

Challenges and Opportunities in Indian Livestock Sector: Current Status and Future Prospects

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Abstract

India's livestock sector plays a crucial role in the nation's agricultural and economic landscape, supporting the livelihoods of millions by providing employment, income, and nutritional security. Nevertheless, the sector grapples with multifaceted challenges, encompassing animal health and veterinary care, sustainability, and environmental concerns. This paper offers a comprehensive review of India's livestock sector, emphasizing its importance while also addressing the existing challenges and potential opportunities. Furthermore, the paper explores the sector's future outlook, focusing on areas such as growth prospects, job creation, and income generation. The study suggests that addressing the challenges facing the sector and capitalizing on emerging opportunities can help the Indian livestock sector achieve its full potential and play an essential role in driving the nation's economic progress and prosperity.

Keywords: Agriculture, Economic development, Employment, Income generation, Livestock,

Introduction

The livestock sector is a crucial component of India's economy, largely augmenting the nation's agricultural GDP and pouring rural growth. As an essential source of income and employment for millions of rural households, particularly small and marginal farmers, livestock farming plays a crucial role in sustaining rural livelihoods. The region also generates generous export returns through dairy products, meat, and leather goods. Moreover, livestock provides essential inputs for sustainable farming practices, including draft power, manure, and dairy products, which are essential for ensuring the country's food sovereignty. In spite of its importance, despite its substance, the livestock region grapples with a range of impediments, such as inadequate feed and fodder, disease epidemics, and the escalating impacts of climate change, which jeopardize its long-term viability and efficiency. Nevertheless, the sector presents

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opportunities for growth, driven by increasing demand for dairy and meat products, technological advancements, and government initiatives promoting livestock development.

This paper undertakes an in-depth examination of the Indian livestock sector, offering a nuanced assessment of its present circumstances and potential future directions. By identifying pivotal challenges and opportunities, this analysis aims to illuminate the critical factors that will influence the sector's evolution and growth.

Review of related studies

This literature review synthesizes the existing body of knowledge on the topic, distilling the most relevant insights from previous research and acknowledging the seminal contributions of scholars in the field.

Kamal Kumar et al. (2021) examined the Indian livestock sector is confronted with a multitude of challenges, encompassing disease outbreaks, antimicrobial resistance, and greenhouse gas emissions, in addition to insufficient human resources and infrastructure for delivering veterinary services. Other challenges include low animal productivity, non-remunerative milk prices, unorganized markets for livestock products, poor livestock extension, and shortage of feed and fodder. To mitigate these challenges, the paper suggests strategies such as adopting sex-sorted semen technology, by-product utilization, and feed supplements, as well as promoting organized markets, livestock-based integrated farming systems, public-private partnerships, and separate cadres for livestock extension.

Risilia D. & Myslimi G. (2024) studied, Albania's livestock sector is grappling with a range of obstacles that impede its facility to reach finest efficiency and long-term sustainability. Key issues include the lack of effective marketing channels, labor shortages, and inadequate knowledge of new technologies among farmers. However, amidst these challenges, inventive solutions present an alleyway to extension, and the deliberate adoption of cutting-edge technologies can considerably boost livestock productivity and efficiency. However, addressing the knowledge gap among farmers through proper education and training is crucial. By tackling these challenges directly, the Albanian livestock sector can increase productivity, ensuring a more sustainable and prosperous future.

Livestock sector in India

India is home to one of the world's prevalent and the largest part vibrant livestock sectors, behind the livelihoods of over 20.5 million people. Livestock agriculture is a cornerstone of the rural economy, generating 16% of small farm households' income and surpassing the national average. Outstandingly, livestock provides a source of income for nearly two-thirds of rural communities. The livestock region is a momentous driver of India's economy, employing around 8.8% of the population. With a plenty of livestock resources, the region contributes largely to the country's GDP, secretarial for 4.11% of the national GDP and a remarkable 25.6% of the total Agricultural GDP. According to topical economic surveys, the livestock region has qualified remarkable growth, with a composite annual growth rate of 7.9% over the last five years. Moreover, the sector's contribution to the total agriculture and allied sector's Gross Value Added has gradually amplified, from 24.32% in 2014-15 to 28.63% in 2018-19. Livestock income has emerged as an imperative secondary source of income for rural families, playing an essential role in achieving the ruthless goal of doubling-up farmers' income.

