**SOCIO-ECONOMIC PROFILE AND MARKET SHARE OF FARM IMPLEMENT TOWARDS VARIOUS BRANDS IN RAJKOT DISTRICT, GUJARAT, INDIA**

**ABSTRACT**

A farm implement is machinery used in farming or other agricultural operations. Rajkot district had the highest number of farm machinery manufacturing industry in the overall state. Primary data was collected through personal interviews with the help of a structured schedule. Three talukas from the Rajkot district were selected randomly. From each taluka, five villages were selected randomly and from each village, eight farmers were selected randomly. In this way, a total of 120 farmers were selected from the Rajkot district. Study concludes that VST Power Tillers (35.83%) lead in mini tractors, while Massey (8.33%) and Mahindra (7.5%) top full-size tractors; Arjun Agro dominates trolly ownership (45.95%), and Mausam Agro (20%) and Bhoomi Agro (18.33%) are key players in seed drills, with local brands prominent in ploughs and cultivators.

**Keywords:** Socio-economic profile of farmers, Farm mechanization, Farm implement, Market share

**1. INTRODUCTION**

A farm implement is a type of machinery used in farming or other agricultural operations. There are many types of such equipment, from hand tools and power tools to tractors and the countless kinds of farm implements used in farming. A diverse arrays of equipment are used in both organic and inorganic farming. Especially since the advent of mechanised agriculture, agricultural machinery is an indispensable part of farming. Farm implements and machinery are used for tillage, harvesting of the crops and post-harvesting operations like threshing, grading and other operations. Thus, there is a strong need for the mechanization of agricultural operations. Farm implements and machinery are used for tillage, harvesting of the crops and post-harvesting operations like threshing, grading and other operations. Thus, there is a strong need for the mechanization of agricultural operations. Agricultural mechanization implies the use of various power sources and improved farm tools and equipment, for reducing the drudgery of human beings and draught animals, enhancing the cropping intensity, precision and timelines of efficiency in utilization of various crop inputs and reducing the losses at different stages of crop production. Mechanization of agriculture is an essential input in modern agriculture. It enhances productivity, besides reducing human drudgery and the cost of cultivation. Mechanization also helps in improving the utilization efficiency of other inputs, safety and comfort of the agricultural workers and improvements in the quality and value addition of the produce. Efficient machinery helps in increasing production and productivity.

**2. METHODOLOGY**

Rajkot district was purposively selected for the study. Rajkot district had the highest number of farm machinery manufacturing industry in the overall Gujarat state. The primary data was collected through personal interviews with the help of a structured schedule. The schedule was designed with open-ended questions, which were used to collect data from the farmers in the study area (Meshram et al., 2020). For primary data collection, three talukas from Rajkot district were selected randomly. From each taluka, five villages were selected randomly and from each village, eight farmers were selected randomly. In this way total of 120 farmers were selected from the Rajkot district. To find out socio socioeconomic profile of farmers and market share of the different farm implement companies, it was measured in terms of companies preferred by farmers for the purchase of farm implements.

**Percentage Method:** Percentage refers to a special kind of ratio that is used in making comparisons between two or more series of data.

Percentage = X/Y × 100

Where:-

X = Number of respondents

Y = Total number of respondents

**3. RESULTS AND DISCUSSION**

**3.1 Socio-economic characteristics of the farmers**

## 3.1.1 Age of farmers

 The detailed description per age of the farmers was classified into three groups, and the data are shown in Table 1

## Table 1: Distribution of the farmers according to their age (n=120)

|  |  |  |  |
| --- | --- | --- | --- |
| **Sr. No.** | **Age** | **Frequency (n)** | **Percentage (%)** |
| 1. | Young (18 to 35 years) | 36 | 30.00 |
| 2. | Middle (36 to 50 years) | 51 | 42.50 |
| 3. | Old (Above 50 years) | 33 | 27.50 |
| **Total :** | 120 | 100.00 |

 The highest percentage, *i.e*. 42.50 per cent of farmers, belonged to the middle age group, those who were between 36 to 50 years old, followed by the young age group (30.00%) and old age farmers (27.50%).

