Development of Livestock Sector in Andhra Pradesh, India

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Abstract

The livestock sector plays a crucial role in cushioning the rural economy in general and during agrarian adversaries in particular. The present paper presents the current status of livestock sector in Andhra Pradesh. The study aimed to analyze the population dynamics of major livestock (cattle, buffaloes, sheep & goat) during different LC (Livestock Census) periods, its contribution to State's GVA (Gross Value Added), products from livestock, their per capita availability, budget allocation to the sector, infrastructure and other facilities available for livestock development and enhancing livestock production and productivity etc. The paper further emphasized the major challenges faced by livestock sector in Andhra Pradesh state, with an overall objective of suggesting suitable policy interventions for implementation by the State Government to make the livestock sector, a viable and sustained one with its contribution to rural economy of the state.

Keywords: Population Dynamics; Gross Value Added; Per Capita Availability; Livestock

Livestock sector in India

Livestock sector contributes to National Economy besides promoting diversification and sustainable agricultural systems. In addition, this sector is a potential export earning one and is also contributing to food and nutritional security. Of late, the concept of Integrated Farming Systems is gaining momentum, and the contribution of livestock sector as a component in enhancing resource use efficiency and farm income is sizeable. Indian Agriculture is largely dependent on serendipitous climatic conditions. In this context, an assured farm income, despite climate adversaries, in making agriculture as a sustainable practice assumes significance, but for the allied sectors like livestock. As per the 20th Livestock Census in 2019 (Table 1), India's total livestock population is about 536.76 million. The total bovine population is 303.31 million, accounting to 193.46 cattle population and 109.85 million buffaloes' population. Sheep population is 74.26 million, whereas goat population is 148.88 million. India has 11.54% of total livestock, 56.7% of buffaloes, 12.5% of cattle, 6.4% of sheep, and 10.52% of goat at global level (Hegde, 2019).

India produced about 198.40 Million Tonnes (MT) of milk; 36.74 Million Kilograms of wool; and 8.60 MT of meat during 2019-20. At global level, India ranked first in total livestock population, milk production, cattle population, buffalo population, goat milk production, and total bovine population. Further, India ranked second in goat population; third in sheep production; fifth in meat production; and ninth in wool production (Amandeep Singh, 2018).

Contribution of Livestock Sector to National Economy

India's livestock sector's contribution to Gross Value Added (GVA) over the years 2011-12 to 2018-19 has shown a steady progress from 4.0% to 5.1% (Fig. 1). Despite the per cent share of agri. & allied sectors dipped during the years, 2012-13; 2014-15; 2015-16; 2018-19 over immediate previous years, the livestock contribution to GVA was either constant or increasing. The increasing contribution of livestock over these years to GVA was however negatively correlated to the contribution of agri. &allied sectors (r=-0.79). This can be inferred as a sustained nature of Indian Livestock sector, with its more and more contribution to GVA, despite reduced contributions from agri. & allied sectors.

Of the 18.8% share of the agriculture and allied sectors in our country's GVA during 2021-22, it is observed that there was a higher growth rate in allied sectors such as Livestock, Forestry & Logging, Fishing & Aquaculture, compared to the crop sector (Ministry of Finance, GoI, 2022).

Growth of Livestock population in India

Indian livestock population in general witnessed a mean positive growth rate of 4.82 during the years 2012 to 2019 (Fig 2). Significant changes were reported from Cattle (1.34), Buffalo (1.06), and total Bovines (1.26) population. The highest growth rates were observed from Sheep (14.12) and Goat (10.14) population.

Growth of Livestock Products in India

The growth rates of livestock products during the period from 2011-12 to 2019-20 are depicted in Fig 3.

a) **Milk:** During the periods 2011-12 to 2019-20, the AGR (Annual Growth Rate) of milk ranged from 5.01 in 2011 to 5.68 during 2019-20. The AGR was highest during 2017-18 (6.62), followed by 2018-19 (6.47) and 2016-17 (6.38), whereas it was lowest during 2012-13 (3.54).
b) **Meat:** Over the years from 2011-12 to 2019-20, the AGR of meat production showed quite contrasting trend with milk production. It peaked during 2011-12 (12.24) and was lowest during 2017-18 (3.66). During 2019-20, the AGR of meat production was about 5.98, which was marginally more than 2018-19 (5.99) (Fig 3).
c) **Wool:** The wool production recorded positive growth rate during the years 2011-12 (4.06); 2012-13 (2.95); and 2013-14 (4.03). The positive growth rate was least during 2014-15 (0.48). Negative growth rates for wool production were recorded during 2015-16 (-9.47) and subsequent years. During 2019-20, the AGR for wool production was about -9.1 (Fig 3).