Table 1: Livestock Demographics in India

Catego ry	195 1	195 6	196 1	196 6	197 2	197 7	198 2	198 7	199 2	199 7	200 3	200 7	201 2	201 9
Cattle	155. 3	158. 7	175. 6	176. 2	178. 3	180	192. 5	199. 7	204. 6	198. 9	185. 2	199. 1	190. 9	192. 5
Adult Female Cattle	54.4	47.3	51	51.8	53.4	54. 6	59.2	62.1	64.4	64.4	64.5	73	76.7	81.4
Buffalo	43.4	44.9	51.2	53	57.4	62	69.8	76	84.2	89.9	97.9	105. 3	108. 7	109. 9
Adult Female Buffalo	21	21.7	24.3	25.4	28.6	31. 3	32.5	39.1	43.8	46.8	51	54.5	56.6	55
Total Bovines	198. 7	203. 6	226. 8	229. 2	235. 7	242	262. 2	275. 7	288. 8	288. 8	283. 1	304. 4	299. 6	302. 3
Sheep	39.1	39.3	40.2	42.4	40	41	48.8	45.7	50.8	57.5	61.5	71.6	65.1	74.3
Goat	47.2	55.4	60.9	64.6	67.5	75. 6	95.3	110. 2	115. 3	122. 7	124. 4	140. 5	135. 2	148. 9
Horses and Ponies	1.5	1.5	1.3	1.1	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.6	0.6	0.3
Camels	0.6	0.8	0.9	1	1.1	1.1	1.1	1	1	0.9	0.6	0.5	0.4	0.3
Pigs	4.4	4.9	5.2	5	6.9	7.6	10.1	10.6	12.8	13.3	13.5	11.1	10.3	9.1
Mules	0.1	0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.2	0.1
Donkey s	1.3	1.1	1.1	1.1	1	1	1	1	1	0.9	0.7	0.4	0.3	0.1
Yak	NC	NC	0	0	0	0.1	0.1	0	0.1	0.1	0.1	0.1	0.1	0.1
Mithun	NA	NA	NA	NA	NA	NA	NA	NA	0.2	0.2	0.3	0.3	0.3	0.4

Total Livestock	292.9	306.6	336.5	344.5	353.2	369.4	419.6	445.2	470.9	485.4	48.5	529.7	512.1	535.8
Poultry	73.5	94.8	114.2	115.4	138.5	159.2	207.7	275.3	307.1	347.6	48.9	648.8	729.2	851.8

Source: Livestock Census, MoFAHD, DAHD, GOI, <https://www.nddb.coop/information/stats/po>

Table 1 provides a comprehensive overview of India's livestock population straddling nearly seven decades, from 1951 to 2019. A thorough examination of the data reveals generous fluctuations and transformations in the country's livestock demographics over this extended period. Notably, the cattle population has shown relative stability, albeit with a slight increase from 155.3 million in 1951 to 192.5 million in 2019. In contrast to cattle, the populations of other livestock species have shown significant growth. The buffalo population has seen a sound increase, going up from 43.4 million to 109.9 million. Correspondingly, sheep and goat populations have also shown substantial growth, with sheep numbers mounting from 39.1 million to 74.3 million and goats from 47.2 million to 148.9 million. However, the most noteworthy growth has been witnessed in the poultry sector, with numbers skyrocketing from 73.5 million in 1951 to an incredible 851.8 million in 2019.

Table 2: Livestock Sector's Economic Output

Item	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
1 Milk Group	3,27,767	3,72,228	4,23,150	4,95,835	5,60,823	6,29,259	7,07,607	7,75,574	8,45,368	9,25,939	10,23,005	11,16,241
2. Meat Group	96,219	1,14,995	1,36,663	1,54,152	1,71,636	2,06,691	2,22,131	2,51,165	2,94,027	3,36,703	3,81,060	4,22,560
Meat	88,469	1,05,828	1,26,211	1,42,195	1,58,640	1,92,015	2,06,607	2,33,744	2,73,627	3,12,541	3,54,064	3,92,516
Beef	11,754	14,324	16,596	20,587	25,020	26,534	27,716	30,964	33,513	35,771	37,322	38,897

