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Farmers' perception and usage of farm machinery in Southern Zone of Andhra Pradesh

C Ramana and P Lavanya Kumari

Abstract
A study was conducted to know the level of usage and perception of the farmers on farm machinery in the Southern Zone which consists of three districts viz., Chittoor, Kadapa and Nellore, of Andhra Pradesh. A total sample of 300 farmers in three districts, 100 from each district, is considered randomly for the study. Most of the farmers are practicing multiple cropping systems to sustain themselves with good profits. Among them 30 per cent are growing Groundnut and Paddy as the major crops, nearly 11 per cent cultivate only paddy as a major crop whereas only 10 per cent farmers depend other pulses along with paddy. Majority (66 per cent) of the farmers are cultivating crops under irrigated conditions, only 10 percent of them depend on rainfed whereas 24 percent farmers cultivating under both the conditions. From the analysis it is noticed that majority of the farmers (93 percent) had moderate knowledge on farm machinery, out of them only 6% of the farmers are doing fully mechanized cultivation and nearly 94% of them are using farm machinery partially in some stages of cultivation. Regarding availability of the farm machinery, it is observed that utmost 10 percent of farmers owned various farm machinery and majority of them purchased on subsidy. Further, statistically a significant impact of age, experience in cultivation, experience in cultivation using farm machinery, education, annual income, labour resources, and awareness on farm machinery is noticed on the perception of the farmers on farm mechanization whereas cultivable land size has not influenced their perception. These findings help the Agricultural scientists and Government officials in taking decisions to enhance the awareness and accustomedness of the farmers towards farm mechanization.

Keywords: Farm mechanization, level of usage, farmer perception

1. Introduction
Profitability and sustainability of Indian agriculture with inclusive growth requires well distributed efforts in appropriate mechanization and energy management. As mechanization is a resource intensive venture, custom hiring of improved agricultural machinery could help the small- and marginal-farmers to reap the benefits of mechanization with little or no capital investment. There is a need to establish Farm Machinery Resource Centres and Farm Machinery Bank and Display Centres at village/ village cluster level. Secretary, DARE & DG, ICAR, 2013. Mechanizing small and non-contiguous group of small farms is against 'economies of scale' for individual ownership of farm machinery. The status of farm mechanization in India is analysed by the trend in growth of mechanically power-operated farm equipment over traditional human and animal power operated equipment. It was observed that there was a direct correlation between farm power availability and productivity during the past six decades. Haryana state of India has the highest tractor density per thousand hectare of net sown area of 84 tractors and followed by 76 tractors for Punjab against all India average of 33 tractors. The sale of transplanter, power weeder, combine harvesters, rotavator and thresher in India is growing at a compound annual growth rate (CAGR) of 50, 50, 28, 20 and 10%, respectively. The available farm power and productivity in India are expected to reach 2.2 kW/ha and 2.3 t/ha, respectively by the year 2020. Status, challenges and strategies for farm mechanization in India (PDF Download Available, C R Mehtha, 2015) [5].
Mechanization often increases cropping intensity but adaptation to mechanization can restrict the mode of farming. Finally, for adapting appropriate mechanization- "there are no absolute and generic guideline for transferring mechanization technology, nor is there a definite set of strategies to promote the adoption of agricultural machines" To estimate and document the available resource so as to estimate dearth quantity and plan suitable machinery to infuse into the Indian farms. Current status and learning about available machinery is more important in identifying and promoting operation area specific mechanization in Andhra Pradesh. Keeping this in view the survey was conducted with following objectives
1. To know the availability of farm machinery
2. To understand the intensity in adopting mechanization