As per the 2017-18 statistics of livestock and its products, India's total import was valued at Rs. 101.24 billion with surpassed total export accounted to Rs. 457.76 billion.

Livestock Sector in Andhra Pradesh

As per 20th livestock census, 2019, the cattle population in Andhra Pradesh is 4.6 Million and amounts to 2.38% of country's cattle. Buffalo's population in AP is 6.22 Million, contributing 5.66% of country's buffaloes. The percentages of sheep and goat in respective livestock national populations are 23.74 (17.63 million) and 3.71 (5.52 million) respectively. Overall, as per 20th census, sheep, followed by buffalo, goat, and cattle are in order of highest population in AP (Table 1).

In Andhra Pradesh, only 1.7% of the total households own all the goats, which is 46.0% of the total livestock population. Total sheep are owned by 1.9% of total households. Similarly, all the buffaloes are owned by 9.0% of total households, while cattle are possessed by 6.6% of households. The details on per cent households with major livestock and per cent share of major livestock in total livestock population of AP are furnished in Fig 4a & Fig 4b respectively.

With regard to the livestock population type, nearly half of total livestock is goat (46%), followed by buffalo population (21.9%). The population of cattle (15.7%) and sheep (15%) are nearly equal.

The total cattle and buffalo population in Andhra Pradesh is 10.82 million in 2018 and witnessed a decline compared to previous census (11.18 million in 2012). Critical observations revealed that since the year 1956, the cattle population is consistently decreasing, with 6.10 million in 1956 to 4.60 million in 2019; whereas buffalo population is increasing with 4.33 million in 1956 to 6.22 in 2019 (Agricultural Statistics at a Glance, 2019-20). However, recently there is a decline in buffalo population (Amaravathi & Mallikarjuna Reddy, 2020).

The population of cattle in AP was seen decreasing from the years 2007 (5.47 M), 2012 (4.72 M), and 2018 (4.6M) (Table 2). The per cent decrease in cattle population from 2007 to 2012 was -14.08, whereas it was -2.54 from 2012-19 (Table 2), showing an increase in absolute number. Similar trend of population decline was also noticed with buffaloes during the years 2007 (8.23 M), 2012 (6.46 M), and 2018 (6.2 M) (Table 2), with the per cent decrease of -21.5 from 2007 to 2012 and -4.02 from 2012 to 2019 respectively. Sheep population however noticed a steady increase over the years and was 12.18 M in 2007, 13.56 in 2012, and 17.6 M in 2018. The per cent increase in sheep population was 11.33 during 2007 to 2012 and 29.79 during 2012 to 2019.Goat population in Andhra Pradesh was seen fluctuating over these years with 4.82 M in 2007, 4.5 M in 2012, and 5.5 M in 2018. The per cent decrease in goat population was -6.64 during 2007-12, which however had witnessed a positive growth of 22.2 per cent during 2012-19.

Contribution of Livestock in Andhra Pradesh to India's Livestock Production

Despite a decline in buffalo and cattle population in AP, the per capita availability of milk in Andhra Pradesh is seen increasing over years since 2001-02. As per 2019-20 statistics, the per capita milk availability in AP was 799 g/day, as against 406 g/day in our country, while the minimum requirement of per capita milk per day is 280 g only as per the recommendations of Indian Council of Medical Research (ICMR).

Andhra Pradesh stands 4th each in milk production (150.44 lakh MTs) and meat production (8.03 lakh MTs) and first in egg production (2036.94 crores) in our country during 2018-19. As per 2018-19 data, Andhra Pradesh contributes to 9.62% of meat production; 8% of milk production; and 1.97% of wool production of India (Fig 5).

Changes in Livestock Production in Andhra Pradesh

The Gross Value Added (GVA) from livestock products across Andhra Pradesh was seen steadily increasing over years from 2015-16 to 2019-20 (Fig 6). During the FY 2019, the GVA from livestock products was about 581 billion INR. The per cent share of livestock products to GVA in AP during 2019-20 was 11.46% at current prices.

a) **Milk Production:** Milk production in AP has witnessed a steady rise as observed from 2016-17 (121.78 Lakh MT) to 2019-20 (152.63 LMT). The per cent increase of milk when compared to previous year was highest in 2017-18 (12.71), followed by 2016-17 (12.58), 2018-19 (9.61), and 2019-20 (1.46). However, during 2020-21, decrease (-3.6) in milk production compared to 2019-20 was observed (Fig 7). It might be due to the negative growth rate of cattle (-2.54) and buffalo (-4.02) populations observed from 2012 to 2019.
b) **Meat Production:** Meat production in AP was on a constant rise from 2016-17 (6.325 LMT) to 2019-20 (8.504 LMT). The per cent increase of meat production over previous year was highest in 2017-18 (12.04), followed by in 2016-17 (11.7), 2018-19 (10.12), and 2019-20 (8.94) (Fig 8).