Mutton	32,667	38,878	44,212	50,176	53,396	63,184	68,362	77,046	94,710	1,18,219	1,36,427	1,55,674
Pork	4,465	4,886	5,783	6,119	5,431	6,637	6,209	6,597	7,655	7,763	8,387	9,029
Poultry Meat	39,583	47,740	59,620	65,313	74,793	95,660	1,04,320	1,19,137	1,37,750	1,50,788	1,71,928	1,88,916
Meat Products	3,346	3,975	4,539	5,244	5,649	6,557	7,016	7,883	9,487	11,547	13,132	14,778
3. By-Products	4,404	5,192	5,914	6,713	7,347	8,120	8,508	9,538	10,913	12,615	13,863	15,266
Hides	1,887	2,213	2,546	2,852	3,194	3,325	3,346	3,783	3,989	4,142	4,188	4,295
Skins	1,189	1,396	1,561	1,760	1,867	2,153	2,329	2,567	3,097	3,824	4,395	5,028
By Products-Others	1,328	1,583	1,807	2,101	2,287	2,642	2,832	3,188	3,827	4,649	5,280	5,943
Eggs	16,633	19,690	22,708	24,382	26,657	29,777	32,513	36,592	41,895	47,805	54,691	58,380
Wool & hair	496	539	584	578	541	628	606	666	654	595	577	594
Dung	32,599	40,453	43,079	45,455	48,478	53,754	56,208	58,537	63,681	70,480	77,497	86,596

Honey and Silk Worm Cocoons	4,326	4,947	6,286	6,930	7,606	8,945	10,175	10,973	12,560	11,772	14,763	15,842
Increment in Stock	9,710	12,086	13,708	15,474	17,757	21,624	13,839	16,276	17,987	20,010	22,556	24,850
Livestock Sector's Economic Output	4,87,751	5,64,937	6,46,178	7,42,807	8,33,498	9,50,677	10,43,079	11,49,783	12,76,172	14,13,303	15,74,149	17,25,064

Source : National Accounts Statistics, MOSPI, GOI,
<https://www.nddb.coop/information/stats/outputvalue>

Table 2 showcases the remarkable growth in the livestock sector's productivity over the past decade. Notably, the value of output has surged exponentially from approximately Rs. 4.88 trillion in 2011-12 to a staggering Rs. 17.25 trillion in 2022-23, underscoring unprecedented expansion. The milk group has been the dominant contributor, accounting for over 60% of the total value. Notably, milk production has consistently increased, rising from 327.7 million tonnes in 2011-12 to 1,116.2 million tonnes in 2022-23. The meat group has also shown significant growth, with production increasing from 96.2 million tonnes in 2011-12 to 422.6 million tonnes in 2022-23. Within the meat group, poultry meat has been the fastest-growing segment, with production increasing from 39.6 million tonnes in 2011-12 to 188.9 million tonnes in 2022-23. The livestock sector has also witnessed growth in the production of other products, including eggs, wool, and silk. Specifically, the value of egg production has risen from Rs. 16,633 crore in 2011-12 to Rs. 58,380 crore in 2022-23. There has been a notable increase in wool and hair production, with its value rising from Rs. 496 crore to Rs. 594 crore over the same period, representing a significant growth. The Indian livestock sector has witnessed unprecedented expansion over the last decade, fueled by escalating demand for livestock products and enhanced productivity, underscoring its emergence as a vital component of the country's agricultural landscape.

**Table 3: Contribution of Agriculture, Allied Sectors, and Livestock to Gross Value Added (GVA)
(Rs. Crore)**

Year	GVA (Total)	GVA (Agriculture & Allied)		GVA (Livestock Sector)	
		Amount	% Share to total GVA	Amount	% Share to total GVA
2011-12	81,06,946	15,01,947	18.52	3,27,334	4
2012-13	92,02,692	16,75,107	18.20	3,68,823	4
2013-14	1,03,63,153	19,26,372	18.58	4,22,733	4
2014-15	1,15,04,279	20,93,612	18.19	5,10,411	4
2015-16	1,25,74,499	22,27,533	17.71	5,82,410	4.63
2016-17	1,39,65,200	25,18,662	18.03	6,72,611	4.81
2017-18	1,55,05,665	28,29,826	18.25	7,85,683	5.06
2018-19	1,71,75,128	30,29,925	17.64	8,82,009	5.13
2019-20	1,83,81,117	33,68,471	18.32	9,77,918	5.32
2020-21	1,82,10,997	37,06,469	20.35	11,13,089	6.11
2021-22	2,16,35,584	40,99,473	18.94	12,38,401	5.72
2022-23	2,46,59,041	44,84,268	18.18	13,55,460	5.49