3. To measure the level of perception on farm machinery and its influencing factors

2. Review of Literature

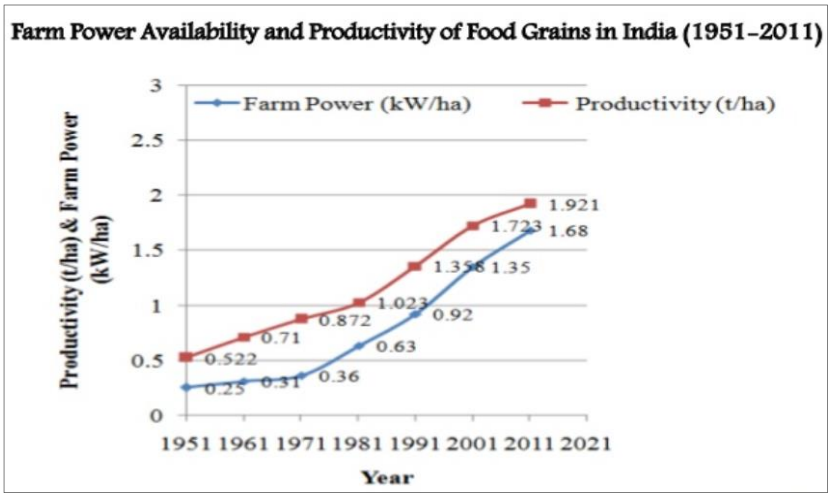
Here are a few reviews though not directly related to survey on farm mechanization but which reveals the importance of studying farmers' pulse on usage and their perception on farm machinery.

Gavino *et al*. (2006) [3] revealed real issues on the farmer level were brought out which partially explained the limited reception of the farmers to the idea of mechanizing the farm system. On the other hand, there are positive indications that given the favourable assistance and encouragement, farmers also recognize the importance of and would like to go into farm mechanization along with cost and speed of operation details. Bina Agarwal (1983) [2] points out that the use of tractors and tube-wells in comparison with the use of bullocks and canals respectively is associated with higher cropping intensity. However, the advantage of tube-wells over canals is found to be much greater than that of tractors over bullocks.

Stout and Downing (1976) [9] defined mechanization to encompass the use of hand tools and animal drawn implements as well as motorized equipment to reduce human efforts to perform certain operation that cannot be accompanied by other means and to improve the quality of work. Mittal and Singh (1975) [6] defined mechanized farms as those farms where farm operations such as ploughing, harrowing and threshing were done by tractors. According to the National Council of Applied Economics Research (1975) [7] Mechanization meant substitution of machines for any kind of labour, animal as well as human.

Mosher (1974) [1] by farm mechanization we mean introducing the use of mechanical procedures into farm operation in an area where these procedures have not previously been used. In the process both the machines themselves and the institutional arrangements by which they are made available to and used by farmers are included. Strictly speaking, the design and manufacture of farm equipment is external to farm mechanization as such, but the suitability of equipment for profitable use on farms in specific localities is so important to the success of farm mechanization that design and manufacture can usefully be included as part of farm mechanization itself.

Singh *et al*. (1972) [8] classify high progressive farmers are those who are possessing tractor and tube-well having at least 50 percent of their cropped area under HYV of crops. According to Vendattappa (1972) [10], mechanization is a picture of sophisticated machines increasingly engaged in the replacement of reduction of human and animal power. According to Singh *et al*. (1971) [4] mechanization of agriculture means the use of machines like tractors, water pumps, threshers, chaff cutters operated by oil, battery or electricity in the place of similar implements operated manually or by bullock power. Figure 1 explores the significant impact of availability of farm machinery and the productivity of food grain in India during 1951-2011.



Source: http://www.icar.org.in

Fig 1: Agricultural productivity has appositive correlation with farm power availability

3. Methodology

This section deals with the methodology adopted for the study. It includes, research approach, design for the study, sample and sampling technique, tools to assess availability along with level of perception of the farmers on farm machinery, data collection procedure and data analysis.

3.1 Research approach

Survey method is adopted to know the availability farm machinery and the perception of the famers towards farm mechanization in Southern zone of Andhra Pradesh.

3.2 Study area and Population

The area of study is the Southern Zone of Andhra Pradesh which consists three districts viz., Chittoor, YSR Kadapa and SPS Nellore. The agricultural farmers holding large and small land areas are considered under the study from three districts in equal manner.

3.3 Sampling frame

This is a cross sectional study which involves various farmers of three districts of Southern Zone Chittoor, YSR Kadapa and SPS Nellore districts.

3.4 Study tool

A structured tool is drafted for farmers to know the availability of various farm machinery including their adequacy, mode of ownership and need for trainings on their operation and also to assess farmer's perception towards farm mechanization.

3.5 Sampling Technique and Sample Size

A Stratified Random Sampling technique has been used to collect data from the farmers from three districts of southern

zone of Andhra Pradesh. The number of farmers from each district comprises 100 each. There by a total of 300 farmers are considered for the study.

3.6 Statistical Analysis

Collected data is analyzed using appropriate statistical tools like frequency tables (one-way tables), Cross tabulations (two-way tables), Percentages, Chi-square tests, and diagrammatic representations using SPSS version 20. Obtained results are properly concluded at respective levels of significance.

