

Study on marketing pattern of tractor in Aligarh district Uttar Pradesh

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■ **ABSTRACT** : The study area comprised of Khair Block of Aligarh District of Uttar Pradesh. The selection of block was done randomly. Geographical locations, type of soil and agroecological situation were collected with the help of geographical and political map peoples especially labour and also at the occasion of marriage and religious functions. In the present study an attempt was made to determine use pattern of tractor and machinery for selected region of Khair. Effort was made to know the use pattern of tractor under its operating conditions and socio-economic situations of farmers Khair Block. The most important aspect of the study was to collect comprehensive and authentic data from the tractor owner farmers of the, selected study area.

■ **KEY WORDS** : Marketing pattern of tractor, Use of tractor

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Farm tractor and equipment play a key role in present agricultural production system. Tractor serves farmers in multifarious and flexible role varying from land preparation, pumping of water and threshing of crops to the transportation of goods and people. Growth of tractor industry (from 881 tractor in 1961 to above 2, 60,000 tractors in the year 2000) is an indicator of the need, importance and use of it in Indian agriculture, as evident from use pattern of tractor varied from region to region and individual to individual based on agro climatic and socio-economic conditions. The share of animate power during the period 1950-1997 reduced from 98.3 per cent to 24.4 per cent, whereas, mechanical plus electric power increased from 1.7 per cent to 75.7 per cent in the same period (Singh and Dobrey, 1999a). Increased population of tractors, diesel engines and electric motors in the past decades increased the power availability on Indian farms. For example, power availability on Indian farms increased from 0.137 KW/ha in 1967 to 1.15 Kw/ha in 2000. However, the distribution of mechanical power is not uniform in the country and it is skewed in favour of certain states and towards certain states and towards certain category of farmers, Punjab has power availability to the tune of 2.69 Kw/ha whereas state like Orissa has only 0.48 Kw/ha. The impact of machinery use is more viable on large and medium irrigated farms as compared to small and marginal farms. Also, in difficult areas,

tractor implement system could not be popularized to desired extent due to poor agro-ecological and economic conditions. In arid regions still the use of animal power is more pronounced than mechanical power (Singh *et al.*, 1995, Alam, 2000). Various factors like cropping system, land ownership, tractor density custom hiring and non-agricultural use of tractors dictate their annual use hours and thus, working life of tractor-implement system in different parts of the country. Generally, in high tractor density area like, Punjab, tractors are underutilized *i.e.* operated for less than 300 h/yr. However, there are categories of farmers who still use bullock power in certain regions like arid zone, eastern Uttar Pradesh, Bihar and Orissa, (Singh and Dhawan, 1994; Balasankri and Salike, 1999; Srivastava *et al.*, 2000; Mani and Rao, 1995 Mani *et al.*, 2000).

■ METHODOLOGY

The detail methodology of data collection and its analysis to meet the objectives of present study is included in this paper which is presented under following headings:

- Sampling and survey methods
- Data collection
- Analysis of data.

Custom of hiring of tractor:

Tractors were hired for agriculture as well as non-agriculture work by needy people. As the land holding size had gone down rearing of bullocks have become uneconomical, people prefer to do tillage and sowing operation by tractor custom hiring. Data were collected regarding the attitude of farmers towards custom hiring and rate of custom hiring. It was expressed in percentage of the total use hours and farms practicing custom hiring to total number of farmers.

Technical data of tractor and equipment:

Information on number of tractors used on farm and models of tractors, years of purchase and other related aspects were collected from farmers.

Frequency of maintenance of tractor:

Number of repair in a particular year of age of tractor were counted with the help of farmers memory recall. Types of repairs were noted under major and minor classes. Major repairs included the job like major engine overhaul. Major repairs included the job like general servicing, changing of minor parts works alike.

Soil and irrigation facility:

The soil of all block is generally rich in organic matter. The soil of the study area is mainly loamy, clay loam type. The area mostly comprised of fertile land, having good irrigation facilities. Block contains canal, tube wells and wells for irrigation purpose.

Cropping pattern and agriculture:

The average size of land holding is Khair in medium in study are mainly wheat, sorghum and millet and the major cereal crops, which are widely grown. This block also grows potato mustard, maize and vegetables.

Sampling and survey methods:

From study area of Khair block was selected by keeping in mind the availability of machinery, irrigation level and varying cropping pattern. A multi stage sampling procedure was followed. From block villages were randomly selected and from each village all the farmers who owned tractor were selected. Thus 100 farmers from three blocks Khair, Iglas and Atroli list of selected villages of Aligarh District is given in Table A.

The following points were kept in mind for collecting the data of the study area:

- To select all the farmer who owned tractors based on sampling and collect information on tractor and implement system with respect to their use maintenance cost, failure and repair frequency and charges for the same.
- To get as far as possible authentic information about

the different items included in the study.

