ordinary least square (OLS) procedure to above formula and the growth rate, r is computed as below:

r = Anti log of $(\log b - 1) \times 100$

Data on livestock population of different species from available published reports from 2003 to 2019 is used for CAGR analysis.

3. Results and Discussion
3.1 Livestock population in Telangana state
The livestock population census is conducted by Animal Husbandry and Dairying Departments of States/UT's under the central sector scheme with 100 per cent central grant from the Department of Animal Husbandry and Dairying in the Ministry of Fisheries, Animal Husbandry and Dairying for proper planning and formulation of any programme meant for bringing improvement in the livestock sector. The livestock census in the country was started in the year 1919. Twenty livestock censuses have been conducted so far and the recent census was held in the year 2019. Table 1 shows the percentage share of different livestock species of Telangana to India based on the recent livestock census report (2019).

Table 1: Share of Telangana in livestock population of India

Type of Animals	India (In millions)	Telangana (In millions)	Percentage share to India (%)
Cattle	192.52	4.23	2.20
Buffalo	109.85	4.23	3.85
Sheep	74.26	19.06	25.67
Goat	148.88	4.93	3.31
Total Livestock	535.82	32.64	6.09

Source: 20th Livestock Census, 2019

3.2 District-wise livestock population in Telangana state
Total livestock population in Telangana is 32.64 million as of the latest livestock census data. Among the large ruminants, the cattle population is 4.23 million whereas the buffalo population is 4.22 million. The present goat and sheep population are 4.93 million and 19.06 million respectively.

