**Present Status and Future Prospectus of Livestock in India: A Review**

**Abstract**

A vital part of the world food chain, livestock farming sustains livelihoods and supplies vital nutrients. This thorough analysis looks at the most recent developments and trends in livestock production worldwide, covering important topics like digitalisation, animal welfare, sustainable intensification, and alternative protein sources. Sustainable intensification uses better resource utilisation and management techniques to increase output while reducing environmental effects. Making decisions allows for proactive management and increases productivity. In order to satisfy growing demand and lessen environmental impact, alternative protein sources like plant-based proteins and cultured meat are also being investigated. Nonetheless, there are issues with animal welfare and environmental sustainability. A sustainable and ethical future for animal production requires striking a balance between these difficulties and the advantages of contemporary trends and advances.

**Keywords**: Livestock production, sustainable intensification, animal welfare, livestock species

**Introduction**

In order to meet the world's food demand, supply key nutrients, and support the livelihoods of millions of people globally, livestock production is essential. This thorough review examines a number of global livestock production topics, such as the industry's issues, production systems, important livestock species, and relevance. The production of livestock contributes significantly to the global food supply. Cattle, sheep, goats, pigs, and poultry are examples of livestock that offer important byproducts like milk, eggs, and wool, as well as essential elements like vitamins and minerals and high-quality animal protein. Additionally, livestock support soil health and agricultural sustainability by supplying manure for fertilisation (FAO, 2020).Different regions have different livestock species' distributions and levels of significance. For example, in portions of Africa, Australia, and North and South America, cattle are primarily farmed for the production of beef. In places like Europe, North America, and India, dairy cattle are common. In areas like Central Asia, the Middle East, and portions of Africa with substantial grazing systems, sheep and goats are common. Systems for producing livestock are likewise very diverse. Animals wander freely and graze on natural pastures in traditional systems, which are frequently found in underdeveloped nations. Intensive production techniques, on the other hand, are common in industrialised nations and entail concentrated animal feeding operations in which animals are kept in small areas and given predetermined meals. Mixed systems, combining elements of both extensive and intensive production, are also common (Herrero et al., 2020) [8] . The livestock production industry faces several challenges. Because livestock contributes to greenhouse gas emissions, deforestation, and water pollution, environmental sustainability is a major concern. One of the industry's biggest challenges is juggling the growing demand for animal products with the requirement for environmental stewardship (Gerber et al., 2013). The effect of livestock production on animal welfare is another difficulty. The escalation of industrial processes,   
such as CAFOs, raise questions about the wellbeing of the animals because of the cramped quarters, limited mobility, and access to innate behaviours. To guarantee ethical and responsible livestock production, animal welfare concerns must be addressed (Fraser et al., 2018). Another important factor in the production of cattle is food security. Producing enough wholesome animal protein to meet demand is becoming more and more important as the world's population continues to rise. However, obtaining food security through livestock production is hampered by issues including scarce resources, climate change, and growing production costs (Herrero et al., 2020). Sustainable intensification techniques are being used in cattle production to address these issues. The goal of sustainable intensification is to maximise output while reducing environmental effects. Improved genetics, precise feeding, effective resource use, and the encouragement of responsible management techniques can all help achieve this (Rufino et al., 2021).

**Current trends in livestock production**

The dynamic industry of livestock production is always changing to satisfy the needs of a growing population, shifting consumer tastes, and international environmental objectives. This thorough analysis examines significant developments and their ramifications while highlighting current trends in animal production. Stakeholders can modify their tactics and procedures to maintain competitiveness, encourage sustainable manufacturing, and handle new issues by being aware of these developments.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.

**Present Status of Indian Livestock Sector**

Indian Livestock sector and Animal Husbandryhas historically been an integral part of agriculture in India and is relevant today as a large section of society is actively engaged and dependent on it.India is rich in **livestock**[biodiversity](https://www.bing.com/ck/a?!&&p=0faf484cb4645944JmltdHM9MTY3NjU5MjAwMCZpZ3VpZD0yMDQ2ZjAwOC1jN2E1LTYyZmQtMGJiZi1lMmIzYzYxNzYzMzMmaW5zaWQ9NTE2NQ&ptn=3&hsh=3&fclid=2046f008-c7a5-62fd-0bbf-e2b3c6176333&psq=biodiversity+drishti+ias&u=a1aHR0cHM6Ly93d3cuZHJpc2h0aWlhcy5jb20vdG8tdGhlLXBvaW50cy9wYXBlcjMvYmlvbG9naWNhbC1kaXZlcnNpdHktYWN0LTIwMDI&ntb=1)**and has developed many specific breeds adapted to various climatic conditions.** The**livestock sector grew at a CAGR of 7.9% during 2014-15 to 2020- 21 (**at constant prices), and its contribution to total agriculture GVA (at constant prices) **has increased from 24.3% in 2014-15 to 30.1% in 2020-21.** Besides their monetary benefit and providing a steady stream of food and revenues for households, **livestock provide employment to the rural family, act as insurance during crop failures a**nd the number of livestock owned by a farmer determines the social status among the community. [Dairy](https://www.bing.com/ck/a?!&&p=5adc1c709b6e6beeJmltdHM9MTY3NjU5MjAwMCZpZ3VpZD0yMDQ2ZjAwOC1jN2E1LTYyZmQtMGJiZi1lMmIzYzYxNzYzMzMmaW5zaWQ9NTE3Nw&ptn=3&hsh=3&fclid=2046f008-c7a5-62fd-0bbf-e2b3c6176333&psq=Dairy+drishti+ias&u=a1aHR0cHM6Ly93d3cuZHJpc2h0aWlhcy5jb20vZGFpbHktdXBkYXRlcy9kYWlseS1uZXdzLWFuYWx5c2lzL2luZGlhLXMtZGFpcnktYW5kLWxpdmVzdG9jay1zZWN0b3I&ntb=1) **is the single-largest agri commodity in India.** It contributes**5% to the national economy and employs**80 million dairy farmers directly. **Recently, ICAR** has registered 10 new breeds of livestock species. This has taken the total number of indigenous breeds to **212 as of January, 2023. Recently released schemes launched in Livestock sector include**