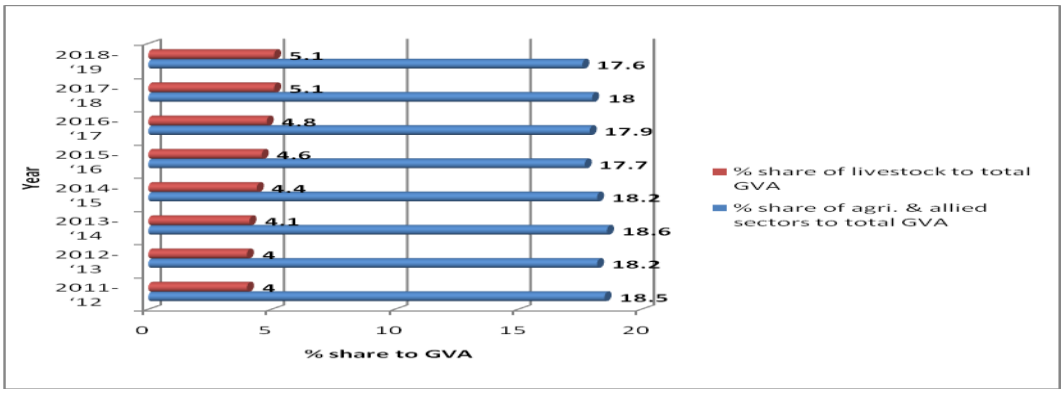


Fig 1. Contribution of Agriculture (including allied sectors) and Livestock sector exclusively to Gross Value Added (GVA) during the years 2011-'12 to 2018-'19

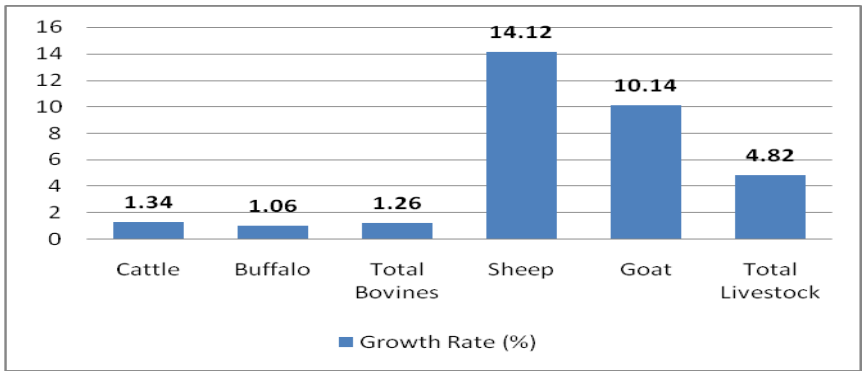


Fig 2. Growth rate of major livestock population in India during the years 2012 to 2019

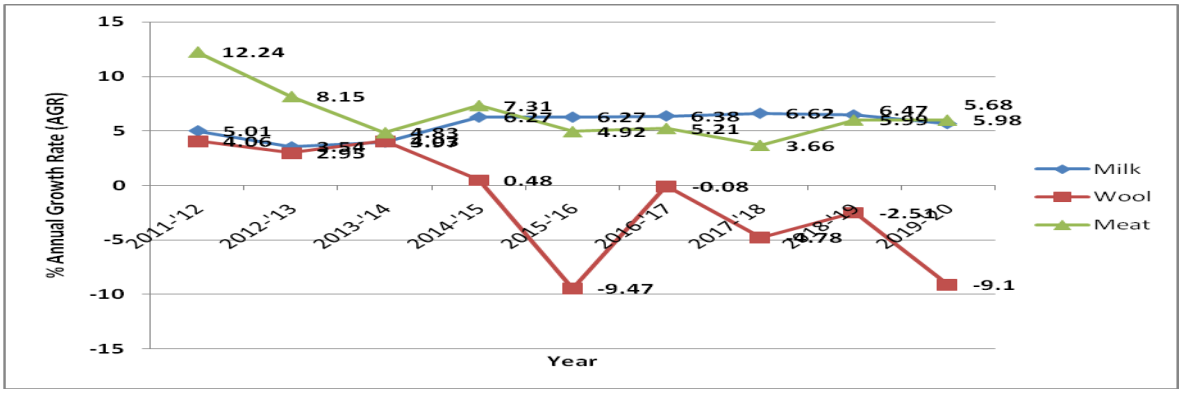


Fig 3. The annual growth rate of India's major livestock products during 2011-12 to 2019-20

