CONSUMERS' PURCHASING PATTERN AMONG RURAL MIDDLE CLASS AND RURAL RICH CLASS : A COMPARATIVE STUDY ON FARM MECHANIZATION

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Abstract : *In the context of globalization and also increasing commercialization of agriculture, mechanization is very important. There has been an increase in the use of farm machinery in Indian Agriculture as it contributed to the increase in output due to timeliness of operations and increasing precision in input application. Most of the mechanical inputs have displaced human and bullock labour, which is socially unjustified. Some states like Punjab, Haryana excelled in farm mechanization, but have experienced it as overinvestment. There cannot be going back from mechanization but we frame suitable policies such as liberalizing land lease market, encouraging cooperative management and custom hiring of machinery, imparting training to the farmers regarding such investment, encouraging standard service inputs, devising machinery problem from small farmers and dry land cultivation.*

Several studies have indicated that there was significant increase in cropping intensity due to the use of tractors and irrigation as a consequence of mechanization. India is a predominantly an agricultural economy with 60- 65 % of her population living in villages and earn their livelihood through agriculture and allied activities. Rural population of India was 91% in 1901(Table 2) and may reach to 50% by 2020. Population: Population of India by 2011-12 is estimated to be 1221.91 million with the annual compound growth rate of 1.80 per cent. Rural people migrate to urban areas for employment and better amenities as such opportunities are not adequately available in rural areas. However, these could be created through selective mechanization of agriculture and appropriate postharvest processing and value addition to the produce in the production catchment. To keep pace with India is a predominantly an agricultural economy with 60- 65 % of her population living in villages

Keywords : *Rural Marketing, Farm Mechanization, Agriculture, Purchase Intention.*

Introduction : Rural marketing in India is seen by many as a huge growth opportunity, considering that about 70 % of India's population lives in 630000 villages in rural areas (according to 2001 census). With such a large number of potential consumers, it is clear why national and multinational corporations would like to successfully penetrate the rural Indian market. A location is defined as rural if at least 75 percent of the population is agrarian. The Indian

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rural market with its vast size and demand base offers great opportunities to marketers. Two-thirds of countries consumers live in rural areas and almost half of the national income is generated here. It is only natural that rural markets form an important part of the total market of India.

According to the NCAER study, there are almost twice as many 'lower middle income' households in rural areas as in the urban areas. At the highest income level there are 2.3 million urban households as against 1.6 million households in rural areas. Middle and high-income households in rural India are expected to grow from 80 million to 111 million by 2009. In urban India, the same is expected to grow from 46 million to 59 million. Thus, the absolute size of rural India is expected to be double that of urban India.

(Rs. In Crore)

Year	2006-07	2007-08	2008-09	2009-10	2010-11
GDP of Agriculture & Allied Sector	619160	655080	654118	656975	692499
Per cent to Total	17.4	16.8	15.7	14.6	14

Source: Central Statistical Organization, Ministry of Statistics and Programme implementation, Govt. of India

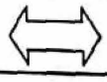
Agriculture is one of the strongholds of the Indian economy and accounts for 14 per cent of the country's gross domestic product (GDP) in 2010-11 and 10.23 per cent (provisional) of the total exports. Furthermore, the sector provided employment to 58.2 per cent of the work force. The Indian Agricultural Scenario reveals that the total geographical area of India is 328.7 million hectares of which 140.3 million hectares is net sown area, while 193.7 million hectares is the gross cropped area, according to the Annual Report 2009-10 of the Ministry of Agriculture.