## 3.1.2. Size of land holding possessed by the farmers

 Land holding capacity possessed by the farmers is a significant socio-economic marker. The land possessed by the farmers is presented in table 2

 The farmers were categorised into five groups based on their land-holding capacity.

|  |
| --- |
| **Table 2: Distribution of farmers according to their land holding (n=120)** |
| **Sr. No.** | **Land holding** | **Frequency (n)** | **Percentage (%)** |
| 1. | Marginal (up to 1.0 hectare) | 00 | 00 |
| 2. | Small (1.01 to 2.0 hectares) | 05 | 04.17 |
| 3. | Semi-medium (2.01 to 4.0 hectare) | 61 | 50.83 |
| 4. | Medium (4.01 to 10.0 hectare) | 46 | 38.33 |
| 5. | Large (more than 10 hectare) | 08 | 06.67 |
| **Total** | **120** | **100.00** |

 The highest percentage of farmers belonged to the semi-medium land holding category, 50.83 per cent, followed by the medium land holding category (38.33%), large land holding category (6.67%), small land holding category (04.17%) and none of them belonged to marginal land holding category (0%). This pattern of land-holding distribution showed that the majority of farmers belonged to the semi-medium and medium land-holding categories.

## 3.1.3 Types of family of farmers

 Types of family of farmers are presented in table 3.

## Table 3: Distribution of farmers according to their type of family (n=120)

|  |  |  |  |
| --- | --- | --- | --- |
| **Sr. No.** | **Type of family** | **Frequency (n)** | **Percentage (%)** |
| 1. | Joint | 41 | 34.17 |
| 2. | Nuclear | 79 | 65.83 |
| **Total** | **120** | **100.00** |

##  The farmers were categorised in two groups based on type of family. The highest (65.83%) per cent of farmers lived in nuclear type family and the remaining 34.17 per cent in joint family.

## 3.1.4 Total farming experience of farmers

 The farmers were categorized into four groups based on their farming experience as shown in table 4 The highest per cent (65.83%) of farmers belonged to more than 15 years category followed by 11 to 15 years (17.50%), 6 to 10 years (11.67%) farming experience, and some of them belonged to the category of up to 5 years (05.00%) farming experience.

**Table 4: Distribution of farmer according to their farming experience (n=120)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Sr. No.** | **Experience** | **Frequency (n)** | **Percentage (%)** |
| 1. | Up to 5 years | 06 | 05.00 |
| 2. | 6 to 10 years | 14 | 11.67 |
| 3. | 11 to 15 years | 21 | 17.50 |
| 4. | More than 15 years | 79 | 65.83 |
| **Total** | **120** | **100.00** |

**3.1.5 Occupation level of farmers**

 Although agriculture is observed to be the main source of employment for the people in the study area, the selected farmers were also engaged in other occupations. Besides agriculture, some farmers were engaged in the dairy business, a few of them engaged in government and non-government activities and school activities. The distribution of heads of sample farmers according to their occupation is given in table 5.

|  |
| --- |
| **Table 5: Distribution of farmers according to their occupation level (n=120)** |
| **Sr. No.** | **Occupation** | **Frequency (n)** | **Percentage (%)** |
| 1. | Farming | 33 | 27.50 |
| 2. | Farming + Animal husbandry | 54 | 45.00 |
| 3. | Farming + Animal husbandry + Business | 03 | 02.50 |
| 4. | Farming + Animal husbandry + Service | 01 | 00.83 |
| 5. | Farming + Business | 28 | 23.33 |
| 6. | Farming + Service | 01 | 00.83 |
| **Total** | **120** | **100.00** |

 The farmers were categorised into six groups based on their occupation level. The highest percentage of farmers belonged to the farming + animal husbandry category (45.00%) followed by Farming (33.00%), Farming + Business (23.33%), Farming + Animal husbandry + Business (02.50%) and only a few of them belonged to Farming + Service and Farming + Animal Husbandry + Service (00.83%). This pattern showed that the majority of farmers belonged to the farming + animal husbandry category for their occupation.

## 3.1.6 Education level of farmers

 The educational level of farmers helps in the adoption of technology at the farm level. Education of the farmers was categorised into six groups *i.e.,* illiterate, primary level, secondary level, higher secondary level and graduation and post-graduation level.

