



## ORIGINAL RESEARCH PAPER

Economy

### CHANGE IN THE OWNERSHIP OF SELECTED FARM ASSETS IN DRYLAND VILLAGES OF DAVANGERE DISTRICT: A MICRO-LEVEL STUDY

**KEY WORDS:** Farm Asset, Dryland Agriculture, Agricultural Mechanization

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#### ABSTRACT

Capital formation is important for attaining resource-use efficiency and better productivity. This study examines changes in the ownership pattern of selected farm assets in Davangere district. Primary data were collected from 360 farm households. They were selected through a multistage random sampling method. The study has analysed trends in ownership of bullock pairs, tractors, open wells, and tube wells. Descriptive statistics and chi-square tests used for this purpose. The findings reveal a significant decline in bullock ownership and the complete disappearance of open wells. In contrast, tractor ownership increased from 6.8% to 16.6%, while tube well ownership increased from 11.1 % to 28.4 %. The results indicate increasing mechanization and dependence on groundwater irrigation. It is reflecting farmers' adaptation to changing technological, economic, and climatic conditions in dryland agriculture.

#### INTRODUCTION

Agriculture capital formation plays an important vital role in improving farm productivity. It helps in strengthening rural livelihoods and sustaining agricultural growth. Capital assets like bullock pairs, tractors, irrigation wells, farm machinery, and other productive resources enable farmers to perform agricultural operations at the appropriate time. Timely performance of farm operation enhances the efficiency of resource use. In dryland regions, where rainfall uncertainty and inadequate irrigation facilities constrain crop production, ownership of productive assets becomes particularly important for reducing production risk. Further, it could contribute for stabilizing farm income. Studies on agricultural capital formation have emphasized that investment in farm assets enhances the productive use of land and labour. It contributes significantly to long-term agricultural development.

Indian agriculture has undergone substantial structural transformation for the last four to five decades. Transformation, covers the increased mechanization, diversification of crops, expansion of horticulture, and rising dependence on irrigation technologies. These changes altered the composition of farm assets. Dhawan (1998) observed that declining public investment in agriculture adversely affects the overall growth of the sector. While Shetty (1990) and Krishnamurthy (1985) highlighted the complementary relationship between public and private investment in agriculture. Similarly, Karmakar (1998) reported declining trends in both public and private agricultural investment. Existing literature on agricultural capital formation has largely concentrated on macro-level trends in public and private investment. Several studies examined complementarities between public and private investment, determinants of capital formation and sectoral investment patterns (Maheshwari, 2013). However, micro-level studies analysing long-term changes in ownership of specific farm assets at the household level, particularly in dryland regions, remain limited.

Dryland agriculture dominates a large part of Davangere district. In this district, canal irrigation facilities are limited and borewell water availability remains uncertain during deficit rainfall years. In such circumstances, changes in ownership of capital assets reflect the adaptive strategies of farmers to changing agrarian conditions. Recent studies on sustainable dryland agriculture and farm mechanization in India also indicate increasing dependence on mechanized farm power and groundwater irrigation under changing climatic conditions (NITI Aayog, 2023; FAO, 2022). Against this background, the present study examines the changing ownership pattern of selected farm assets among dryland farmers in Davangere district between 1991-92 and 2021-22.

#### Methodology

This study is based on the primary data collected from the sample farmers of Davangere district. Though some part of the district connected with the canal irrigation facility, about 3/4<sup>th</sup> of the villages of the district don't have canal irrigation facility. Significant proportion of district farmers have the borewell irrigation facility but the water yield in these borewells is very low. It is particularly in the deficit rainfall years. In this backdrop, Davangere district deliberately selected for the study. Multi stage random sampling method has been used for the selection of the sample farmers. In the first stage three taluks have been randomly selected. From each taluk separate lists of villages which are not having the canal irrigation facility have been prepared. From each list 6 villages have been selected. In this process, totally 18 villages have been selected. From each village 20 farm households were randomly selected leading to total sample of 360 farm households. Survey was conducted during April-June 2022. Out of 360 households interviewed 296 families were able to give information on asset ownership position in 2021-22 as well as in 1991-92.

#### RESULTS AND DISCUSSION

Traditionally, bullock pairs are the most productive assets in the Indian farm families. It is particularly true in dryland farming system due to limited mechanization. They were widely used for ploughing, transportation and such other farm operations. Information about the ownership of bullock pairs was collected from sample farm households for two periods of time viz. 1991-92 and 2021-22. The information collected from the sample households has been consolidated and presented in table-1. The results of the study reveal the significant declining trend in the ownership of the bullock over the last three decades.

**Table-1: Trends in the Ownership of Bullock Pairs**

| Time period | Ownership Status |            |           | Chi-square Value |
|-------------|------------------|------------|-----------|------------------|
|             | Owned            | Not owned  | Total     |                  |
| 1991-92     | 201 (68.8)       | 91 (31.2)  | 296 (100) | 48.585*          |
| 2021-22     | 119 (40.2)       | 177 (59.8) | 296 (100) |                  |

\* indicate significance at one percent probability level

The results of the study reveal that during 1991-92, out of the total 296 sample households, 201 households (68.8%) reported to be owned the bullock pairs. It implies that bullock ownership was highly prevalent among the rural households in the beginning of 1990s. At that time, agriculture was largely depended on traditional source of farm power. Bullock served not only as a source of farm power but also as an important economic indicator among the farm households. Contrary to the above, by 2021-22, a considerable decline in the bullock

ownership was observed. Only 40.2 percent of the farm households reported the ownership of the bullock pairs. Thus, over the period of three decades the proportion of the households owning the bullocks declined by 29 percentage points. The calculated chi-square value (48.585) significant at one percent probability level and it clearly indicate that the change in the ownership pattern is statistically significant.