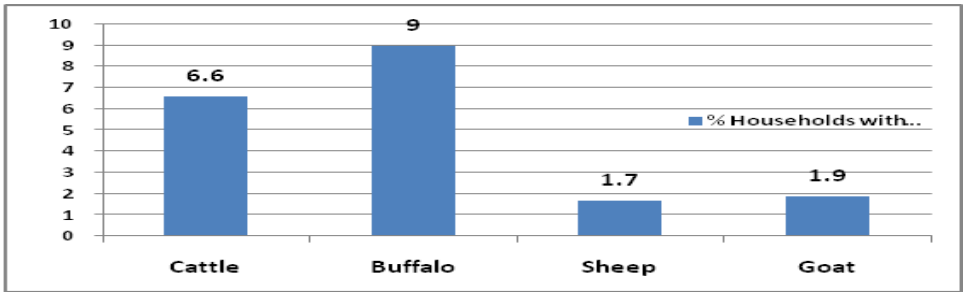


Fig 4a. Per cent households owning major livestock in Andhra Pradesh

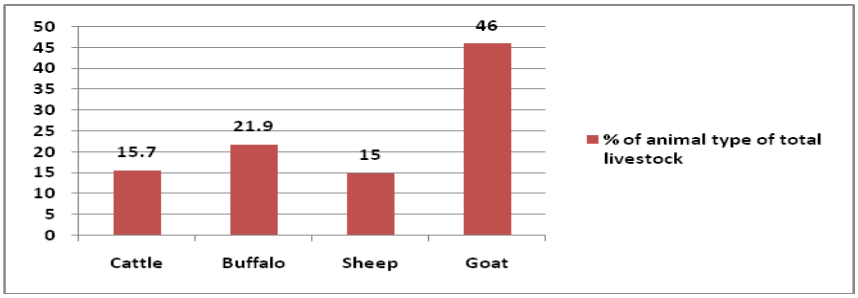


Fig 4b. Per cent share of major livestock in total livestock population of Andhra Pradesh.

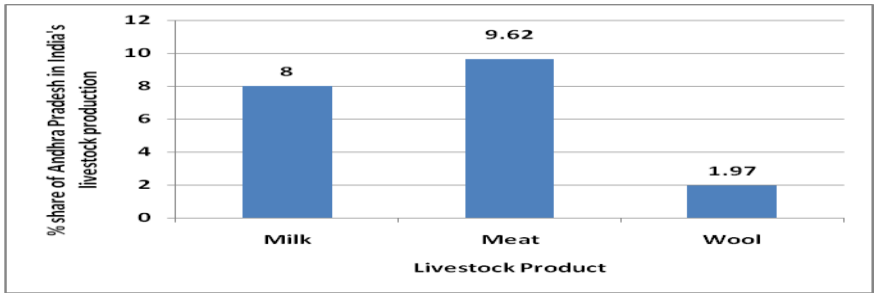
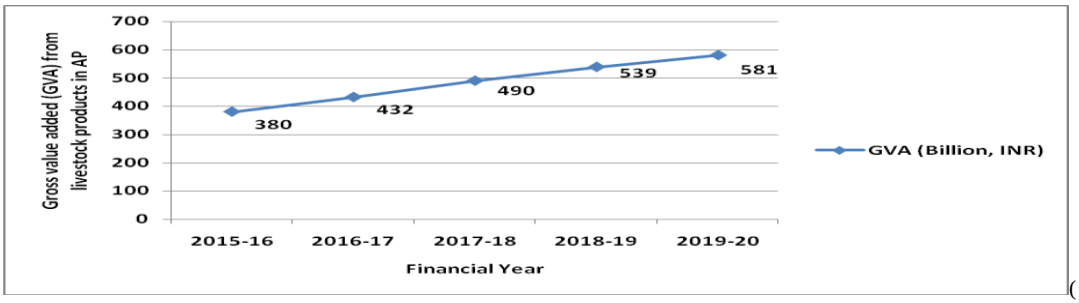


Fig 5. Per cent share of livestock of Andhra Pradesh in India's livestock production (2018-19)



Source: https://www.statista.com/statistics/1083051/india-economic-contribution-of-livestock-products-in-ap/)

Fig 6. Increasing GVA from livestock products in Andhra Pradesh during 2015-19.