Telangana ranks 1st in sheep population, 9th in Buffalo population, 12th in goat population, 15th in cattle population and 8th in total livestock population in India. Figure 1, 2 and 3 shows top ten districts of cattle, buffalo, sheep, goat and total livestock population in Telangana state.
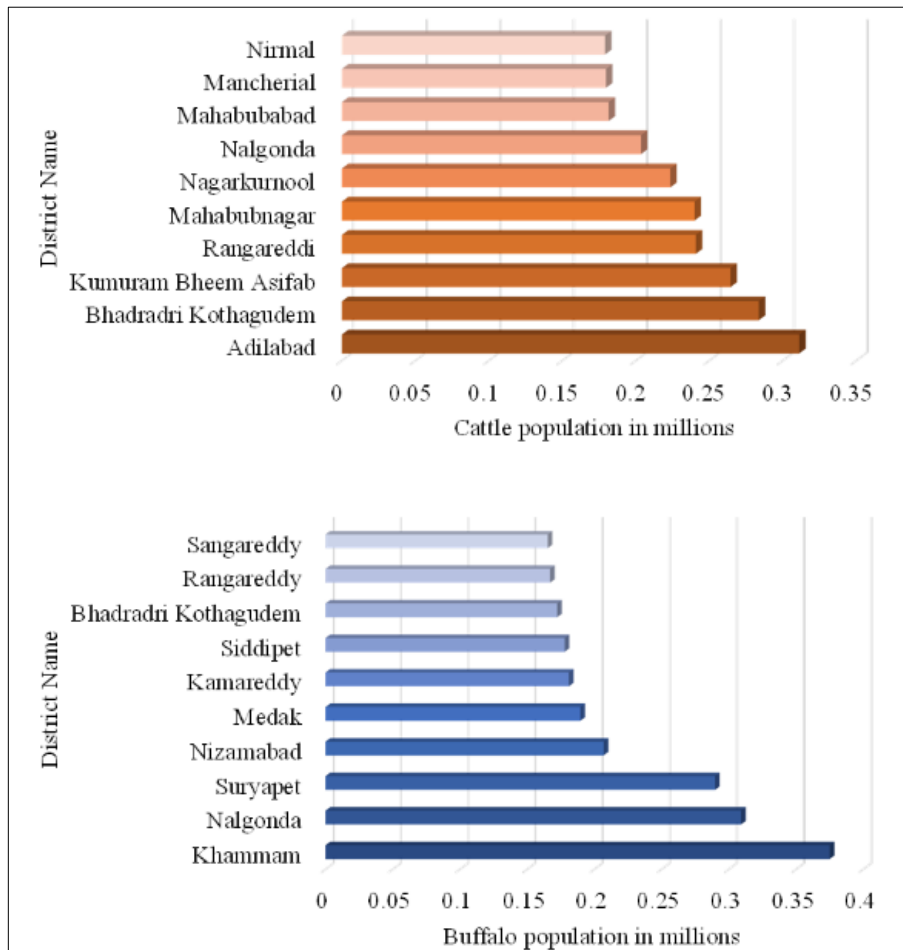
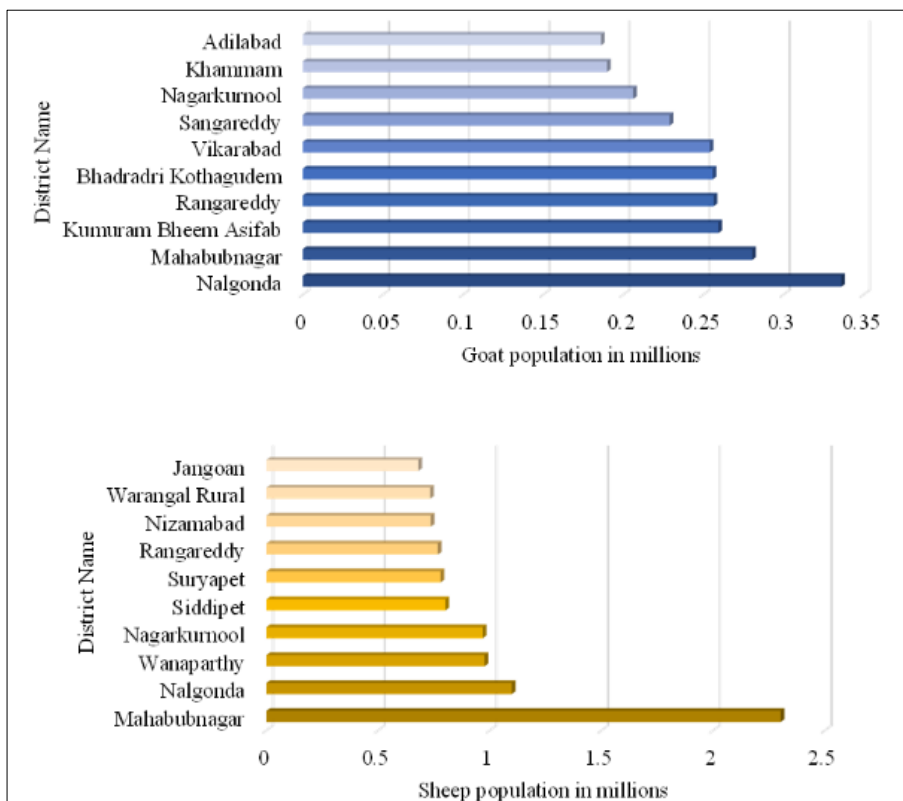**Fig 1:** Top 10 districts of Telangana in large ruminants

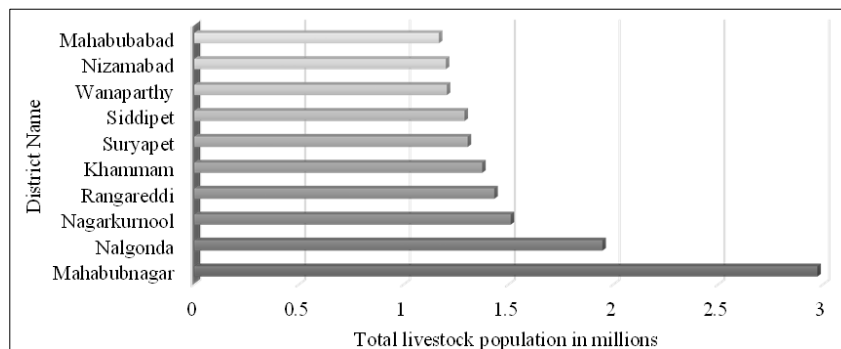**Fig 2:** Top 10 districts of Telangana in small ruminants

