

Livestock Husbandry and Environmental Problems

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Abstract- Livestock husbandry is one of the significant agricultural sub-sector that competing overall economic expansion as it contributes 1.5 percent to GDP globally. About 29 percent of the world's land surface is used for livestock production, either by permanent pasture for grazing or croplands for animal fodder and feed. In a world where a growing number of consumers and producers have instant access of livestock products we have a moral mandate to guide the expanding and rapidly changing global livestock sector so as to minimize its negative environmental impacts and maximize the potential benefits both economically and environmentally. Thus researcher tried to analyse the growth of livestock and their possible impacts on environment in India. The secondary sources were used for analysis. The data were collected from different national and international journals, reports, magazines etc. and processed and with simple statistical techniques. It is found that Indian livestock is growing rapidly and there are both positive and negative effects of livestock husbandry on environment.

Index Terms- Livestock, Economy, Growth, Environment

I. INTRODUCTION

Livestock are omnipresent economic resource in poor communities across the developing world. Two-third of resource-poor rural households estimated to keep several types of livestock in the world (Livestock in Development, 1999). Livestock husbandry practice is having varied reasons like producing food to produce a regular supply of nutrient-rich animal source food that provide a critical supplement and diversity to staple plant-based diets, generate income to meet an urgent need of cash, to provide manure so as to contribute a greater crop production for food and income, to provide traction power for transportation and crop production, to serve as financial instruments and enhance social status as an indicator of social importance within the community, (either based on the size of a family's livestock holdings or in their sharing of livestock with others) to strengthen social bonds (including the use of livestock as dowry or bride price) etc. Thus the multiple objectives of livestock husbandry suggest that it is false to view livestock as a conventional, independent production activity rather it is integrated within household production and consumption decisions, making the role of animals to play in household well-being.

However, the utility of livestock has been undergoing a steady transformation due to structural changes in agriculture and food consumption patterns. The uses of livestock in non-food functions are becoming weaker and weaker. Mechanization of agricultural operations is the important cause of declining the use of livestock as a source of draught power. Use of dung manure is

increasingly being replaced by chemical fertilizers. While their importance as a source of quality food has increased. Consequently, the consumption of animal food products increased rapidly due to sustained income and economic growth, a fast-growing urban population, burgeoning middle income class, changing lifestyles, increasing proportion of women in workforce, improvements in transportation and storage practices and rise of supermarkets especially in cities and towns.

Livestock husbandry is an important agriculture sub-sector of Indian economy. It significantly contributes to the agricultural GDP in India. Livestock generated outputs worth Rs 2075 billion (at 2004-05 prices) in 2010-11 which comprised 4% of the total GDP and 26% of the agricultural GDP. The total output worth was higher than the value of food grains (12th five year plan, 2012-17). Livestock-derived food items (meat, milk and eggs) are the great contributor in the Indian economy. This sector is an integral component of Indian agriculture supporting livelihood of more than two-thirds of the rural population. There are various types of services of animals such as to provide nutrient-rich food products, draught power, dung as organic manure and domestic fuel, hides & skin, and are a regular source of cash income for rural households in India. They are a natural capital, which can be easily reproduced to act as a living bank with offspring as interest, and an insurance against income shocks of crop failure and natural calamities.

Livestock employed a good percentage of agricultural work forces and promotes gender equity. More than three-fourth of the labour demand in livestock production is met by women. A number of states in India like Punjab, Haryana, Jammu & Kashmir, Himachal Pradesh, Kerala, Gujarat, and Rajasthan show less stress of rural poverty where livestock accounts for a sizeable share of agricultural income as well as employment (12th five year plan, 2012-17).

Livestock industries are also a significant source of livelihoods at global level. They are organized in long market chains that employ at least 1.3 billion people and directly support the livelihoods of 600 million poor smallholder men and women in the developing world (Perry and Sones, 2007). At the same time livestock systems occupy 45 percent of the global surface area (Reid *et al.*, 2008). Land is inextricably linked from livestock to natural resource management. Different types of livestock systems have different impacts on land use and its changes. There are several types of livestock transition like transition from pastoral to agro-pastoral systems, from agro-pastoral systems to mixed crop-livestock systems with different degrees of intensification, from mixed crop-livestock systems to specialized industrial landless systems etc (Frans Swanepoel, Aldo Stroebel and Siboniso Moyo, 2010).