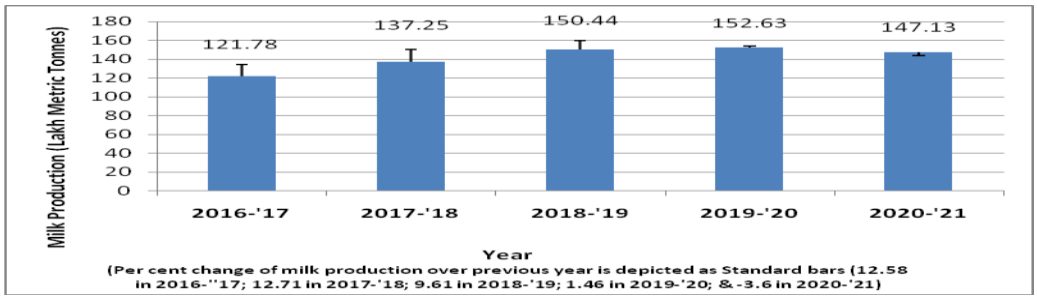


Fig 7. Milk production in Andhra Pradesh during 2016-17 to 2020-21

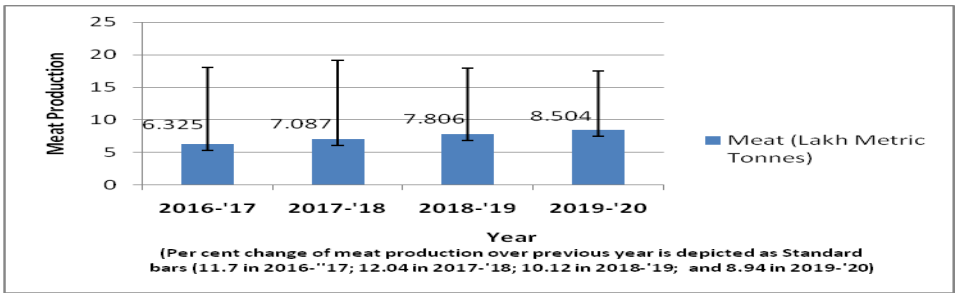


Fig 8. Meat production in Andhra Pradesh during 2016-17 to 2019-20

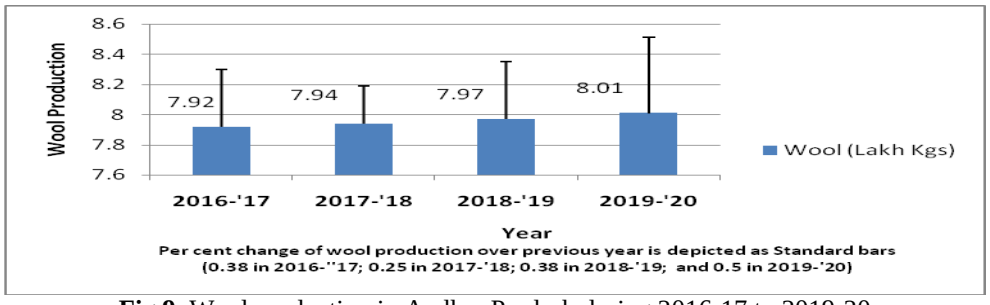


Fig 9. Wool production in Andhra Pradesh during 2016-17 to 2019-20

Fig 10. Livestock disease forewarning by NADRES of ICAR-NIVEDI

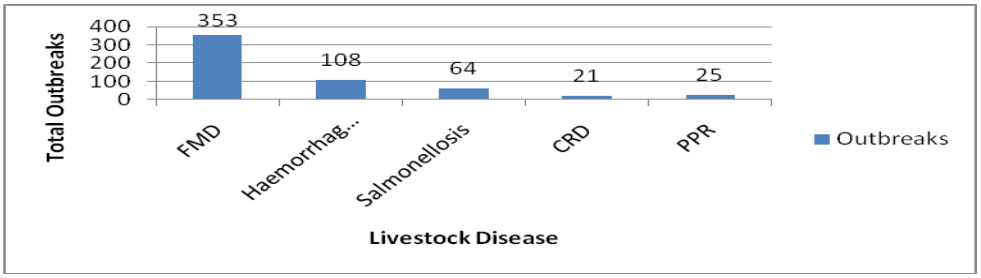


Fig 11. Details of diseases that caused major outbreaks in Indian Livestock sector during 2021
Source: Annual Report of Dept of Animal Husbandry & Dairying, 2021-'22

c) **Wool Production:** Though wool production over years from 2016-17 was on rise up to 2019-'20, the per cent increase over previous year was less than one per cent. The wool production was 7.92 lakh kg in 2016-17; 7.94 lakh kg in 2017-18; 7.97 lakh kg in 2018-19; and 8.01 lakh kg in 2019-20. The per cent increase of wool production over previous year was highest in 2019-20 (0.5), followed by 2016-17& 2018-19 (0.38), and 2017-18 (0.25) (Fig 9).

Infrastructure and other Facilities available for Livestock Development in Andhra Pradesh

Artificial Insemination (AI)

Andhra Pradesh restructured its livestock breeding operations through involvement of farmers' organizations by establishing APLDA (Andhra Pradesh Livestock Development Agency) during the year 2000. The goal is to expand AI activities to cover entire breedable population for achieving optimized productivity through improved breeding, channelize the inputs for AI facility, ensure quality control of inputs, and capacity building of personnel for effective management.

