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Livestock sector in India - Significance for small and marginal farmers

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Abstract

The Indian agriculture is characterized by majority of marginal and small farmers. In India livestock is owned by more than 70% of rural households and a major portion of the livestock owning households are small, marginal and landless. Livestock resources are more equally distributed compared to land. Thus, livestock resources have more potential to bring equity in terms of income and employment. They can prove to be a worthy weapon in the economic upliftment of small and marginal farmers. The average size of marginal holdings is only 0.24 ha at all India level while for small holdings, the average size is 1.42 ha. Livestock has a significant role in the economic empowerment of small and marginal farmers , particularly in Indian conditions where the size of land holdings is shrinking With this background the paper aims to shows that, small-scale producers continue to dominate in milk production, which is the prime product of Indian livestock, they also possess the highest share of cattle and buffaloes, the paper also reveals that the diversification among the livestock species kept by the smaller sized farm categories i.e. marginal, small, and semi-medium increased, while the diversification among the livestock species kept by medium and large farmers decreased. It highlights the fact that the income from livestock holds utmost importance to small and marginal farms in general and marginal farms in particular.

Key worlds: Rural households, economic empowerment, farm categories,

Introduction

Livestock sector plays a significant role in national economy as well as in the socio-economic development of India (Taneja, 2011).

The demand for livestock based products is increasing tremendously in India because of rise in income, population growth and urbanization. The size and distribution of India's livestock population present a golden opportunity for India to achieve the objective of economic growth and poverty alleviation among small and marginal farmers. Livestock is the best insurance against the vagaries of nature like drought, famine and other natural calamities (GoI, 2012). Livestock are important for savings and investments for poor smallholders (Kitalyi et al., 2005). Livestock rearing contributes to the on-farm diversification and intensification, which could be one of the strategies for smallholders to escape poverty and to maintain some stability in their earnings. Livestock helps in supplementing family income and generating employment in the rural sector, especially among the landless, small, marginal farmers, and hence is a dependable "bank on hooves" in times of need.

Livestock has an important role in the development of a sustainable agricultural system, particularly in Indian conditions, where the size of land holdings is shrinking due to rapid increase in population and increased urbanization. The distribution patterns of income and employment shows that the small/ marginal farm households hold more opportunities in livestock production.

Rural poverty is largely disseminated among landless and marginal households which consist of about 70 percent of rural population (Kozel and Parker, 2003; Taneja and Birthal, 2004). Livestock are an important source of income for small, marginal and the landless farmers (Pica-Ciamarra et al., 2011).

Hence, the growth and developments in this sector can become a boon to the resource poor farmers and can be instrumental in enhancing the income and livelihood of small and marginal farmers. With this

background the paper aims to highlight the role of smallholders in milk production of India. It also shows the distribution (cattle and buffaloes) and diversification of livestock resources among various farm categories. It also aims to reveal the importance of livestock farming in the economic viability of different farm size groups by estimating the share of income generated by livestock sector in total farm income vis-à- vis other sectors.

Methodology

The paper shows the distribution, diversification of livestock resources mainly cattle and buffaloes in India. It also depicts the share of income generated by various farm categories.

Analytical Tool: Diversification in the livestock species kept by farmers is measured with the help of Simpson Index of Diversity (SID)

The Index ranges between 0 and 1. If there exists complete specialisation, the index moves towards 0. The index is interpreted, as follows

$$SID = 1 - \sum_{i=1}^{n} P_i^2$$

Where, SID is the Simpson index of diversity, and Pi is the proportionate value of i^{th} livestock species in the total livestock species kept by farmers

Database

This study is based on secondary data. The data on livestock holdings of different farm size groups are collected from Input Survey Database, Agricultural Census Division, Department of Agriculture and Cooperation, GoI (Government of India) The data pertaining to distribution of net income (monthly) per household by farm size groups at state level for the eastern states are taken from (Haque et al., 2010).