Agriculture and Farm Mechanization

Agriculture mechanization has experienced a tremendous growth over the last few years. Due to widespread modernization visible in the agricultural sector, farming communities have started employing agro- equipments extensively in various domains of cultivation like tillage, sowing, irrigation, plant protection, threshing etc. The awareness among farming communities to implement the latest available technologies in farming has resulted in a shift towards mechanization, extending the scope of agri-machinery in the nation

However, the country suffers from low levels of farm mechanization, which stems from numerous impediments, both at consumer preference and operational level. The researcher made an attempt to identify the factors influencing rural consumer behavior towards purchasing and deliberate on resolving issues inhabiting the growth of farm mechanization, measures needed to meet these challenges and roles the various stakeholders have therein. Further the overall Indian Farm Equipment Market is on a growth phase, the reasons behind the revival include easy availability of finance schemes and reduction in interest rates. The Government focuses on building and

improving infrastructure also had a positive effect on the overall performance of the farm equipment sector. The agricultural equipment Market driven by several factors and their impact on the agricultural equipment industry are furnished below.

Factors	Impact on agricultural equipment industry
Improved availability of credit	
Emergence of contract farming and dedicated sourcing with corporate partnership	
Opportunity for employment in urban areas pressuring agricultural wages upwards	
Increased competition driven by WTO norms	

Introduction to Farm Mechanization Industry in India

Agricultural Equipment industry plays a key role in supporting the performance of the agricultural sector in India. However the farm equipment sector in India is nascent, but a fast growing one, that is set to experience sustained growth due to increased mechanization of farming, easy availability of credit and emerging practices, such as contract farming and also farming activities are increasingly getting mechanized, and the availability, quality and performance of agricultural equipment has an increasing impact on improving the output and productivity of the agricultural sector.

Status of Farm Mechanization:

- Even though farm mechanization shows an increasing trend, there are wide ranging disparities in the levels of mechanization across states.
- Northern States such as Punjab, Haryana, Uttar Pradesh (particularly Western and Tarai belt) have achieved a faster growth in mechanization over various Plans.
- The sale of other implements and machines like combine harvesters, threshers and other power-operated equipment have been increasing almost throughout the country.
- The pace of mechanization in North-Eastern States has not been satisfactory due to constraints such as hilly topography, socio-economic conditions, high cost of transport, and lack of institutional financing and lack of farm machinery manufacturing industries.
- Mechanization in Western and Southern states of the country viz., Gujarat, Maharashtra, Rajasthan and certain areas of Tamil Nadu, Andhra Pradesh etc., has increased with the increase in area under irrigation and also with the growing awareness among farmers.

Policy on Farm Mechanization:

There is no separate National Policy on Agricultural Mechanization. However, this aspect is covered under the agriculture policy of the National government which promotes agricultural mechanization with the following goals in mind:

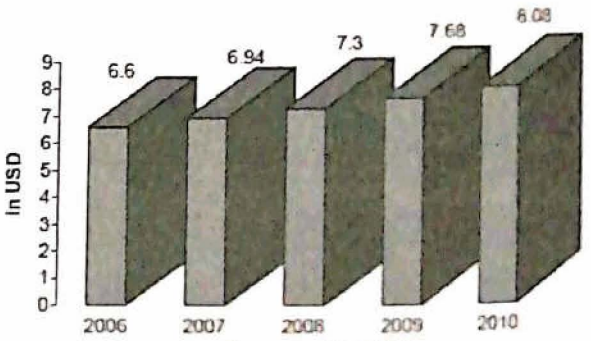
- Agricultural mechanization should lead to a sustainable increase in yields and cropping intensity with the objective of meeting the planned growth rate in agricultural production and maintaining it.
- The income of agricultural workers should rise at a satisfactory rate so that the disparity between urban and rural incomes is contained and they get opportunity to lead a dignified life.
- The benefits of agricultural mechanization should apply to all types of farmers including small and marginal ones in different regions of the country, particularly rain fed areas.
- Agricultural mechanization should create a worker friendly environment especially for women workers by lessening hard labour, health hazards and improve safety in production operations.
- Agricultural mechanization should lead to a reduced cost of production agricultural thereby increase the income of farmers and impart a price advantage while competing for export contracts in the international market.

