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Market Research on Factors Influencing the Buying Decision on Tractors by Farmers in Adilabad District, Telangana

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Authors' contributions

This work was carried out in collaboration among all authors. Author BK designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors BGK and PR managed the analyses of the study. Author DSC designed and managed the statistical analysis. All authors read and approved the final manuscript.

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ABSTRACT

Consumer makes buying decision in everything they buy in their lives. It deals from purchasing to evaluating it after purchase so, market research on factors influencing the buying decision is necessary. Hence, the study focus on buying decision on tractors by farmers and penetration level of tractors in each market segment in Adilabad district, Telangana state from January –march 2020. Garrett ranking technique and arithmetic mean were used to analyse the data. The study revealed that 5 different tractor brands of tractors, viz. Eicher, Mahindra, Swaraj, John Deere and Escorts with different models. Farmers ranked Fuel/Oil efficiency as the first factor in purchase of tractor Farmers ranked fuel/oil efficiency as the first factor in purchase of tractor followed by subsidies, maintenance cost, horse power, low priced tractor, recommendations by relatives/friends/local

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mechanics/dealers/company persons, brand reputation, spare parts, product appearance, service of the company, sales promotion/ gift scheme, easy availability of finance and resale value in the descending order of ranking. Dealer ranked the factors that the farmers considered in tractor purchase were subsidy followed by fuel efficiency, maintenance cost, low price, horse power, recommendation by relatives/ local mechanics/ dealers/ company persons, spare parts, recommendation of people on brand, product appearance, service of company, sales promotion/gift scheme, and resale value in the descending order of ranking. Apart from these, the sample farmers believed that 40-50 horse power segment was the most suitable segment for the selected area and it is ranked first by sample farmers. Greater than 50 horse power segment was the next suitable segment 3 per cent 30-40 horse power segment was preferred by 2 per cent of the sample farmers.

Keywords: Tractors; consumer behaviour; buying decisions; penetration level; Garrett ranking.

1. INTRODUCTION

The agriculture sector in India has been one of the largest employment generators with about 45 per cent of the population employed in agriculture or allied activities and it contributes 15 per cent of the GDP [1]. The farm land size of the farmers has been decreasing thereby, impacting the efficiency, overall productivity and farm output significantly with significant scope for efficient farming practices and mechanization (Indian Agriculture Tractor Market Report, 2019). Farm mechanization is an important contributor to the generation of agricultural income and firms must design their marketing efforts to increase the use of tractor mounted farm implements among the farmers. For this entire farm mechanisation, farmers require combine harvesters, transplanters, land levelers, rotavators and threshers which are tractor mounted and run by the tractor. Tractor is highly versatile machinery having many uses, used in agriculture for both land reclamation and carrying out various crop cultivation activities.

The tractor market is segmented on the basis of power configuration. In Indian market there are five categories based on the engine horsepower (HP), i.e. Under 20 HP, 21-30 HP, 31-40 HP, 41-50 HP and over 51 HP. Current trend of sale of tractors in the country indicates that highest sale, i.e. 46.2 per cent is of 31-40 horse power tractors followed by 27.62 per cent of 41-50 horse power, 13.83 per cent of 21-30 horse power, 11.61 per cent of above 51 horse power and 0.75 per cent of less than 20 horse power tractors [2].

In Telangana State, Mahindra and Mahindra tractors have high sales followed by TAFE (Massey Ferguson) and John Deere. Demand for higher HP tractors is increasing with choices shifting to high-powered tractors since they can be used for a variety of purposes. In overall country Utter Pradesh ranks first in tractor sales with 71,527 units followed by Rajasthan and Madhya Pradesh with 61,193 and 48, 375 unit sales respectively in the year 2015-16. Tractor sales in Telangana were 13,153 during the year 2015-16 [3].

The Indian tractor market is dominated by aboriginal Indian OEMs, namely Mahindra and Mahindra, TAFE and Escorts. Key international tractor manufactures namely, John Deere CNH have been able to penetrate the market and establish a decent market presence over the two decades after having entered the country in the late 1990s through JVs and establishing their own industrial bases subsequently [1].