## Table 6: Distribution of farmers according to their education level (n=120)

|  |  |  |  |
| --- | --- | --- | --- |
| **Sr. No.** | **Education level** | **Frequency (n)** | **Percentage (%)** |
| 1. | Illiterate | 10 | 08.33 |
| 2. | Primary level (1st to 8th ) | 42 | 35.00 |
| 3. | Secondary level (9th to 10th ) | 44 | 36.67 |
| 4. | Higher secondary level (11th to 12th ) | 12 | 10.00 |
| 5. | Graduation and post-graduation | 12 | 10.00 |
| **Total** | **120** | **100.00** |

 The results presented in table 6 shows that the majority of farmers belonged to the secondary-level educational status. The highest percentage (36.67%) of farmers belonged to secondary level followed by Primary level (35.00%), Higher Secondary, graduation and post- graduation level (10.00%) and Only a few of them belonged to illiterate category (08.33%).

## 3.1.7 Annual income of the selected farmers

|  |
| --- |
| **Table 7: Distribution of farmers according to their annual income (n=120)** |
| **Sr. No.** | **Categories** | **Frequency (n)** | **Percentage (%)** |
| 1. | Low (≤410513) | 25 | 20.83 |
| 2. | Medium (410514-873654) | 78 | 65.00 |
| 3. | High (>873654) | 17 | 14.17 |
| **Total** | **120** | **100.00** |

**Mean-642083 S.D. - 231570**

 The farmers were categorised into three groups based on their annual income. The results are presented in table 7 shows that the highest percentage (65.00%) of farmers belonged to the annual income range of ₹410514-873654, followed by 20.83 per cent of farmers belonging to the annual income range of less than or equal to ₹410513 category and followed by 14.17 per cent farmers belonged to greater than 873654.

## 3.1.8 Sources of irrigation facilities available

 The irrigation is very crucial when it comes to farming also farming depends upon the season, soil type, method of irrigation and age of the crop.

## Table 8: Source of irrigation facilities available to farmers (n=120)

|  |  |  |  |
| --- | --- | --- | --- |
| **Sr. No.** | **Source of irrigation** | **Frequency (n)** | **Percentage (%)** |
| 1. | Openwell + Borewell | 10 | 08.33 |
| 2. | Openwell + Canal | 07 | 05.83 |
| 3. | Openwell | 103 | 85.84 |
| **Total** | **120** | **100.00** |

 The results are presented in table 8 shows that 85.84 per cent of farmers had a source of openwell for irrigation, followed by 08.33 per cent of farmers who had openwell + borewell and 05.83 per cent of farmers who had openwell + canal for irrigation.

**3.1.9 Irrigation method used by farmers**

 The irrigation method is as important as irrigation to the crop.

|  |
| --- |
| **Table 9 Method of irrigation used by farmers (n=120)** |
| **Sr. No.** | **Irrigation method** | **Frequency (n)** | **Percentage (%)** |
| 1. | Surface | 116 | 96.67 |
| 2. | Drip | 04 | 03.33 |
| 3. | Sprinkler | 00 | 00.00 |
| **Total** | **120** | **100.00** |

 The results are presented in table 9 shows that 96.67 per cent of farmers had used surface irrigation method and followed by drip irrigation method with 03.33 per cent.

**3.2 Market share of major farm implements**

**3.2.1 Market share of tractor towards various brands**

|  |
| --- |
| **Table 10: Market share of tractor towards various brands (n=45)** |
| **Sr. No.** | **Tractor brands** | **Frequency (n)** | **Percentage (%)** |
| 1. | Massey Tractor | 10 | 22.22 |
| 2. | Mahindra Tractor | 09 | 20.00 |
| 3. | New Holland Tractor | 07 | 15.56 |
| 4. | John Deere Tractor | 02 | 04.44 |
| 5. | Ford Tractor | 02 | 04.44 |
| 6. | Eicher Tractor | 04 | 08.89 |
| 7. | Escort Tractor | 08 | 17.79 |
| 8. | HMT Tractor | 01 | 02.22 |
| 9. | VST Power Tiller | 02 | 04.44 |
| **Total** | **45.00** | **100.00** |

 The results are presented in table 10 shows that out of 120 farmers 45 farmers had tractor (more than 30 hp) from that 22.22 per cent farmers had Massey which is highest, second highest was Mahindra (20.00%), followed by Escort (17.79%), followed by New Holland (15.56%), followed by Eicher (08.89%), Followed by John Deere, Ford and VST (04.44%), and at last few of them had HMT (02.22%).

