

## Mechanization in Agriculture with Respect to Potato and Groundnut Crops

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### ABSTRACT

*The farm mechanization plays a vital role in reducing human drudgery and raising agriculture productivity. Thus, study of mechanization in agriculture was carried out in Banaskantha district of Gujarat state with randomly selected 120 potato and groundnut growers. The attributes under study were age, education, family type, family size, social participation, caste, land holding and annual income. The extent of mechanization of respondents was also studied. The study revealed that 39.00 per cent groundnut growers and 28.34 per cent of potato growers had adopted 50.10 to 60.00 per cent mechanization. The education, family size, social participation, land holding and annual income had positive and significant relationship with mechanization.*

**Keywords :** Mechanization, Potato, Groundnut

### INTRODUCTION

The mechanization of Indian agriculture has assumed greater importance in increasing agricultural production and productivity by utilizing scarce agricultural inputs more effectively and reducing human drudgery. The green revolution characterized by the use of high yielding variety seeds, irrigation, chemical fertilizers and insecticides induced farmers to increase cropping intensity and adopt modern methods of agriculture. The introduction of high yielding varieties necessitated the support of mechanical power sources, improved agricultural implements, machines and hence selective mechanization become a necessity. Potato and groundnut are the major crops of the district. This investigation related to the extent of mechanization in potato and groundnut farming is an attempt in this direction with the following objectives.

### OBJECTIVES

- (i) To study selected personal and socio-economic characteristics of the respondents
- (ii) To measure the extent of mechanization in potato and groundnut farming
- (iii) To ascertain association between selected personal and

socio-economic characteristics of respondents and their extent of mechanization

### METHODOLOGY

The study was carried out in the Banaskantha district of Gujarat state. Three talukas viz; Dantiwada, Deesa and Dhanera of Banaskantha district were selected for the study. From these three talukas, five villages having highest production of potato and groundnut crops were selected purposively. From each village four tractor owners and four other than tractor owners were selected randomly. Thus, a sample of study was 120 farmers. Keeping in view, the interview schedule was prepared through discussion with experts. The extent of mechanization was calculated on the basis of weight age of different implements/machine, number of years of using implement/machine and total cropped area under which the implements/machine used for potato and groundnut crops. The data were collected from the respondents by arranging personal interview. The 'Z' test was used to compare the characteristics of tractor owners and other than tractor owners. Pearson correlation co-efficient was calculated to know the relationship. Other appropriate statistical tools were used to analyze the data.

**RESULTS AND DISCUSSION****Personal and Socio-economic characteristics of the respondents****Table 1: Distribution of respondents according to their personal and socio-economic characteristics**

n=120

Sr. No.	Characteristics	Classification	Tractor owner (n-60)		Other than tractor owners (n-60)		Z value
			Frequency	Per cent	Frequency	Per cent	
1	Age	Young (Below 35 years)	11	18.34	07	11.66	1.19*
		Middle(35 to 50 years)	34	56.66	26	43.34	
		Old (above 50 years)	15	25.00	27	45.00	
2	Education	Illiterate	11	18.34	22	36.67	2.11*
		Primary level (up to 7 standard)	25	41.66	27	45.00	
		Secondary level (From 8 to 12 standard)	18	30.00	10	16.66	
		Higher Education (Above 12 standard)	06	10.00	01	1.67	
3	Family Type	Nuclear	23	38.33	29	48.34	1.20 <sup>NS</sup>
		Joint	37	61.67	31	51.66	
4	Family size	Small (below 5 members)	14	23.34	18	30.00	1.12 <sup>NS</sup>
		Medium (5 to 7 members)	31	51.66	28	46.66	
		Large (Above 7 members)	15	25.00	14	23.34	
5	Social participation	No participation	18	30.00	21	35.00	1.99*
		Participation in one organization	20	33.34	24	40.00	
		Participation in more than one organization	13	21.66	09	15.00	
		Participation in more than one organization with holding position	09	25.00	06	10.00	
6	Caste	Lower	04	6.66	3	5.00	2.05*
		Middle	35	58.34	45	75.00	
		Higher	21	35.00	12	20.00	
7	Land holding	Small size (up to 2 ha)	08	13.33	33	55.00	2.18*
		Medium size(2.1 to 5 ha)	23	38.34	15	25.00	
		Large size(Above 5 ha)	29	48.33	12	20.00	
8	Annual income	Low(up to ₹ 25000)	18	30.00	23	38.34	2.12*
		Medium(₹ 25001 to 50000)	16	26.66	22	36.66	
		High(Above Rs.50000)	26	43.34	15	25.00	

\*Significant at 0.05 level of significance

NS=Non-significant

**(1) age**

The data presented in Table-1 shows that majority of tractor owners (56.66 per cent) were middle age group while

45.00 per cent of other than tractor owners were from old age group. The calculated 'Z' value (1.19) was found significant. It indicates that both the groups of the respondents were different as far their age is concerned.