Fig 3: Top 10 districts of Telangana in total livestock population

3.3 Percentage change in different livestock population in Telangana

In the state-wise comparison of percentage change in total livestock population among the major states in India during 2012 to 2019, Telangana ranks second with 22.10 per cent growth rate, following West Bengal with 23.43 per cent growth rate (Telangana Socio Economic Outlook, 2022). Table 2 shows the percentage change in the population of different livestock species during 2012 to 2019.

Table 2: Percentage change of livestock population over previous census

Sl. No.	Major Species Category	Population 2012 (In millions)	Population 2019 (In millions)	% growth
1	Cattle	4.88	4.23	-13.30
2	Buffalo	4.16	4.23	1.58
3	Sheep	12.83	19.06	48.52
4	Goat	4.57	4.93	7.85
5	Total livestock	26.70	32.64	22.10

Source: 19th and 20th Livestock Census reports

3.4 Growth rate of species-wise livestock population in Telangana

Except for cattle population, buffalo, sheep and goat population showed an increasing trend during 1993-2019. Cattle population showed a decreasing trend over the years during the specified period. Consumers prefer buffalo milk over cow milk due to its advantages in terms of compositional, nutritional and health aspects which resulted low demand for cow milk and milk products (Mane and Chatli, 2015) [12]. This can be attributed to the decreasing trends of cattle population over the years. The outbreak of foot and mouth disease (FMD) in Telangana is said to be one of the major reasons which resulted in the drastic reduction of population of different livestock species during 2007. Figure 4, 5 and 6 shows the trends in population of different species of livestock in Telangana from 1993 to 2019.
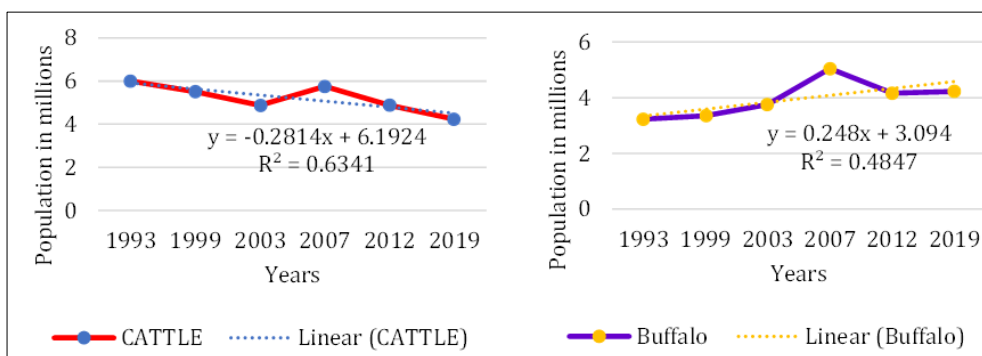

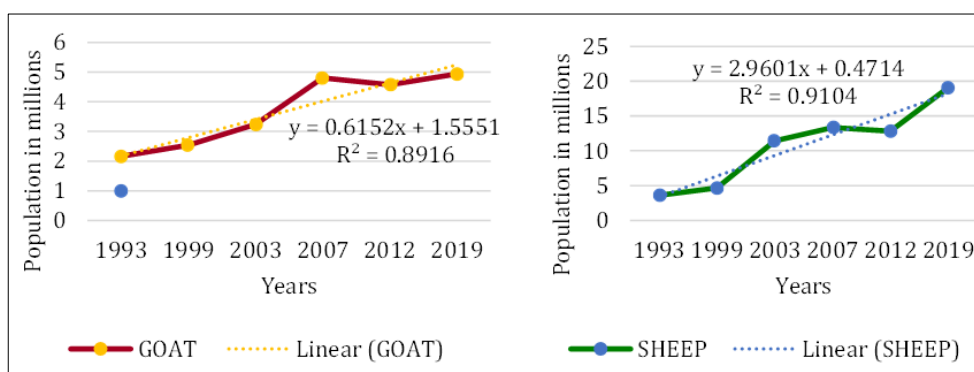**Fig 4:** Trends of population of large ruminants from 1993 to 2019