- To make random selection so that the result should be unbiased and appropriate statistical tools can be applied for analysis.
- To determine gaps in sue and maintenance pattern of tractors.

Table A : Selected Block of Aligarh District and list of selected village

Sr. No.	Block	Selected villages
1.	Khair	(i) Arrana (ii) Aandla (iii) Milk (iv) Raypur
2.	Iglas	(i) Hasthpur (ii) Chandfari (iii) Taharpur
3.	Atroli	(i) Jakhara (ii) Shekhupur (iii) Nagla Hamaya

Method of data collection:

Data were collected through personal interview in a specially designed schedule for this study. Farmers from the 10 villages of selected block were contacted. The authorized agencies and workshops of the tractors in study were also contacted for verification of certain data. Thus the desired information was collected in structured schedule from all 100 farmers from 10 selected villages. Apart from above parameters, the schedule included personal data of farmers, availability of farming infrastructure, cropping pattern and all other relevant information. In technical information segment, the information of availability and make of tractors, equipment used, annual use hours, maintenance and repair cost of tractor adherence to, maintenance scheduling and frequency of repairs were also collected. Data were also collected on operation wise use of tractor and use of custom, hiring *viz-a-viz* agricultural and non-agricultural use in hours per annual.

Cropping pattern:

Information was also collected from farmers of respective study area through personal discussion on different crops grown during rainy seasons. The source of irrigation whether it is cannel, tube well or tank or a conjunction of above.

Tractor utilization:

Use of tractor on farm was divided in the following categories:

- Agricultural use of tractor (Operation wise)
- Non-agricultural use of tractor

- Custom of hiring of tractor.

■ RESULTS AND DISCUSSION

The ownership pattern and farmers background was studied under the following headings:

Tractor ownership versus land holding:

Information based on ownership and use pattern of tractor implement system was developed from, the data obtained from the farmers owing tractor-implement system. The land ownership pattern for the selected farmers of the Khair block arid villages are given in Table 1 From the data, it is clear that all categories of farmers owned tractors but it was maximum with semi-medium category farmers (Fig.1). The recent trend in tractor purchase in based on bank loan and below a certain land holding, no bank provides loan. As an appreciable number of tractors were new, the land ownership became one of the determinant factors of tractor ownership.

Table 1 : Landholding versus tractor ownership pattern (Based on sample survey)

Category	Land holding in ha	Percentage of tractors
Small	0 – 1 ha	05.00%
Medium	1 – 4 ha	57.00%
Large	More than 4 ha	04.00%

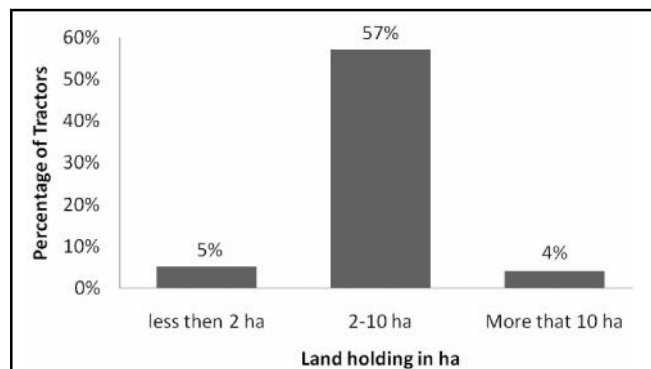


Fig. 1 : Area wise categories of farmer of study area

Age of operators/farmers:

The age wise distribution of tractor operators in block is given in Table 2 as clear from Table 2. It was stated by the respondent that young operators were relatively less careful primarily due to their age and stage. Other flows with young operators were non holding of driving license, having lack of experience both in driving are in trouble-shooting during minor break downs. On the contrary, it was observed that farmers in age group of more than 35 years had proper experience and could handle minor troubles in their tractors but they were almost not having driving license similar to young operators.

A section of respondent reported that most of the accident cases were credited to operators in age group below 25 years.

Table 2 : Age wise distribution of farmer in study area based on sample survey

Age in year	Percentage of farmer
Below 25	1.45%
25 – 50	45.34%
More than 50	53.21%

Education level of operators/farmers:

The education level pattern of tractors operator is given in Table 3. In block more than 38% tractor operators were 10th pass. It was due of age factor as most of the tractor operators were in youth category.

Table 3 : Education level of tractor operators (Based on sample survey)

Education	Percentage of farmer
Above Intermediate	06.00%
Intermediate	17.00%
High School or less then	60.00%
Un educated	17.00%

Distribution of pattern of tractor population with age and powers range:

This distribution pattern of tractor population with age and power range is given under the following points: It is important to note that the tractor power availability was calculated based on only tractor power and land holding size of tractor owner farmers. It must not be confused with average power availability from different power sources.

