



## A Study on Factors Influencing Repurchasing Decision and Constraints Faced by Farmers Towards Mixed Fertilizer in East Godavari District of Andhra Pradesh

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Mixed fertilizers play a major role in self-sufficiency in food production and helps in achieving higher yield. The present study was aimed to analyze the factors influencing repurchasing decision and constraints faced by farmers towards mixed fertilizers in East Godavari District of Andhra Pradesh. The data were analyzed using descriptive statistics, binary logistic regression and Garette ranking technique. Logistic regression analysis revealed that satisfaction level and quality are showing significant relationship with willingness to repurchase towards mixed fertilizers. So higher satisfaction level and quality helps consumers to be loyal towards the mixed fertilizer. Lack of credit facility from dealers and wholesalers and non availability of all required medicines were the major constraints faced by the farmers in purchase of mixed fertilizers, hence providing credit facility by dealers and wholesalers may boost up the sales of mixed fertilizer in the market.

**Key words:** Repurchasing decision, Mixed fertilizers, Constraints

Agriculture plays a major role in developing countries especially towards economic growth. India is a highly populated country that requires more agricultural output to meet the food demand for the growing population. Hence there is large scope in usage of fertilizers to meet the required output. Since the demand for food goes on increasing day by day the use of mixed fertilizer came into prevalence in order to get high output within the existing resources.

Fertilizer sector plays a crucial role in Indian economy; it provides input to agriculture sector. India is the third largest producer and second largest consumer (25.3 million tonnes) of fertilizer in world after China and United States. In India consumption of fertilizer has been increased by 30.06 lakh tonnes from the year 2007 to 2014. The growth of Indian fertilizer market has been largely determined by the policies pursued by the government.

NPK when applied significantly increase the yield of both root and stem. NPK even applied in low fertility level field resulted with good yield and economic benefits (Wivine, 2017). Application of NPK fertilizer has resulted in good yield and growth parameters. NPK applied @ 150 kg ha<sup>-1</sup> to Okhra has given mist optimum yield (Omotoso *et al.*, 2007).

The aim of the study was to identify the factors influencing repurchase decision and constraints faced by the farmers towards mixed fertilizers.

### Material and Methods

#### Sampling and data collection

The research was carried in East Godavari district of Andhra Pradesh as it had high agriculture

production standing in fifth place in the state in consumption of fertilizer. Primary data was collected using questionnaire by personal interview in five divisions having more agriculture production from East Godavari district based on their sales performance. A total of 140 farmers were selected for this study. The factors influencing repurchasing decision was identified by using logistic regression and constraints were identified using Garette's ranking technique.

Logistic regression is used to derive coefficients of explanatory variables to have influence on dependent variable. The logistic regression model is as follows

$$p = p(Y = 1/X) = \frac{e^{\beta_0 + \sum_{i=1}^0 \beta_i X_i}}{1 + e^{\beta_0 + \sum_{i=1}^0 \beta_i X_i}}$$

and,

$$1 - P = p(Y = 0/X) = \frac{1}{1 + e^{\beta_0 + \sum_{i=1}^0 \beta_i X_i}}$$

A transformation of P known as the logit transformation and is defined as

$$\text{Logit}P = \log \left[ \frac{P}{1 - P} \right] = \beta_0 + \sum_{i=1}^0 \beta_i X_i$$

In this model the variables are given as

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Y = Willingness to repurchase (yes, no)

X<sub>1</sub> = Satisfaction level towards mixed fertilizer (highly satisfied, satisfied, neutral, dissatisfied, highly dissatisfied)

X<sub>2</sub> = Brand loyalty towards brand (not at all influential, slightly influential, somewhat influential, very influential, extremely influential)

X<sub>3</sub> = Dealers influence towards brand preference (not at all influential, slightly influential, somewhat influential, very influential, extremely influential)

X<sub>4</sub> = Price of mixed fertilizer (strongly agree, agree, neutral, disagree, strongly disagree)

X<sub>5</sub> = Quality of mixed fertilizer (strongly agree, agree, neutral, disagree, strongly disagree)

X<sub>6</sub> = Flexibility of mixed fertilizer (strongly agree, agree, neutral, disagree, strongly disagree)

The likert scale factors were chosen from likert scale response anchors (Vagias 2006).

