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Contribution of Animal Husbandry to Indian Economy, Its Characteristics and Future: A Review

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SUMMARY

Animal husbandry has played a vital role in the Indian economy for a long time. Animal husbandry has contributed immensely towards meeting the demands of food, raw material for industries, and employment opportunities for rural people, thereby playing a significant role in sustaining rural livelihoods. This review paper elaborates on the contribution of animal husbandry to the Indian economy, its characteristics, and future.

INTRODUCTION

In today's time of climate change coupled with the ever-expanding population, there will be increased burden on the global food production systems and animal source food will hold the key to food security of the most vulnerable populations. The increased demand for animal source food is expected to translate into more livelihood opportunities in the livestock sector, especially in the developing world. India is no stranger when it comes to the significance of livestock sector as an integral part of the economy and its contributions to livelihood and food security of large Indian population. Livestock sector is the key driver of rural Indian economy and acts as crucial insurance against the vagaries of crop failure, providing round the year income, and wholesome food. Livestock plays an important role in Indian economy. World milk production (roughly 81% cow milk, 15% buffalo milk, and 4% for goat, sheep and camel milk combined) increased by 1.1 percent to about 887 million tonnes in 2021. India is the largest producer of milk globally with 23.67 percent share in total milk production in the world. In India, about 50 percent of milk is consumed on-farm. Dairy is the single largest agricultural commodity contributing 5 percent of the Indian national economy and employing more than 8 crore farmers directly. India accounts for about 7 percent of the global egg production, 2.42 percent of global meat production, and 7.56 percent of global fish production and houses the largest population of milch animals in the world (FAOSTAT, 2022; Economic Survey, 2022). About 20.5 million people depend upon livestock for their livelihood. 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. Livestock is considered a sign of wealth as the farmers who own livestock are found to be economically better than farmers without livestock. Animal husbandry was found to be the most attractive and remunerative activity for Antodaya beneficiaries. Livestock provides livelihood to million with little access to land.

Poverty alleviation and employment generation:-

16.44 million Workers as per usual status (principal status and subsidiaries status) were engaged in activities of farming animals, mixed farming, fishing and aquaculture. Livestock provides livelihood to landless laborers and marginal farmers which own the bulk of livestock. Around 70 percent of the population living in rural areas depend on agriculture and allied activities for livelihood hence there is a need for a subsidiary occupation like poultry keeping, sheep and goat rearing. Farmer's suicides are a worrisome social issue for India today and are largely being blamed on drought blamed on drought processing. It is reported that livestock seems to have an influence in overcoming the severity of suicidal trend among the Indian farmers up to 79 percent. Minimum availability of land for feed and fodder is an important determinant of the size of livestock holding. Given the resources with the land scarce households, the utility of livestock as a provider of livelihood opportunities is far greater for them. Goat and sheep are known as the poor man's cow or bank on hooves which survive with least resources. Even in the 21st century draught power provided by oxen, male buffaloes, ponies or mules are cheap modes of transport for the poor farmers. Livestock help improves food and nutritional security by providing nutrient-rich food products, generate income and employment and act as a cushion against crop failure, provide draught power and manure inputs to the crop subsector, and contribute to foreign exchange through exports.

Women empowerment: When the women are empowered the society is empowered and the financial independence is very important for empowerment. Growing rural to urban migration by men, there is

'feminisation' of the agriculture sector, with an increasing number of women in multiple roles as cultivators, entrepreneurs, and laborers. With women predominant at all levels of production, preharvest, post-harvest processing, packaging and marketing of the agricultural value chain, to increase productivity in agriculture, it is imperative to adopt gender specific interventions. The rural women play a significant role in the rearing of livestock and are responsible for most of the operations relating to feeding, breeding, management, and health-care of the livestock. The rapidly increasing demand for livestock products creates opportunities for the empowerment of women. The major share of the credit for India's position as largest milk producing country in the world and a significant increase in the per capita availability of milk in the country has to go to the largely illiterate rural women dairy farmers.