4. Results and discussion

The age of the farmer can be regarded as one of the significant factors in farming processes which comprises faming experience. The level of education is a vital parameter to make them updated and knowledgeable in the area of their farming operations. Hence the information of the famers on these two parameters indicated in table-1.

Table 1: Demographic Factors of the Farmers

Age	N (%)	Education	N (%)
< 35 years	46	Can read and write	50
	15.3%		16.7%
35 -50 years	177	Primary	45
	59.0%		15.0%
> 50 years	77	Secondary and upto 10th	163
	25.7%		54.3%
		Inter or degree	42
			14.0%
Total	300	Total	300
	100.0%		100.0%

Table-1 states that the farmers are from age group of 35 years and above. Majority (59 percent) of the farmers included in the survey belongs to the age group 35-50 and nearly 26 percent (77) belong to the age group of above 50 years. It's interesting to know that 54 per cent of the farmers are from secondary to Intermediate. Only about 17 per cent can have ability to read and write as per the present data.

Table 2: Farm experience and Annual income

Experience In Cultivation	N (%)	Experience in cultivation using Farm Machinery	N (%)	Annual income	N (%)
< 15 years	68	< 10 years	61	< Rs. 50000	28
	22.7%		20.3%		9.3%
15 -30 years	131	10 - 20 years	140	Rs.50000 - Rs.75000	187
	43.7%		46.7%		62.3%
> 30 years	101	> 20 years	99	> Rs.75000	85
	33.7%		33.0%		28.3%
Total	300	Total	300	Total	300
	100.0%		100.0%		100.0%

From table-2 it is observed that 23 percent of the farmers have less than 15 years of farming experience, 44 percent with 15-30 years and 34 percent had more than 30 years of experience in farming. 47 per cent of the farmers are using farm machinery with the duration of 10 -20 years whereas 33 percent of the farmers are using farm machinery about 20 years. Only 10 percent of the farmers have less than Rs.50000 as their annual income. 62 per cent of the farmers have about Rs.50000 to Rs.75000 of income and early 28 percent of the farmers getting more than Rs.75000 per annum from farming processes. This could be because of the portion of land holdings, or low yield from high portion of land holdings too.

Table 3: Details of Land and resources

Cultivable Land size	N (%)	Water Resources	N (%)	Labour resources	N (%)
1 or 2 acres	100	Only rainfed	29	Inadequate	38
	33.3%		9.7%		12.7%
3 or 4 acres	156	Only irrigated	199	Somewhat adequate	261
	52.0%		66.3%		87.0%
5 and above acres	44	Both	72	Adequate	1
	14.7%		24.0%		.3%
Total	300	Total	300	Total	300
	100.0%		100.0%		100.0%

The table-3 exhibits the key characteristics of the farmers' Land related matters. The land cultivated by most of the farmers (52 per cent) range from 3-4 acres. 33 per cent of them have either 1 or two acres of land and nearly 15 percent possess more than 5 acres of land. It's very interesting to find from the analysis that 66 per cent of the farmers' are cultivating under irrigated conditions whereas only 10 percent of them depend on rainfed. But 24% are cultivating under both the conditions. Regarding the labour facilities, majority farmers (87 percent) conveyed their adjustment with somewhat adequate labour resources whereas 13 percent are suffering with inadequate labour resources.

Table 4: Having tractors and other means of Farm machinery

Owns Tractor from how many years	N (%)	Other means of management instead of Farm machinery	N (%)	Total
Tractor available	74	No Tractor	226	300
	24.7%		75.3%	100.0%
Duration		**Alternative action**		
< 5 years	16	Hiring	217	
	5.3%		72.3%	
5 - 10 years	19	using bullock drawn implements	9	

	6.3%		3.0%	
10 - 15 years	17			
	5.7%			
15 - 20 years	10			
	3.3%			
20 - 25 years	12			
	4.0%			

Now a days agriculture farming requires at least a tractor for all types assistance in farming operations. As per the data available only 75 percent of the farmers don't have a tractor on their own in which 72 percent are hiring it and only 3 percent depend on bullock drawn implements. But the rest of the farmers are having a tractor since 25 years in which majority of the farmers are having from the past 5-10 years whereas only 4 per cent of the farmers possess it for the past 20-25 years.

