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FACTORS INFLUENCING TRACTOR OWNERSHIP IN DRYLAND AGRICULTURE A MICRO-LEVEL STUDY IN DAVANGERE DISTRICT, KARNATAKA

Economy

Dr. Rajeshwari Pujari Associate Professor & Principal GFGC, Jagaluru Davangere District Karnataka

ABSTRACT

This study examines the factors influencing tractor ownership in dryland agriculture using primary data from 800 farm households. This study has been conducted in Davangere district, Karnataka. The findings reveal that only 30.8 percent of farmers expressed a desire to own tractors. The study observed a strong positive association between farm size and ownership. Marginal and small farmers showed minimal inclination due to economic and structural constraints. Garrett ranking results indicate that small landholding size, high initial investment, and operating costs are the major deterrents. Credit constraints and availability of custom hiring services further reduce ownership incentives. The study concludes that tractor ownership is economically unviable for smaller farmers. It highlights the need for promoting shared mechanization models and improved credit access.

KEYWORDS

Desire To Own Tractor, Ownership Of Tractor

INTRODUCTION

Capital formation plays a pivotal role in enhancing agricultural productivity. Ownership of capital assets enable the farmers to perform timely operations and efficient use of resources. Farm mechanization, particularly tractor ownership, represents a crucial component of agricultural capital stock. It influences production efficiency, labour substitution, and cost structures. In dryland regions like Davangere district investment decisions in farm machinery are shaped by resource constraints. Institutional factors and risk are also plying important role in investment decision. Public investment in agriculture is being declining over the decades. Hence, increasing importance of private capital assets in agriculture has intensified the need to understand farm-level investment behaviour (Dhawan, 1998). Empirical studies have consistently highlighted that factors such as landholding size, income, and access to credit significantly influence capital formation decisions (Desai, 1969; Singh Baldev, 1970). Furthermore, mechanization has been associated with improved productivity. It has also reduced labour dependence, particularly in regions facing labour scarcity (Gajendra Singh, 2015).

Small and marginal farmers often depend on hired services due to economic and structural constraints. It is expected to affect timeliness and efficiency of farm operations. Previous research has largely focused on aggregate trends in capital formation, public versus private investment dynamics, and macro-level determinants (Karmakar, 1998; Gulati and Bathla, 2002). While these studies provide valuable insights, they overlook micro-level behavioural aspects. The studies like farmers' perceived need, willingness, and constraints in owning specific capital assets like tractors have not found do importance in the earlier studies. In such context, investment decisions are inherently influenced by risk, variability in rainfall, and economic viability.

The present study addresses this gap by examining tractor ownership behaviour at the household level in Davangere district using primary data. It is specifically exploring how socio-economic characteristics, perceived utilities, and financial constraints influence farmers' decisions to invest on tractor ownership. By adopting a micro-level analytical framework, the study contributes to a better understanding of private capital formation dynamics in rainfed agriculture. It provides insights for policy interventions aimed at promoting equitable access to farm mechanization. The specific objectives of the study are to analyse farmers' desire and ownership of tractors and to identify key constraints affecting ownership decisions.

Methodology

This study is based on **primary data** collected from sample farm households of **Davangere district of Karnataka.** Predominance of rainfed agriculture and variation in the ownership of tractors across the strata are the rational for the selection of Davangere district for this study. In order to ensure adequate representation to different strata of the farmers, **multistage random sampling method has been used.** In the first stage, taluks categorised under the Central Dry Zone were identified and two taluks were randomly selected. In the second stage, from each of selected taluk, villages not covered under canal irrigation were listed. From such list of selected two taluks, 10 villages were randomly selected. Thus totally 20 villages were selected in the second stage. In the third stage, 40 farmers' households were randomly selected from each village.

A total sample of **800 farm households** was surveyed. Primary data were collected using a **pre-tested structured interview schedule**. Information about the size of holding, perceived need (desire) to own tractors and actual ownership status as well as reasons for lack desire to own tractor were collected. Post enumerative classification of respondents into **marginal, small, medium, and large farmers** was made based on the farm size category**.** Results were presented in the tabular format. The reasons for lack of desire were ranked using **Garrett's ranking technique**, which converts ranks into mean scores for prioritisation of constraints.

Results and Discussion

Primary data from the 800 sample farmers was collected through survey. Information about the farmers perceived desire to invest on the tractor was collected. Farmers perceived desire to own the tractor has been presented across the different farm size category in the table-1.

Table-1: Farmers perceived desire/Need to Own Tractor

Desire to Own Harvesting Yard	Marginal Farmers	Small Farmers	Medium Farmers	Large Farmers	Total
Have Desire	8 (2.2)	20 (9.9)	132 (86.8)	86 (97.7)	246 (30.8)
Not having desire	350 (97.8)	182 (90.1)	20 (13.2)	2 (2.3)	554 (69.3)
Total Farmers	358 (100)	202 (100)	152 (100)	88 (100)	800 (100)
Chi-square Value	587.906*				

* Indicate significance at 1 percent probability level.