Consumers make purchase decisions in each and every aspect of their life. Thus studying consumer behavior becomes more vital. All marketing decisions and activities are based on assumptions about consumer behaviour. Consumer behaviour deals with the behaviour that consumer displays in the consumption of goods right from purchasing, using, evaluating and disposing them. In other way, it deals with what they buy, how often they use it when they buy it, why they buy it where they buy and how they evaluate it after purchase. Understanding the consumer purchase process and the post purchase opinion are critical to a marketer so as to design the marketing activities effectively. Each step in the consumer decision making process is highly influenced by both internal and external factors. The internal factors include the individual's own motivation personality, perception, learning attitude and his own past experience in addition to the internal influencing factors, the external factors like the company's marketing efforts, ideas/opinions of friends, relations, family members and reference group

members also have profound impact on the purchase decision of individuals. Tractor purchase is no exception to this phenomenon. Any such information would be very much useful for the tractor firms in knowing the factors influencing the tractor purchase by the farmers so that the companies can redesign the promotional and marketing strategies to increase their market share in the tractor market.

Grainger [4] identified the factors that influence the farmers in tractor purchase which are dealer competency and design quality, pre purchase considerations, deal enhancers, potential future savings, perceived value, dealership concerns, financial implications, mutual benefits, after sales competency of the dealer, potential trouble and availability of the spare parts and post purchase peace of mind in North West Province. Agrawal [5] found that 25-35 Hp range tractors were more preferred by Rs 50000 – Rs 1 lakh income group and product feature (99 per cent) was one of the most considered attribute followed by purpose (96 per cent). Besides around 46 per cent of the respondents perceived engine as most preferred feature in deciding to buy a tractor in Jashpur district of Chhattisgarh State. Farmers were influenced by subsidies available to farm equipment followed by horse power, after sales service, price and brand name respectively in consideration while buying tractors [6]. Interestingly, financial support was given first rank followed by product capacity, after sales service, price of the product, maintenance cost and product brand name respectively in Maharashtra [7]. Similarly, loan availability was the major factor followed by references given by friends and relatives, cost of spares, service backing, resale value, and horse power in Sivaganga district of Tamilnadu State [8]. Great percentage of farmers in Krishna district of Andhra Pradesh were following the advice of the fellow farmers and dealers and great per cent of the farmers sometimes ask local products and other advertised products Rao [8].

Since such studies are very few in Telangana state, a market research study was carried out in Adilabad district of Telangana with the objectives, (i) to analyse the factors influencing buying decision of farmers with regard to tractor in adilabad district of telengana state; and (i) to identify the market segments and the penetration level of tractors in each market segment.

2. METHODOLOGY

2.1 Study Area

The Adilabad district of Telangana State was purposively chosen for the study. Farmers in the district are adopting various farm implements/machinery for their cultivation practices. Major crops cultivated in the area are cotton, soybeans, pluses like red gram and bengal gram and grains (wheat, rice and sorghum).

2.2 Sampling Procedure

For collecting primary data, six mandals where tractor usage is more in the district were selected for study. Data were collected from 120 farmers comprising 4 farmers from each villages in six mandals of Adilabld district where tractor use was more based on secondary data. Besides, six dealers were contacted to collect data regarding sale of tractors. From the tractor firms operating in Telangana, three firms were chosen to collect data regarding their products and marketing strategies and obtained data. Separate schedules prepared for the farmers, dealers and company personnel were subjected to pilot testing at Jainad taluka before data collection so as to get a brief idea about the tractor market and to check the viability of the schedule. In addition, data on tractor producton, sales areas population and demography were collected from secondary sources mainly Agricultural Research Data Book of Indian Agricultural Statistics Research Institute (IASRI) and District Census Handbook, Adilabad.

The data was coded, analyzed and was presented in the form of tables to draw valid conclusions. The analysis carried out were CGR, averages, percentages and Garrett ranking technique. CGR was calculated by using QBASIC programming software. For averages, percentages and Garrett ranking, Microsoft excel was used. Frequencies and percentages were used to know the distribution of the respondents according to selected variables.

2.3 Analytical Techniques

2.3.1 Arithmetic mean

The arithmetic mean was the quotient that results when the sum of all the observations in a series, is divided by the number of observations.

$$\bar{X} = \frac{\Sigma x}{N}$$

Where,

$\bar{X}$ = Arithmetic Mean
$\Sigma x = Sum of Observations$
N = Number of Observations

2.3.2 Garrett ranking technique

The Garrett ranking technique was used to study the opinions of the respondents of which a list of pre-determined attributes was presented to the farmers and they were asked to rank them in order of merit. The per cent position of each rank was found out by following equation

Per cent position = $100(Rij - 0.5) / Nj$

Where,

R_{ij} = Rank given for the i^{th} items by the j^{th} individual and

N_j = Number of items ranked by the j^{th} individual.