Garret's ranking technique was used to rank each

factor and those ranks were converted into per cent position by using the following formula,

$$\text{Per cent position} = \frac{100 \sum (R_{ij} - 0.5)}{N_j}$$

Where,

R<sub>ij</sub> = Rank given for i<sup>th</sup> factor by j<sup>th</sup> individual

N<sub>j</sub> = number of factors ranked by j<sup>th</sup> individual

By referring to the Garrett's table, the estimated per cent position was converted into score and then for each factor the scores of all the respondents were added and the mean value was estimated. The mean score is used to rank and find out the constraints faced by farmers in acquiring mixed fertilizer on basis of the rank obtained.

## Results and Discussion

### *Socio-economic characteristics of sample farmers*

Socio-economic factors like age, education, occupation, land holding pattern *etc.* will highly

**Table 1. Socio-economic characteristics of sample farmers (n = 140)**

Factors	Respondents (in numbers)	Percentage
Age (years)		
Adulthood (25 to 40)	48	34.29
Middle Age (40 to 60)	84	60.00
Senior Citizen (Above 60)	8	5.71
Education		
Illiterate	71	50.71
Primary	50	35.71
Secondary	16	11.43
Higher secondary	1	0.71
Graduation & Above	2	1.44
Occupation		
Only Agriculture	115	82.15
Agri & allied Activities	25	17.85
Annual Income (Rs.)		
Below 5 lakhs	105	75.00
5 – 10 lakhs	21	15.00
10 – 15 lakhs	10	7.14
Above 15 lakhs	4	2.86
Land holding		
Marginal (< 1hac)	24	17.14
Small ( 1-2hac)	55	39.29
Medium (2-4hac)	40	28.57
Large (> 4hac)	21	15.00

influence repurchasing decision and constraints faced by farmers towards mixed fertilizer. Hence, it is essential to understand the socio-economic characters of the farmers in the study area and factors are given in the Table 1.

Of the total sample, it could be seen that majority of farmers belonged to middle age group (66.43), and were mostly illiterates (50.71). Most of the farmers had agriculture as their primary occupation (82.15) with annual income of below 5 lakhs (75) per cent

and most of them came under marginal and small farmer category.

#### **Awareness level**

Awareness level towards different types and brands of mixed fertilizers will increase knowledge level that could influence brand preference. So awareness level of various mixed fertilizer brands were studied based on multiple responses given by the farmers and the details are given in Table 2.

**Table 2. Awareness level of different Mixed Fertilizer brands**

Company	No. of farmers who had awareness*	Percentage to Total*
Coromandel International Limited	140	100
Godavari Fertilizers and Chemicals	57	40.7
KPR Agrochem Limited	140	100
Nagarjuna Fertilizers and Chemicals Limited	85	60.7
Southern Petrochemical Industries Corporation	66	47.1
Navratna Fertilizers Private Limited	27	19.2

\*Multiple responses

From Table 2 it could be inferred that all (100 per cent) respondents were having awareness on Coromandel international limited and KPR agrochem limited companies and only 60 per cent of the farmers

were aware of Nagarjuna fertilizers and chemicals limited company, whereas least percentage (27) of them were aware of Navaratna fertilizers private limited company.

**Table 3. Quantity of the mixed fertilizer purchased by the farmers (n=140)**

No. of farmers	Company	Quantity kg/acre
75	KPR Agrochem Limited (Ajay)	300
65	Coromandel International Limited (Gromour)	225

#### **Quantity Acquired**

Evaluation of quantity purchased helps in knowing the demand of the product and would give a glimpse on forecast for future production. The quantities of the mixed fertilizer purchased were given in the Table 3.

From Table 3 it could be inferred that majority of farmers (75) preferred Ajay mixed fertilizer with

quantity of 300 kg per hectare and (65) farmers preferred Gromour with quantity of 225 kg per hectare.