Table 4 : Year wise distribution of tractors study in area (Based on sample survey)

Age of holding time	Percentage of tractors
1992-1998	10.90%
1999-2004	34.83%
2005-2011	34.90%
2012-Till	20.90%

Use pattern of tractor drawn equipment:

Tractor is used for agricultural works like tillage, seeding, pumping of water, harvesting and threshing. An appreciable share of annual use hours of tractors goes towards non-agricultural use like haulage of building materials, and transportation of people especially on social and religious occasions.

The use pattern of tractor was studied under the following points.

Table 5 : Tractor use pattern in study area (Based on sample survey)

Use pattern	Percentage of total annual use	Average annual in hours
Agriculture	45.00%	450
Non-Agriculture	7.00%	70
Custom hiring	48.00%	480
Total	100%	1000

Agricultural and non-agricultural uses of tractors of tractors in study area:

Use pattern of tractor for agricultural and non-agricultural job is presented in Khair block recorded 37.1% of agricultural use of tractors, respectively. The average use hour of tractor for own agricultural use was 355 hours in the Khair block. Table 8 also present the use pattern of tractor on custom hiring included agricultural and non-agricultural use of tractor.

Custom hiring:

Tractor implement system is a costly item and its ownership may not be profitable for farmers below a threshold land holding, it is not used for custom hiring. As a general trend, animal power is decreasing at faster pace due to imitated

Table 6 : Custom hiring rate of tractor with equipment for different farm operations in study area (Based on sample survey)

Operation	Rates (Rs./h)
Cultivator	400
Harrow	450
Leveller	700
Seed cum ferti drill	600
Thresher	11-12% of the wheat grained

Table 7 : Tractor fuel consumption in different operations (Based on sample survey)

Operation	Horse-power range wise fuel consumption (l/hr)		
	25-35(hp)	35-45(hp)	45-55(hp)
Tillage	2.5 – 3.0	3.0 – 4.0	4.0 – 5.0
Sowing	2.0 – 3.0	2.5 – 3.5	3.0 – 4.0
Threshing	3.0 – 4.0	4.0 – 5.0	5.0 – 6.0
Transport	1.5 – 2.0	3.0 – 3.5	3.5 – 4.0

Table 8 : Operation wise use of tractor in study area

Operation	Avg. use of hours	Percentage of use on farm
Ploughing + leveling	205	57.85%
Threshing	75	21.22%
Seeding and planting	40	11.38%
Transportation	35	9.89%
Total	355	100%

soft energetic of animal power and uneconomical cost of rearing draft animal specially in the present scenario where land holding is decreasing. As described in preceding section, custom-hiring use comprised of both agricultural and non-agricultural jobs. Low tractor density encouraged more use on custom hiring basis in the study area. Socio economic conditions were another factor, which influenced tractor use on custom hiring. It had been observed that, in general, tractor owners of higher land holding category with respectable socio-economic background did not prefer using tractor custom hiring. Barhpura had relatively backward situation both in terms of socio-economic and agro-ecological which confirms with the observations made by Panwar *et al.*, 2000. More time required for completion of different farm operations using bullocks as well as drudgery involved were major reasons for preferring custom hiring of tractor, even by those farmers who owned bullocks. The custom hiring rates are almost equal in all ten villages. The rates are given in Table 6 Tractors were third on hourly basis.

Operation wise use of tractors:

The operation wise use pattern of tractors in block is shown in Table 8 generally the use of tractors for farm works was confined to mainly three operations like tillage, threshing and transport. Tillage operations which included both primary

Table 9 : Availability of tractor drawn equipment in respective study area (Based on sample survey)

Equipment	Percentage of using equipment
Disc harrow	100%
Cultivator	100%
Potato planter	33.33%
Seed cum ferti drill	20.37%
Thresher	64.81%
Leveller	22.22%
Bund maker	11.85%
Potato digger	25.92%
M.B. plow/Disc plow	11.12%

Table 10 : Source of Irrigation in study area

Source of Irrigation	Percentage irrigated area
Only Tube well	55.50%
Only canals	5.50%
Both	49.00%
Total	100%

Table 11 : H.P. Wise distribution of tractor in study area

H.P. of tractor	Percentage of tractor
20-30 H.P.	22.69%
30-40 H.P.	56.89%
Above 40 H.P.	20.22%

	18-25	25-50	Above 50
Farmer	19.018%	43.97%	31.51%
Businessman and Serviceman	16.786%	14.167%	12.336%
Labour	36.827%	31.061	18.98%

and secondary tillage, constituted the major share of annual use of tractors in agriculture. For threshing operations the percentage share of tractor use, was 20% average all villages' above-mentioned order. Interestingly transport recorded