## **(2) Education**

The 41.66 per cent of tractor owners had primary level of education. This was followed by 30.00 per cent of the respondents who had secondary level of education while 18.34 per cent of the respondents were illiterate. Only 10.00 per cent of the respondents had higher education. In case of other than tractor owners, 45.00 per cent of the respondents had education up to primary level followed by 36.67 and 16.66 per cent of the respondents having illiterate and secondary level of education, respectively. Only 1.67 per cent of the respondents had higher level of education. The calculated 'Z' value (2.11) was found to be significant indicating that both the groups of respondents differed as regards to their level of education.

## **(3) Family type**

The data revealed that 61.67 per cent of the tractor owners belonged to joint family, while 38.33 per cent belonged to nuclear family. In case of other than tractor owners 51.66 per cent of the respondents belonged to joint family and 48.34 per cent of the respondents belonged to nuclear type of family. The calculated 'Z' value (1.20) was found non-significant and indicates that both the groups of respondents had no difference as regards to type of family.

## **(4) Family size**

The data indicated that 51.66 per cent of the tractor owners had medium size family. This was followed by nearly equal number (23.34 per cent and 25.00 per cent) of the respondents who had small and large size of family respectively. Same trend was observed in other than tractor owners. Nearly half (46.66 per cent) of the farmers had medium size family, followed by 30.00 per cent of the respondents had small size family and 23.34 per cent of the respondents had large size family. The calculated 'Z' value (1.12) was found non-significant which indicates that no difference among both the groups as regard to their family size.

## **(5) Social participation**

It is clear from Table-1 that majority of tractor owners (33.34 per cent) and other than tractor owners (40.00 per cent) had participation in one organization. The calculated 'Z' value (1.99) found significant indicates that both the groups differed as regards to social participation.

## **(7) Caste**

The data presented in Table-1 revealed that 58.34 per cent of the tractor owners were from middle caste and 35.00 per cent of the respondents were from higher caste. Only 6.66 per cent of the respondents belonged to lower caste. In case of other than tractor owners, 75.00 per cent of the respondents came from middle caste, while 20.00 per cent of the respondents came from higher caste. Only 5.00 per cent of the respondents came from lower caste. The significant 'Z' value 2.05 leads to conclude that the respondents from both the groups differed as regards the caste.

## **(8) Land holding**

The data in Table-1 indicated that 48.33 per cent of the tractor owners had large size of land holding, followed by 38.34 per cent had medium sized land holding. Only 13.33 per cent of the farmers possessed small size of land holding. As regards to other than tractor owners, 55.00 per cent of the respondents had small size of land holding, followed by 25.00 per cent had medium sized land holding and 20.00 per cent of the respondents had large size of land holding. The calculated value of 'Z' 2.18 was significant and indicates that the respondents of both the groups differed significantly with regard to the size of their land holdings.

## **(9) Animal income**

It was found that majority of tractor owners (43.34 per cent) had annual income above ₹ 50,000/- and other than tractor owners (38.34 per cent) had annual income up to ₹ 25,000/-. The 'Z' test (2.12) was found to be significant indicates that the respondents of both the groups were differed as far as their annual income was concerned.

## **Extent of mechanization in potato and groundnut farming**

With a view to measure the extent (percentage) of mechanization in potato and groundnut farming, the extent of mechanization was measured in terms of percentage, category wise and practice wise. The respondents were asked to provide practice wise information about the mechanized implements and machines they used in farming.