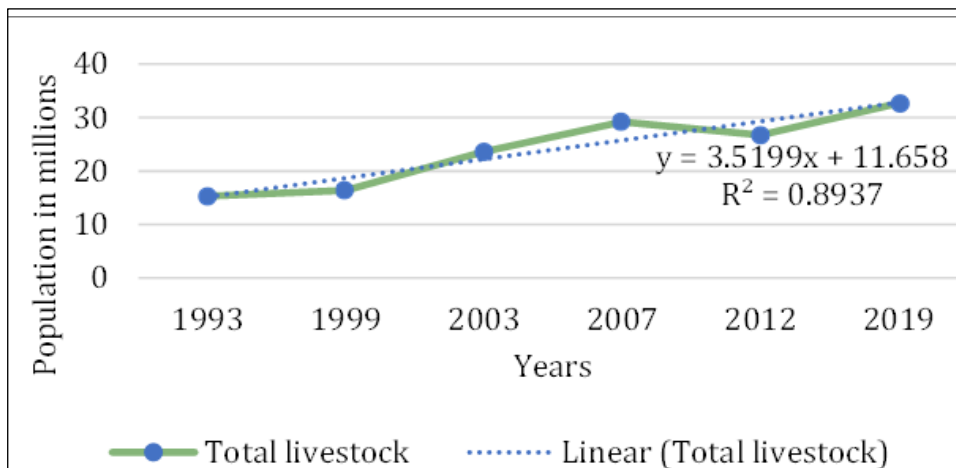**Fig 5**: Trends of population of small ruminants from 1993 to 2019

Fig 6: Trends of total livestock population from 1993 to 2019

Similar results were obtained using CAGR method. Populations of buffalo, sheep and goat were showing positive CAGR during the period of 2003 to 2019 whereas cattle population exhibited a negative CAGR. Table 3 shows the results obtained by CAGR method for different livestock species in Telangana during 2003 to 2019.

Table 3: Compound Annual Growth Rate of different livestock species

Sl. No.	Species	CAGR (%)
1	Cattle	-5.68
2	Buffalo	1.61
3	Sheep	16.09
4	Goat	12.94

4. Conclusion
Livestock plays an important role in agriculture sector, especially in drylands of Telangana. The increase in the population of livestock across the country is significant which is an indication of its importance. Mahbubnagar ranks first in total livestock population followed by Nalgonda and Nagarkurnool districts. In cattle population, Adilabad district ranks first followed by Bhadradri Kothagudem and Kumuram Bheem Asifab districts. Khammam district ranks first in buffalo population followed by Nalgonda and Suryapet districts. The highest sheep populated district is Mahabubnagar, followed by Nalgonda and Wanaparthy districts. Nalgonda district ranks first in goat population, followed by Mahabubnagar and Kumuram Bheem Asifab districts. Population of buffalo, sheep and goat showed a positive percentage growth rate of 1.58 per cent, 48.52 per cent and 7.85 per cent respectively whereas the cattle population exhibited -13.30 per cent growth rate over the previous livestock census. CAGR of buffalo (1.61 per cent), goat (12.94 per cent) and sheep (16.09 per cent) population is increasing while that of cattle is decreasing (-5.68 per cent) over the years in Telangana during 2003 to 2019.

The study indicated that the population of cattle is showing a negative trend whereas buffalo population is increasing over the years in Telangana. Considering the paradigm shift in the consumer demand towards buffalo milk, specific policy intervention should be made for the sustainable development of cattle farmers. The population of small ruminants showed an increasing trend over the years. Since the meat produced from Telangana is known for its unique quality, its marketing and export should be encouraged with significant promotional and extension activities.

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