Out of 800 farmers interviewed, only 246 farmers observed to have the desire to own the tractor. It accounts for the 30.8 percent of the total respondents interviewed. About 45 percent of the farmers observed to be marginal farmers. Small and Marginal farmers together account for the 70 percent of the total farmers. Only 2.2 percent of the marginal farmers and 9.9 percent of the small farmers found to have the desire to own the tractor. Contrary to it, 97.7 percent of the large farmers and 86.8 percent of the medium farmers reported their desire to own the tractor. It is clear from the discussion that desire to own the tractor observed to be closely associated with the farm size category of the farmers. In order to assess the association between the farm size category of the farmers and their desire to own the tractor, chi-square value has been calculated.

The calculated chi-square value is statistically significant at 1 percent probability level. It means, perceived desire to own the tractor is significantly associated with farm size category of the farmers. The percentage of farmers having desire to own the tractor found increase with the increase in the size farm holding. The intensity of the need to

have the tractor is significantly lower among the Marginal and small farmers.

Based on the discussion with the farmers during the pilot survey six reasons for lack of desire to own the tractor has been identified. During the survey, farmers who did not have desire to own the tractor were asked to rank the given six reasons. Mean Garret score has been calculated and ranks were assigned based on the mean score. The Garrett ranking results of the reasons for lack of desire to own tractor among farmers is given in table-2.

Table-2: Reasons for lack of desire / need to own Tractor

Sl. No.	Reasons for Lack of Desire	Garrett Mean Score	Rank
1	Small Size of landholding	78.64	1
2	High Initial Investment Cost	74.21	2
3	High Operating and Maintenance Costs	69.85	3
4	Economically unviable investment	65.37	4
5	Credit constraint	60.92	5
6	Availability of Custom Hiring Services	56.48	6
Total respondent with lack of desire to own Tractor		554	

The results, clearly indicate that economic and structural constraints play a decisive role in shaping farmers' reluctance to own tractors. Among the 554 respondents who expressed a lack of desire to own a tractor, *small size of landholding* emerged as the most dominant factor. The Garrett Mean Score (78.64) was observed to be highest for small size of holding. It was closely followed by *high initial investment cost* (74.21). These two factors were particularly prominent among marginal and small farmers. It is reflecting their limited operational scale and financial capacity. Small and fragmented landholdings reduce the economic feasibility of tractor ownership. It is because, their scale of cultivation does not justify such capital-intensive investment. The third and fourth ranked factors—*high operating and maintenance costs* (69.85) and *economically unviable investment* (65.37)—further reinforce the economic burden associated with tractor ownership. Even if farmers manage to invest initially, recurring expenses such as fuel, repairs, and servicing make tractor use costly. It is burden to the farmers when utilization levels remain low. This indicates that tractor ownership is not only a question of affordability but also of long-term viability. C*redit constraint* (60.92) and *availability of custom hiring services* (56.48), ranked fifth and sixth respectively. They were relatively more significant among marginal farmers. Limited access to institutional credit restricts their ability to mobilize funds for purchasing tractors.

At the same time, the increasing availability of hiring facility provides an alternative mechanism. It allowing farmers to access tractor services on a need basis without bearing ownership costs. This reduces the necessity of owning a tractor for those with smaller landholdings. Overall, the findings suggest that tractor ownership is largely unattractive to marginal and small farmers. It is mainly because of scale inefficiency, high capital requirements, and viable alternatives like custom hiring. The results highlight the importance of promoting shared access models and improving credit facilities rather than encouraging individual ownership in such contexts.

Ownership status of the tractors has been consolidated and presented across the different farm size category in table-3. In the preceding table, it was observed that 246 farmers reported their desire to own the tractor. Out of them, 114 farmers observed to actually own the tractor which accounts for 46.3 percent of the farmers who have the desire to own the tractor. The percentage of the farmers who own the tract observed to be increasing with the increase in the size of holding. The percentage of farmers owning the tractor was observed to be highest among the large farmers (67.4%) whereas it was lowest among marginal and small farmers (25%). The chi-square test results reveal the significant association between the farm size and ownership status of the tractors. Thus, ownership of the tractors increases with the size of land holding.

Table-3: Ownership Status of Tractors across the Farm Size Category

Ownership Status	Marginal & Small Farmers	Medium Farmers	Large Farmers	Total
Owned	7 (25.0)	49 (37.1)	58 (67.4)	114 (46.3)
Not owned	21 (75.0)	83 (62.9)	28 (32.6)	132 (53.7)
Total	28 (100)	132 (100)	86 (100)	246 (100)
Chi-square Value	25.040*			

* indicate significance at one percent probability level.

CONCLUSION

The study establishes that the desire to own tractors is strongly influenced by farm size, with marginal and small farmers showing minimal inclination to own tractor. It is mainly because of structural and economic constraints. Small holdings, high investment costs, and low utilization make ownership economically unviable for small and marginal farmers. Availability of alternatives like hiring facility further reduce the need. Therefore, policy should prioritize strengthening Custom Hiring Centres and promoting cooperative or group-based ownership models. Additionally, improving access to affordable and timely institutional credit can help farmers make efficient mechanization choices.

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