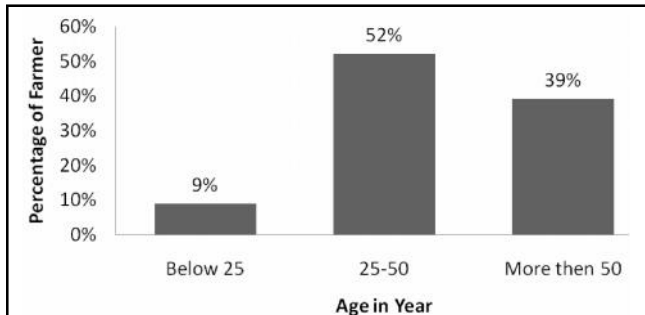


Fig. 2 : Age wise distribution of farmer in study area

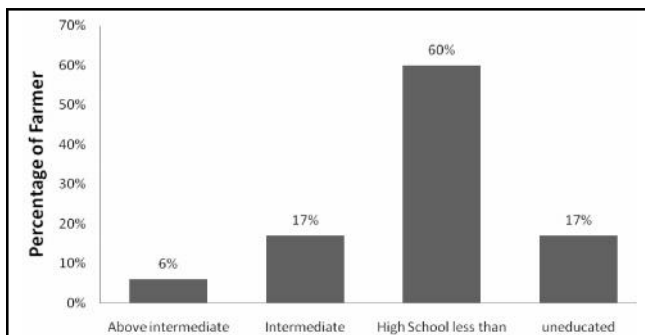


Fig. 3 : Education level of tractor operators

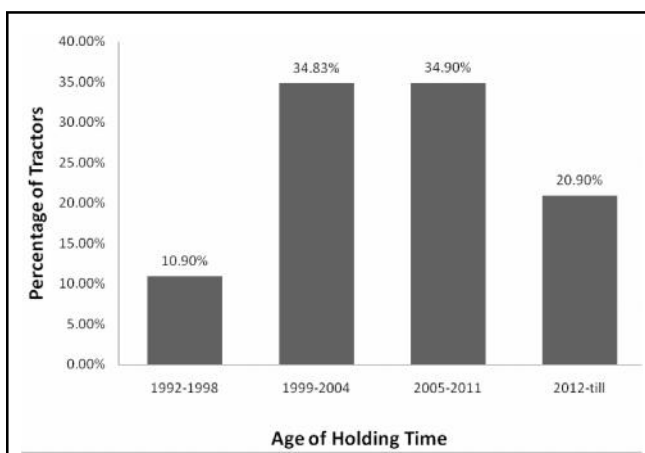


Fig. 4 : Year wise distribution of tractors study in area

almost equal share of tractor use hour in all the blocks. Thus it was clear that use of tractor for transport was stabilized and there was no special variation for a block. Another feature of operation wise use of tractor was that tractor was not used for inter culture, puddling and plant protection. Unlike other areas of northern India, tractor was also not used for pumping water in this area. Fuel consumption in different operations for different horse power range of tractors is given in Table 7. Fuel consumption was maximum for their shin operation followed by tillage operation.

Availability of equipment:

The availability of tractor drawn equipment and implements in the study areas is presented in table 10. Tractor owners in the Khair block had a good number of farm implement for tillage.

Conclusion:

The farmers in the high (above 5 ha) category owned highest percentage (34.68%) of tractors in the study area. Even (11.320) per cent farmers in medium in medium (1-4 ha) category owned tractors.

Maintenance cost of tractors in study area varied from, low to medium. This was due to variations in tractors operators' education and ownership.

In villages where irrigation was good and land holding size was more, these factors coupled with diversified cropping pattern led to more agricultural use of tractors. A sizeable part of tractor was also used for non-agricultural jobs.

Tractor use in agricultural mainly confined to four operations namely tillage, sowing, threshing and transportation in the study area, user of tractor in tillage operation was found maximum.

Annual use of tractor varied in range of 355 hours in Khair block of U.P. which was below economical annual use.

The tractors were used about 10% of annual use for non agricultural works.

All the tractor owners in study area had more than one till 199 implements. This was as per the expected trend. All the tractor owner farmers had cultivator and trolley. No farmer had harvesting machinery. Thus, there existed a clear gap machinery ownership. The thresher population in the study area was high.

Custom hiring rates were almost same within the study area. It was observed that in the study area tractors were hired on hourly basis.

As the breakdown of tractor machinery system is uncertain however, maximum failure occurred due to brake failure gear damage and clutch plate failures.

More annual use of tractor resulted into more repair and maintenance cost during initial years of tractor age repair frequency was low.

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