Comparative Analysis of Sustainable Livestock Development as a Source of Livelihood to Farmers of Maharashtra and Jammu and Kashmir

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Abstract

This research focuses on the development of livestock and related issues in two Indian states. The increasing demand for meat and milk in these two states is placing a great deal of stress on the natural resource base. Additionally, a large portion of the land in these states is farmed for animal feed, specifically cereals. In terms of economic output, livestock production in these two states has the potential to overtake all other agricultural activities. In these two states, livestock has helped people's economic standing. However, several challenges are impeding the growth of cattle in the states, such as issues related to deforestation, overgrazing, and degradation, the "involution" of mixed farming systems, and waste management in areas with high animal concentration. Measures that only address the external symptoms of environmental damage will never produce the same results as policies that focus on the underlying causes of the problem. Demand must be considered when setting the price of livestock products to achieve sustainable development in livestock specie-mix. There is a lot of room for technological development, which could result in reduced resource consumption per unit of output and increased livestock production.

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Introduction

There are many different types, purposes, and formats for rearing livestock. Over 550 million livestock farmers have been able to secure a living through livestock husbandry, which has been sustainably contributing to the global economy (Arshad Bhat, 2020; Wani M.H., 2021; Thornton et al., 2002). In addition to the direct revenue from the cattle and livestock products, it makes significant contributions through the development of entrepreneurship and employment along its value chain. Furthermore, companionship, entertainment, and security provided by farm and pet animals enhance human welfare in ways that are not taken into consideration in economics. The growth in the agricultural sector has been obscured by the explosion in human population, but livestock development programs have managed to drive livestock production to meet the demands of both rising population and rising living standards (Joanne Millar and Viengxay, 2011). If the strategies for livestock development and marketing are properly addressed, livestock can help reduce poverty and ensure the socioeconomic security of farming and rural communities (Arshad Bhat, 2020; Wani M.H., 2021; Binswanger and Deininger, 1997; LID, 1999; ILRI 2003; IFAD, 2004).

India boasts the largest livestock base in the world, which sustains two thirds of rural communities and is distributed more fairly than land.

About 8.8% of the population is employed by it, and it makes up 25.6% of the GDP from agriculture and 4.1% of the GDP overall (Livestock Census, 2019). Additionally, livestock ensures food and nutrition security for people in all social classes. The Indian livestock industry is strong because of its mixed farming system and mass production approach, which generates year-round income and jobs during the country's lean agricultural season. Furthermore, animals play a significant role in the sociocultural and religious context. Livestock sector is likely to emerge as an engine for agricultural growth in the coming decades and is also considered as a potential sector for export earnings (Jabir, 2007).

Livestock Population Dynamics

The dynamics of the livestock and poultry populations in Jammu and Kashmir and Maharashtra are shown in Table 1. These factors have helped both states' populations remain healthy and to reduce poverty while also improving livelihood patterns and living standards (Planning Commission, 2019; Arshad Bhat, 2020; Wani M.H., 2021). Compared to Jammu and Kashmir, the state of Maharashtra is seeing a higher rate of population growth in livestock. Marginal farmers and those who give up farming are entering the livestock industry in Maharashtra and Jammu & Kashmir, helping to meet the country's food and nutrition needs.

Table 1. Number of livestock and poultry in Maharashtra and Jammu and Kashmir during 2012 & 2019

States/ UTs	Cattle	Buffalo	Small Ruminants	Others	Pack Animals	Total Livestock	% change	Total Poultry	% Change							
	2012	2019	2012	2019	2012	2019	2012	2019	2012	2019	2012	2019		2012	2019	
Jammu & Kashmir	2798	2532615	739	690829	5407	4977721	56	27436	199	90098	9200	8318699	903.20	8273	33059	2.99
Maharashtra	15484	13924926	5594	5603692	11015	13285212	326	161000	68	37610	32489	33012854	1117.0	77795	32662	-0.35
All India	190904	192523359	108702	109851678	200242	223145401	10371	9113210	1838	1188335	512057	535828876	1000.10	729209	32503039	47.84

Note: Totals may not tally due to rounding up of figures

0 negligible with respect to thousands/not reported

Source: 19th Livestock Census, Department of Animal Husbandry, Dairying & Fisheries, M/O Agriculture

Adoption of cross-bred/improved Animals in both the states

Increasing productivity is the only practical solution given the sharp rise in the demand for livestock products and the scarcity of resources for horizontal expansion. Crossbreeding is an important tool for achieving a rapid and long-term increase in productivity and production in livestock species that are economically significant. Nevertheless, due to agro-ecological/socio-economic limitations, ignorance, and inadequate resource availability and management, the population increase of crossbred cattle appeared to be weak. Compared to arid and semiarid systems, the percentage of crossbred cattle, sheep, and pigs is higher in semi-arid moist and coastal climates (Table 2).