Nonetheless, there are a number of environmental challenges and socio-economic problems that need to be overcome through appropriate policies, technologies and

strategies in order to harness the pro-poor potential of livestock. The problems may include insufficient productivity in low-producing animals, huge gap between the potential and the realized yields in Indian livestock, limited extent success in crossbreeding of indigenous species with exotic stocks to enhance genetic potential of different species, quantitative and qualitative deterioration of common grazing lands, frequent outbreaks of diseases like FMD, BQ, PPR, Influenza etc. to affect livestock health and productivity and a large share of ruminants in greenhouse gases (Methane and Nitrous oxide to global warming, the mitigation of which is a major challenge). The important livestock – environment challenges are land degradation particularly of semi-arid region, extensive grazing and large-scale forest degradation, and loss in biodiversity, animal waste products which exceeds the absorption capacity of land and water, emission of greenhouse gases from livestock

wastes, groundwater contamination and pollution, involution of mixed farming system, and slaughterhouses etc.

II. OBJECTIVE

Keeping in view the significance and of livestock husbandry researcher tried to

- i. Present a trend of livestock growth in India and
- ii. To show the relationship of livestock with environment.

III. METHODOLOGY

Data were collected from published record, annual report of livestock census, and different journals and articles. These data were processed and analyzed with simple statistical techniques.

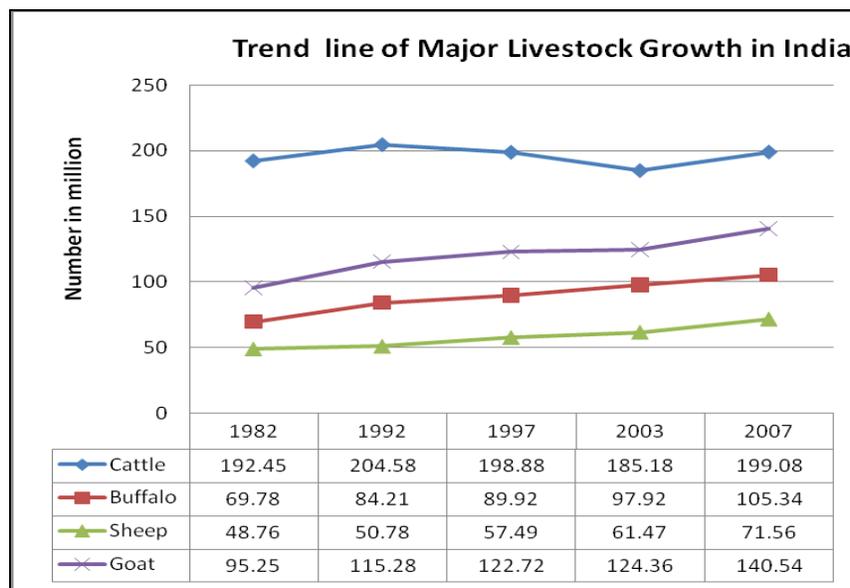


Figure 1

Source: 12th five year plan (2012-17)

IV. DISCUSSION

Growth of Livestock Heads in India

Livestock production is a permanent and growing component of global agriculture. Due to rapidly increasing incomes and high income elasticities in India, consumption of meat and milk and their products are increasing rapidly as shown in table 2 since 1981-82. As a result, this sector has been growing at a faster rate considerably than the other agriculture sector except crop sector. Figure 1 shows the growth in major livestock in different census year. All livestock species showing almost positive trend of growth from the year 1982 to 2007 with slight fluctuation in buffalo population. While trend of cattle head production has a big fluctuation between 1992 and 2003 showing a negative trend of growth. However after 2003, cattle show a big leap of production with positive trend of production. It is mainly because of the high level of mechanization of agriculture, low productivity of cows for milk production as well as

prohibition of cow slaughter on religious ground especially in India (Khan N and Iqbal M.A, 2008).

Buffalo, the second important big ruminant, also exhibited an improving nature of growth in their head number. Their numbers rose up at rather high rate. Goat and sheep the small ruminants, shot up at very fast and steady rate in the study area India. The increase in their numbers is on account of increasing demand of mutton (meat) in Indian states due to high level of social acceptability among all religious groups unlike beef and pork. They are usually reared at household level by female members and poors who have small amount of capital to invest for big ruminants like cattle and buffalo. Their rearing is also preferred especially in Muslim families considering it as religious obligation as the most of the prophets reared goats in their lives. Besides, the goats are also sacrificed every year by same community on the occasion of EID-UL-AZHA in abundant number (Khan N et al, 2008).

This trend is expected to continue at commercial level. The increase of animal numbers at traditional level need expanding of grazing area but horizontal expansion of the area is not possible

anymore due to urbanisation and industrialisation. According to Khan's study livestock number is also intensifying per human head and per hectare of land. This intensification can have negative impact on environment. The pressure of livestock production has gone beyond the adsorptive capacity of the resource base, polluting water and air. Intensive production can

have heavy strain on the water and air quality. Intensification of crop and livestock production in some of the semi-arid and tropical highlands of India is leading to extensive soil degradation.