Table 5: Level of awareness and usage of Farm Machinery

Awareness on farm machinery	N (%)	Level of usage of farm machinery	N (%)
Low	21	Using in all stages of cultivation	15
	7.0%		5.0%
Moderate	279	Using some stages of cultivation	283
	93.0%		94.3%
Total	300	Using when scarcity in labour	2
	100.0%		.7%
		Total	300
			100.0%

The above interpretation discussed in table-5 is about the farmer's awareness towards farm machinery and its level of usage. Interestingly it is noted that majority of the farmers (93 percent) had moderate knowledge whereas only 5% of the farmers are doing fully mechanized cultivation and nearly 94% of them are using farm machinery partially in some stages of cultivation.

Table 6: Source of awareness and the details of own farm machinery

Trainings attended	N (%)	Membership in groups	N (%)	Having own farm Machinery	N (%)	Having knowledge on their operation	N (%)
Yes	36	Member	2	Yes	22	No	85
	12.0%		0.7%		7.3%		28.3%
No	264	Not a member	298	No	278	Yes	215
	88.0%		99.3%		92.7%		71.7%
Total	300	Total	300	Total	300	Total	300
	100.0%		100.0%		100.0%		100.0%

From the table-6 it is observed that only 12 percent of the farmers expressed tendency in attending trainings or demonstration on farm machinery whereas the remaining farmers could not attend which is the important aspect to be focused by the Scientists to build up the proper awareness among the farmers. Further, only 2 out of 300 farmers had the membership in groups by which they could procure required farm machinery. Moreover 7.3 percent of the famers participated in the survey in three districts had various types of farm machinery on their own and only 71 percent of the farmers had the awareness on their operation.

Table 7: Major crop grow`n by farmers

	District			
	Chittoor	**Y.S.R Kadapa**	**Nellore**	**Total**
Paddy only (2)	5	18	10	33
	5.0%	18.0%	10.0%	11.0%
G.Nut and Banana	0	2	0	2
	0.0%	2.0%	0.0%	.7%
G.Nut, Redgram and Banana	1	1	0	2
	1.0%	1.0%	0.0%	.7%
Paddy and Banana	0	5	0	5
	0.0%	5.0%	0.0%	1.7%
G.Nut, Paddy and Blackgram/Greengram/Jowar/Maize/Redgram (3)	1	14	16	31
	1.0%	14.0%	16.0%	10.3%
Chillies and teak	0	0	2	2
	0.0%	0.0%	2.0%	.7%
G.Nut and Bengalgram	0	11	0	11
	0.0%	11.0%	0.0%	3.7%
G.Nut, Bengal gram/black gram	0	8	0	8
	0.0%	8.0%	0.0%	2.7%

G.Nut, Vegetables/onion/tomoto/leafy vegetables	8	2	1	11
	8.0%	2.0%	1.0%	3.7%
G.Nut and Paddy (1)	37	21	34	92
	37.0%	21.0%	34.0%	30.7%
G.Nut, Paddy and Mango	5	0	1	6
	5.0%	0.0%	1.0%	2.0%
G.Nut, Paddy and tomato	13	0	0	13
	13.0%	0.0%	0.0%	4.3%
G.Nut and Sugarcane	11	0	0	11
	11.0%	0.0%	0.0%	3.7%
G.Nut and Mango	3	0	0	3
	3.0%	0.0%	0.0%	1.0%
Paddy and Bengalgram	0	6	6	12
	0.0%	6.0%	6.0%	4.0%
Paddy, Blackgram/Jowar/Maize/Redgram (4)	2	12	11	25
	2.0%	12.0%	11.0%	8.3%
Paddy, Chillies and Cotton	0	0	6	6
	0.0%	0.0%	6.0%	2.0%
Paddy, chillies/vegetables/Malbar neem/teak	0	0	5	5
	0.0%	0.0%	5.0%	1.7%
G.Nut amd lemon	1	0	8	9
	1.0%	0.0%	8.0%	3.0%
Paddy and Sugarcane	6	0	0	6
	6.0%	0.0%	0.0%	2.0%
Paddy, G.Nut and Sugarcane	7	0	0	7
	7.0%	0.0%	0.0%	2.3%
Total	100	100	100	300
	100.0%	100.0%	100.0%	100.0%

Table-7 indicates the list of crops grown in three districts. Majority of the farmers (30 per cent) are growing Groundnut and Paddy as the major crops, nearly 11 per cent told that they cultivate paddy as a major crop whereas only 10 per cent farmers told that they depend on paddy, ground nut and also other pulses and similarly 8 per cent of the farmers revealed that they grow paddy and other pulses in their cultivation. Hence the most of the farmers are practicing multiple cropping systems to sustain themselves with good profits.