Table 2. Number of exotic/crossbred cattle in Maharashtra and Jammu and Kashmir- 2012 & 2019

States/UTs	% of total Sheep		% change	% of total Pigs		% change	% of total Cattle		% change
	2012	2019		2012	2019		2012	2019	
Jammu and Kashmir	1.44	0.21	-0.79	43.90	21.90	20.9	64.80	56.72	55.72
Maharashtra	34.46	0.52	-0.48	11.49	8.86	7.86	26.44	32.61	31.61
India	0.39	6.70	5.7	23.86	20.95	19.95	23.94	26.19	25.19

Source: Ministry of Fisheries, Animal Husbandry and Dairying, Govt. of India. (ON2223)

Regional priorities, preferences, and resource availability-for example, the preference for buffalo over cow in an irrigated region-all contribute to the regional variation in the adoption of crossbreeding programs involving different animal species. It seemed that hill and mountain regions were preferred by sheep for crossbreeding, followed by coastal regions. Cattle are best raised in low-input, low-output systems in hill and mountain environments, which is incompatible with crossbreeding regulations. The abundance of native livestock (Table 3) offers a chance to increase productivity through crossbreeding while also aiding in the preservation of the region's genetic heritage. Of the 800 cattle breeds worldwide, India is home to 27 of them, along with 7 breeds of buffalo. According to Srivastava and Amit Kumar (2019), the Indian Council of Agricultural Research recognized 43 native breeds as of 2018; three buffalo breeds and two cattle breeds were added that year (Press Information Bureau, 2019). A higher potential for increasing animal productivity through the replacement of native breeds with improved animals was suggested by the variation (Table 4).

Table 4. Estimates of coefficient of variance of adoption of crossbred technology in India 2012-2019

S. No.	Species	Coefficient of Variance
1	Sheep	0.74
2	Pigs	0.18
3	Cattle	0.06

However, the production varies greatly amongst the nation's states, primarily due to the dynamics of the livestock population. Jammu and Kashmir has taken the lead in per-capita availability than Maharashtra (Table 5). India's per capita milk and egg availability improved or trended upward because of the government of India as well as government of Jammu and Kashmir implementing various schemes and improved cooperative performance. But to meet the constantly rising demands, the production lines are under a great deal of strain.

Table 5. Estimates of per capita availability of milk and eggs in Maharashtra and Jammu and Kashmir

(gram/day & number/annum)						
States/UT's	**2013-14**		**2018-19**		**2013-19**	**2013-19**
	Milk	**Eggs**	**Milk**	**Eggs**	**% change of Milk**	**% change of Eggs**
Jammu & Kashmir	302	45	401	14	0.33	-0.69
Maharashtra	219	43	266	50	0.21	0.16
India	**307**	**61**	**394**	**79**	**0.28**	**0.30**

Growth of veterinary institutions in Maharashtra and Jammu and Kashmir

There are now significantly more veterinary hospitals, veterinary dispensaries, polyclinics, and veterinary aid centers, stockmen centers, and mobile dispensaries due to increased plan allocation, new livestock development schemes, and growing animal ethics concerns (Tables 6 and 7).

Table 6. Veterinary institutions per thousand animals in Maharashtra and Jammu and Kashmir

States/UT's	Veterinary hospital polyclinics/000 animals			Veterinary dispensaries/000 animals			Veterinary Aid centres/stockmen centres/mobile dispensaries/000 animals		
	2012	2019	% change	2012	2019	% change	2012	2019	% change
Jammu and Kashmir	0.010129	0.006058	-0.99394	0.048523	0.015236	-0.98476	0.027853	0.039409	-0.96059
Maharashtra	0.037669	0.028746	-0.97125	0.08103	0.248848	-0.75115	0.003135	0.415604	-0.5844
India	0.019713	0.022537	-0.97746	0.041536	0.047722	-0.95228	0.049321	0.052569	-0.94743

Table 7. Veterinary practitioners per thousand animals in Maharashtra and Jammu and Kashmir

State/UT's	Veterinary practitioners per thousand animals
Jammu and Kashmir	-
Maharashtra	1.301159
India	0.143245

*Note for year 2010: *: including Jharkhand; $: including Chhattisgarh; #: Uttaranchal; Source: Ministry of Agriculture, Govt. of India.*

Through the prevention of diseases, this has completely changed the way that animal health care is delivered, directly affecting animal welfare. Although there has been a notable increase in the number of professional veterinarians in some states, there is a significant shortage of veterinarians and paravets in other areas, which is becoming increasingly problematic given the new and evolving diseases that pose risks to biosecurity.