Source: National Accounts Statistics-2024, MOSPI, GOI

Table 3 illustrates the livestock sector's contribution to India's Gross Value Added (GVA) from 2011-12 to 2022-23. The sector's share in the total GVA has remained relatively stable, ranging from 4% to 6%. The livestock sector's Gross Value Added (GVA) has exhibited steady growth, surging from Rs. 3,27,334 crore in 2011-12 to Rs. 13,55,460 crore in 2022-23, with a robust average annual growth rate of 10%. Moreover, the data highlights the significant contribution of agriculture and allied sectors, which consistently account for around 18-20% of the country's total GVA, underscoring their vital role in the national economy.

Role of Livestock in Socio-Economic Development

India's socio-economic landscape is significantly influenced by the Livestock Industry, especially for farmers engaged in mixed farming. The benefits of livestock are multifaceted, encompassing:

Employment Opportunities

The livestock sector is a significant employer, providing livelihoods to around 16.44 million people, as revealed by the National Sample Survey Office's (NSSO) 68th Round Survey on Employment and Unemployment. This encompasses a range of opportunities in animal husbandry, dairy farming, fisheries, and related fields. By providing a steady income stream, the sector plays an important role in helping rural households, especially those with limited landholdings or access to alternative employment opportunities.

Leadership in Milk Production

India has established itself as the world's largest milk producer, with an impressive output of 188 million tonnes in 2018-19, Registering a notable 6.5% year-on-year growth rate. As a result, the country has witnessed a significant rise in per capita milk availability, which now stands at an impressive 394 grams per person per day. The dairy sector is a vital component of the Indian economy, generating employment and income opportunities for millions of rural households. Furthermore, the sector has been instrumental in bolstering national nutrition and food security, making substantial contributions to the country's comprehensive growth and development.

Income Generation

Approximately 20.5 million individuals rely on livestock for their livelihood, with the sector accounting for 16% of small farm households' income. For 3.7% of agricultural households, livestock rearing is the main source of income. The sector provides important financial support to numerous rural households, especially those with limited land or alternative employment opportunities. The income generated from livestock enables households to meet their fundamental needs, including food, clothing, education, and other essential expenses.

Contribution to GDP and Agriculture GDP

The livestock sector is a key accelerator of India's economy, sharing 11% to the country's GDP and a substantial 25.6% to the Agricultural GDP. As a vital component of the Indian economy, the field supports millions of livelihoods, bringing income, and ensures food security, thereby playing a very important role in fostering economic growth and development.

Food Security

Livestock products, comprising milk, meat, and eggs, serve as essential sources of animal protein for millions of Indians. As of 2017-18, the country's per capita milk availability was approximately 375 grams per day, while egg consumption reached 74 per annum. By providing essential nutrients, vitamins, and minerals, the livestock sector is instrumental in bolstering national nutrition and food security, contributing to a balanced diet for the population.

Social Security

In rural communities, livestock ownership provides a crucial safety net, conferring social standing, respect, and self-esteem, especially for families without landholdings. Livestock ownership is often perceived as a symbol of prosperity and wealth, fostering a sense of pride and self-worth. Moreover, it provides a reliable source of income and employment, enabling households to meet their fundamental needs and improve their overall well-being.

Manure and Fuel: Alternative Uses of Livestock By-Products

In rural areas, livestock dung is a valuable resource with multiple uses, including fuel, fertilizer, and construction material. Utilizing dung as a fuel source offers a sustainable alternative to fossil fuels, reducing reliance on non-renewable energy sources. Additionally, dung serves as a natural, organic fertilizer, minimizing the need for synthetic fertilizers and promoting environmentally friendly agricultural practices.

India's livestock sector encounters significant hurdles

India's livestock sector confronts a myriad of complex challenges that impede its progress and expansion. To overcome these obstacles, a holistic and integrated strategy is necessary, tackling the diverse issues and fostering sustainable expansion and improvements in the field.

Improving the Efficiency of Farm Animal Production

India's livestock field struggles with substantial productivity gaps. Notably, the average annual milk production of Indian cattle is 1172 kg, lagging behind the global average by a significant 50% (FAO, 2020). This disparity stems from suboptimal breeding practices, inadequate nutrition, and insufficient healthcare. Similarly, the poultry sector struggles with productivity, with average egg production per layer bird ranging from 280-300 eggs per year, falling short of the 320-350 eggs per year achieved in developed countries (ICAR, 2020). To bridge this gap, it is essential to adopt improved breeding practices, ensure adequate nutrition and healthcare, and leverage technological advancements.