Though Andhra Pradesh is one of the leading States among the per cent Artificial Insemination (A.I.) covered for female bovines (45%), the State was next to Kerala (100%), Tamil Nadu (67%), Haryana (63%), Karnataka (60%), and Punjab (49%), as against the national mean coverage of 30% (Table 3).

The Govt. of Andhra Pradesh has launched the scheme of 'Gopalmitras' during the year 2012 for training the educated unemployed rural youth in the areas of Artificial Insemination. These Gopalmitras, also offer First Aid & Vaccination Services, besides AI services (http://aplda.ap.gov.in).

Veterinary Institutions and Development Programmes

India has 65,758 veterinary institutions (11,959 polyclinics, 25,850 dispensaries, 27,949 Veterinary Aid Centres/Stockmen Centres/Mobile Dispensaries) as on 31st March 2021 (Table 4). In India, Rajasthan state has the highest number of Veterinary Institutions (8,518), followed by Uttar Pradesh (5,050), Maharashtra (4,853), Karnataka (4,212), Odisha (4,094), Himachal Pradesh (3,458), and West Bengal (3,330). A total of 3,188 veterinary institutions including Veterinary hospitals/Polyclinics (337), dispensaries (1,576) Veterinary aid centres (1275) are available in Andhra Pradesh as on 31st March 2021.

The important veterinary institutions involved in meeting the livestock services in the state are as given below.

- Three FSBs (Frozen Semen Banks) at Visakhapatnam, Nandyal, and Banavasi
- A Central Herd Registration (CHR) Unit in Ongole with 10 recording centres
- A "Cattle Breeding Farm" (CBF) at Chadalawada
- A "Composite Livestock Farm" (CLF) at Chintaladevi
- Bovine Breeding Complex (BBC) at Nekarikallu
- A "Frozen Semen Bull Station" at Banavasi
- An "Andrology Laboratory" for four Frozen Semen Bull Stations (FSBS)
- A State Veterinary University (Sri Venkateswara Veterinary University, SVVU)
- A National Kamadhenu Breeding Centre (NKBC)
- Andhra Pradesh Livestock Development Agency (APLDA)
- The Livestock Development Schemes operated in Andhra Pradesh included i) Food and Feed Development Scheme, ii) National Animal Disease Control Programme, iii) National Artificial Insemination Programme, iv) National Livestock Mission, v) Rashtriya Gokul Mission (RGM), vi) Fodder Security Policy for Livestock etc.

Credit Flow and Insurance

Presently, more than 40% of rural credit flow is towards supporting the livestock sector in AP. Further, a substantial amount of the loans are transacted among the SHG (Self Help Group) members for the purpose of rearing milch animals in AP. The Community managed micro insurance provided by the State Govt. of AP is leveraging on the capacities built in the community against death and disability. The "Livestock Loss Compensation Scheme" facilitates compensation to farmers in the event of mortality of livestock (cattle, buffaloes, sheep & goat etc.).

Table 1- Details of major livestock population in India and Andhra Pradesh as per 2019 livestock census.

Animal Type	Livestock population (million)				
	World	India	% Indian livestock in World	Andhra Pradesh	% AP livestock in India
Cattle	1009.69	193.46	19.16	4.6	2.38
Buffalo	204.000	109.85	53.85	6.22	5.66
Sheep	1176.00	74.26	6.32	17.63	23.74
Goat	1000.00	148.88	14.88	5.52	3.71

Table 2- Livestock population in Andhra Pradesh during latest three censuses

Type of livestock	Population (in million)		
	2007	2012	2019
Cattle	5.47	4.72 (-14.80)	4.6 (-2.54)
Buffaloes	8.23	6.46 (-21.50)	6.2 (-4.02)
Sheep	12.18	13.56 (11.33)	17.6 (29.79)
Goat	4.82	4.5 (-6.64)	5.5 (22.2)

Note: Figures in parentheses indicate per cent change over previous census

Table 3- Artificial Insemination coverage to bovine females in major States of India during 2020-21

S. No.	State	Breeding population as per 20th Livestock Census (LC) (2018-'19)(lakhs)	Total A.I. Centres (No.)	Total A.Is. performed (lakhs)	A.I. Coverage (%)
1	Andhra Pradesh	49.42	7711	47.21	45
2	Punjab	37.62	5158	38.61	49
3	Karnataka	56.75	7027	71.88	60
4	Haryana	29.79	2916	39.37	63
5	Tamil Nadu	49.78	8988	70.22	67
6	Kerala	6.89	2989	16.03	100
7	All India (incl. of other states)	1332.9	1,12,361	784.64	30

Source: Annual Report of Dept of Animal Husbandry & Dairying, 2021-22. Note: % A.I. coverage was for 2018-19 data only.

