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# Use of farm equipment and labour utilization pattern of rice growers in Davanagere district

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**Abstract**
The Present study was carried out in two taluks of Davanagere district in Karnataka State during 2020-21 to assess the Farm equipment and labour utilization pattern of Rice growers in Davanagere district. A total of 120 rice growers were interviewed for the purpose. The results revealed that cent percent (100%) of large farmers owned the sickles and spade followed by Nearly half (53.00%), 46.70%, 41.70% and 35.00% of Large farmers owned the power sprayer, Tractor, cultivator and knapsack sprayer, respectively. It is found that cent percent (100%) of small farmers owned the sickles followed by 88.30% and 68.30% of small farmers owned the sickles, spade and harrow, respectively. In labour utilization pattern, the average total human labour used by small farmers was 43.71 man days which is more than large farmers (37.72 man days).

**Keywords:** Farm equipment, labour utilization, rice growers

## Introduction
Agriculture has been a way of life and continues to be the single most important livelihood of the masses. Agricultural policy focus in India across decades has been on self -sufficiency and self -reliance in food grains production. Considerable progress has been made on this front. Food grains production rose from 52 million tonnes in 1951 -52 to 296.65 million tonnes in 2019 -20. The share of agriculture in gross domestic product (GDP) has reached almost 20 per cent for the first time in the last 17 years, making it the sole bright spot in GDP performance during 2020-2021.The resilience of the farming community in the face of adversities made agriculture the only sector to have clocked a positive growth of 3.4 percent at constant prices in 2020-2021, when other sectors slide. The share of agriculture in GDP increased to 19.9 per cent in 2020-21 from 17.8 per cent in 2019-20 (Economic survey 2020-21) [1]. Farm mechanization is the application of engineering and technology in agricultural operations to do a job in a better way to improve productivity. This includes development, application, and management of all mechanical aids for field operation, water control, material handling, storing and processing. Mechanical aids include hand tools, animal drawn equipments, power tiller, tractor, oil engines, electric motors, combine harvesters, processing and hauling equipments. Farm mechanization has immense potential for improving farm productivity. Empirical data reaffirm that availability of farm power has a direct correlation to agricultural productivity. Appropriate crop and region-specific agricultural equipment enable efficient utilization of farm inputs making farming viable and attractive. Though the country has been witnessing considerable progress in farm mechanization, its spread across the country still remains uneven. The farm power availability hovers around 2.02 kw/ha which is much lower than that of Korea (7+ kw/ha), Japan (14+kw/ha), and the U SA (6+kw/ha). It is estimated that in order to upscale farm productivity so as to grow more food given the stagnant net sown area, farm power availability must reach at least 2.0 kw/ha by the end of Twelfth Five Year Plan. Gradual increase in farm mechanization will also help release agricultural labour for other emerging and valued sectors, thus contributing more towards GDP (Economic survey, 2020-21) [1].

## Methodology
Davanagere district was selected purposively, because of its one of the Rice growing area. Davanagere district has six taluks, out of which Davangere and Channagiri taluks were selected purposively considering the highest area and production. The top six villages having the highest area under Rice cultivation in Davangere taluk and six villages having the highest area under Rice cultivation in Channagiri taluk were selected from the district for the purpose

of the study. From each village, five small farmers and five big farmers were selected. Thus, from each selected taluk, thirty small and thirty big farmers were selected by using simple random sampling. The total sample constituted from two taluks was 120. The data was collected using personal interview schedule and analysed, tabulated using Statistical Analysis.

**Results and Discussion**

Close look at Table 1 reveals that, cent percent (100.00%) of large farmers owned the sickles and spade followed by Nearly half (53.00%), 46.70%, 41.70% and 35.00% of Large farmers owned the power sprayer, Tractor, cultivator and knapsack sprayer, respectively. It is found that cent percent (100.00%) of small farmers owned the sickles followed by 88.30% and 68.30% of small farmers owned the spade and harrow, respectively. None of the small farmers owned machines for transplanting. About 6.7 per cent of large farmers owned Transplanter for transplanting the seedlings. Both small and large farmers did not possess any machines required for fertilizer application. For the irrigation purpose, 5 per cent of small and 16.7 per cent of large farmers owned pump sets. All the small and large farmers owned sickles for weeding and only 5 per cent of large farmers owned Rotory weeder for weeding operation. The major equipments used for plant protection chemical application were Knapsack sprayer and Power sprayer. About 68 per cent and 11 per cent of small farmers owned Knapsack sprayer and Power sprayer respectively. Among large farmers 35 per cent and 53 per cent owned Knapsack sprayer and Power sprayer respectively. None of the small farmers owned machineries for harvesting and threshing.