However governmental policy has important influence on farmers' purchase intention. Where more support policies from government, the more positive farmers' purchase intention will be. If governments support farmers to buy and manage agricultural machinery, and give subsidies on finance, then farmers' entry barriers of usage and purchase of agricultural machinery will reduce. When farmers' positivity is aroused, they certainly generate positive purchase intention.

The key agricultural equipment Market in India

India is the second largest manufacturer of tractors in the world. The Indian tractor industry closed fiscal year 2005 on a very positive note with 2,50,000 units registering a growth of over 30 % over previous year. The government's focus on the agricultural economy with increased real lending ensuring availability of cheap finance led to the growth. Tractor industry is categorized on the basis of power delivered by the engine Horse Power (hp). 30-40 hp tractors primarily used in southern and western region due to hard soil condition dominate Indian market. It is followed by range of 21-30 hp, which finds its market in soft soil conditions well irrigated northern state. The tractor industry comprises 14 players, including three MNCs and led by (MM) Mahindra & Mahindra Ltd, (TAFE) Tractors & Farm Equipment Ltd, and (PT) Punjab tractors Ltd.

Indian Agriculture Equipment Market



Source: FICCI

Objectives of the study

In view of this concept the objective of the study is to ascertain whether there is a significant difference between the high income rural customers and the middle income rural customers with regard to purchase farm mechanization through rating 1 Mostly unimportant, 2 unimportant, 3 neutral, 4 important and 5 highly important on motivating factors such as (4 Ps) Product, Price, Place and Promotion with respect to purchase decision on farm mechanization.

Keeping the above objectives in view, stratified random samples of total 400 respondents were selected. These respondents were classified into two groups such as rural middle class and rural rich class, out of 400 respondents 300 were from rural middle class and 100 from rural rich class. The influencing factors of 4Ps (Product, Price, Place and Promotion) were studied on the purchase decision of rural consumer. For the analysis of data and test the hypothesis the z test statistical tool has been adopted.

Research Methodology

Total Population Population above poverty line	37,35 lakhs (3735.20-720.42)= 30.14
Urban	6.48
Rural population above poverty line Middle income group ¾ th of 2351.35 High income group 1/4rh of 2351.35	23.51 17.63 5.84

The above Table depicts the census data pertaining to Chittoor district of Andhra Pradesh, it is noted that the urban and rural population of the district constitutes a total population of 37 lakhs and from the total population of the district, the 400 sample size selected for the study. This sample size of 400 is split in the ratio of high income group and middle income group which is 1:3 ratios. The number of high income group respondents are 100 while the number of middle income group respondents are 300.

Hypothesis based on the survey

1. H1: There is no significant difference between rural middle income group and rural high income group consumer regarding (4P's) **Product** factor in purchasing farm equipment.
2. H0: There is a significant difference between rural middle income group and rural high income group consumer regarding (4P's) **Product** factor in purchasing farm equipment.
3. H1: There is no significant difference between rural middle income group and rural high income group consumer regarding (4Ps) **Price** factor in purchasing farm equipment.
4. H0: There is a significant difference between rural middle income group and rural high income group

consumer regarding (4Ps) **Price** factor in purchasing farm equipment.

5. H1: There is no significant difference between rural middle income group and rural high income group consumer regarding (4Ps) **Place** factor in purchasing farm equipment.

6. H0: There is no significant difference between rural middle income group and rural high income group consumer regarding (4Ps) **Place** factor in purchasing farm equipment

7. H1: There is no significant difference between rural middle income group and rural high income group consumer regarding (4Ps) **Promotion** in purchasing farm equipment.

8. H0: There is no significant difference between rural middle income group and rural high income group consumer regarding (4Ps) **Promotion** in purchasing farm equipment.