Results and Discussion

3.1 Role of Smallholders in Milk Production of India

Small and marginal farmers play a pivotal role in India's milk Production. They contribute about 70% of milk production in India. In states like Uttar Pradesh, Tamil Nadu, Gujarat Haryana and Jharkhand they contribute about 70% of milk production while in other states like Assam, Bihar and Kerala they contribute more than 80% of milk production. Their contribution reached to as high as 90% of the milk production in Uttarakhand, West Bengal and North- Eastern Sates (Table 1).

Table 1: Contribution of Smallholders in Milk Production, 2011

States	Share of smallholders (%)	
	Milk producing households	Milk production
Andhra Pradesh	68.61	63.25
Assam	85.23	84.78
Bihar	89.86	84.35
Chhattisgarh	65.00	52.94
Gujarat	75.21	69.76
Haryana	73.75	68.00
Himachal Pradesh	91.13	89.96
Jammu and Kashmir	90.00	88.94
Jharkhand	89.45	67.48
Karnataka	62.71	64.46
Kerala	92.50	83.52
Maharashtra	59.55	51.84
Madhya Pradesh	57.91	51.26
Orissa	89.21	88.78
Punjab	73.40	51.00
Rajasthan	60.35	46.51
Tamil Nadu	81.31	75.91
Uttar Pradesh	86.25	77.25
Uttarakhand	95.82	95.15
West Bengal	95.55	92.91
North Eastern States	96.16	92.81
Union Territories	90.71	82.26
All India	77.40	68.81

Source: Kumar and Joshi, 2012

3.2 Distribution of Livestock Resources in India

Distribution of Cattle /Buffaloes by Farm Category

There is a continuous rise in the share of small and marginal farmers in the case of in- milk cattle and in- milk buffaloes from 1980-81 to 2011-12 (Table 2 and 3). Their share in milk cattle increased from 50.80 % to 78.17% while the share of semi medium, medium and large farmers in, in-milk cattle declined from 21.27% to 13.57%, 19.65% to 6.86% and 8.87% to 1.41% respectively during the same period. A substantial decline can be witnessed in the share of cattle kept by large farmers which declined continuously and was reduced to half from 1980-81 to 1990-91, thereafter; also it continued declining and reached to a very low level of 1.41%.

The small and marginal farmers' share in, in-milk buffaloes has increased from 53.49% to 71.60% during 2011-12. It has continuously been increasing since 1980-1981 while the reverse has happened in the case of other farm categories. Semi-medium, medium and large farmers witnessed a decline from

Table 2: Distribution of Cattle by Farm Category (%)

Year	Small (1.0-1.99) and marginal (below 1.0 ha)	Semi-medium (2.0 - 3.99 ha)	Medium (4.0- 9.99 ha)	Large (10 and above ha)	Total cattle
1980-81	50.81	21.27	19.05	8.87	100
1986-87	58.00	20.41	16.01	5.57	100
1990-91	59.88	20.36	15.07	4.69	100
1996-97	71.35	15.88	9.76	3.00	100
2001-02	74.12	15.04	8.64	2.20	100
2006-07	75.31	14.22	8.25	2.22	100
2011-12	78.17	13.56	6.86	1.41	100

Source: Input Survey Database, Agricultural Census Division, Department of Agriculture and Cooperation, GoI

Table 3: Distribution of Buffaloes by Farm Category (%)

Year	Small (1.0-1.99) and marginal (below 1.0 ha)	Semi-medium (2.0 - 3.99 ha)	Medium (4.0- 9.99 ha)	Large (10 and above ha)	Total buffaloes
1980-81	53.49	21.25	18.71	6.55	100
1986-87	53.84	21.16	19.23	5.76	100
1990-91	56.31	21.64	16.92	5.13	100
1996-97	65.68	18.42	12.67	3.24	100
2001-02	65.70	19.00	12.42	2.88	100
2006-07	65.82	18.62	12.75	2.81	100
2011-12	71.60	16.66	9.56	2.18	100

Source: Input Survey Database, Agricultural Census Division, Department of Agriculture