By using score card or conversion table prepared by Garrett, scores were allocated to the percentage values. The score values of each percent position are added and then the mean of Garret scores was calculated for each attribute. Attribute with highest mean score is considered as most influencing factor.

3. RESULTS AND DISCUSSION

It was observed in the study area that there were 5 different tractor brands, viz. tractor and farm equipment and Eicher, Mahindra, swaraj, John deere and Escorts and different models in Hp segments of 40-50 & 50-60 of above tractor brands.

From Table 1, it is observed that Mahindra and Mahindra had six popular models in the selected area with 41 tractors out of 120 sample farmers, i.e. 34 per cent of total sample farmers. And they are in the HP segment ranging from 40-50.

Table 1. List of tractor brands and models

Tractor brand	Model name	HP segment	Number of tractors
MAHINDRA	SAARPANCH 475DI	44	6
	SAARPANCH 575DI	47	4
	BHOOMIPUTRA 475DI	42	5
	BHOOMIPUTRA 575DI	45	5
	YUVO 475DI	42	12
	YUVO 575DI	45	9
	TOTAL		41
EICHER and TAFE	380	40	5
	480	42	18
	551	49	3
	5660	50	3
	9000 PLANETARY PLUS	50	2
	TOTAL		31
JOHN DEERE	5039D	41	2
	5042D	44	2
	5045E	46	23
	5050E	51	3
	TOTAL		30
ESCORTS – POWERTRAC	439 PLUS	41	7
	YURO 45 PLUS	47	1
	YURO 50 PLUS	50	2
	TOTAL		10
SWARAJ	735 XT	35	3
	742 FE	42	2
	843 XM OSM	43	1
	744 FE	44	2
	TOTAL		8
TOTAL			**120**

Source: Field Survey, 2020

Eicher and TAFE had five popular models in the selected area with 31 tractors in the range of 40-50 HP out of 120 sample farmers, i.e. 26 per cent of total sample farmers. John Deere has four popular models in the selected area with 30 tractors out of 120 sample farmers, i.e. 25 per cent of total sample farmers in the HP segments ranging from 40-50 and 50-60.Escorts – Powertrac had three popular models in the selected area with 10 tractors out of 120 sample farmers, i.e. 8 per cent of total sample farmers in the HP segments ranging from 40-50. Swaraj had four popular models in the selected area with 8 tractors out of 120 sample farmers, i.e. 7 per cent sample farmers in the HP segments ranging from 30 -40 and 40-50.

Uniqueness of the product: The ratings show that out of 6 sample dealers and 6 company personals, 42.67 per cent of the sample dealers and company personnel's rated their products as very unique, 50 per cent of the sample dealers and company personnel's rated their products as unique and remaining 8.33 per cent are not clear regarding the uniqueness of the product.

3.1 Factors Influencing Buying Decision on the Tractors

3.1.1 Farmers' perspective

The factors which a farmer considered influencing the tractor purchase were presented in Table 2. It could be found that most of the sample farmers' ranked fuel/oil efficiency as first as in study area farmer after using on their own fields they go for rental basis for another fields therefore to get profit fuel efficiency is needed. As tractor prices are high and with the government providing subsidy, this lessens the burden on the farmers. So, subsidies rank second. Maintenance cost is another variable cost which farmer as to bear in the operations time so they are ranked third. The knowledge of the horse power is ranked fourth. Even with subsidy being ranked second, still most of the farmers search for a low priced tractor. Therefore most of the sample farmers in all the talukas ranked price as fifth factor influencing their purchase. While buying tractors farmers take recommendations from different persons about performance of the different brands, models of the tractor. So, Recommendations of Relatives/ Friends/Local mechanics/Dealers/Company Persons is ranked sixth because they can also influence the decision of purchase. Recommendations of the people depend on the brand reputation so it is ranked seventh. For tractors, availability of the spare parts in dealership is very important and it is ranked eighth. Product appearance is ranked ninth by sample farmers. The service of the company is ranked tenth. Sales promotion/ Some Gift Scheme are ranked eleventh. Easy availability of finance is ranked twelfth. Lastly, resale value is ranked thirteen.

