

AVAILABILITY OF FARM POWER AND ITS SOURCES IN HARYANA STATE

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ABSTRACT

A study was conducted to assess availability of farm power and its sources in Haryana state. The districts Karnal, Fatehabad, Bhiwani and Mewat were selected for the survey. A total of 200 farmers of different farm sizes were interviewed through a pre-designed questionnaire. The average farm power availability on the surveyed farms in Haryana state was found to be 5.5 kW/ha. In the surveyed farms of the districts Karnal, Fatehabad, Bhiwani and Mewat, farm power availability has been found to be 5.4, 6.2, 5.1 and 5.3 kW/ha, respectively. However, there is a significant difference in mechanical power availability in the districts. It was found to be 3.75 kW/ha in Karnal whereas in Mewat district, it was 1.79 kW/ha. Many factors such as land holding, cropping pattern, irrigation facilities and annual income of farmers affect the power availability on farms. The estimated number of different power sources namely tractors, power tillers, electric motors and diesel engines per 1000 ha were found to be 132, 3, 204 and 92, respectively. The availability of mechanical power in Haryana is tremendously increasing. However, it is still very low when compared to developed nations.

KEYWORDS: Farm Power, Mechanization & Sources

Received: Jan 01, 2017; **Accepted:** Jan 28, 2017; **Published:** Feb 01, 2017; **Paper Id.:** IJASRFEB201750

INTRODUCTION

Farm Power is the most important factor in agriculture to operate different farm equipments for different farm operations and stationary operations like irrigation, threshing/ shelling/ cleaning/ grading and other post harvest operations. The adoption of farm machinery enables the farms to operate large farm holdings, intensified cropping patterns and therefore increases farm productivity and income of farmers. The efficient use of farm machinery resulted in saving cost of production and increasing net income of the farmers (Singh, 2006).

Agricultural workers, draught animals, tractors, power tillers, diesel engines, electric motors are used as sources of farm power in Indian agriculture. In India, the share of agricultural workers and draught animals in total farm power availability decreased from 60.8% in 1971-72 to 10.1% during 2012-13. On the other hand, the share of tractors and electric motors in farm power availability increased from 6.8 to 45.8% and 14 to 26.8%, respectively during the last four decades. The total power availability on Indian farms has increased from 0.293 (during 1971-72) to 1.841 kW/ha at a CAGR of 4.58% (Mehta et al, 2014).

Haryana state has the highest tractor density (tractors per thousand hectare of net sown area) of 84 and is followed by Punjab (76), Uttar Pradesh (51), Bihar (44), and Tamil Nadu (43) states. Average tractor density per thousand hectare of net sown area in India is 33. Tractor density is the lowest in Kerala (4) and is followed by Assam (9) and West Bengal (17) among the states of India (Mehta et al, 2014).

MATERIAL AND METHODOLOGY

Haryana is located in the north-west India between 27°39' to 30°35' N and 74°28' to 77°36' E with an altitude ranging from 213 to 1097 m. The study was conducted in the villages of four districts in Haryana.

All the districts were arranged in descending order of tractor population density (No. of tractors per 1000 ha of area) as shown in Table 1. The districts were divided in four homogeneous groups and from each group one district was randomly selected. The four selected districts were Karnal, Fatehabad, Bhiwani and Mewat. Ten villages from each district and 5 farmers from each village were selected randomly. In total, 200 farmers were interviewed through pre-designed questionnaire. Farm power availability was calculated by summing farm powers available from mechanical and animate power sources per hectare of operational land holding.

Farm Power Availability

It is expressed as under:

$$\text{Farm power availability (kW/ha)} = \text{Total power available (kW)} / \text{Cultivated area (ha)}$$

Table 1: Tractor Population Density in different Districts of Haryana State

S.N.	District	Area (ha)	Tractors	Tractors Per 1000 ha
1.	Panipat	126800	31731	250.2
2.	Kurukshetra	153000	36264	237.0
3.	Jhajjar	183400	43238	235.8
4.	Karnal	252000	54634	216.8
5.	Gurgaon	122000	18704	153.3
6.	Rohtak	174500	26353	151.0
7.	Jind	270200	40452	149.7
8.	Kaithal	231700	32290	139.4
9.	Fatehabad	253800	34334	135.3
10.	Hisar	398300	45379	113.9
11.	Sirsa	427700	47046	110.0
12.	Ambala	157400	17208	109.3
13.	Mahendergarh	189900	17402	91.6
14.	Rewari	159400	12488	78.3
15.	Bhiwani	477800	36099	75.6
16.	Sonipat	212200	15787	74.4
17.	Faridabad	78300	5803	74.1
18.	Yamunanagar	176800	13009	73.6
19.	Mewat	149400	8675	58.1
20.	Panchkula	89800	4445	49.5
21.	Palwal	136800	3851	28.2
22.	Haryana	4421200	545192	123.3

Source: Statistical Abstract of Haryana 2013-14

RESULTS AND DISCUSSIONS

Availability of Human and Animated Power in Agriculture

In the districts Bhiwani, Fatehabad, Karnal and Mewat, human power (kW per 1000 ha) working in agriculture was 39.04, 34.02, 22.74 and 44.99, respectively. The animal power available on the surveyed farms of the four districts Bhiwani, Fatehabad, Karnal and Mewat were found to be 9.7, 8.58, 7.09 and 12.29 kW per 1000 ha, respectively as shown in Figure 1. Based on the surveyed data, the average human power availability in the four districts is 34.07 kW per 1000

ha.