Planning and Fiscal Support

Livestock development schemes/programmes in Maharashtra and Jammu and Kashmir

In nearly every state and territory in the nation, a variety of programs have been implemented on time to support the growth of the livestock and dairy industries. For the growth and advancement of this industry, there are currently five major developmental schemes/programmes in place: the Rashtriya Gokul Mission, the National Animal Disease Control Program, the National Artificial Insemination Program, the National Livestock Mission, and the Fodder and Feed Developmental Scheme. The Integrated Sample Survey scheme was introduced in 1985–1986 with the goal of generating baseline informaticsregarding livestock production. The schemes' budget for 2007–08 was 690.32, but in 2018–19, it increased to 1802.66 (Table 8).

Table 8. Funds released under major centrally sponsored schemes in Maharashtra and Jammu and Kashmir (2007-2008 to 2018-2019)

States/UT's	*(Rs. in Lakh)*													
	Integrated Sample Survey				Feed & Fodder under National Livestock Mission				Rashtriya Gokul Mission		Livestock Health and Disease Control			
	2007-08	2010-11	2015-16	2017-18	2010-11	2015-16	2017-18	2019-20	2017-18	2018-19	2014-15	2015-16	2016-17	2018-19
Jammu and Kashmir	0.73	-	-	12.00	213.40	-	812.33	-	196.75	1744.97	745.47	40.00	155.00	1069.84
Maharashtra	48.80	70.00	80.00	123.79	376.30	500.00	1199.83	-	300.00	3314.57	1184.06	935.74	2356.00	1686.36
India	690.32	972.11	1304.02	1802.66	3251.00	9982.00	30441.40	9789.99	20263.75	75043.60	16549.94	14267.09	23711.35	37524.93

The National Livestock Mission's primary goals are to increase productivity, foster entrepreneurship and the creation of jobs, fortify state farms' infrastructure in terms of automation, modernization, and biosecurity, preserve endangered breeds, develop minor livestock, establish rural slaughterhouses, and provide livestock insurance. In 2011–12, the schemes received an outlay of 3251.00 lakhs, but in 2018–19, that amount increased significantly to 9789.99 lakhs (Table 8). The issues of animal feed resource scarcity are addressed by the Sub-Mission on Fodder and Feed Development. The mission of Rashtriya Gokul Mission is to develop and conserve native breeds using a targeted, methodical approach. The mission also calls for the construction of integrated cattle development centers across the nation and the improvement of non-descriptive cattle to increase productivity and milk production. The program's funding, which was 20263.75 lakhs in 2014–15, has increased dramatically to 75043.60 lakh in 2018–19. August 2010 saw the implementation of the nation's Livestock Health and Disease Control scheme, which aims to prevent, control, and contain the spread of economically significant animal diseases as well as zoonotic diseases. In comparison to the 2014–15 budget of 16549.94 lakhs, the Scheme received a massive outlay of 37524.93 lakhs in 2018–19. These initiatives have improved animal comfort, ensured safe food production, and boosted the farming community's economic standing in addition to increasing output and productivity.

Prospects for Livestock Farming

Demand driven progress

The growing human population, rising socioeconomic status, and consequently greater purchasing power are the main factors driving the demand for livestock products (Delgado, 1999). Several empirical studies have shown that there is a structural shift in food consumption occurring toward livestock products (Huang and Bouis, 1996; Kumar, 2007). Trade liberalization might spur demand for livestock products even more. Compared to developed countries, where annual meat consumption ranges from 88 to 100 kg, developing countries are expected to see an increase in meat consumption from 25.5 to 37 kg per person between 1997 and 2030. According to (FAO, 2018), consumption of eggs will increase from 6.5to 8.9 kg and from 13.5 to 13.8 kg in developed and developing countries, respectively, in 2030. Similarly, consumption of milk and dairy products is predicted to increase from 45 kg/person/p.a. to 66 kg in developing countries and from 212 to 221 kg in industrial countries.

Large domestic and international market

Most livestock produce from Jammu and Kashmir and Maharashtra is sold domestically, and this percentage is expected to rise. In rural areas, half of India's milk is sold to non-producers or consumed by the country's milk producers. The remaining portion is marketable surplus that is either sold directly to households or given to private dairies or public cooperatives. It is anticipated that the growing trend away from cooperatives and toward private businesses will create new channels for processed goods and the global market, driving up demand for production. The Indian government has encouraged this trend by implementing a national dairy action plan that offers incentives to large dairy corporations like Fonterra, Lactalis, and Nestle to import production and processing technologies. The entry of foreign dairy corporations is also contributing to a greater industrialization of livestock production. Experts are crossing their fingers, though, regarding how multinational corporations are operating, particularly in the dairy industry. With more access to infrastructure and technology, as well as intensive production methods, large-scale producers can outcompete smaller ones. Smallholder systems' economic participation becomes more challenging as a result, and their access to the expanding consumer market is restricted. The livestock industry's uneven expansion and the growing exclusion of smallholders raise questions about sustainability, food security, livelihoods, animal welfare, and the environment.