Middle class respondents =300

Rating / Factor	1	2	3	4	5	Total
Product	108	42	64	86	00	300
Price	60	39	66	93	42	300
Place	102	83	43	35	37	300
Promotion	84	26	36	117	37	300

Middle class respondents =100

Rank / Factor	1	2	3	4	5	Total
Product	31	13	22	20	14	100
Price	20	13	22	31	14	100
Place	07	11	09	15	58	100
Promotion	22	20	22	33	03	100

Product attributes		
No. of responses		
Rating	**Rural Middle income**	**Rural High income**
1	108	31
2	42	13
3	64	22
4	86	20
5	00	14
Total	**300**	**100**

Middle income				High income			
Rating	frequency			Rating	frequency		
x	f	f*x	variance	x	f	f*x	variance
1	108	108	219.8209	1	31	31	92.7799
2	42	84	7.645879	2	13	26	6.9277
3	64	192	21.03749	3	22	66	1.6038
4	86	344	212.8824	4	20	80	32.258
5	0	0	0	5	14	70	72.1406
Total	300	728	461.3867		100	273	205.71
	Mean1	**2.426667**			**Mean2**	**2.73**	
	variance1		**1.537956**		**variance2**		**2.0571**

Calculation of 'z' value $z = \frac{Abs(Mean1 - Mean2)}{\sqrt{\left[\frac{Var1}{300} + \frac{Var2}{100}\right]}}$

Z calculated value=1.892233

Table value of z at 95% confidence =1.96

The mean rating given by the respondents in the middle income group towards product attributes is 2.43 while that of the high income group is 2.73. The calculated value of Z test is 1.89, which is less than the table value 1.96. Hence we accept the null hypothesis that there is no significance difference between rural middle income group and rural high income group respondents towards rating product attributes.

Price attributes		
No. of responses		
Rating	Rural Middle income	Rural High income
1	114	20
2	44	13
3	60	22
4	48	31
5	34	14
Total	**300**	**100**

	Middle income				High income		
Rating	Frequency			Rating	Frequency		
x	f	f*x	variance	x	f	f*x	variance
1	114	114	232.0114	1	20	20	59.858
2	44	88	10.1376	2	13	26	6.9277
3	60	180	16.224	3	22	66	1.6038
4	48	192	110.8992	4	31	124	49.9999
5	34	170	215.9136	5	14	70	72.1406
Total	300	744	1845.12	total	100	306	190.53
	Mean1	**2.48**			**Mean2**	**3.06**	
	variance1		**6.1504**		**variance2**		**1.9053**

Calculation of 'z' value $z = \frac{Abs(Mean1 - Mean2)}{\sqrt{\left[\frac{Var1}{300} + \frac{Var2}{100}\right]}}$

Z calculated value= 3.667568773

Table value of z at 95% confidence =1.96

The mean rating given by the respondents in the middle income group towards product attributes is 2.48 while that of the high income group is 3.06. The calculated value of Z statistic is 3.667, which is more than the table value 1.96.

Hence we reject the null hypothesis that there is significance difference between rural middle income group and rural high income group respondents towards rating of product attribute.

Place attributes		
No. of responses		
Rating	Rural Middle income	Rural High income
1	102	7
2	83	11
3	43	9
4	35	15
5	37	58
Total	**300**	**100**

	Middle income				High income		
Rating	frequency			Rating	frequency		
x	f	f*x	variance	x	f	f*x	variance
1	102	102	201.8286	1	7	7	65.5452
2	83	166	13.72638	2	11	22	46.6796
3	43	129	15.13789	3	9	27	10.1124
4	35	140	88.85485	4	15	60	0.054
5	37	185	248.8389	5	58	290	51.2488
Total	300	722	568.3867	total	100	406	173.64
	Mean1	**2.406667**			**Mean2**	**4.06**	
	variance1		**1.894622**		**variance2**		**1.7364**

Calculation of 'Z' value $z = \frac{Abs(Mean1 - Mean2)}{\sqrt{\left[\frac{Var1}{300} + \frac{Var2}{100}\right]}}$

Z calculated value = 10.74422

Table value of z at 95% confidence =1.96

The mean rating given by the respondents in the middle income group towards product attributes is 2.40 while that of the high income group is 4.06. the calculated value of Z statistic is 10.74422, which is more than the table value 1.96. Hence we reject the null hypothesis that there is significance difference between rural middle income group and rural high income group respondents towards rating of product attributes.