Table 8: Particulars of the Farm equipment purchased by the farmers

S. No.	Name of the equipment	Subsidy		Non subsidy		Total	
		N	%	N	%	N	%
1	Rotovator	22	7.3	2	0.7	24	8.0
2	9 tyne cultivator	20	6.7	6	2.0	25	8.3
3	Seed drill	29	9.7	0	0.0	29	9.7
4	Cultivator	26	8.7	2	0.7	28	9.3
5	Blade harrow	21	7.0	1	0.3	22	7.3
6	M.B plough	17	5.7	1	0.3	18	6.0
7	Disc harrow	11	3.7	0	0.0	11	3.7
8	7 tyne ridge plough	5	1.7	2	0.7	7	2.3
9	Bhoom sprayer	4	1.3	0	0.0	4	1.3
10	Disc Puddler	3	1.0	0	0.0	3	1.0
11	Mini rotovator	3	1.0	0	0.0	3	1.0
12	Spike tooth harrow	3	1.0	1	0.3	4	1.3
13	7 tyne bottom plough-	2	0.7	0	0.0	2	0.7
14	8 tyne cum fertilizer drill	2	0.7	0	0.0	2	0.7
15	9 tyne cultivator	2	0.7	0	0.0	2	0.7
16	Automatic Seed drill	2	0.7	0	0.0	2	0.7
17	Multi crop thresher	2	0.7	0	0.0	2	0.7
18	7 tyne cultivator	1	0.3	0	0.0	1	0.3
19	7 tyne plough	1	0.3	0	0.0	1	0.3
20	8 tyne cum fertilizer	1	0.3	0	0.0	1	0.3
21	8 tyne seed cum fertilizer drill	1	0.3	0	0.0	1	0.3
22	9 tyne seed cum fertilizer drill	1	0.3	1	0.3	2	0.7
23	Levelling blade	1	0.3	0	0.0	1	0.3
24	Multi crop planter	1	0.3	0	0.0	1	0.3
25	Ridge plough	1	0.3	1	0.3	2	0.7
26	Spike tooth harrow	1	0.3	1	0.3	2	0.7
27	Wet pod thresher	1	0.3	0	0.0	1	0.3

Table-8 exhibits the list of farm equipment purchased by the farmers on their own in which some equipment under subsidy and some with non-subsidy. From the table it is observed that the percent of farmers who have various farm machinery is below 10 percent. Majority of them have owned purchased under subsidy.

Association analysis

Table 9: Impact of age on attitude of the farmers on Farm mechanization

Chi-square value	p-value	Farmer's Attitude/perception on Farm mechanization		Total
21.98**	.000	Moderately Positive	Highly positive	
Age	< 35 years	4	42	46
		8.7%	91.3%	100.0%
	35 -50 years	20	157	177
		11.3%	88.7%	100.0%
	> 50 years	26	51	77
		33.8%	66.2%	100.0%
Total		50	250	300
		16.7%	83.3%	100.0%

**significant at 1% level

The table-9 exhibits the association between age and farmer's attitude on farm mechanization. The Chi-square test shows a negative association between both at 1% level of significance. The more the age, the positive attitude is low. The young farmers aged less than 35 years had high positive attitude towards farm mechanization whereas this percent is 66 percent in the age more than 50 years. This indicates the good acceptance of farm mechanization despite lack of access, awareness on operation and high cost of the equipment.

Table 10: Impact of farmer's experience in cultivation on their attitude towards Farm mechanization

Chi-square value	p-value	Farmer's Attitude/perception on Farm mechanization		Total
24.93**	.000	Moderately Positive	Highly positive	
Experience In Cultivation	< 15 years	5	63	68
		7.4%	92.6%	100.0%
	15 -30 years	13	118	131
		9.9%	90.1%	100.0%
	> 30 years	32	69	101
		31.7%	68.3%	100.0%
Total		50	250	300
		16.7%	83.3%	100.0%

Out of the most experienced farmers (>30 years) majority, 68 per cent expressed high positive attitude regrading farm mechanization whereas that is nearly 93 percemt in less experienced farmers (<15 percent). The existing difference between these percentages is significant at 1% level. Hence it can be concluded that there is impact of experience on their attitude towards farm mechanization with negative correlation. This could be because of the long run experience with manual implements and age factor they might have some sort of phobia in changing their practice towards farm mechanization.