Table 2 : Distribution of respondents according to extent of mechanization

n = 120

Extent of mechanization (%)	Potato		Groundnut		Combination of potato and groundnut	
	Frequency (n=120)	Per cent	Frequency (n=120)	Per cent	Frequency (n=120)	Per cent
0-10	05	04.16	06	5.00	05	04.16
10.1-20	08	06.66	10	8.34	08	06.66
20.1-30	15	12.50	14	11.66	17	14.16
30.1-40	23	19.16	21	17.50	26	21.66
40.1-50	31	25.84	30	25.00	33	27.50
50.1-60	34	28.34	36	30.00	29	24.16
60.1-70	04	03.34	03	2.50	02	01.66
70.1-80	0	0	0	0	0	0
80.1-90	0	0	0	0	0	0
90.1-100	0	0	0	0	0	0

The extent of mechanization was measured in terms of percentage ranging from 0 to 100. It was divided in to ten equal parts, viz., 0-10 per cent mechanization, 10.1-20 per cent mechanization and so on. Inclusive method was used to classify the data i.e., the upper limit of 10 of class 0-10 is considered in that class.

#### (a) Potato crop

The data regarding potato crop given in Table 2 indicated that 28.34 per cent of respondents were observed in between 50.1-60 per cent of mechanization. This was followed by 25.84, 19.16 and 12.50 per cent of the respondents observed in between 40.1-50, 30.1-40 and 20.1-30, respectively. The lowest per cent of the respondents were observed in between 0-10, 10.1-20 and 60.1-70 per cent mechanization.

#### (b) Groundnut crop

In case of groundnut farming, the data presented in Table 2 indicated that a 39 per cent of the respondents had adopted 50.1-60 per cent of mechanization, followed by 25.00, 17.50 and 11.66 per cent of respondents adopted 40.1-50, 30.1-40 and 20.1-30, respectively. The 8.34 per cent, 5.00 per cent and 2.5 per cent of respondents had adopted 10.1-20, 0-10 and 60.1-70 per cent of mechanization, respectively.

#### Overall mechanization

Regarding the overall mechanization in both potato and groundnut farming, it is clear from Table 2 that the highest number (27.50 %) of respondents had adopted 40.1-50 per cent of mechanization. This was followed by 24.16, 21.60 and 14.16 per cent of respondent had adopted 50.1-60, 30.1-40 and 20.1-30 per cent of mechanization. The 6.66,

4.16 and 1.66 per cent) of respondents had adopted 10.1-20, 0-10 and 60.1-70 per cent of mechanization respectively.

Thus it can be concluded that more than fifty per cent (57.50 %) of the potato growers had 20.1-50 per cent mechanization, while majority (72.50 %) of groundnut growers were having 30.1-60 per cent of mechanization. The overall picture shows that a good number of farmers (i.e., 73.32 %) of the both crops adopted mechanization in between 30.1 to 60 per cent.

#### Relationship of extent of mechanization of farmers with their selected characteristics

The correlation co-efficient ( $r'$ ) was calculated to study the relationship between selected characteristics of respondents and extent of mechanization. The results are presented in Table-3.

Table : 3 Correlation coefficient between selected independent variable of the respondents and their extent of mechanization n = 120

Sr. No.	Characteristics of the respondent	Correlation coefficient ( $r'$ )
X <sub>1</sub>	Age	-0.18300 <sup>NS</sup>
X <sub>2</sub>	Education	0.40943**
X <sub>3</sub>	Family type	0.16677 <sup>NS</sup>
X <sub>4</sub>	Family size	0.26102**
X <sub>5</sub>	Social participation	0.59961**
X <sub>6</sub>	Caste	0.5938 <sup>NS</sup>
X <sub>7</sub>	Land holding	0.44359**
X <sub>8</sub>	Income	0.40831**

\*\*Significant at 0.01 level of significance

NS= Non-significant

There was negative but non-significant relationship between age of the respondents with their extent of mechanization. The education, family size, social participation, land holding and annual income of the respondents were found to have positive and significant relationship with their extent of mechanization. Family type and caste of the respondents were found to have positive but non-significant relationship with their extent of mechanization.

## **CONCLUSION**

The present study revealed that majority of tractor owners belonged to middle age group, educated to primary level, had medium sized joint family, participated in one organization, having large sized land holding, middle caste and annual income above ₹ 50,000.00. While, in case of other than tractor owners, majority of them belonged to middle age group, primary level of education, nuclear family, medium size of family, participated in one organization, middle caste, small size of land holding and annual income up to Rs. 25000.00. The 39.00 per cent groundnut growers and 28.34 per cent potato growers had adopted 50.1-60 per

cent mechanization. Age had negative and non-significant relationship with extent of mechanization. The education, family size, social participation, land holding and annual income had positive and significant relationship with extent of mechanization.

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