Production of Major Livestock Products in India

	Milk	Wool	Meat
	Million Tonnes	Million Kgs.	Million Tonnes
1981-82	34.3	33.1	-
1991-92	55.7	41.6	-
1996-97	69.1	44.4	-
2002-03	86.2	50.5	2.1
2006-07	102.6	45.1	2.3
2010-11	121.8	43	4.8

Source: 12th five year plan (2012-17)

Note: Meat Production from Commercial Poultry Farm is included from 2007-08.

V. IMPACT OF LIVESTOCK HUSBANDRY

Positive Impacts

However, Livestock are beneficial as well as harmful both for human beings and environment. In other words livestock husbandry and their production processes have both positive and negative effects on environment. The positive effects on environment can be realised when there is managed grazing system which improves species (flora) wealth, mixed farming (crop cultivation and livestock keeping) enhances water infiltration and recharges groundwater reserves, sustains the resource base and effects resource enhancement and support resource sparing etc. The use of livestock in mixed farming saves fossil fuel. Livestock contributes to soil fertility maintenance through manure and enabling rotation with N fixing plants. Livestock grazing can improve biodiversity. Contrary to this, livestock contribute to enhance the economic power of various rural people and now a day this sector has been industrialized. Providing nutrition rich food is another benefit of livestock to human beings. Organic farming and gobar gas plant also contributes to the environment.

Negative Impacts

In spite of that livestock contributes to environmental problems/climate change both at local and global level. The most important source of methane emissions in India is enteric fermentation from domestic livestock, which is showing steady increase over a period of time. During 1980–81 it was 9820 Gg (Giga grams), which has increased to 11,790 Gg during 1997–98. The share of enteric fermentation from livestock was more than 68 per cent of the total methane emissions from the agricultural sector during 1996–97 (Syed Ajmal Pasha). Methane gas is 23 times more aggressive in causing global climate change than carbon dioxide. Methane is the by-product of animal production and manure management, rice cultivation, production and distribution of oil and gas (pipelines), coal mining, and landfills. Every year, livestock and manure management are estimated to

emit 80 teragrams of methane, representing 25% of man-made sources. Methane is produced as a by-product of the feed digestion of mainly ruminants and, on average, about 6 percent of the feed energy is lost in methane. Methane emission is the direct result of the capacity of ruminants to digest large amounts of fibrous grasses and other feeds which cannot be used for human consumption. Nitrous oxide is the most aggressive greenhouse gas produced by livestock (296 times CO₂). It is produced from animal manure. Every year, livestock emit approximately 0.5 teragrams of nitrous oxide, representing 6% of man-made sources (FAO, Briefing Notes).

Some of the health problem is directly related to human beings due to the association of human beings with livestock. It also caused by the poor techniques of animal husbandry influenced by local customs and traditions and the hazards of climate. These problems coupled with lack of proper land use management, poor conservation practice and absence of regulations which led to a series of environmental problems. Spraying large amounts of manure sends dust particles into the air that can penetrate the lungs of humans nearby. The particles carry toxic gases such as ammonia, which can impede the lungs from clearing dust particles, and hydrogen sulphide, which can prevent cells from using oxygen and causes loss of consciousness, coma, or death at high exposure levels.

The environment becomes worse in the rural areas where livestock are allowed to wander free in search of food and water. The animals have helped to spread diseases of various kinds to both humans and domestic animals. In addition livestock (directly or indirectly) are an important source of land degradation, deforestation (loss of bio-diversity), waste production, pollution of land, water and air which are some of negative effects on environment.

VI. CONCLUSION

Livestock husbandry is growing in India very fast since last two decades. There are number of causes such as rapidly increasing incomes and high income elasticities in India,

consumption of meat and milk, rapid urbanisation, population growth, increase in middle income class families, changing food habits, migration from village to urban areas etc. However, there are many livestock-environment focus areas which need careful attention, otherwise environment / ecology and the livestock production systems would be collapse. The area includes land degradation particularly of semi-arid region, extensive grazing and large-scale forest degradation, and loss in biodiversity, excessive animal waste production etc. Livestock waste emits greenhouse gases such as methane and nitrous oxide, contributing to global warming, groundwater contamination, and pollution, involution of mixed farming system, etc.

On the other hand, contribution of livestock in sustainable agriculture is recognisable and can be greatly enhanced, provided the appropriate enabling environment is created. Some systems, especially in the arid zones are much more resilient. In systems, where livestock does contribute to environmental degradation, such as soil degradation and global warming, the share of livestock in causing these phenomena is also accountable. Thus the livestock sector needs more attention to mitigate the potential negative effects of increased intensification of livestock on environment.

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