Disease Management

Livestock production in India is severely impacted by diseases, with recurrent outbreaks of Foot and Mouth Disease, Black Quarter infection, and Influenza resulting in staggering annual economic losses of approximately Rs. 20,000 crores. The impact of these diseases is exacerbated by inadequate vaccination coverage, with only 30% of cattle and 20% of sheep and goats being vaccinated against major diseases. To mitigate this challenge, improving vaccination coverage, enhancing disease surveillance, and promoting the use of diagnostics are essential steps.

Feed and Fodder Management

A severe shortage of feed and fodder hampers India's livestock sector, leading to reduced productivity. Alarming, ICAR (2020) reports a significant national deficit of 23.4% in dry fodder, 11.2% in green fodder, and a staggering 28.9% in concentrates. This shortage can be attributed to inadequate irrigation facilities, poor crop management practices, and insufficient feed production. To bridge this gap, it is essential to promote the utilization of crop residues, augment feed production, and streamline feed distribution networks.

Infrastructure and Institutional Support

India's livestock sector is hindered by inadequate infrastructure and institutional support, stifling its growth potential. The scarcity of veterinary institutions, subpar slaughterhouse facilities, and underdeveloped market infrastructure exacerbate the issue (NSSO, 2019). Moreover, livestock farmers encounter substantial hurdles due to restricted access to vital services, with a mere 10% having access to credit and a negligible 5% having access to insurance (NSSO, 2019). To overcome these obstacles, investing in in-

rastructure development, bolstering institutional support, and leveraging technology are crucial steps.

Marketing and Value Addition

The livestock sector in India faces challenges related to marketing and value addition. Livestock markets are often informal, irregular, and lack transparency, affecting the prices received by farmers and the quality of products (ICAR, 2020). Inadequate processing and value addition infrastructure reduces the sector's profitability, with only 10% of milk being processed and 20% of meat being processed (DAHD, 2020). To overcome these challenges, it is essential to foster the growth of formal markets, upgrade infrastructure for processing and value addition, and leverage technology to drive progress.

Environmental and Social Concerns

India's livestock sector is grappling with significant environmental and social concerns. The livestock sector has a significant environmental footprint, contributing around 15% of India's total greenhouse gas emissions, while also being a major source of water pollution and land degradation (MoEFCC, 2020). Furthermore, unsustainable livestock farming practices can exacerbate poverty, inequality, and social injustice, with a staggering 60% of livestock farmers living below the poverty line (NSSO, 2019). To mitigate these challenges, it is crucial to promote sustainable livestock production practices, enhance environmental sustainability, and foster social equity, ensuring a more eco-friendly and socially responsible livestock sector.

Policy and Governance

India's livestock sector is hindered by inadequate policy support and ineffective governance. Despite its significant contribution to the agricultural sector, the livestock sector receives a mere 2% of the overall budget allocated for agriculture and allied sectors, highlighting a significant funding gap (DAHD, 2020). Weak governance and regulatory frameworks further impede the sector's growth, with poor implementation of policies and programs undermining its performance (ICAR, 2020). To overcome these challenges, it is essential to strengthen policy support, enhance governance, and leverage technology to improve the sector's efficiency, productivity, and overall competitiveness.

Opportunities in Indian Livestock Sector

The Indian livestock sector presents a vast array of opportunities for growth, development, and investment, poised to make substantial contributions to the nation's economy. By harnessing its potential, the sector can generate employment opportunities, enhance the livelihoods of millions, and play a vital role in driving India's economic progress.

Growing Need for Livestock Produce

India's demand for livestock products is experiencing a significant surge, driven by a combination of factors including rapid population growth, urbanization, and rising incomes. The dairy sector is witnessing particularly robust growth, with a projected Compound Annual Growth Rate (CAGR) of 15% between 2020 and 2025. This upward trend is largely attributed to the increasing popularity of milk, cheese, and other dairy products among Indian consumers. Similarly, the meat and poultry market is forecasted to increase at a CAGR of 10% from 2020 to 2025, driven by increasing demand for chicken, eggs, and other

meat products. This presents an opportunity for livestock farmers and processors to increase production and meet the growing demand.