3.1.2 Dealers' perspective

Dealer perception about factors that a farmer considers in tractor purchase was presented in Table 3. Most of the sample dealers and company personal ranked subsidy as first as the burden on the farmers is lessened due to government subsidy on tractor prices. In the study area, tractor owned farmers after using on their own fields go for rental services of their tractors to other fields. Hence, fuel efficiency was rank second. Maintenance cost is another variable cost which farmer as to bear in the operations time so they are ranked third. Even with subsidy being ranked first, still most of the farmers search for a low priced tractor. Therefore, most of the sample farmers ranked price as fourth factor influencing their purchase. The horse power was ranked as fifth. While buying tractors farmers take recommendations from different persons about performance of the different brands, models of the tractor. So, recommendations by relatives/ friends/ local mechanics/ dealers/ company persons was ranked sixth in influencing the decision of purchase. Availability of the spare parts in dealership is very important and hence, it was ranked seventh. Recommendations of the people on the brand reputation was ranked eighth. It seemed that product appearance is not so important in the study area and hence, it was ranked ninth by sample dealers and company personnel. The service of the company was ranked tenth. Sales promotion/ some gift scheme was ranked eleventh. Procedures in obtaining a loan are a part and parcel of access to finance. But nowadays due to many financial institutions and own finance provided by the tractor company itself, loan procedures are made simple and hence, availability of loans is easy. Accordingly, easy availability of finance was ranked twelfth. Lastly, resale value was ranked thirteen.

3.1.3 Market segments and the penetration level of tractors in each market segment

In the Adilabad district, most of the soil is black soil and crops grown are cotton, pulses, soyabean and rice. Black soils are hard and require high horse power tractor to do field operations.

As can be seen in Fig. 1, the sample farmers believed that 40-50 horse power segment was the most suitable segment for the selected area and it is ranked first by sample farmers. Greater than 50 horse power segment was the next suitable segment 3 per cent. 30- 40 horse power segment was preferred by 2 per cent of the sample farmers.

This is understandable because of the presence of black soil mostly in the district which required high horse power tractor. The ranking given by the farmers for different power segment of tractors are given in the Fig. 2.

Table 2. Farmers' perspective on factors influencing tractor purchase in the study area

S. no	Name of the factors	Mean score	Garrett's rank
1	Fuel/Oil Efficiency	67.02	1
2	Subsidy	64.87	2
3	Low Maintenance Cost	61.29	3
4	HP	60.79	4
5	Low Price	60.74	5
6	Recommendations of Relatives/Friends/Local mechanics/Dealers/Company Persons	58.54	6
7	Brand Name/Reputation	53.99	7
8	Spare parts availability	47.90	8
9	Product look and technical Specifications	41.25	9
10	After sales service	38.66	10
11	Sales promotion/ Some Gift Scheme	33.95	11
12	Easy availability of Loans	33.52	12
13	Resale Value and Exchange Value	28.69	13

Source: Field Survey, 2020

Table 3. Dealers' perspective on factors influencing tractor purchase in the study area

S. no	Name of the factors	Mean Score	Garrett's Rank
1	Subsidy	70.91	1
2	Fuel/Oil Efficiency	70.66	2
3	Low Maintenance Cost	69.75	3
4	Low Price	59.50	4
5	HP	58.58	5
6	Recommendations by Relatives/Friends/Local mechanics/Dealers/Company Persons	56.08	6
7	Spare parts availability	53.83	7
8	Brand Name/Reputation	44.91	8
9	Product look and technical Specifications	41.16	9
10	After sales service	40.58	10
11	Sales promotion/ Some Gift Scheme	32.25	11
12	Easy availability of Loans	26.58	12
13	Resale Value and Exchange Value	25.91	13