Integrated farming:

Generally, a form of integrated farming and mixed farming which is livestock rearing alongside crop cultivation and small herd of goat or sheep is carried out in India. Most of the goat keepers are either landless laborers or small and marginal farmers. Thus, the goat is definitely the animal of the "poorest rural poor" and it is usually looked after by the woman of the house. They provide food and nutritional security to the millions of marginal and small farmers and agricultural laborers. Rice-based integrated farming system model developed for marginal farmers in Tamil Nadu revealed that a net profit of INR 11,755/year from rice– poultry– fish– mushroom in 0.4 ha area, while in conventional cropping system (CCS) with rice– rice– green manure/ pulses, a net income of INR 6,334/year was obtained from the same area. The integrated farming system generated a net income of Rs. 58,360 and an employment of 573 man days on a small piece of land (1.25 ha), ensuring a high standard of living for small and marginal farmers. The recycling of animal dung/wastes in fish ponds for natural fish production is important to sustainable aquaculture and to reduce expenditure on costly feeds and fertilizers which form more than 50 percent of the total input cost. The burning of paddy stubs or crop residues has been identified as a source of pollution. Traditionally goat and sheep or livestock have been allowed to graze to consume the crop residue on the farm while their dropping and urine on the farm proved to be a fertilizer for the next crop.

Diverse enterprises

Rearing of a wide variety of animals like yaks, camels and Mithun apart from cattle, sheep and goat are unique characteristics of animal husbandry in India. The country has exported 1175193.02 MT of buffalo meat products to the world for the worth of Rs. 24613.24 Crores/ 3303.34 USD Millions during the year 2021-22. Backyard poultry known as the zero input enterprise provides income by sale of eggs or meat. Swine rearing is common in certain parts of our nation and its export potential should be realised. In high altitude regions, yaks provide milk, meat, fur, and transport. In hilly areas rabbit farming is a profitable venture. It exported 74,413.05 MT of natural honey in 2021-22, valued at US$ 163.77 million and US$ 190.06 million in 2022-23 (Apr-Feb). The honey market in India was valued at Rs 23.3 billion in 2022 and is expected to grow at a CAGR of 8.4% to Rs 38.8 billion by 2028. Indian honey has a good export market with the use of the modern collection, storage, beekeeping equipment, honey processing plants and bottling technologies the potential export market can be tapped. Rabbits need less space and are reared in cages like poultry. The marked rise in rabbit project development activities in developing countries, observed over the past ten years, may be attributable to the increased awareness of subsistence rural and peri-urban inhabitants to the potential of small-scale rabbit production. Poultry occupies a crucial place in India and chicken is the most widely accepted meat in India, free from religious taboos. Many Indian families in urban areas have begun to accept eggs as a regular supplementary part of their vegetarian diet.

Source of energy and manure:

India is keen on exploring clean energy production avenues like biogas and thus attention should be paid to the abundance of dung that is produced as a result of having one of the largest cattle populations. Biogas technology provides an excellent opportunity for mitigation of greenhouse gases (GHG) emissions and reducing global warming. The work of transforming cow-dung into economically valued products has not been treated as a matter of significant interest by economists and analysts of the Indian rural scene. Almost 50 percent of the dung produced is converted to dung cakes. Traditionally dung is used as fuel as "upla for cooking" and as manure. But this dried dung cake is a source of environmental pollution and the same dung if used to make methane will become cleaner fuel. Huge amount of waste generated from poultry and livestock farms and their disposal is becoming an issue. The success of schemes like GOBAR- DHAN yojana will help in utilization of dung and farm waste. Following reforms can help increase remuneration from animal husbandry.

Critical reforms needed for growth in the future:

Promotion of Marketing and Processing

Milk production during 2020-21 and 2021-22 is 209.96 million tonnes and 221.06 million tonnes respectively showing an annual growth of 5.29%. The per capita availability of milk is around 444 grams/day in 2021-22. Currently, the total Poultry population in our country is 851.81 million (as per 20th Livestock Census) and egg production is around 129.60 billion during 2021-22. The per capita availability during 2021-22 is around 95 eggs per annum. The Egg production has shown positive growth as 6.19% during 2021-22. Wool production in the beginning of Twelfth Plan (2012-13) was 46.05 million Kg and increased to 48.14 million Kg in 2014-15 but declined to 33.04 million Kg in 2021- 22. Meat production during 2014-15 was 6.69 million tonnes which has been further increased to 9.29 million tonnes in 2021-22. The Meat production has shown positive growth as 5.62% during 2021-23. The export of Animal Products includes Buffalo meat, Sheep/ Goat meat, Poultry products, Animal Casings, Milk and Milk products and Honey, etc. India's exports of Animal Products in 2021-22 was Rs. 30,953.29 Crores/ 4,152.25 USD Millions in , which include the major products like Buffalo Meat (Rs. 24613.24 Crores/ 3303.34 USD Millions), Sheep/ Goat Meat (Rs. 447.58 Crores/ 60.03 USD Millions), Other Meat (Rs. 45.52 Crores/ 6.11 USD Million), Poultry Products (Rs. 529.80 Crores/ 71.03 USD Millions), Dairy Products (Rs. 2928.80 Crores/ 391.59 USD Millions), Animal Casing (Rs. 474.04 Crores/ 63.53 USD Millions), Processed Meat (Rs. 10.56 Crores/ 1.42 USD Millions), Casein (Rs. 592.78 Crores/ 79.36 USD Million), Albumin (Eggs & Milk (Rs. 89.82 Crores/ 12.04 USD Millions)), and Natural Honey (Rs. 1221.18 Crore/ 163.75 USD Millions). The demand for Indian buffalo meat in the international market has sparked a sudden increase in meat exports. Buffalo meat dominated the exports with a contribution of over 79.56% in total Animal Products export from India in 2021-22. Indian meat and milk products can be made suitable for the international market by manufacturing products like cream, cheese, Greek yogurt, sausages or salami. Food processing with milk and meat companies should be made attractive investment destinations for Make in India initiative and draw Foreign Direct Investment. Food processing has been brought under priority sector lending and can also avail tax benefits and subsidized loans benefit of MSME (Micro, Small and Mini Enterprises). The global demand for meat is predicted to rise by more than 55 percent between 1997 and 2020, with meat production reaching 455 million tons by 2050. Women and farmers in livestock sector need to be educated on utilizing the government initiative of Start-up and Stand up India to avail finances for livestock based enterprises. Focus on livestock products and their inclusion in the manufacturing sector can improve Indian economy which is already agro and livestock based.

Conservation of Indigenous Breeds:

Global warming and climate changes are the burning topics and concern for the whole world. The ambient temperature of the earth is said to rise by 1.5-2°C (Celsius) and extreme climatic conditions are being experienced. As a result of climate change occurrence of floods and drought frequencies has increased. The indigenous or native stock has a poor performance relative to highly selected commercial lines but they have the ability to survive in challenging environments. Promotion of Indigenous high yielding cattle that are known for maintaining performance at higher ambient temperature is the need of time. Research had proved that Indigenous breed like Tharparkar, Gir, Red Sindhi produced the favored A2 variant of β-caesin. Populations, which consume milk containing high levels of βcasein A2 variant, were found to have a lower incidence of cardiovascular disease and type-1 diabetes. Milk with A2 protein is sold at a premium price due to their health benefits. Government schemes like Kamdhenu yojana will help in revival of indigenous germplasm.

Improvement in Healthcare System:

Landless and marginal farmers have the majority of livestock holdings, which are a vital source of income for them. When the animals fall sick they become unproductive and their care becomes a large expense. Veterinary Health Care needs to be accessible and doorstep treatment should be available since farmers find it difficult and expensive to transport large animals. Animal health services are important in reducing losses due to animal diseases. Technologies for disease control and cure are known but delivery problems exist. Certain state governments in India are pursuing a cost recovery approach and are encouraging private practitioners to cope with the financial constraints and to deliver broad and effective animal health and breeding services. The production potential of animals depends crucially on feed quality, genetic potential and animal health services system. On all these counts, India has a poor record. The public sector continues to be the primary provider of veterinary services, and the deteriorating fiscal situation of most state governments is making it extremely difficult to either expand the reach of these services or improve the quality of service delivery.