**3.2.2 Market share of mini tractor towards various brands**

|  |
| --- |
| **Table 11: Market share of mini tractor towards various brands (n=94)** |
| **Sr. No.** | **Mini tractor brands** | **Frequency (n)** | **Percentage (%)** |
| 1. | VST Power Tiller | 43 | 45.72 |
| 2. | Mahindra and Mahindra | 16 | 17.02 |
| 3. | Captain Tractor | 17 | 18.09 |
| 4. | Eicher Tractor | 02 | 02.12 |
| 5. | Sonalika Tractor | 10 | 10.63 |
| 6. | Trishul Tractor | 01 | 01.07 |
| 7. | Bhoomi Tractor | 01 | 01.07 |
| 8. | Dharatiputra Tractor | 01 | 01.07 |
| 9. | Stilltrack Tractor | 01 | 01.07 |
| 10. | Vaibhav Tractor | 01 | 01.07 |
| 11. | Davada Machinery | 01 | 01.07 |
| **Total** | **94** | **100.00** |

The results are presented in table 11 shows that out of 120 farmers 94 farmers had mini tractor (less than 30 hp) from that 45.72 per cent farmers had VST Power Tiller which is highest, second highest was Captain (18.09%), followed by Mahindra (17.02%), followed by Sonalika (10.63%), followed by Eicher (02.12%) and very few (01.07%) had Trishul, Bhoomi, Dharatiputra, Stilltrack, Vaibhav and Davada like locally manufactured mini tractor.

**3.2.3 Market share of seed drill**

|  |
| --- |
| **Table 12 Market share of seed drill towards various brands (n=112)** |
| **Sr. No.** | **Seed drill brands** | **Frequency (n)** | **Percentage (n)** |
| 1. | Mausam Agro Pvt. Ltd. | 24 | 21.42 |
| 2. | Kishan Agro Engineering | 15 | 13.40 |
| 3. | Rovin Agritech. | 03 | 02.68 |
| 4. | Bharat Agro Engineering | 15 | 13.40 |
| 5. | Shapar Agro Engineering | 04 | 03.57 |
| 6. | Bhoomi Agro Industries | 22 | 19.64 |
| 7. | Khedut Agro Engineering Pvt. Ltd. | 13 | 11.60 |
| 8. | Dharati Agro Engineering | 09 | 08.04 |
| 9. | Gujarat Agro Engineering | 07 | 06.25 |
| **Total** | **112** | **100.00** |

 The results presented in table 12 show that out of 120 farmers, 112 had a seed drill. Among them 21.42 per cent used Mausam Agro Pvt. Ltd., which is the highest. The second highest was Bhoomi Agro Industries (19.64%), followed by Kishan Agro Engineering and Bharat Agro Engineering (13.40%) then Khedut Agro Engineering Pvt. Ltd. (11.60%), Dharati Agro Engineering (08.04%), Gujarat Agro Engineering (06.25%), Shaper Agro (03.57%), and a few had Rovin Agritech (02.68%).