Source: Field Survey, 2020

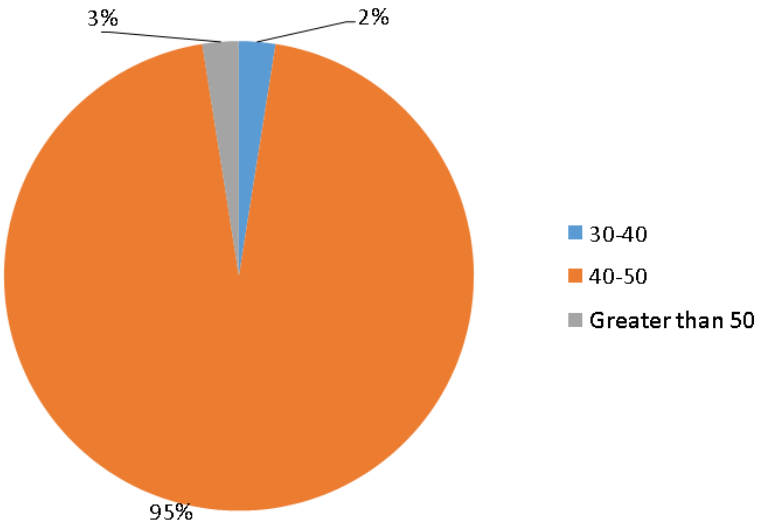

Fig. 1. Distribution of tractors in each segment in Adilabad district

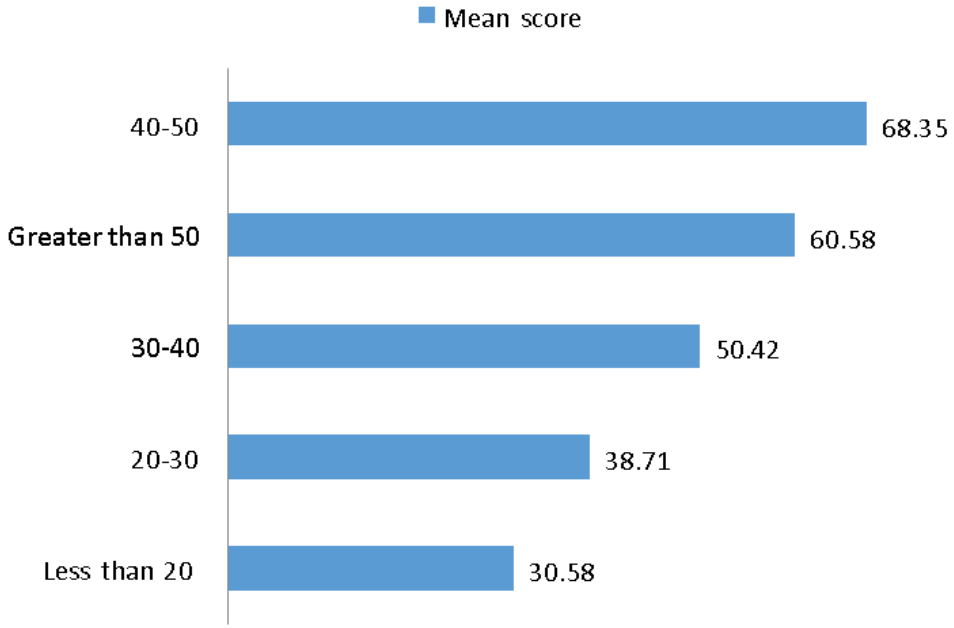

Fig. 2. Preference given by the farmers for different power segments of tractors in Adilabad district

4. CONCLUSIONS

It was observed that there are 5 different tractor brands of tractors, viz. Eicher, Mahindra, Swaraj, John Deere and Escorts with different models in Hp segments of 40 -50 and 50-60. Farmers ranked fuel/oil efficiency as the first factor in purchase of tractor followed by subsidies, maintenance cost, horse power, low priced tractor, recommendations by relatives/friends/ local mechanics/dealers/company persons, brand reputation, spare parts, product appearance, service of the company, sales promotion/ gift scheme, easy availability of finance and resale value in the descending order of ranking. Dealer ranked the factors that the farmers considered in tractor purchase were subsidy followed by fuel efficiency, maintenance cost, low price, horse power, recommendation by relatives/ local mechanics/ dealers/ company persons, spare parts, recommendation of people on brand, product appearance, service of

company, sales promotion/gift scheme, and resale value in the descending order of ranking. Apart from these, the sample farmers believed that 40-50 horse power segments was the most suitable segment for the selected area and it is ranked first by sample farmers. Greater than 50 horse power segment was the next suitable segment 3 per cent. 30-40 horse power segments were preferred by 2 per cent of the sample farmers.

CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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