The significant decline in the ownership of the bullocks reflects the ongoing structural transformation. There is gradual shift from the traditional to mechanized farming practices. Mechanization of agronomic practices enable the farmers to perform the practices more quickly. It was within the limited moisture period or other kind of suitable time. Maintenance cost of bullocks is growing due to rising cost of agriculture labour besides shrinking grazing lands in the villages. Majority small and marginal farmers find it economically unviable to maintain bullocks.

Information about the ownership of the tractor in 2021-22 as well as in 1991-92 was collected form the sample households and results have been consolidated and presented in table-2. The results indicate a gradual but significant increase in tractor ownership. It reveals the growing mechanization of agriculture in the region. During 1991-92, only 6.8 percent sample households reported to be owned tractors. This low level of tractor ownership during the early 1990s may be attributed to lower penetration of mechanized farming practices in dryland agriculture. However, by 2021-22, the number of tractor-owning households increased considerably. Forty-nine households accounting for 16.6 percent of the total sample households reported to owned the tractors. The calculated Chi-square value (13.796) significant at one percent probability level. It indicates that the increase in tractor ownership over the years is statistically significant.

Table-2:Trends in the Ownership ofTractor

| Time period | Ownership Status |            |           | Chi-square Value |
|-------------|------------------|------------|-----------|------------------|
|             | Owned            | Not owned  | Total     |                  |
| 1991-92     | 20 (6.8)         | 276 (93.2) | 296 (100) | 13.796*          |
| 2021-22     | 49 (16.6)        | 247 (83.4) | 296 (100) |                  |

\* indicate significance at one percent probability level

The increase in tractor ownership clearly reflects the changing technological and economic environment in agriculture sector. Several factors reported to be contributed for increasing number of tractors. They are; Rising scarcity of labour, increasing wage rates, increasing need for timely agricultural operations, and expansion of mechanized cultivation practices. Institutional factors like Improve access to Institutional credit facilities and government subsidies have also been contributed for increased tractors. In dryland agriculture, timely land preparation and sowing are highly crucial because crop cultivation depends heavily on uncertain rainfall. Tractors enable farmers to complete farm operations quickly and efficiently within the short rainfall window. Timely performance of operations has contributed for improving crop productivity. Overall, the findings indicate a gradual transition from animal-powered farming to mechanized agriculture in the dryland villages of Davangere district.

Table-3 presents the trends in the ownership of irrigation wells among the sample farm households. The results indicate a significant transformation in the pattern of irrigation assets. The data relating to open wells reveals that during 1991-92, only 13 households (4.4%) owned open wells. However, by 2021-22, none of the sample households reported ownership of open wells.

Table-3:Trends in the Ownership ofWells

| Ownership Status of the Assets | Time period |         | Chi-square Value |
|--------------------------------|-------------|---------|------------------|
|                                | 1991-92     | 2021-22 |                  |

|           |           |             |             |         |
|-----------|-----------|-------------|-------------|---------|
| Open well | Owned     | 13 (4.4)    | 0 (0.0)     | 13.292* |
|           | Not Owned | 283 (95.6)  | 296 (100.0) |         |
|           | Total     | 296 (100)   | 296 (100.0) |         |
| Tube well | Owned     | 33 (11.1)   | 84 (28.4)   | 27.707* |
|           | Not Owned | 263 (88.9)  | 212 (71.6)  |         |
|           | Total     | 296 (100.0) | 296 (100.0) |         |

\* indicate significance at one percent probability level

The Chi-square value (13.292) was significant at one percent probability level. It has indicated decline in ownership of open wells is statistically significant. The disappearance of open wells from the study area may be attributed to; 1) declining groundwater levels, 2) poor recharge of shallow aquifers, 3) irregular rainfall, and 4) increasing water scarcity in dryland regions. Contrary to the above, ownership of tube wells increased considerably. In 1991-92, only 33 households (11.1 %) owned tube wells. By 2021-22, the number of tube well-owning households increased to 84 (28.4%). The Chi-square value (27.707) was significant at one percent probability level. It indicates statistically significant increase in tube well ownership. The increasing adoption of tube wells reflects farmers' growing dependence on groundwater irrigation. Overall, the findings indicate a clear shift from traditional shallow irrigation sources towards deeper groundwater extraction systems.

CONCLUSION

The study has observed significant change in the ownership pattern of capital assets among dry land farmers in the study area. Ownership of bullock pairs and open wells declined considerably. Whereas tractor and tube well ownership increased significantly. It indicates significant shift towards mechanization and groundwater-based irrigation. These changes reflect farmers' adaptation to the condition of labour scarcity and uncertain rainfall. Need for timely farm operations demanded mechanisation. However, increased dependency on tube wells raises concerns regarding groundwater sustainability. Policy efforts should therefore promote efficient water management through groundwater recharge and micro-irrigation strategies. Expansion of custom hiring centres can improve access to mechanization for small farmers

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