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

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Authors' contributions

This work was carried out in collaboration between all authors. Author MS chose the topic for review and wrote the first draft of the manuscript. Author PB proof read the manuscript and added the suggestions advised. Author MG managed the literature searches and made appropriate corrections. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/AJAEES/2018/43337

Editor(s):

(1) Ian McFarlane, School of Agriculture Policy and Development, University of Reading, UK.

Reviewers:

(1) Shakti Ranjan Panigrahy, Anand Agricultural University, India.

(2) Rayees Ahmed, Sher-e-Kashmir University of Agricultural Sciences and Technology of Jammu (SKUAST-J), India.

(3) Kamran Baseer Achakzai, Pakistan.

Complete Peer review History: <http://www.sciedomain.org/review-history/25972>

Received 11th June 2018

Accepted 14th August 2018

Published 23rd August 2018

Review Article

ABSTRACT

Livestock has played an indispensable role in the Indian economy. Animal husbandry is culturally and economically integrated into the society. Livestock is a source of protein, livelihood and draught power. Diverse enterprises like Apiculture, Sericulture, and Pisciculture have been reared traditionally for many years. Indigenous stock has higher resistant to diseases and can better adapt to climate change. They act as a buffer to crop failure and sudden monetary losses. Rearing a wide variety of animals like yaks, camels and Mithun apart from cattle, sheep and goat are unique characteristics of animal husbandry in India. Technological backwardness, financial constraints, and inadequate veterinary services are few issues that hinder the progress in the sector.

Keywords: *Animal husbandry; Indian economy; poultry; livestock.*

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1. INTRODUCTION

Indian livestock sector is one of the largest in the world with holdings of 11.6 percent of the world [1]. India is an agrarian economy and farmers are known as the backbone of the economy. Animal husbandry is the backbone in the economy of these farmers, by bringing an additional and steady income. The growth rate of the livestock sector has been steady and is around 4-5 percent despite receiving less investment compared to the manufacturing and service sectors [2]. The share of the livestock sector in the total value of the output of the agricultural sector increased from 28.2 percent to 30.1 percent during 2004-05 to 2012-13 [3]. There is a significant inverse relationship between poverty and value of livestock output. The states with higher livestock share have a low level of poverty and vice versa [2]. India has around 65.07 million sheep, 135.2 million goats and 10.3 million pigs as per 19th livestock census [4]. Livestock acts as a storehouse of capital insurance against crop production risks and a coping mechanism against livelihood shocks as well as a vital source of dietary protein [5]. Protein malnutrition in children has reduced in India with the increasing availability of egg and milk. Traditionally specific tribes or societies are known for specific animals as their source of livelihoods such as Raikas and Camels, Gujjar and Sheep, Brokpa and Yak. India ranks first in the world milk production with an annual production of 132.4 million which contributes about 16 percent to the world milk production [1].

Changes in livelihood pattern of young Brokpa if not taken seriously then the conservation of Yak related bio-cultural diversity is at stake [6]. 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 [7]. Few of the many ways in which animal husbandry contributes to Indian economy are discussed in following passages.

2. 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 [8]. 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 [9]. 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 [10].

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 [11]. 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 [12].

3. 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, pre-harvest, post-harvest processing, packaging and marketing of the agricultural value chain, to increase productivity in agriculture, it is imperative to adopt gender specific interventions [13]. 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 [14]. 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 [15].

4. 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 [16]. They provide food and nutritional security to the millions of marginal and small farmers and agricultural laborers [17]. 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 [18]. 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 [19]. 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 [20]. 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.

5. 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. In the year 2012–2013 total production of buffalo meat was 3.59 million tonnes (MT) while India produced 1.53 MT of buffalo meat [21]. 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. India has exported 25,780.74 million tonnes (MT) of

natural honey to the world for the worth of Rs. 356.28 crore during the year of 2012-13. 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 [22]. 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 [23]. 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 [24].

6. 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 [25]. 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 [26]. Almost 50 percent of the dung produced is converted to dung cakes [27]. 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.

7. CRITICAL REFORMS NEEDED FOR GROWTH IN THE FUTURE

7.1 Promotion of Marketing and Processing

Milk production during 2015-16 and 2016-17 was 155.5 million tonnes and 165.4 MT million tonnes respectively showing growth of 6.37 percent [4].

80 percent of the milk produced is handled by unorganized sector and 20 percent by corporate and private sectors [28]. Export of processed meat products in 2017-18 was only 269.66 MT [29]. Women make traditional milk product of ghee and curd which today find a ready market and sell at higher cost as compared to milk can be carried out. Export earnings from livestock products rose from Rs. 1500.93 crores in 2001-02 to 2253.33 crores during 2004-05. Meat and poultry products accounted for 83 percent of total export earnings [30]. 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 [31]. Women and farmers in livestock sector need to be educated on utilizing the government initiative of Startup 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.

7.2 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 [32]. 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 [33]. Populations, which consume milk containing high levels of β -casein A2 variant, were found to have a lower incidence of cardiovascular disease and type-1 diabetes [34]. 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.

7.3 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 [35]. 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 [36]. 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 [37].

7.4 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 [38]. 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- Pashuhaar 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 [39] can be seen as contributing to the socio-cultural

system of rural areas, with an impact on both behaviour and knowledge. It is believed that ICT will become the prime basis for the future economic development of livestock industry and failure to adopt could cause major problems [40]. Computer-based information system called "Animal Health Information System" (AHIS) used by dairy owners provides scientific information on animal health management particularly diseases in the form of text in the local language. 85 percent respondents perceived AHIS as very useful, and 15 percent told it is useful to them for decision making. No one felt it as useless [41].

8. CONCLUSION

Agriculture and animal husbandry have been a part of Indian economy since long. India has one of the largest populations of livestock and stands first in milk production. Livestock helps in women empowerment and provides livelihood to many marginal farmers. In Agriculture based economy real development can be achieved only by developing farming community who raise livestock as the main component. Poverty alleviation programmes of the government won't be successful until and unless the focus on investment of the governmental policies is not agriculture and animal husbandry. India's real development will be achieved only when agro-livestock sector receives highest investment priorities with latest technologies incorporated with traditional knowledge.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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Peer-review history:

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