**3.2.4 Market share of blade harrow and plough**

|  |
| --- |
| **Table 13 Market share of blade harrow and plough towards various brands (n=120)** |
| **Sr. No.** | **Brands of blade harrow and plough** | **Frequency (n)** | **Percentage (%)** |
| 1. | Bhoomi Agro Industries | 17 | 14.17 |
| 2. | Ghanshyam Industries | 03 | 02.50 |
| 3. | Local Manufacturing | 69 | 57.50 |
| 4. | Aksar Agro Engineering | 11 | 09.17 |
| 5. | Ganga Industries | 11 | 09.17 |
| 6. | Shakti Agro Industries | 07 | 05.83 |
| 7. | Vaibhav Agro Industries | 01 | 00.83 |
| 8. | Shapar Agro | 01 | 00.83 |
| **Total** | **120** | **100.00** |

 The results are presented in table 13 shows that most of the farmers (57.50%) prefers local manufacturing of blade harrow and plough, second highest was Bhoomi Agro Industries (14.17%), followed by Aksar Agro Engineering and Ganga Industries (09.17%), followed by Shakti Agro Industries (05.83%), followed by Ghanshyam Industries (02.50%) and very few had Vaibhav Agro Industries and Shapar Agro (00.83%) Blade harrow and plough.

**3.2.5 Market share of rotavator**

|  |
| --- |
| **Table 14: Market share of rotavator towards various brands (n=03)** |
| **Sr. No.** | **Brands of rotavator** | **Frequency (n)** | **Percentage (%)** |
| 1. | Shaktiman | 03 | 100.00 |
| **Total** | **03** | **100.00** |

 The results are presented in table 14 shows that out of 120 farmers only 3 farmers had Rotavator that all farmers had Shkatiman Rotavator (02.50%).

**3.2.6 Market share of thresher**

|  |
| --- |
| **Table 15: Market share of thresher towards various brands (n=05)** |
| **Sr. No.** | **Brands of thresher** | **Frequency (n)** | **Percentage (%)** |
| 1. | Geeta Industries | 02 | 40.00 |
| 2. | Ganga Agro Industries | 02 | 40.00 |
| 3. | Ghanshyam Industries | 01 | 20.00 |
| **Total** | **05** | **100.00** |

 The results are presented in table 15 shows that out of 120 farmers 05 farmers (40.00%) had Thresher from that Geeta Industries and Ganga Agro Industries had highest market share (40.00%) and very few had Ghanshyam Industries Thresher (20.00%).

**3.2.7 Market share of MB plough**

|  |
| --- |
| **Table 16: Market share of MB plough towards various brands (n=03)** |
| **Sr. No.** | **Brands of MB plough** | **Frequency (n)** | **Percentage (%)** |
| 1. | Shakti Agro Industries | 03 | 100.00 |
| **Total** | **03** | **100.00** |

 The results are presented in table 16 shows that out of 120 farmers only 03 had MB plough from that all farmers had Shkati Agro Industries MB plough (100.00%).

**3.2.8 Market share of nine tyne cultivator**

|  |
| --- |
| **Table 17: Market share of nine tyne cultivator towards various brands (n=31)** |
| **Sr. No.** | **Brands of nine tyne cultivator** | **Frequency (n)** | **Percentage (%)** |
| 1. | Aksar Agro Engineering | 02 | 06.45 |
| 2. | Shakti Agro Industries | 02 | 06.45 |
| 3. | Bhumi Agro Pvt. Ltd. | 01 | 03.22 |
| 4. | Local manufacturing | 26 | 83.88 |
| **Total** | **31** | **100.00** |

 The results are presented in table 17 shows out of 120 farmers 31 farmers had nine tyne cultivator from that Local manufacturing had a market share of 83.88 per cent, followed by Aksar Agro Engineering and Shakti Agro Industries (06.45%) and very few had Bhumi Agro Pvt. Ltd. Industries Cultivator (03.22%).

**3.2.9 Market share of trolley**

|  |
| --- |
| **Table 18: Market share of trolly towards various brands (n=37)** |
| **Sr. No.** | **Brands of trolley** | **Frequency (n)** | **Percentage (%)** |
| 1. | Arjun Agro Industries | 17 | 45.95 |
| 2. | Nilkanth Tractors | 06 | 16.21 |
| 3. | Radhe Agro Pvt. Ltd. | 03 | 08.11 |
| 4. | Captain Tractors Pvt. Ltd. | 04 | 10.82 |
| 5. | Khedut Trolly  | 02 | 05.41 |
| 6. | Gatral Industries  | 01 | 02.70 |
| 7. | Not known | 04 | 10.82 |
| **Total** | **37** | **100.00** |

 The results are presented in table 18 shows that out of 120 farmers 37 farmers had trolly from that Arjun Agro Industries had market share of 45.95 per cent, followed by Nilkanth Tractors (16.21%), followed by Captain Tractors Pvt. Ltd. (10.82%), followed by Radhe Agro Pvt. Ltd. (08.11%), followed by Khedut Trolly (05.41%), few had Gatral Industries trolly (02.70%) also some farmers (10.82%) not known about the brand of trolly.

