



Review Article

LIVESTOCK: A DRIVING FORCE OF FOOD SECURITY AND SUSTAINABLE DEVELOPMENT IN INDIA

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Received: April 24, 2018; Revised: May 07, 2018; Accepted: May 09, 2018; Published: May 15, 2018

Abstract- Livestock is an important constituent of the Indian economy in general and particularly that of agricultural sector. In rural India where over 15–20% families are landless and about 80% of the land holders belong to the category of small and marginal farmers, livestock is the main source of livelihood. The present paper deals about benefaction of livestock with respect food and nutritional security, income and employment and poverty reduction etc., India is the largest milk producer in the World it accounts for 146 million tons and per capita milk consumption increased by 303 to 351 grams per day in 2016-17. They contributed about 16 percent to their income, more so in states like Gujarat (24.4 %), Haryana (24.2 %), Punjab (20.2 %) and Bihar (18.7 %). The regression results shows inverse relationship exist between the livestock GDP, Agricultural GDP and Poverty Ratio. Furthermore, the positive environmental externalities associated with livestock includes saving of chemical fertilizers due to use of dung as manure and prevention of carbon dioxide emission due to use of animal energy in agriculture. Despite of this, negative externalities they cause to environment through emission of greenhouse gases, overgrazing/deforestation and water pollution. Improving the efficiency of livestock production through breeding aspects and improving feed conversion ratio in developing countries, can double livestock productivity while having its adverse environmental impacts since livestock have been singled out as one of the largest sources of methane emission after rice.

Keywords- Livestock, food and nutrition, methane, externalities, poverty, feed conversion ratio

Citation: Mallikarjuna Swamy N., *et al.*, (2018) Livestock: A Driving Force of Food Security and Sustainable Development in India. International Journal of Agriculture Sciences, ISSN: 0975-3710 & E-ISSN: 0975-9107, Volume 10, Issue 9, pp.-5937-5939.

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Introduction

Livestock is an important constituent of the Indian economy in general and particularly that of agricultural sector. In rural India where over 15–20% families are landless and about 80% of the land holders belong to the category of small and marginal farmers, livestock is the main source of livelihood. The Indian livestock sector is on a high growth trajectory and currently contributes 27 per cent to the agricultural gross domestic product. It is of special importance as it has strong backward and forward linkages, which promote many industries like livestock-based food processing and leather industries. Thus, improving the emphasis on the development of livestock sector will not only increase its share in the agricultural and national GDP but will also assist the sector in becoming one of the major foreign exchange earners in the Indian economy in the near future. Across the world, demand is growing for animal food products because of rapid income and population growth. Such demand has been supported by major technological innovations and infrastructure improvements in developed and developing nations.

Livestock Food and Nutritional security

Livestock farming holds enormous potential for improving food security and poverty. Increasing the amount of quality protein in the diet is an essential component of good nutrition, particularly for children in their critical growth years. Increasing consumer demand for meat, milk and other livestock products, arising from population increases, greater urbanization and income growth, Livestock production is an important contributor to sustainable food security for many nations, particularly in low-income areas and marginal habitats that are unsuitable for crop production. Animal products account for approximately one-third of global human protein consumption. In India fifth largest meat producer in the world at around 6.3 million tonnes which accounts for 3 percent of world meat production

(220 million tonnes) and per capita meat consumption in India is around 5 kg, compared to the global average of 47 kg and India is the largest milk producer in the World it accounts for 146 million tons and per capita milk consumption increased by 303 to 351 grams per day in 2016-17[1]. Diets in developing countries are deficient in not only quantitative terms, but even more so in terms of quality. The estimated disability-adjusted life years (DALYs) attributed to protein-energy malnutrition, iron-deficiency anemia and vitamin A deficiency in the developing world are 17.4 million, 15.6 million and 0.6 million respectively [2]. Given the high bioavailability of protein, iron and vitamin A in meat, eggs and milk, increasing the availability of animal-source foods (ASFs) for poor populations in developing countries could significantly reduce the burden of disease attributable to protein and micronutrient deficiencies [3-5].

Livestock Income and Employment

Livestock has been an important source of livelihood for small farmers. They contributed about 16 percent to their income, more so in states like Gujarat (24.4 %), Haryana (24.2 %), Punjab (20.2 %) and Bihar (18.7 %) (Planning Commission, 2012). The livestock plays significant role in improving the socio-economic conditions of rural masses.

Livestock and Poverty linkage

Demand growth will continue to be a significant factor driving trends in the livestock sector in the future. However, supply side factors, should to be tackle to reduce the poverty level African and south Asian countries particularly India and Bangladesh included in FAO's Furthermore, Livestock ownership is usually slightly more prevalent and equitable than land ownership. Livestock are kept by household's bottom expenditure quintile are more likely to have livestock in their

asset portfolio than wealthier households. The main objective is to find out the impact of livestock and agriculture sector on Poverty in India. In order to work out the objective the data has been taken from various sources like planning commission (2015), Hand Book of Statistics on Indian Economy (2015) and Basic Animal Husbandry and Fisheries Statistics (2014) from 1980 to 2012. Further, Interpolation has been carried out since some of the years (1983, 1992 and 2006) data is not available. Different regression model has been carried out in that log-log model has been chosen mainly because of Regression Coefficient value, R₂ and Level of Significance [6-10].

The specific model is as follows:

$$\log Y = \log \alpha + \beta_1 \log X_1 + \beta_2 \log X_2 + \epsilon$$

Y is the Poverty ratio of India, α is the constant term, β_n is the regression coefficient of the corresponding variable, X_n is the corresponding variable, ϵ is the random disturbance term, n is in the range of 1 to 2.