* [Animal Husbandry Infrastructure Development Fund (AHIDF):](https://www.drishtiias.com/daily-updates/daily-news-analysis/rashtriya-gokul-mission-1/print_manually)Under this scheme, the Central Government provides a **3% interest subvention to the borrower and credit guarantee**up to**25% of total borrowing.**
* [National Livestock Mission (NLM):](https://www.drishtiias.com/current-affairs-news-analysis-editorials/news-editorials/2022-01-18)This scheme has been restructured for **2021-22 to 2025-26.** The scheme focuses on entrepreneurship development and breeds **improvement in poultry, sheep, goat and piggery,** including feed and fodder development.
* **Livestock Health and Disease Control (LH&DC) Scheme:**It is being implemented to supplement the State/UT governments efforts towards**preventing, controlling and containing animal diseases of economic and zoonotic importance**by vaccination**.**
* [National Animal Disease Control Programme (NADCP):](https://www.drishtiias.com/daily-updates/daily-news-analysis/national-animal-disease-control-programme-national-artificial-insemination-programme#:~:text=Key%20Highlights-,National%20Animal%20Disease%20Control%20Programme%20(NADCP),%26%20Mouth%20Disease%2C%20%26%20brucellosis.) It is being implemented to control **Foot & Mouth Disease and Brucellosis**by completely vaccinating cattle, buffalo, sheep, goat and pig populations against Foot & Mouth Disease and**bovine female calves of 4-8 months of age against brucellosis.**

ICAR's mission to document all animal genetic resources in the country in collaboration with State Universities, Animal Husbandry Departments, NGOs, and others is a good step in this direction. Also, the **Department of Agricultural Research and Education (DARE) has started notifying all registered breeds in the Gazette since 2019** to claim sovereignty over these indigenous breeds. **Veterinary Ambulance Service and Compulsory Livestock Vaccination:** In order to provide **immediate primary treatment for injured animals,**ambulance services should be expanded in veterinary hospitals. In addition, **livestock primary vaccination should be made mandatory,** and regular veterinary surveillance should be conducted in a time-bound manner. **Towards One-Health Approach:** There is a need to **recognize**[One Health Approach](https://www.bing.com/ck/a?!&&p=3c168856fd13c3a1JmltdHM9MTY3NjU5MjAwMCZpZ3VpZD0yMDQ2ZjAwOC1jN2E1LTYyZmQtMGJiZi1lMmIzYzYxNzYzMzMmaW5zaWQ9NTE2Nw&ptn=3&hsh=3&fclid=2046f008-c7a5-62fd-0bbf-e2b3c6176333&psq=One+Health+Approach++drishti+ias&u=a1aHR0cHM6Ly93d3cuZHJpc2h0aWlhcy5jb20vZGFpbHktdXBkYXRlcy9kYWlseS1uZXdzLWVkaXRvcmlhbHMvb25lLWhlYWx0aC1jb25jZXB0&ntb=1)**and understand the interconnection between people, animals, plants,** and their shared environment and encourage collaborations in research and sharing of knowledge at multiple levels across various disciplines like**human health, animal health, plants, soil, environmental and ecosystem**that can help in health sustainability and tackling **zoonotic diseases** as well.

**Challenges for Livestock sector in India**

***Lack of Transparency:***

Nearly half of the country's livestock is still unclassified. Also, Indian livestock product markets are mostly underdeveloped, **uncertain, lack transparency and often dominated by informal market intermediaries.**

***Rising Animal Diseases:***

There has been an increase in communicable diseases among animals. Most recent is the outbreak of [lumpy skin disease (LSD)](https://www.bing.com/ck/a?!&&p=481c2e1d7acee50bJmltdHM9MTY3NjU5MjAwMCZpZ3VpZD0yMDQ2ZjAwOC1jN2E1LTYyZmQtMGJiZi1lMmIzYzYxNzYzMzMmaW5zaWQ9NTE3MA&ptn=3&hsh=3&fclid=2046f008-c7a5-62fd-0bbf-e2b3c6176333&psq=lumpy+skin+disease+(LSD)++drishti+ias&u=a1aHR0cHM6Ly93d3cuZHJpc2h0aWlhcy5jb20vZGFpbHktdXBkYXRlcy9kYWlseS1uZXdzLWFuYWx5c2lzL2x1bXB5LXNraW4tZGlzZWFzZS0x&ntb=1) **in cattle across various states of India.**

***Lack of Extension Services*:**

While the role of extension services in enhancing crop production and productivity is widely recognized, **livestock extension never got the attention it deserves,** and this has been one of the reasons for low productivity of India’s livestock sector.

**Future Prospects of Indian Livestock sector**

The Indian livestock sector is poised for substantial expansion, fuelled 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:

* Adoption of latest technology
* Strengthening veterinary infrastructure in the country
* Enhancing disease survilance
* Promoting vaccination program
* Promoting sustainable livestock production practices
* Promoting export-oriented production
* Precision livestock farming, artificial insemination, and genomics
* Encourage environmentally friendly practices
* Improving market access for rural livestock farmers and entrepreneurs
* Diversifying into value-added products like cheese, yogurt, and meat snacks

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

Disclaimer (Artificial intelligence)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

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