**3.3 Market share of minor farm implements**

|  |
| --- |
| **Table 19: Market share of minor farm implements towards various brands (n=120)** |
| **Sr. No.** | **Implement** | **Brand of implement** | **Frequency (n)** | **Percentage (%)** |
| 1. | Sickle | Local manufacturing | 120 | 100 |
| 2. | Guntaka | Local manufacturing | 120 | 100 |
| 3. | Hoe (Kudali) | Local manufacturing | 120 | 100 |
| 4. | Spade (Favada) | Local manufacturing | 120 | 100 |
| 5. | Rack (Khurpi) | Local manufacturing | 120 | 100 |
| 6. | Pichaxe (Tirkam) | Local manufacturing | 120 | 100 |

 The results are presented in table 19 shows that all farmers prefer local manufacturing minor farm implements over branded minor farm implements.

**3.3.1 Market share of knapsack sprayer**

|  |
| --- |
| **Table 20: Market share of knapsack sprayer towards various brands (n=120)** |
| **Sr. No.** | **Brand of knapsack sprayer** | **Frequency (n)** | **Percentage (%)** |
| 1. | Sisa sprayer | 13 | 10.83 |
| 2. | Shakti sprayer | 09 | 07.50 |
| 3. | Ravi sprayer | 07 | 05.83 |
| 4. | Samruddhi sprayer | 05 | 04.17 |
| 5. | Not known | 86 | 71.67 |
| **Total** | **120** | **100** |

 The result presented in table 20 shows that 10.83 per cent had a Sisa sprayer, followed by Shakti sprayer (07.50%), followed by Ravi sprayer (05.83%), followed by Samruddhi sprayer (04.17%) and most of the farmers were not aware of the brand of knapsack sprayer which they were using.

**4. CONCLUSION**

Demographic analysis showed most farmers were over-middle-aged and experienced, with 50.83% holding semi-medium land and 65.83% living in nuclear families. A significant portion also engaged in animal husbandry or business for additional income. Educational levels were mainly primary and secondary, while most farmers earned mid-range incomes. Irrigation heavily relied on openwells and surface methods, with minimal use of efficient systems like drip irrigation, indicating a need for awareness and resources to improve water sustainability.

In terms of specific equipment, the study found that the most preferred tractor brands were Massey (08.33%), Mahindra and Mahindra (07.5%), and Escort Tractors (06.67%), with a significant portion of farmers also owning mini tractors, such as VST Power Tillers (35.83%). The market share for farm implements like seed drills, blade harrows, and rotavators showed a preference for established brands, such as Mausam Agro Pvt. Ltd. (20%) and Bhoomi Agro Industries (18.33%) for seed drills. The majority of farmers (45.95%) own Arjun Agro Industries trolly. Local manufacturers also played a significant role in providing affordable and accessible machinery, particularly for ploughs and cultivators.

Disclaimer (Artificial intelligence)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

**5. REFERENCES**

1. Alam, M. M., Siwar, C., Murad, M. W., Molla, R., & Toriman, M. (2010). Socioeconomic profile of farmer in Malaysia: study on integrated agricultural development area in North-West Selangor. *Agricultural Economics and Rural Development (ISSN 1841-0375)*, **7**(2), 249-265.

2. Akhtar, M. H., & Hayat, M. U. Q. M. (2021). Economic Profile of Tribal Areas in South Punjab: Analyzing Opportunities and Challenges for Sustainability. *Journal of Contemporary Macroeconomic Issues*, **2**(2), 1-10.

4. Bhattathiri, S. M. (2014) Segmentation and Tractor Usage Analysis of Kerala Market, *Acedemia Education.* **1**(1): 1-61

5. Chavda, H.; Marviya, P. B. and Savaliya, V. A. (2016). A Study on Consumer Behaviour Towards Purchase of Agriculture Inputs in Junagadh District. *Advances in Life Sciences*, **5**(5), 1647-1651.