Table 11: Impact of farmer's experience with farm machinery on their attitude towards Farm mechanization

Chi-square value	p-value	Farmer's Attitude/perception on Farm mechanization		Total
7.567*	.023	Moderately Positive	Highly positive	
Experience in cultivation using Farm Machinery	< 10 years	4	57	61
		6.6%	93.4%	100.0%
	10 - 20 years	23	117	140
		16.4%	83.6%	100.0%
	> 20 years	23	76	99
		23.2%	76.8%	100.0%
Total		50	250	300
		16.7%	83.3%	100.0%

Generally experience with any type of farm machinery influences the attitude of the farmers towards farm mechanization. Table-11 indicates the association between their experience with farm machinery and their attitude towards farm mechanization. Interestingly it is observed that majority in less experienced farmers have high positive attitude towards farm machinery whereas this percentage is only 77 for highly experienced farmers. Chi-square test suggests that there is significant association between experience with farm machinery and their interest towards farm mechanization at 5% level.

Table 12: Impact of farmer's education on their attitude towards Farm mechanization

Chi-square value	p-value	Farmer's Attitude/perception on Farm mechanization		Total
10.93*	.012	Moderately Positive	Highly positive	
Education	Illiterate	2	48	50
		4.0%	96.0%	100.0%
	Primary	13	32	45
		28.9%	71.1%	100.0%

	Secondary and upto 10th	29	134	163
		17.8%	82.2%	100.0%
	Inter or degree	6	36	42
		14.3%	85.7%	100.0%
Total		50	250	300
		16.7%	83.3%	100.0%

The level of education is a vital parameter to make them updated and knowledgeable in the area of their farming operations. It's interesting to know that only 31 per cent of the farmers have an education qualification of Intermediate and above. Only about 4 per cent are illiterates and in the rest 29 percent with primary education and 18% with secondary education including 10th class as per the present analysis. Except in the case of illiterate as for as education is higher the attitude is also become high that indicates a positive association between education and attitude.

Table 13: Impact of land size on their attitude towards Farm mechanization

Chi-square value	p-value	Farmer's Attitude/perception on Farm mechanization		Total
0.508	.776	Moderately Positive	Highly positive	
Cultivable Land Size	1 or 2 acres	16	84	100
		16.0%	84.0%	100.0%
	3 or 4 acres	28	128	156
		17.9%	82.1%	100.0%
	5 and above acres	6	38	44
		13.6%	86.4%	100.0%
Total		50	250	300
		16.7%	83.3%	100.0%

The impact of size of the land held by farmers may also have an effect on their opinions on farm mechanization by which farming become encouragable. The same is gauged through the application of chi-square analysis. The above interpretation in table-13 clearly manifests that irrespective of size of the land farmers have similar type of attitude towards farm mechanization. That means size of the land didn't influence their perceptions.

Table 14: Impact of annual income on their attitude towards Farm mechanization

Chi-square value	p-value	Farmer's Attitude/perception on Farm mechanization		Total
66.729**	.000	Moderately Positive	Highly positive	
Annual income	< Rs. 50000	20	8	28
		71.4%	28.6%	100.0%
	Rs.50000 - Rs.75000	20	167	187
		10.7%	89.3%	100.0%
	> Rs.75000	10	75	85
		11.8%	88.2%	100.0%
Total		50	250	300
		16.7%	83.3%	100.0%

The table-14 illustrates the correlation between the annual income and the level of attitude towards farm mechanization. The farmers holding low income obviously disinterested in farm mechanization whereas this attitude is observed nearly 88% of farmers in higher income group. This data evidently signifies that there is a positive correlation between annual income and positive attitude towards farm mechanization at 1% level.

Table 15: Impact of annual income on their attitude towards Farm mechanization

Chi-square value	p-value	Farmer's Attitude/perception on Farm mechanization		Total
60.342**	.000	Moderately Positive	Highly positive	
Labour resources	Inadequate	23	15	38
		60.5%	39.5%	100.0%
	Somewhat adequate	27	234	261
		10.3%	89.7%	100.0%
	Adequate	0	1	1
		0.0%	100.0%	100.0%
Total		50	250	300
		16.7%	83.3%	100.0%

A labour resource is also a vital aspect in farming which drives farmers towards farm mechanization. The association between labour resources and the attitude of the farmers towards form mechanization is found significantly positive with the help of chi-square test at 1% level. Among the farmers suffering with inadequate labour resources 61 percent expressed moderately positive attitude and only 39 percent showed positive attitude at high level. It indicates the requirement of proper awareness on farm machinery including their accessibility and subsidy and other details.