Export Opportunities

India has a significant opportunity to export livestock products to other countries, particularly in the Middle East and Southeast Asia. The country is already the largest exporter of buffalo meat, with exports valued at over Rs. 26,000 crores in 2020-21. There are also opportunities to export dairy products, such as cheese and butter, to countries like the UAE, Saudi Arabia, and Bangladesh. To tap into these export opportunities, the sector needs to focus on improving quality, increasing productivity, and enhancing competitiveness.

Organic and Niche Markets

There is a growing demand for organic and niche livestock products in India, driven by increasing consumer awareness of health and environmental benefits. Organic livestock products, such as organic milk, eggs, and meat, are in high demand, particularly among urban consumers. Niche markets for specialty products, such as goat milk, sheep milk, and camel milk, present promising opportunities, given their high demand in specific regions. To capitalize on these markets, the livestock sector must prioritize quality enhancement, productivity improvement, and competitiveness augmentation, ultimately catering to the distinct preferences and needs of these niche markets.

Technology and Innovation

The use of technology and innovation can improve the productivity and efficiency of livestock farming in India. The adoption of technologies, such as artificial insemination, embryo transfer, and genomics, can improve the quality and productivity of livestock. The livestock sector can also leverage innovation in feed and nutrition to drive growth, particularly through the development of novel feed formulations and the exploration of alternative feed sources. To tap into these opportunities, strategic investments in research and development are essential, complemented by initiatives that encourage the uptake of pioneering technologies and innovations, ultimately boosting the sector's efficiency, sustainability, and competitiveness.

Government Initiatives and Support

The Indian government has introduced various initiatives to strengthen the livestock sector, with the National Livestock Mission being a flagship program aimed at enhancing the productivity and efficiency of livestock farming, ultimately boosting the income of livestock farmers and promoting overall sector growth. Additionally, the government offers subsidies and incentives to livestock farmers through programs like the Rashtriya Gokul Mission, aimed at improving the productivity of indigenous cattle breeds ¹. These initiatives, coupled with support mechanisms, can help the sector navigate challenges and capitalize on opportunities.

Private Investment in Livestock

India's livestock sector can greatly benefit from private sector participation, which is crucial for fueling growth, innovation, and development in the industry. Significant investment opportunities exist in livestock infrastructure, including the establishment of modern slaughterhouses and meat processing

plants. Furthermore, other than public companies can join with farmers to enhance productivity and efficiency in livestock farming, while also providing crucial market access for livestock products. To unlock these opportunities, promoting private sector participation and investment is essential, which can be achieved through policies and initiatives that foster a conducive business environment.

Future Prospects of Indian Livestock sector

The Indian livestock sector is poised for substantial expansion, fueled by escalating demand for livestock products both domestically and internationally, presenting a promising outlook for growth and development. The sector is poised to experience substantial increases in production, employment, and income generation. A report by IMARC Group forecasts that the Indian livestock market will experience rapid expansion, with a projected Compound Annual Growth Rate (CAGR) of 12% between 2022 and 2027, driven primarily by the increasing demand for dairy products, meat, and eggs.

Government initiatives, such as the National Livestock Mission and the Rashtriya Gokul Mission, are expected to play a crucial part in fostering sector growth. These initiatives aim to achieve ambitious targets, including increasing milk production to 300 million tons by 2025, up from 188 million tons in 2020, and boosting meat production to 10 million tons by 2025, up from 6.3 million tons in 2020. Furthermore, technological advancements, such as precision livestock farming and genomics, are anticipated to enhance productivity and efficiency, contributing to the sector's growth trajectory. As the Indian livestock sector continues to evolve, it is likely to present lucrative opportunities for stakeholders, including farmers, investors, and industry players. Furthermore, the sector's expansion is anticipated to be fueled by rising demand for value-added products, including cheese, yogurt, and meat snacks, which are projected to experience robust growth at a 15% CAGR between 2022 and 2027. Overall, the future prospects of the Indian livestock sector appear promising, with opportunities for growth, employment, and income generation, contributing to the country's economic development.

Conclusion

The livestock sector is a vital component of rural India's economy and well-being, providing essential goods and services such as food, draught power, manure, employment, income, and export earnings. Despite its growth potential, the sector faces significant hurdles, including animal health and veterinary care challenges, sustainability and environmental concerns, which threaten to undermine its long-term viability. To overcome these challenges and leverage emerging opportunities, a comprehensive approach is necessary, involving collaborative efforts from the government, private sector, and technological innovators.