Animale power working in agriculture depended on land holding, income of family and other income sources available in the area. Human and animal power working in agriculture was highest in Mewat due to small land holding, large family size and low income while Karnal had lowest due to high family income and non-availability of family labour.

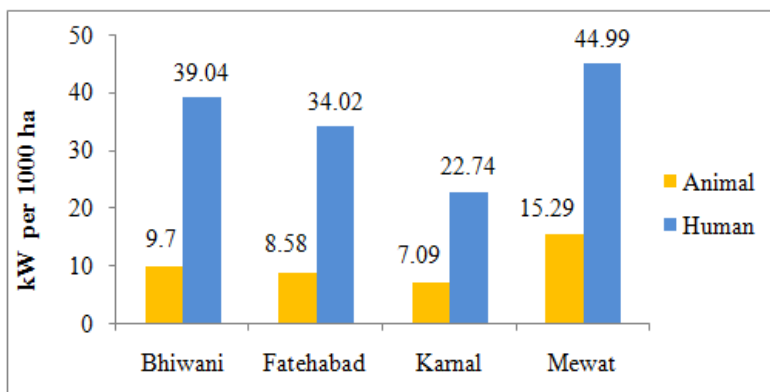


Figure 1: District-Wise Human and Animal Power in Agriculture per 1000 ha

Estimated Number of Mechanical Farm Power Sources per 1000 ha of Area Sown

In 2001, tractor density (per 1000 ha) in Haryana state was 63.66 whereas it was 94.13 in Punjab (Singh, 2006). In the present study the estimated number of tractors, power tillers, electric motors and diesel engines per 1000 ha were found to be 132, 3, 204 and 92, respectively in Haryana state as shown in Figure 2. This reveals that the tractor density in Haryana has increased more than double in comparison to 2001. The number of power sources per 1000 ha of net area sown in the selected villages of Karnal, Fatehabad, Bhiwani and Mewat districts were: Tractor - 108, 160, 132 and 133; Electric Motor - 319, 237, 100 and 118 and Diesel Engine - 22, 88, 117 and 170, respectively. However, in Punjab the availability of farm power sources tractors, diesel engines, electric motors and combine harvesters in 2012-13 were 115, 46.5, 287 and 2.0 per 1000 ha, respectively (Lohan et. al, 2015).

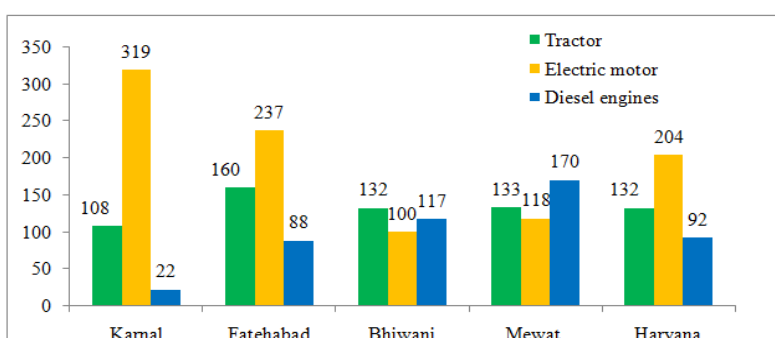


Figure 2: Estimated Number of Mechanical Farm Power Sources per 1000 ha

Farm Power Availability

In the present study, it was found that the average farm power availability on the surveyed farms in Haryana was found to be 5.5 kW/ha. In a study conducted by Srivastava (2006), it was concluded that while the farm power availability of Punjab in 2001 had reached to over 3.5 kW/ha and 2.25 kW/ha in Haryana state, it was still less than 0.90 kW/ha in many states like Orissa, Rajasthan, Himachal Pradesh, Jammu & Kashmir, Chhattisgarh, Jharkhand, Gujarat, Assam,

Madhya Pradesh and Maharashtra and the total farm power availability at national level was only 1.35 kW/ha. This reveals that during the last 10 years, the farm power availability in Haryana state has almost doubled but it is still less than Punjab state as during 2012-13 the power availability of Punjab state had reached upto 5.68 kW/ha due to which this Punjab state became the highly mechanized state in the country followed by Haryana, Uttar Pradesh, Andhra Pradesh and Tamil nadu (Lohan et. al, 2015).

In the surveyed farms of the districts Karnal, Fatehabad, Bhiwani and Mewat farm power availability was found to be 5.4, 6.2, 5.1 and 5.3 kW/ha, respectively. Highest farm power availability was found in Fatehabad district among the surveyed districts as the number of tractors per 1000 ha was highest in the district and the lowest in Bhiwani. The mechanical power availability calculated from secondary data source in the four districts Karnal, Fatehabad, Bhiwani and Mewat was found to be 3.75, 2.21, 2.38 and 1.79 kW/ha, respectively.

CONCLUSIONS

The following conclusions were drawn from the present study:

- There is significant difference in farm power availability in different districts as well as from overall power availability of the state. Among the four surveyed district, the mechanical farm power availability was the highest (3.75 kW/ha) in Karnal whereas it was lowest (1.79 kW/ha) in Mewat.
- The reason behind this difference in power availability depends upon size of land holding, annual income of farmers, type of crops and irrigation facilities, as these factors affect the use of different power sources considerably.
- The mechanical power in Haryana is increasing rapidly while the animal power on farms in Haryana has almost diminished. It is a well established fact that the farm power availability is directly proportional to the productivity. Thus, the farm power availability in Haryana state is still low as compared to developed nations.

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