Table 4- Leading States with relatively higher Veterinary Institutions in India as on 31.03.2021

S. N.	State	Veterinary Hospitals/ Polyclinics	Veterinary Dispensaries	Veterinary Aid Centres (Stockmen Centers/Mobile Dispensaries)	Total
1	Andhra Pradesh	337	1576	1275	3188
2	West Bengal	112	267	2575	3330
3	Himachal Pradesh	465	1759	1234	3458
4	Odisha	541	3239	314	4094
5	Karnataka	695	2135	1382	4212
6	Maharashtra	39	1908	2906	4853
7	Uttar Pradesh	2208	267	2575	5050
7	Rajasthan	2530	198	5790	8518
	All India	11959	25850	27949	65758

(Source: Annual Report of Dept of Animal Husbandry & Dairying, 2021-'22).

Challenges and Suggestions / Interventions for Sustainable Development of Livestock in Andhra Pradesh

Despite positive growth in livestock population and production, the development of livestock sector is hampered by several factors that need immediate attention and interventions in areas of research, extension, administration, and policies.

Disease Outbreaks

Reduced productivity due to frequent disease outbreaks in livestock including poultry is a major concern. The major livestock diseases like Foot & Mouth Disease (FMD); Peste-Des-Petits Ruminants (PPR) are devastating in terms of cases and fatality respectively.

The NADRES (National Animal Disease Referral Expert System of ICAR-NIVEDI (National Institute of Veterinary Epidemiology and Disease Informatics) is providing an excellent livestock disease forecast for important diseases in different states of our country (Fig 10).

The details of diseases that caused major outbreaks (>20 outbreaks) in India during 2021 are presented in Fig 11.

Andhra Pradesh along with other states viz., West Bengal, Rajasthan, Karnataka and Tamil Nadu were reported to be high risk States with respect to PPR disease. Andhra Pradesh was also under high-risk category for diseases such as "Sheep & Goat Pox; *Haemorrhagic Septicaemia* (HS), and Anthrax (Bardhan et al., 2020). Of late, "Lumpy Skin Disease" (LSD), (viral infection) in cattle was rampant in Kadapa, Kurnool, and Ananthapuramu districts of Andhra Pradesh in the year 2020. The LSD entered India in the year 2019. Thousands of cows fell ill due to LSD in Chittoor, Krishna, and West Godavari districts, besides East Godavari district, where more than 4000 cows suffered during 2020 (The Hans India, 2020). Srikakulam district in Andhra Pradesh also witnessed LSD in cattle in the year 2022. Reports in this district indicated that at least 15 cattle have been afflicted and one died during 2022 (The New Indian Express, 2022). Since, no vaccine was available, stringent measures are necessitated to curb the entry, spread and outbreaks of these dreadful diseases. Similarly, other diseases such as FMD, Blue Tongue and Brucellosis were rampant in Andhra Pradesh.

The Govt. of AP should intensify disease surveillance, provide measures for economic and effective control of livestock diseases, develop infrastructure, and promote veterinary facilities and extension services for protecting livestock health.

Low Production & Productivity of Livestock

In India, the 49% share of milk production is from indigenous non-descriptive buffaloes, 28% from cross bred cows, 20% from indigenous, non-descriptive cow, 1% from exotic, and 3% from goat.

Of the total of 46 lakh cattle population in Andhra Pradesh, the exotic/crossbred population is 22.62 lakhs, and the remaining 23.37 lakh is indigenous cattle (BAHS, 2019). The average milk yield in India for exotic cows is 11.88 kg/day, 8.09 kg/day for crossbred cows, and 2.57 kg/day for non-descript cows. The milk yield from indigenous buffalo is 6.43 kg/day and non-descript buffalo is 4.51 kg/day. The average milk yield of goat is very negligible with 0.44 kg/day.

Improving the productivity of milk especially for non-descript cows, and for non-descript buffaloes is a big challenge. Proper programmes are to be designed and adopted for cross breeding, enhancing the population of exotic cows and cross-bred cows for enhanced milk production.

Availability of Fodder and Feed Concentrate

There is a net deficit of 49.96 lakh MT of dry fodder, 315.24 lakh MT of green fodder, and 21.40 lakh MT of concentrate feed availability in Andhra Pradesh as against the total requirement of 255.36 LMT of dry fodder, 776.68 lakh MT of green fodder, and 51.78 lakh MT of concentrate feed (GoAP, 2015).