Table-1 Results of Log-Log Model

Variable	Regression Coefficient	Standard Error	t- value	Probability Value
Intercept	10.092	3.619	2.788	0.009
Agriculture GDP	-0.456	0.042	-10.33	0.020**
Livestock GDP	-0.075	0.012	-6.25	0.042**
R ²	0.7347			

Note: ** indicates 5% level of Significant

The regression results of the linkage between poverty and livestock has been depicted in the table. The results indicate that there is an inverse relationship exist between the livestock GDP, Agricultural GDP and Poverty Ratio. The Coefficient value of -0.456 indicates that if one percentage increase in Agriculture GDP to the Total GDP it leads to decrease in the 0.456 percentage decrease in the poverty. The Coefficient value of -0.075 indicates that if one percentage increase in Livestock GDP to the Total GDP it leads to decrease in the 0.075 percentage decrease in the poverty. It evident that there is significant inverse relationship exists between the livestock and poverty.

Livestock Sector National Economy and Export earnings

Contribution of livestock to the national economy in terms of GDP at current prices is 4.1 and Agriculture and allied sector alone contributed about 15.1 per cent to the total GDP. Out of the total agricultural GDP, livestock sector contributed about 27.25 per cent during 2012-13. India is now the fifth largest exporter of bovine meat in the world, and its present share in world bovine exports is noteworthy as the bovine meat is the heavily traded commodity in the world market. Meat and meat products are the main livestock products exported, accounting for above 90 per cent of total export earnings from the livestock sector. In recent years, the export performance of livestock products has improved due to trade liberalization. Total export earnings from livestock, poultry and related products were Rs. 354088.6 million during 2015-16.

Prejudice: Feed for livestock reduce availability of food for Human consumption

It is often assumed that lack of food for the poor and hungry could be remedied by reducing demand for feed. Each year livestock consumes 77 million tons of protein from feed that is potentially suitable for human consumption, whereas only 58 million tons of proteins are contained in food products supplied by livestock. This loss is a result of the recent trend towards more concentrate-based diets for livestock. It obscures the fact that proteins contained in animal products are of higher quality for human nutrition than those in the feed provided to the animals.

An important aspect that is often not considered is that livestock and their feed also make a contribution to food security objectives by providing a buffer in national and international markets that can be drawn upon in case of food shortages. In the previous world, food crises of 1974/75 and 1981/82, overall grain supplies fell significantly. The livestock sector provided an important buffer function by contracting or switching to alternative feed supplies, thus contributing to lowering demand for grains. A similar buffer function has also been observed in the most recent food crisis in 2007 and 2008.

Positive externalities associated with livestock production

Livestock are often criticized for their negative externalities to environment. However, in the mixed farming systems followed in India, the livestock help in saving natural resources through their synergistic relationship with cropping activities. According to Dikshita and Birlhal the positive environmental externalities associated with livestock production in India's mixed farming systems. These include: land saving due to recycling of agricultural by-products as animal feed and also due to use of dung- cake as domestic fuel; saving of chemical fertilizers due to use of dung as manure and prevention of carbon dioxide emission due to use of animal energy in agriculture. Land saving from livestock production system due to recycling of crop by-products as animal feed and use of dung as domestic fuel has been estimated as 42 M. ha.

Negative Externalities

According to a report published by the United Nations Food and Agriculture Organization, the livestock sector generates more greenhouse gas emissions as measured in CO₂ equivalent – 18 percent – than transport.

Conclusion

Livestock are central for achieving many of the Sustainable Development Goals (SDGs) and directly relevant to most of them. The growing demand for livestock products in developing countries, driven by population growth, higher incomes and urbanization, represents a huge opportunity for hundreds of millions of poor smallholder livestock farmers, processors and marketers, many of whom are women, to meet that market demand and rise out of poverty. Livestock products (meat, milk, eggs) provide essential nutrients that contribute to food and nutritional security. Even small amounts of animal-sourced foods in the diets of children improve not only their physical development but also their cognitive and learning abilities. For the poor, illiterate rural work force, with the failure of agriculture in the absence of regular monsoon and decrease in availability of farm labour, livestock keeping is a boon to rescue and secure their livelihood particularly for the marginal and landless livestock farmers of rural India. Indian livestock industry makes up for a significant amount of world's livestock resources. Both the national economy as well as socio-economic growth of country is backed by the livestock sector. Apart from its performance there are some problems like unorganized livestock market and less productivity per animal as compared developed countries. Improving the efficiency of livestock production in developing countries, especially the productivity per animal, can double livestock productivity while halving its adverse environmental impacts since livestock have been singled out as one of the largest sources of methane emission after rice. The veterinary scientist should focus more on feed conversion efficiency and easily availability of mineral mixtures and feed mix to small and marginal farmers at affordable prices.

Application of review: The outcomes of the study helps to take appropriate decisions and frame policies with regard to livestock sector to make the sector more competitive in nature and export orientated.

Review Category: Agricultural Economics

Acknowledgement / Funding: Author thankful to University of Agricultural Sciences, Gandhi Krishi Vignan Kendra, Bengaluru, Karnataka 560065, India

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Author Contributions: All author equally contributed

Author statement: All authors read, reviewed, agree and approved the final manuscript

Conflict of Interest: None declared

Ethical approval: This article does not contain any studies with human participants or animals performed by any of the authors.

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