Digitalization:

Any Information and communication technology (ICT) intervention that improves the livelihoods of poor rural families is likely to have significant direct and indirect impacts on enhancing production, marketing and post-harvest activities which, in turn, can contribute further to poverty reduction. Under Pashu sanjivani scheme Unique Identification number (UID) is provided to milch animals and the data is uploaded on Information Network on Animal Health and Productivity (INAPH). E- Pashuhaat portal an online portal for connecting farmers and breeds has been developed by the government and works like an online marketplace for livestock. "Pashu Poshan" app was launched by a state government. Hortinet app and livestock disease forewarning app have been developed to increase digitalization. Information and communication technology can be seen as contributing to the socio-cultural

The existing scheme available from Ministry of Fisheries, Animal Husbandry & Dairying for supporting Livestock Production:

Rashtriya Gokul Mission (RGM):

The Rashtriya Gokul Mission (RGM) is being implemented for development and conservation of indigenous bovine breeds since December 2014. The scheme is important in enhancing milk production and productivity of bovines to meet growing demand of milk and making dairying more remunerative to the rural farmers of the country. The scheme is also continued under umbrella scheme Rashtriya Pashudhan Vikas Yojna from 2021 to 2026 with a budget outlay of Rs.2400 crore. The RGM will result in enhanced productivity and benefit of the programme, percolating to all cattle and buffaloes of India especially with small and marginal farmers. This programme will also benefit women in particular since over 70% of the work involved in livestock farming is undertaken by women.

National Livestock Mission:

The scheme is implemented with the following three Sub-Missions:

- Sub-Mission on Breed Development of Livestock & Poultry
- Sub-Mission on Feed and Fodder development
- Sub-Mission on Extension and Innovation

Sub-Mission on Breed Development of Livestock & Poultry:-

The sub-mission proposes to bring sharp focus on entrepreneurship development and breed improvement in poultry, sheep, goat and piggery by providing the incentivization to the individual, FPOs, SHGs, Section 8 companies for entrepreneurship development and also to the State Government for breed improvement infrastructure.

Sub-Mission on Feed and Fodder development:

This sub-mission aims towards strengthening of fodder seed chain to improve availability of certified fodder seed required for fodder production and encouraging entrepreneurs for establishment of fodder Block/Hey Bailing/Silage Making Units through incentivisation.

Sub-Mission on Research & Development, Livestock Insurance, Extension and Innovation:

The sub-mission aims to incentivize the Institutes, Universities, Organizations carring out research and development related to sheep, goat, pig and feed and fodder sector, extension activities, livestock insurance and innovation.

(iii) Livestock Health & Disease Control scheme

The overall aim of the Livestock Health & Disease Control scheme is to improve the animal health sector by way of implementation of prophylactic vaccination programmes against various diseases of livestock and poultry, capacity building, disease surveillance and strengthening of veterinary infrastructure. It is envisaged that implementation of the scheme will ultimately lead to prevention & control, subsequently eradicating the diseases, increased access to veterinary services, higher productivity from animals, boosting up of trade in livestock and poultry, in livestock and poultry products and improving socio- economic status of livestock and poultry farmers. The funding pattern is 100% central assistance for the CADCP and the non-recurring components of ESVHD, and 60:40 between Central and State for the other components as well as for ASCAD, with 90:10 for hilly and NE States and 100% for UTs.

National Programme for Dairy Development (NPDD):

The NPDD scheme aims to enhance quality of milk and milk products and increase share of organized milk procurement. The scheme has two components:

Under NPDD, Fund sharing Pattern of Centre & State is as under:

Component 'A' focuses towards creating/strengthening of infrastructure for quality milk testing equipment as well as primary chilling facilities for State Cooperative Dairy Federations/ District Cooperative Milk Producers' Union/SHG run private dairy/Milk Producer Companies/Farmer Producer Organisations. The scheme will be implemented across the country for the period of five year from 2021-22 to 2025-26.

Component 'B' (Dairying through Cooperatives) provides financial assistance from Japan International Cooperation Agency (JICA) as per project agreement already signed with them. It is an externally aided project, envisaged to be implemented during the period from 2021-22 to 2025-26 on pilot basis in Uttar Pradesh and Bihar initially with the objective of creation of necessary dairy infrastructure for the purpose of providing market linkages for the produce in villages and for strengthening of capacity building of stake-holding institutions from village to State level.

Animal Husbandry Statistics:

The Animal Husbandry Statistics (AHS) Division of Department of Animal Husbandry & Dairying (DAHD) is entrusted with the generation of Animal Husbandry Statistics through the Centrally Sponsored Scheme "Livestock Census and Integrated Sample Survey "under the development programmes category with two components, (i) Livestock Census (LC)& (ii) Integrated Sample Survey (ISS).The scheme is being implemented by the Department of Animal Husbandry and Dairying through State Animal Husbandry Departments.