**Table 1:** Status of Use of Farm Equipments in Rice Cultivation by the Sample Farmers

| Operation/equipments | Small farmer (n=60) | | Large farmer (n=60) | |
|---|---|---|---|---|
| | Used by the farmers (Nos.) | Percent | Used by the farmers (Nos.) | Percent |
| **A. Land preparation** | | | | |
| Tractor | 06 | 10.00 | 28 | 46.70 |
| Power tiller | 04 | 06.70 | 12 | 20.00 |
| Cage wheel | 03 | 05.00 | 18 | 30.00 |
| Peg puddler | 00 | 00.00 | 02 | 03.30 |
| M.B plough | 05 | 08.30 | 15 | 25.00 |
| Disc plough | 01 | 01.70 | 06 | 10.00 |
| Cultivator | 06 | 10.00 | 25 | 41.70 |
| Leveler | 04 | 06.70 | 20 | 33.30 |
| Harrow | 14 | 23.30 | 20 | 33.30 |
| Spade | 53 | 88.30 | 60 | 100.00 |
| **B. Transplanting** | | | | |
| Transplanter | 00 | 00.00 | 04 | 06.70 |
| **C. Fertilizer application** | | | | |
| Broadcaster | 00 | 00.00 | 00 | 00.00 |
| **D. Irrigation** | | | | |
| Pumpset | 03 | 05.00 | 10 | 16.70 |
| **E. Weeding** | | | | |
| Sickles | 60 | 100.00 | 60 | 100.00 |
| Rotory weeder | 00 | 00.00 | 03 | 05.00 |
| Cono weeder | 00 | 00.00 | 00 | 00.00 |
| **F. Plant Protection** | | | | |
| Knapsack sprayer | 41 | 68.30 | 21 | 35.00 |
| Power sprayer | 07 | 11.70 | 32 | 53.30 |
| **G. Harvesting and threshing** | | | | |
| Rice thresher | 00 | 00.00 | 04 | 06.70 |
| Combined harvester | 00 | 00.00 | 02 | 03.40 |

Close look at Table 2 reveals that, the average total human labour used by small farmers was 43.71 man days which is more than large farmers (37.72 man days). Small farmers used 16.01 man days for weeding followed by 10.15 man days for transplanting, 2.98 man days for spreading of FYM, 2.35 man days for transportation of FYM, 2.19 man days for drying, winnowing and bagging, 2.15 man days for seed bed preparation and 1.92 man days for harvesting and threshing. The average total human labour used by large farmers was 37.72 man days. Large farmers used 12.00 man days for weeding followed by 9.23 man days for transplanting, 2.74 man days for spreading of FYM, 1.58 man days for seed bed preparation and 2.01 man days for drying, winnowing and bagging. Other operations for which human labour used were transportation of FYM, PPC application, fertilizer application, irrigation and puddling. The average bullock labour used by small farmers was 5.17 BPD which was more than large farmers (1.03 BPD). Small farmers used 2.04 BPD for transportation followed by 1.48 BPD for ploughing, 0.71 BPD for harrowing and 0.59 BPD for puddling operation. The average bullock labour used by large farmers was 1.03 BPD. Large farmers used 0.26 BPD for transportation followed by 0.23 BPD for ploughing, 0.21 BPD for threshing, 0.19 BPD for puddling operation and 0.14 BPD for harrowing.

**Table 2:** Labour Utilization Pattern in Rice Cultivation

| Sl. No | Labour/Operations | Small farmers (n=60) | | Large farmers (n=60) | |
|---|---|---|---|---|---|
| **1** | **Human labour (Man days)** | **Quantity** | **Percent share** | **Quantity** | **Percent share** |
| | Transportation of manure (FYM) | 02.35 | 05.40 | 01.59 | 04.50 |
| | Spreading of manure (FYM) | 02.98 | 06.90 | 02.74 | 07.40 |
| | Seed bed preparation | 02.15 | 04.10 | 01.58 | 04.20 |
| | Puddling | 01.12 | 02.60 | 01.03 | 02.80 |
| | Transplanting | 10.15 | 23.30 | 09.23 | 24.60 |
| | Weeding | 16.01 | 36.70 | 12.00 | 31.90 |
| | Fertilizer application | 01.57 | 03.60 | 01.62 | 04.40 |
| | Irrigation | 01.86 | 04.30 | 01.95 | 05.30 |
| | Plant protection chemicals | 01.41 | 03.30 | 01.60 | 04.40 |
| | Harvesting and Threshing | 01.92 | 04.40 | 01.86 | 04.20 |
| | Drying, winnowing and bagging | 02.19 | 05.10 | 02.01 | 05.40 |
| | Total Human Labour | 43.71 | 100.00 | 37.72 | 100.00 |
| **2** | **Bullock Labour (BPD)** | | | | |
| | Ploughing | 01.48 | 28.70 | 00.23 | 22.40 |
| | Puddling | 00.59 | 11.50 | 00.19 | 18.50 |
| | Transportation | 02.04 | 39.50 | 00.26 | 25.30 |
| | Harrowing | 00.71 | 13.80 | 00.14 | 13.60 |
| | Threshing | 00.35 | 06.80 | 00.21 | 20.40 |
| | Total Bullock Labour | 05.17 | 100.00 | 01.03 | 100.00 |
| **3** | **Machine works (Hours)** | | | | |
| | Ploughing | 00.32 | 13.50 | 01.38 | 24.60 |
| | Puddling | 00.16 | 06.80 | 00.24 | 04.30 |
| | Transportation | 01.09 | 45.80 | 02.17 | 38.70 |
| | Harrowing | 00.29 | 12.20 | 00.56 | 09.10 |
| | Transplanting | 00.14 | 05.90 | 00.56 | 09.10 |
| | Harvesting and Threshing | 00.38 | 15.10 | 00.71 | 12.70 |
| | Total Machine Labour | 02.38 | 100.00 | 05.62 | 100.00 |

## Conclusion

It was found that cent percent (100%) of large farmers owned the sickles and spade followed by Nearly half (53.00%), 46.70%, 41.70% and 35.00% of Large farmers owned the power sprayer, Tractor, cultivator and knapsack sprayer, respectively. It is found that cent percent (100%) of small farmers owned the sickles followed by 88.30% and 68.30% of small farmers owned the sickles, spade and harrow, respectively. In labour utilization pattern, the average total human labour used by small farmers was 43.71 man days which is more than large farmers (37.72 man days).

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