21.55% to 16.66%, 18.71% to 9.56% and 6.55% to 2.18% respectively from 1980-81 to 2011-12. The share of milk buffaloes kept by large farms declined in a similar way, as it declined in case of in-milk cattle. It declined to half i.e. from 6.55% to 3.24% during 1980-81 to 2001-02. Thereafter, it continued declining and reached to 2.18% in 2011-12

3.3 Extent of Diversification among Livestock Species by Farm Category

Smallholders are poor and, by and large practice subsistence agriculture with a very limited marketable surplus. Their plight calls for an urgent need to increase their income. Experiences from developing countries suggest that diversification of agriculture towards high-income commodities can help them to augment their income (Ryan and Spencer, 2001). Similarly, diversification among farm animals can be helpful in decreasing the risk for small-scale farmers and enhancing their income.

The Simpson's Index of Diversification (SID) shows diversity among livestock species kept across different size groups of farms. Six types of livestock species were taken to calculate the index i.e. cows, buffaloes, pigs, sheep goat and poultry. Table 4 shows that during 1996-97, the level of diversification in livestock species measured by SID was very high for large farmers as compared to small farmers. It was 0.52 for small and marginal farmers while 0.74 for large farmers during 1996-97. Overtime, SID increased remarkably in the case of small and marginal livestock producers, from 0.52 in 1996-97 to 0.78 in 2011-12, with the annual growth rate of 3.33%. In the case of semi- medium farmers, it increased, from 0.52 to 0.58, while it decreased substantially for medium farmers from 0.58 to 0.30 at -3.66% annually and declined slightly from 0.74 to 0.70 for large farmers during the same period (Table 4). Figure 4 shows a steady rising trend in the diversity index for livestock kept by small and marginal farmers. Hence, the diversification among the livestock species kept by the smaller sized farm categories i.e. marginal, small, and semi-medium increased, while the diversification among the livestock

Table 4: Diversification in Livestock Species by Farm Category

Farm category	1996-97	2001-02	2006-07	2011-12	Annual growth rate in SID from 1996-2011(%)
Small (1.0-1.99 ha) & marginal (Below1.0 ha)	0.52	0.61	0.72	0.78	3.33
Semi-medium (2.0 - 3.99 ha)	0.52	0.79	0.75	0.58	0.77
Medium (4.0- 9.99 ha)	0.58	0.71	0.52	0.3	-3.22
Large (10 and above ha)	0.74	0.77	0.75	0.7	-0.36

Source: Results on the data collected from Input Survey Database, Agricultural Census Division, Department of Agriculture and Cooperation, GoI.

species kept by medium and large farmers decreased. The larger farm categories are concentrated towards cattle only. The exceptional rise in the diversification of small and marginal farmers shows that now their livestock's are not only concentrated towards small ruminants like sheep and goat but they are also diversifying towards pigs and large ruminants like cattle and buffaloes. Greater diversification facilitates greater income. Akter et al. (2007) used the livelihood options study of overseas development institute, London specifically the census survey 2001/02 and panel survey 2003/2004. The study found that poorer households depend disproportionately on livestock. They further found that the poorer groups (small-scale producers) diversified the livestock holdings by decreasing the size of single species; the drop in one species at farm level was more than offset by the rise in the size of other species.

Diversification of species by smallholders might be the result of some adaptive mechanism to cope up with the risk in income from livestock under the rapidly changing scenarios of rising demand for livestock products. The outstanding demand for livestock products gives considerable opportunities for the poor to escape poverty by diversifying their livestock husbandry.

3.4 Role of Livestock Farming in Economic Viability of Marginal and Small Farms

In rural India, where over 15%-20% families are landless and about 80% of landholders are small and marginal farmers, livestock are the main source of livelihood. The expensiveness of modern inputs such as tractors and fertilisers for poor farmers is compensated by livestock husbandry (Info resources, 2007).

Table 5 shows the distribution of net income (monthly) per household of a cross section of cultivating households in Eastern states (India) by farm size groups.