6. Chandra, A., Karthikeyan, C., & Mansingh, P. (2023). The Determinants of Socio Economic Status of Farmers–A Systematic Literature Review. *Review of Applied Socio-Economic Research*, **25**(1), 138-150.

8. Krishnankutty, J.; Blakeney, M.; Raju, R. K. and Siddique, K. H. M. (2021) Sustainability of Traditional Rice Cultivation in Kerala, India - A Socio-Economic Analysis. *Sustainability*. **13**(2): 980

9. Kumar, S.; Kour, A. and Smriti (2023) Socio- economic profile of the farmers in Rupnagar, Punjab, India. *The Pharma Innovation Journal,* **12**(12): 2740-2743

10. Leimane, I.; Krieviņa, A. and Miglavs, A. (2014). Improving of small farm market capability in Latvia. *Procedia-Social and Behavioral Sciences*, **110**: 182-189.

11. Mandal, S. K. and Maity, A. (2013). Current trends of Indian tractor industry: A critical review. *Applied Science Report*, **3**(2): 132-139.

12. Mahesh, Manjunath, K. Amaresh Kumar, K. Satishkumar, B. Umesh, and B. V. Sreenivas. "Socio-economic profile analysis of dairy farmers of Yadgir district of Kalyana Karnataka region." *Journal of Pharmacognosy and Phytochemistry* 9, no. 4 (2020): 350-353.

13. Mehta, C. R.; Chandel, N. S. and Senthilkumar, T. (2014). Status, challenges and strategies for farm mechanization in India. *Agricultural Mechanization in Asia, Africa and Latin America*. **45**(4): 43-50.

14. Mehta, C. R.; Chandel, N. S.; Jena, P. C. and Jha, A. (2018). Indian agriculture counting on farm mechanization. *Agricultural Mechanization in Asia, Africa and Latin America*. **50**(1): 84-89.

15. Meshram, M., Khare, N. K., & Singh, S. R. K. (2020). Socio-economic profile of integrated farming system practicing farmers in Madhya Pradesh state. *The Pharma Innovation Journal*, **9**(4), 155-159.

16. Prasad, K.; Kumari, V. and Chander, S. (2023). An Impact of the Changes in Family Life and Structure in India. *International Journal of Education and Management Studies*, **13**(2): 260-262.

17. Pradhan, S., Naberia, S., & Harikrishna, Y. V. (2021). Socio-economic correlates of livelihood security of small farmers in Jabalpur district of Madhya Pradesh. *Indian Journal of Extension Education*, **57**(3), 57-59.

19. Sharpe, B. and Rodríguez, F. (2018). Market analysis of heavy-duty commercial trailers in Europe. *International Council on Clean Transportation*. pp: 1-31

20. Singh, R.; Kumar, A. and Sharma, P. (2014). Farm power and machinery availability on Indian farms: A study on the impact of mechanization on agricultural productivity. *Indian Journal of Agricultural Economics*, **69**(3): 345-356.

21. Singh, A., Praksh, S., Singh, D. K., Yadav, R. N., Singh, D., & Singh, A. (2022). Socio-economical profile and its correlation with entrepreneurial behaviour of vegetable growers in Varanasi district of Uttar Pradesh. *Asian Journal of Agricultural Extension, Economics & Sociology*, **40**(11), 448-454.

22. Singh, R.; Kumar, V. and Sharma, P. (2020). Design, development and field assessment of controlled seed metering unit to be used in grain drills for direct seeding of wheat. *Journal of Agricultural Engineering Research*, **30**(2): 12-20.

23. Singh, S. P.; Singh, R. S. and Singh, S. (2011). Sale trend of tractors and farm power availability in India. *Agricultural Engineering Today*. **35**(2): 25-35.

24. Subhash, C. and Vinod, K. (2023) Socio-economic Impact of Custom Hiring Centres on Farmers in Haryana. *IAHRW International Journal of Social Sciences,***11**(1): 39-44.