Table 16: Impact of awareness of farmers on attitude towards Farm mechanization

Chi-square value	p-value	Farmer's Attitude/perception on Farm mechanization		Total
11.152**	.001	Moderately Positive	Highly positive	
Awareness on farm machinery	Low	9	12	21
		42.9%	57.1%	100.0%
	Moderate	41	238	279
		14.7%	85.3%	100.0%
Total		50	250	300
		16.7%	83.3%	100.0%

Generally, awareness always positively correlated with attitude. Hence in this study, the impact of the awareness on the attitude towards farm machinery is observed and summarized in table-16. From the table it can be understood that as for the awareness on farm machinery is increasing the attitude is also enhances positively. From this it can be suggested that through proper awareness campaigns the knowledge can be enhanced in turn leads mechanized cultivation.

Major findings

- Majority of the farmers participated in the survey are from the age group 35-50 years and with the equation level of secondary or upto 10th class.
- Majority of the farmers (44 percent) have 15-30 years of farming experience and 34 percent are in the field of cultivation since 30 years. But 47 percent of the farmers have 10-20 years of experience in using farm machinery.
- Only 10 percent of the farmers have less than Rs.50000 as their annual income. 62 per cent of the farmers have about Rs.50000 to Rs.75000 of income and early 28 percent of the farmers getting more than Rs.75000 per annum from farming processes.
- The cultivable land size for 52 per cent of the farmers ranges from 3-4 acres. 33 per cent of them have either 1 or two acres of land. It's very interesting to find from the analysis that 66 per cent of the farmers' are cultivating under irrigated conditions whereas only 10 percent of them depend on rainfed. But 24 percent are cultivating under both the conditions.
- Only 75 percent of the farmers don't have a tractor on their own in which 72 percent are hiring it and only 3 percent depend on bullock drawn implements. But the rest of the farmers are having a tractor since 25 years in which majority of the farmers are having from the past 5-10 years whereas only 4 per cent of the farmers possess it for the past 20-25 years.
- Interestingly it is noted that majority of the farmers (93 percent) had moderate knowledge on farm machinery whereas only 5% of the farmers are doing fully mechanized cultivation and nearly 94% of them are using farm machinery partially in some stages of cultivation.
- Only 12 percent of the farmers are attending demonstration on farm machinery whereas the remaining farmers could not attend. Further, only 2 out of 300 farmers had the membership in groups by which they could procure required farm machinery. Moreover 7.3 percent of the famers had various types of farm machinery on their own and only 71 percent of the farmers had the awareness on their operation.
- Majority of the farmers (30 per cent) are growing Groundnut and Paddy as the major crops, nearly 11 per cent told that they cultivate only paddy as a major crop whereas only 10 per cent farmers told that they depend on paddy, ground nut and other pulses and similarly 8 per cent of the farmers revealed that they grow paddy and other pulses in their cultivation. Hence the most of the farmers are practicing multiple cropping systems to sustain themselves with good profits. It is observed that the percent of farmers who have various farm machinery is below 10 percent. Majority of them have owned purchased under subsidy.
- The significant impact of age, experience in cultivation, experience in cultivation using farm machinery, education, annual income, labour resources, awareness on farm machinery is noticed on the perception of the farmers on farm mechanisation whereas cultivable land size has not influenced their perception.

Conclusion

It is evidently published by the ICAR that the availability of farm machinery is positively influence the productivity of the Food grains in India. Though the mechanization is a crucial input for agricultural crop production but historically it has been neglected in the context of developing countries due to several factors. This study explored the availability, usage and the perception of the farmers on farm mechanization in southern zone of Andhra Pradesh particularly. It is also identified the significant factors for acceptance and accustomedness of the farmers towards farm mechanisation. In turn this survey findings help the Agricultural scientists and Government officials in taking decisions viz., need to increase the type of farm machinery under subsidy; need for initiating research for inventing new farm equipment to focus on more specific needs crop wise; need for conducting awareness programmes and workshops to motivate the farmers towards mechanization over the scarceness of labourer for good yields more economically.

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