#### **Willingness to repurchase**

A logistic regression was performed to ascertain the respondent's willingness to repurchase the mixed fertilizers in future and the results presented in Table 4.

**Table 4. Factors influencing repurchasing decision on Mixed fertilizers**

Variables	Co-efficient	S.E.	P value	Exp(B)
Constant	-12.481	4.461	0.005	0.000
Satisfaction	2.933	0.903	0.001*	18.782
Brand Loyalty	0.332	0.589	0.574	1.393
Quality	2.731	0.817	0.001*	15.344
Price	-1.583	1.228	0.197	0.205
Flexibility	-0.031	0.574	0.957	0.970
Dealer's Influence	-1.685	0.469	0.000*	0.186

Nagalkerke R square value - 0.675

\*Significance at 1% level, \*\*Significance at 5% level.

Nagalkerke R Square value (0.675) denotes that 67 per cent of variation in repurchasing decision was

contributed by the selected variables viz., satisfaction, brand loyalty, quality, price, flexibility and dealers influence.

According to Table 4 satisfaction, brand loyalty and quality positively affects the likelihood whereas price, flexibility and dealers influence negatively affects the livelihood. Increase in satisfaction, brand loyalty and quality will increase the repurchasing decision towards mixed fertilizer. Similarly, when price increases the willingness to repurchasing the mixed fertilizers decreases since price is major factor which plays an important role among farmers. Also when flexibility increases the repurchasing decisions decreases since farmers believe that specific mixed fertilizer to crop would give high yield. Satisfaction level (18.782) is the most influencing factor likely to account for repurchasing of mixed fertilizer followed by quality (15.344). Brand satisfaction and trust perceived value play important role in repurchasing the brand (Yu syaun chen *et al.*, 2016), and helps consumer to stay loyal to that brand (Constanza, 2015) were showing similar results to that of the present study.

### Constraints

Constraints play a major role everywhere since it is most important thing a farmer experiences within that product or brand. In order to satisfy the farmers and retain them we should make ensure that they face very less or no problems. Constraints help in revising and upgrading company's flaws and loop holes which can satisfy customer and increase their market. Lacks of credit facility, non – availability of diagnostic facilities are the main constraints faced by tribal dairy farmers (Eqbal *et al.*, 2013). The constraints faced by the sample respondents in acquiring the product were ranked using Garrett's ranking technique is given in Table 5.

**Table 5. Constraints faced by the farmers in acquiring mixed fertilizer**

Particulars	Mean score	Rank
No credit facility from dealers and wholesalers	61.46	I
Not available all requirements locally	51.10	II
Yield difference between brands is not quantifiable	50.00	III
High cost	45.82	IV
Not available timely	44.89	V

From the above table it can be inferred that no credit facility from dealers and wholesalers (61.46) and not available all requirements locally (51.10) are the most important constraints faced by the farmers. The other constraints were yield difference between brands is not quantifiable (50.00), high cost (45.82) and not available timely (44.89).

### Conclusion

Based on the results of the study it was concluded that most of the respondents belongs to middle age category which implies middle aged persons are most likely to prefer farming. Most of the farmers were illiterates indicating they are likely to involve in agriculture other than studies and jobs. Most of the farmers responded agriculture is only their main occupation other preferring allied activities. Most of the farmers have annual income less than 5 lakhs because they have Agriculture as their only occupation. Majority of them are small farmers and they are highly aware about Coromandel and KPR companies which show that they are the main companies operating and preferred by the farmers. While studying the repurchase decision, satisfaction and quality are positive and significantly influencing with repurchase decision indicating that the more the satisfaction and quality, farmers likely to repurchase them. Hence the fertilizer companies might ensure that farmers should be highly satisfied with their product to make them loyal towards that brand. Lack of credit facility was found to be the major problem experienced by the farmers. Hence providing credit facility by dealers and wholesalers may facilitate farmers to acquire more quantity thereby increasing market for fertilizers.

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