Promotion attributes		
No. of responses		
Rating	Rural Middle income	Rural High income
1	84	22
2	26	20
3	36	22
4	117	33
5	37	3
Total	300	100

	Middle income				High income		
Rating	frequency			Rating	frequency		
x	f	f*x	variance	x	f	f*x	variance
1	84	84	170.9718	1	22	22	65.8438
2	26	52	4.733163	2	20	40	10.658
3	36	108	11.83359	3	22	66	1.6038
4	117	468	289.6191	4	33	132	53.2257
5	37	185	245.0156	5	3	15	15.4587
Total	300	897	722.1732	total	100	275	146.79
	Mean1	2.99			Mean2	2.75	
	variance1		2.407244		variance2		1.4679

Calculation of 'Z' value $z = \frac{Abs(Mean1 - Mean2)}{\sqrt{\left[\frac{Var1}{300} + \frac{Var2}{100}\right]}}$

Z calculated value= 1.592825545

Table value of z at 95% confidence =1.96

The mean rating given by the respondents in the middle income group towards product attributes is 2.99 while that of the high income group is 2.75 the calculated value of Z statistic is 1.59, which is less than the table value 1.96. Hence we accept the null hypothesis that there is no significance difference between rural middle income group and rural high income group respondents towards rating of product attribute.

Significance difference in overall scores between middle income and high income groups						
Middle Income Group		Product	Price	Place	Promotion	Overall 4Ps
	Mean	2.43	2.48	2.4	2.99	2.575
	Variance	1.53	6.15	1.89	2.4	2.9925
High Income Group	Mean	2.73	3.06	4.06	2.75	3.15
	Variance	2.05	1.9	1.73	1.46	1.785

Calculation of 'Z' value $Z = \frac{Abs(Mean1 - Mean2)}{\sqrt{\left[\frac{Var1}{300} + \frac{Var2}{100}\right]}}$

Z calculated value =.3.447071234

Table value of z at 95% confidence =1.96

As calculated value is more than table value, the null hypothesis is rejected. Hence there is a significant difference in the overall 4Ps scores of middle income and high income groups of rural consumers.

Conclusion

This paper studied farmers' purchase intention for agricultural machinery among rural middle class and rural rich class. Agricultural mechanization helps in increasing production, productivity and profitability in agriculture by achieving timeliness in farm operations, bringing precision in metering and placement of inputs, reducing available input losses, increasing utilization efficiency of costly inputs (seed, chemical, fertilizer, irrigation, water etc.), reducing unit cost of produce, enhancing profitability and competitiveness in the cost of operation. It can be concluded from the overall study that there is a significant difference between middle income group and rich income group while making purchase decision with regard to farm equipments.

The factors that mainly influencing farmers' purchase intentions are price and place which play a major role among rural middle class and rural rich class but the product and promotional factors are not significant while purchasing the farm mechanized equipment. For many families, buying agricultural machinery is a big household expenditure, so the purchase behavior is very discrete. The purchase decision is mainly based on their own evaluations, and others' opinion is not very important relatively. This shows farmers' purchase behavior is becoming mature and rational gradually. When farmers feel more convenient in purchasing and maintaining agricultural machinery, their purchase

intention will increase. So, the improvements of sales and service network are also helpful to positive intention.

Despite these results, on an individual basis the importance of these factors change from farmer to farmer. However, market is changing constantly, and farmers' purchase psychology is difficult to describe accurately, so this paper is merely a suggestive template on farmers' purchase intention research. A survey based on wider samples and other theories will be necessary.

Moreover the awareness among farming communities to implement the latest available technologies in farming has resulted in a shift towards mechanization, agricultural machinery corporations conduct many training and guidance activities to increase their competitiveness in the market. This rise hopes in extending the scope of agri-machinery in the nation.

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