National Animal Disease Control Programme (NADCP):

National Animal Disease Control Programme (NADCP) is a flagship scheme launched by Hon'ble Prime Minister in September, 2019 for control of Foot & Mouth Disease and Brucellosis by vaccinating 100% cattle, buffalo, sheep, goat and pig population for FMD and 100% bovine female calves of 4-8 months of age for brucellosis with the total outlay of Rs.13, 343.00 crore for five years (2019-20 to 2023-24).

Foot and Mouth Disease (FMD) is a highly contagious viral vesicular disease of cloven-hoofed animals such as cattle, buffaloes, sheep, goats and pigs etc. FMD leads to reduction in milk yield, decreased growth rate, infertility, reduced working capacity in bullocks, trade embargo in the international market. Control of FMD can be achieved by mass vaccination of susceptible livestock repeatedly at regular intervals till the incidence of the disease comes down. This will pave way to gradual eradication of the disease from the country.

Brucellosis is a reproductive disease of cattle and buffaloes caused by bacterium Brucella abortus. The disease is characterized by fever, induces abortion at the last stage of pregnancy, infertility, delayed heat, interrupted lactation resulting in loss of calves, loss in production of meat and milk. Bovine brucellosis is endemic in India and appears to be on the increase in recent times, perhaps due to increased trade and rapid movement of livestock. In the absence of any treatment for Brucellosis in bovine animals, the disease can be prevented by vaccination. Control of Brucellosis can be achieved by an once-in-a-lifetime vaccination of female bovine calves (4 – 8 months old).

Dairy Processing & Infrastructure Development Fund:

Consequent to the Union Budget 2017-18 announcement, Dairy Processing & Infrastructure Development Fund has been set up with a corpus of Rs. 8,004 crore with National Bank for Agriculture and Rural Development (NABARD). The CCEA in its meeting dated 12.09.2017 has approved the scheme which has the objective to provide subsidized loan @6.5% to capital stressed milk cooperatives for primarily replacing their decades old chilling and processing plants and addition of value added product plants. Out of Rs 10,881 crore of financial outlay for project components of DIDF, Rs 8,004 shall be loan from NABARD to NDDB/NCDC, Rs 2,001 crore shall be end borrowers contribution, Rs 12 crore would be NDDB/NCDC's share and Rs 864 crore shall be contributed by DAHD toward interest subvention. The project focuses on building an efficient milk procurement system by setting up of processing and chilling infrastructure & installation of electronic milk adulteration testing equipment at village level.

The Scheme envisages providing loan assistance to State Dairy Federations, District Milk Unions, Milk Producers Companies, Multi State Cooperatives and NDDB subsidiaries across the country who are termed as Eligible End Borrowers (EEBs). The funding period (2017-18 to 2019-20) of the scheme to be revised to 2018-19 to 2022-23 and the repayment period to be extended upto 2030-31 with spill over to first quarter of the FY 2031-32.

Animal Husbandry Infrastructure Development Fund (AHIDF)

Hon'ble Prime Minister has announced for setting up of Rs. 15000 crore Animal Husbandry Infrastructure Development Fund (AHIDF) under Atma Nirbhar Bharat Abhiyan stimulus package. The Animal Husbandry Infrastructure Development (AHIDF) has been approved for incentivizing investments by individual entrepreneurs, private companies, MSME, Farmers Producers Organizations (FPOs) and Section 8 companies to establish (i) the dairy processing and value addition infrastructure, (ii) meat processing and value addition infrastructure and (iii) Animal Feed Plant.

Supporting Dairy Cooperatives and Farmer Producer Organizations engaged in dairy activities:-

A Scheme named “Supporting Dairy Cooperatives and Farmer Producer Organizations engaged in dairy activities” was approved to provide working capital loan to State Cooperatives and Federations. An amount of Rs. 303 crore has been released to National Dairy Development Board till December 2021 for implementation of the scheme.

CONCLUSION

Animal husbandry has been a significant contributor to the Indian economy, and its characteristics are diverse and region-specific. The future of the sector is promising, provided the challenges are addressed in a timely and effective manner. Governments need to invest in the sector by providing necessary infrastructure and marketing support, and research institutions need to focus on developing better technologies and livestock breeds suitable for Indian conditions.

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