To address the sector's challenges and capitalize on emerging opportunities, key strategies for success in the Indian livestock sector include:

- Improving health and veterinary services is crucial to reduce disease incidence and enhance productivity in the Indian livestock sector. This can be achieved by strengthening veterinary infrastructure, enhancing disease surveillance, and promoting vaccination programs. Furthermore, enhancing veterinary capacity, optimizing animal nutrition, and adopting optimal management practices can also lead to improved health outcomes. By adopting these strategies, India can substantially enhance the health and productivity of its livestock, ultimately yielding benefits for farmers, the national economy, and food security.

- Promoting sustainable livestock production practices, Encourage environmentally friendly practices, such as organic farming, regenerative agriculture, and efficient water management, to minimize the sector's ecological footprint.
- Adopting technological innovations, such as precision livestock farming, artificial insemination, and genomics, can improve productivity and efficiency. Encouraging private sector investment in livestock infrastructure, such as feed mills, slaughterhouses, and meat processing plants, can also help modernize the sector.
- To capitalize on emerging export opportunities, promoting export-oriented production, particularly for buffalo meat, can be beneficial.
- Diversifying into value-added products like cheese, yogurt, and meat snacks can further boost the sector's profitability and competitiveness, while also catering to evolving consumer preferences.
- Improving market access for rural livestock farmers and entrepreneurs can stimulate entrepreneurship, generate employment opportunities, and increase incomes, ultimately contributing to rural economic growth and development, while strengthening policy support through subsidies, incentives, and regulatory frameworks can further propel growth and development. Through the adoption of these strategic initiatives, India's livestock sector can successfully overcome its obstacles, realize its growth potential, and make a substantial contribution to the nation's economic growth, food security, and sustainable development.

References

1. BIRTHAL PS, TANEJA VK and THORPE W (2006) "Smallholder livestock production in India: Opportunities and challenges", Proceedings of an ICAR–ILRI international workshop, NCAP (National Centre for Agricultural Economics and Policy Research)—ICAR (Indian Council of Agricultural Research), New Delhi, India
2. <https://benisonmedia.com/charting-the-future-challenges-and-opportunities-in-indian-animal-feed-and-agri-inputs/>
3. Kamal Kumar, Lalita Garg, Rishi Kumar Singh and Mahesh Chander (2021) "Challenges in the Indian livestock sector and suggested interventions: An overview" Journal of Entomology and Zoology Studies, 9(1): 422-428
4. IMARC Report (2022) "Indian Animal Feed Market Report by Product Type (Poultry Feed, Cattle Feed, Aquafeed), and Region 2022-2037" <https://www.imarcgroup.com/indian-animal-feed-market>
5. Livestock Census, MoFAHD, DAHD, GoI, Livestock Sector in India : Agenda for the Future, Policy paper by ICAR, 1999, <https://krishi.icar.gov.in/jspui/bitstream/123456789/700/1/pb7.pdf>
6. National Accounts Statistics-2024, MOSPI, GOI, <https://www.mospi.gov.in/publication/national-accounts-statistics-2024>
7. National Dairy Development Board, official website, <https://www.nddb.coop/>
8. Risilia D. & Myslimi G. (2024). Challenges and Opportunities in the Livestock Industry for higher productivity and sustainability: The case of Albania. European Scientific Journal, ESJ, 20 (19), 70. <https://doi.org/10.19044/esj.2024.v20n19p70>
9. Singh K. and Gupta S. K. 2021, "Current Status and Future Prospects of Livestock Sector in India" Indian Journal of Animal Sciences, 91(4):255-268, DOI:10.56093/ijans.v91i4.114325
10. Singh S. K. and Singh R. K. (2018) "Indian Livestock Sector: Challenges and Opportunities" Journal of Agricultural Science, 60, 167–185. <https://doi.org/10.1007/s42965-019-00029-w>

11. Swain B.K., Mishra¹ S.K., Sahu A. and Beura¹ C.K. (2023) “Challenges and Future Prospects of Livestock and Poultry Farming in Indian Coastal Ecosystem - An Overview” J. Indian Soc. Coastal Agric. Res. 41(1): 53-63 <https://doi.org/10.54894/JISCAR.41.1.2023.126458>.