Limiting Factors

Competition with natural resources

The future will see a growing impact of competition for natural resources, especially water and land, on production. Regulations pertaining to animal welfare, the environment, and carbon limitations are projected to have an increasing impact on livestock production. The future demand for livestock products may be significantly restrained by socioeconomic factors like shifting sociocultural values and worries about human health. How these factors manifest in various parts of the world over the next few decades is a matter of great uncertainty. Raising livestock presents several environmental and public health risks, including the pollution of water and air caused by animal waste, the loss of biological diversity, the dangers of importing products and animals, and the safety of the food produced. Raising livestock carries risks that can result in zoonotic infections, injuries, or asthma (Scherf, 1995).

Negative attitude towards livestock rearing

Worldwide, people are becoming more hesitant and reluctant to raise livestock due to economic progress and rising income levels. Livestock is a vector for disease transmission, carrying pathogens that can infect humans or other animals. Some people around the world do not choose to raise livestock because they believe it to be a losing endeavour because the costs of production outweigh the profits.

Major challenges facing livestock sector in Maharashtra and Jammu and Kashmir

1. Farm animals produce less on average, and their management is severely lacking in technology. In India, only around 5% of farm households have access to information about livestock technology.
2. In comparison to its contribution to the agricultural GDP, the livestock sector received only around 12% of all public spending in agriculture and related sectors.
   Institutional safeguards are not strong enough to protect animals from harm. Currently, only 6% of animal heads-poultry excluded-are insured. This problem is made worse by insufficient institutional credit availability. India has an 11% shortfall in dry feed, a 35% shortfall in green feed, and a 28% shortfall in concentrate feed. Barely 5% of the cultivated land is used for fodder production. The common grazing lands have been declining both in terms of quantity and quality.
3. The markets for livestock and livestock products are undeveloped, erratic, unpredictable, and opaque, except for poultry products and, to a lesser extent, milk. Slaughtering facilities are inadequate as only about half of the total meat production comes from un-registered, make-shift slaughterhouses. Marketing and transaction costs of livestock products are high, taking 15-20 per cent of the sale price.
4. Environmental issues will be a big challenge, particularly lowering greenhouse gas emissions through mitigation and adaptation plans.
5. Limited services for artificial insemination due to a lack of technical personnel, infrastructure, and high-quality germplasm
6. While globalization will open up opportunities for more people to engage in international trade, it will also impose strict standards for food safety and quality, which seems like a significant obstacle. diseases that are common, developing, and reemerging; a weak gross root level surveillance system; and a shortage of immunization supplies and infrastructure.

Conclusion and Future strategy

Considerable and ongoing innovation in livestock systems at the national and international levels (Dijkman, 2009) Options for livestock development are desperately needed, such as tightening regulations to govern contracts along food commodity chains, accepting/guaranteed collective rights/community control (Gura, 2008), constructing social protection, and fortifying ties to urban areas (Wiggins, 2009). Most likely, a significant investment is the most important of these (World Bank, 2009).

The following should be done in order to achieve maximum benefits from the livestock;

- It is necessary to focus on a particular specie-mix rather than growing the number of unremarkable animals. encouraging the growth of high-yielding animal populations through crossbreeding and reducing the number of low-yielding animal populations to reduce the overall population. It is imperative that livestock informatics continue to be developed in the public domain.

- It would be crucial to preserve native cattle in their specific habitats by offering financial compensation for losses in output. creation of elite male mother farms to supply the necessary germplasm in accordance with the breeding strategy for a particular species.
- Promoting the Open Nucleus Breeding System is necessary given the current livestock situation to reduce productivity losses and genetic deterioration in farmers' flocks. It's also necessary to support low-input, low-output rearing systems in areas with limited resources.
- Resources on common property, such as highland pastures, must be developed and protected. As part of CPR's conservation policy, scientific development of the forage area must be given top priority.
- An effective system for surveillance and monitoring diseases that includes clinical level disease reporting is crucial for managing animal health. Incentives for eliminating economically significant diseases such as para tuberculosis, brucellosis, etc. should be included in the culling of the animals.
- Promoting integrated farming systems is necessary to enable the most efficient use of available land and ensure the use of inputs.
- Raising livestock needs to be done according to scientific principles. It has been determined that to connect livestock production with markets, additional requirements for value addition include technology transfer and produce marketing that is safe and secure.

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