The total household income of farmers in the study regions included the net income from crop farming, fisheries, livestock and income from the non-farm sector. Table 5, shows the proportion of net income per household contributed by various sectors, according to farm size categories. The share of monthly income from farm and non-farm sources among the sample households of the study regions revealed that the share of income contributed by farm sources (crop farming, livestock, fisheries) is more than the share of income contributed by non-farm sources in all states. It is also revealed that, except Jharkhand, in all the selected states, the share of farm income from the livestock sector is the highest, followed by the share of farm income from crop farming and fisheries. In Jharkhand, the share of income from livestock sector almost equates with the share of income from crop farming. It can be seen from table 5 that, in the case of small and marginal farmers, the share of income from livestock is more than the share of income from crop farming while the opposite is true in the case of medium and large farmers. The exception holds for Orissa, where the share of income from crop farming is a little bit higher than the share of income from livestock farming for small farmers. Further, the share of income from crop farming shows a positive relationship with farm size while the share of income from livestock is inversely related to farm size in all study regions except Bihar, where the share of income from livestock sector is greater for small farmers than to the marginal farmers.

The income from livestock holds utmost importance for small and marginal farmers in general and to marginal farmers in particular. As evident from table 5, that the share of income from livestock is 30.62%, 42.91%, 51.27%, 61.39% and 41.17% of marginal farmers in Bihar, Jharkhand, Orissa, Uttar

Table 5: Distribution of Net Income (Monthly) per Household by Farm Size Groups, 2010-11

Farm Size Categories	Share of Income from Farm Sources			Share of Income from Non - Farm Sources	Total Household Income
	Income from Crop Farming	Income from Livestock	Income from Fisheries	Non-Farm Income	
Bihar					
Marginal	20.52	30.62	0.31	48.53	100
Small	26.28	36.52	0.06	37.12	100
Medium	33.85	28.30	0.48	37.35	100
Large	54.30	28.04	N.A	17.65	100
Total	26.85	31.79	0.26	41.08	100
Jharkhand					
Marginal	11.86	42.91	N.A	45.21	100
Small	31.68	41.00	N.A	27.30	100
Medium	43.00	21.15	5.12	30.71	100
Large	65.56	17.57	0.97	15.88	100
Total	32.69	32.52	1.76	33.00	100
Orissa					
Marginal	24.22	51.27	0.007	24.49	100
Small	38.52	35.89	N.A	25.57	100
Medium	45.24	34.93	0.11	19.69	100
Large	48.76	27.25	2.180	21.80	100
Total	35.13	40.30	0.09	24.46	100
Uttar Pradesh					
Marginal	14.16	61.39	N.A	24.43	100
Small	16.50	44.09	N.A	39.39	100
Medium	37.40	27.71	1.75	33.11	100
Large	62.06	24.21	N.A	13.71	100
Total	24.91	42.73	0.45	31.89	100
West Bengal					
Marginal	13.53	41.17	0.91	44.36	100
Small	26.36	31.39	0.72	41.52	100
Medium	27.69	27.02	2.95	42.31	100
Large	69.45	18.34	1.40	10.80	100
Total	28.38	30.15	1.85	39.61	100

Source: Calculated from the data collected from Haque et al. (2010).

Note: 1. Primary data were based on a survey of a cross section of cultivating households in selected districts of the eastern states. The field study was undertaken for the agricultural year 2010-11.

2. N.A stands for not available

Pradesh and West Bengal respectively. It is worthy to note that, in all states, except Bihar, the share of income from livestock is the highest for marginal farmers among all farm size categories.

Turner (2004), also opines that the share of income from livestock is usually higher among the poor livestock keepers. Moreover, among various agricultural activities, livestock production has more income redistributive effect on households and is very useful in reducing rural income inequality (Kumar et al., 2007). Hence, livestock farming is immensely important for the economic viability of land scarce farmers. Moreover, the rising demand of livestock products offers the way towards the prosperity of small

and marginal farmers. Farm income could rise dramatically with a rising demand for livestock products.

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