

Potential, availability and projections of animal farming in India

Opinion

Draught animal have traditionally been used as major source of motive and stationary power source throughout the country. Apart from farm operations, they are used for short distance haulage of men and materials in the rural areas of the country. The twin objectives of achieving the enhanced food and nutritional security and mitigating environmental and human health are the demand of the day which can be fulfilled by use of animal in farming operation. The draught animal will provide bio-energy as well as draught power in the farm of green energy.

The trend of energy use and nutrient intake in Indian agriculture and the changing role of draught animal power in meeting the energy demand at national and regional level and share of livestock population in meeting the nutrient requirement (manure) needs to be estimated. In integrated farming, animal farming is an integral part of food-producing systems. Animal can:

- Convert forage, crop residues, food and fiber into high quality manure to help in maintaining soil fertility;

Table 1 Distribution of Number of operational holding

Size group	Number of holdings (million)	Area operated (million ha.)	Average operated area per holding (ha.)	Percentage of holdings to total holdings	Percentage of area operated to total area
Marginal (Less than 1.00 ha.)	92.4	35.4	0.38	67.04	22.25
Small (1.00-2.00 ha.)	24.7	35.1	1.42	17.93	22.07
Semi- Medium (2.00-4.00 ha.)	13.8	37.5	2.71	10.05	23.59
Medium (4.00 – 10.00 ha.)	5.9	33.7	5.76	4.25	21.18
Large (above 10.00 ha)	1	17.4	17.38	0.73	10.92
All holdings	137.8	159.2	1.16	100	100

Source: Agricultural Census 2011-12

The country has total operated area of 159.2 million hectare and total operational holdings of 137.8 million numbers showing average size of operational holding as 1.16 hectare. Food grain production has been 259.3 million tonne having average productivity of 1.62 ton per hectare.¹ After more than four decades of government efforts to promote from mechanization through tractor, the question is whether tractors, small tractors, power tillers can completely replace draught

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- Provide draught power for about half of the world's crop production; and
- Make important contribution to agricultural economy and livelihood (Table 1)

Table 2 Population of draught animals (million Numbers)

Type of animal	Total population	Young animals and others	Animal available for work	Draught power availability (million kilowatt)
Bullocks	67.92	23.44	44.48	16.902
Buffaloes	16.1	11.91	4.19	1.592
Camels	0.4	0.12	0.28	0.106
Mules	0.2	0.05	0.15	0.057

animal? The answer may be no because marginal and small holding size farmers constitute 85% (117 million numbers) of total operational holdings sharing 44.58% (71.15 million hectare) of total operated area and they can't afford tractors due to small and fragmented land holding and difficult terrain in hilly area Sahu et al.² The small and marginal farmers (<2 ha) solely depends on human and animal power (Table 2).

Table Continued

Type of animal	Total population	Young animals and others	Animal available for work	Draught power availability (million kilowatt)
Donkeys	0.32	0.11	0.21	0.08
Horses &Poney	0.62	0.1	0.52	0.198
Yaks	0.08	0.03	0.05	0.019
Mithuns	0.3	0.13	0.17	0.065
Total	85.94	35.89	50.05	19.019

*1 draught animal=0.38kW

There has been a continuous shift from animal based farm energy to mechanical source in the farm of tractors and self-propelled machinery. As a result, the annual use of draught animals has been come down from about 1500 hours per year to less than 300 hours per year Choudhary et al.³ The populations of draught animals have been come down from 63.9 million in 2003 to 50.05 million in 2012 Anonymous.⁴ Though this data tends to show the draught animals in poor light for future, the overall scenario in the country needs to be locked at from the point of view of socio-economic status of farmers, agro climatic and geographical constraint in shifting to mechanical source and non-availability of electric supply and fossil fuels in thousands of villages. Such constraints continue to force the farmers to rely upon on animal energy from farm energy needs. Density of draught animals is very high in 5 states, namely Arunachal Pradesh, Assam, Himachal Pradesh, Jammu & Kashmir and Jharkhand. The area under one animal in these state are less than 1 ha/animal Anonymous.⁴ Use of draught animals for short distance (5-10km) haulage of men and material is economically viable especially in areas not connected by proper motorable roads. These animals also contribute 40 million tons of excreta which can be converted to nitrogen-rich farm yard manure, biogas generation and compost and enrich the soil with organic carbon.

The animal system compare to mechanical power may be slow but it is stable with locally available feed & inputs. The animal farming has been found to be cost effective and energy efficient on small farms. Since large numbers of draughts are available in the country due to milk programme the male ones need to be maintained and used

Source: Livestock census 2011-12

in small farms.

Hence there is need to identify areas where draught animals are likely to be used in the foreseeable future and adopt more efficient implements and machinery to reduce the drudgery to farmers and obtain higher output from the animals for increased productivity.

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Conflicts of interest

Author declares that there is no conflict of interest.

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