To meet the growing needs of fodder, urbanization impacts are to be minimized, and grazing lands are to be protected from encroachment. Diversification in nature of fodder and feed material is a good idea to research and implement upon. Besides these, the aspects such as a) promotion of silage as green fodder, b) encouraging fodder banks, c) intercropping of fodder crops in horticulture groves, d) tank bed fodder cultivation, e) production of fodder blocks with fortified maize stovers, f) Azolla production on subsidized basis, g) promoting hydroponic fodder as commercial activity, h) Market development, i) P-P partnerships etc. need special attention and sops.

Integrated Farming System (IFS) with livestock as a component is another aspect that promotes agro-industries, input efficiency, cost minimization, energy saving and income generation round the year for the farmers. Model IFS units need to developed and promoted at farm field level for economic viability of farms.

Greenhouse Gas (GHG) Emissions from Enteric Fermentation

As per the FAO (FAOSTAT, 2020), the GHG emissions from agricultural sector in 2017 was majorly from "Enteric Fermentation" (38.81%). Further, manure management (6.46%), manures applied to

soils (3.53%), cultivation of organic soils (2.36%), also significantly contribute to GHG emissions. As per the internal assessment by the Andhra Pradesh Government, there has been a sharp rise in the GHG emissions from 54 million tonnes of CO_2 equivalent in 2005-'06 to 103 million tonnes of CO_2 in 2013-'14, amounting to 8.4% of compound annual growth (CAGR). Also the per capita GHG emission increased from 1.16 tonnes in 2005-'06 to 2.06 tonnes in 2013-'14 in Andhra Pradesh. In Andhra Pradesh, the enteric fermentation constituted about 47% of the total CO_2 equivalent emissions. Approximately, about 7% of the emissions were attributed to livestock manure management and burning of crop residue (The Times of India, 2017).

Reduction in GHG emissions from livestock sector and thereby the global warming through alternate and viable strategies is a mammoth challenge. More and more research has to be taken up in areas of improving cattle diets, adopt soil conservation methods, arranging biogas plants, recycling of manures etc. The cultivation of fodder crops with low Carbon emission needs to be encouraged.

Limited Funding to Animal Husbandry

The state Government of Andhra Pradesh has allocated an amount of Rs. 11,891.20 Crores for the agriculture sector, for the financial year 2020-21, and Rs. 1,279 Crore for the animal husbandry sector. While the allocations for financial year 2019-20 were Rs. 20,677 Crores. The growth of allocation has decreased by 34.14% in 2020-21 as compared to 2019-20. For animal husbandry, dairy development and fisheries, the growth stands at negative 33.08%.

The budget share of livestock sector in total budget allotted under "Agriculture &allied activities" need to be enhanced for smooth and effective functioning of livestock developmental programmes being operated in the state.

Limited Technical Expertise for Artificial Insemination (AI) activities

Presently, the AI system in India is associated with difficulties in areas such as timely delivery of AI, lack of proper mechanisms for use of semen from certified semen stations, non-adherence to state breeding policy, absence of a mandatory system of animal identification and data retrieval, and poor control over AI technicians (Gupta et al., 2017). Though, technical expertise in the form of "Gopalmitras" is available for implementation of AI activities, trained personnel is required, owing to the lower coverage of A.I. with only 45% in the state.

The MAITRI (Multipurpose AI Technicians in Rural India) groups for delivering breeding inputs at farmers' doorsteps need to be introduced in AP as is in practice in other States. The Gopalmitra groups may be merged/ included in the MAITRI programme offered by the Central Government.

Women Empowerment

Livestock sector is considered as a women's enterprise in Andhra Pradesh (Sunandini *et al.*, 2020), indicating that women play a crucial role in post-harvest processes of livestock and fishery products. It is also an established fact that women accounted for 93% of total employment in dairy production (World Bank, 1991) in performing tasks such as collecting fodder, collecting and processing dung.

More and more participation of women is required to make livestock sector a profitable and sustainable venture, since women are also involved in economic decision making.

Poor Infrastructural Facilities

In terms of infrastructural facilities, AP needs to establish more number of Veterinary Institutions viz., Veterinary Hospitals/Polyclinics, Dispensaries, Veterinary Aid Centres, Stockmen Centres, & Mobile Dispensaries for effective sustenance of livestock sector in AP.

Other important challenges for livestock sector in India that need attention are "Antimicrobial resistance, unorganized market, poor livestock extension, milk pricing" (Kamal Kumar et al., 2021).

Way Forward

Besides the aforementioned interventions, the Govt. of AP should intensify the facilities for processing and value addition of livestock produce, availability of credit to livestock sector, create more access to markets, establish organized market linkages, and attract more and more Central Govt. support for the overall development of livestock sector in the state.

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