FACTORS INFLUENCING SEED PURCHASE DECISIONS IN RURAL AREAS OF GUJARAT

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ABSTRACT

The paper presents farmers purchasing decision process of the seed. The paper suggests that certain demographic factors of farmers will influence their purchase decision process. Several characteristics are hypothesized and tested using multivariate techniques. The analysis indicated that the all factors are influencing or affect purchase decision of farmers in rural areas. The results revealed that null hypothesis is perfectly ignored.

KEYWORDS: Purchase Decision, Seeds, Rural, Farmers, MANOVA

INTRODUCTION

The selection of seeds that suitable crops and season wise grow for most crucial decision take farmer for their farm. In the survey of farmers purchase decision, farmers were asked to rate of the importance of various factors in making purchase seeds decision. The multivariate analysis are used to test whether certain characteristic of the farmers have an effect on the importance attributes to factors affecting for seeds purchase decision differ significantly from farmers in their rating of the importance of the factors.

Table 1: Factor a Farmer May Consider when Purchasing a Seed in their Farm

Sr. No.	Factors
1	Brand loyalty
2	Relationship with suppliers
3	Timely supply
4	Proximity of point of purchase
5	Credit facility
6	Cost consideration
7	Quality of seed material
8	Provision for technical guidance

OBJECTIVE OF THE STUDY

To test relative importance of various demographic factors on the decision to purchase seeds.

HYPOTHESES

It seems useful to gain a better understanding of determinates of the factors used by farmers seed purchase decision. In this study, farmers were asked to rate of factors according to importance in their seed purchase decision

(Table 1). These factors are interpreted as a list of possible desirable criteria for farmer's seed purchases. The objective is to see if these selected factors are actually important in farmers seed purchase decision making and under conditions that importance changes.

To the extent that general characteristics of factors influence the demographic factor on farmers, these may influence what farmers perceives as important considerations. Following this logic, it is hypothesized that the importance that farmers on various considerations when purchasing seed is influenced by:

- Farmers Age

- Farmers Landholding

- Famers Annual Income from Agricultural

- Regions

- Farmers Education qualification

- Furthermore, it is hypothesized that check which factors consider farmers for most important of seeds purchase decision.

THE DATA

The data for this study were obtained from a personal interview method. The survey sample was drawn from farmers who is own land. The Survey questionnaire listed a number of factors which were hypothesized to be important in farmer's decision to purchase a seed (Table 1). the farmers was asked to rate the importance of each factor in his decision making process by responding with 1 to 10. ("1" signified not important and a 10 is highly important.) In addition to rating these factors, the farmers were asked question respect to the agricultural income and education qualification etc. of them.

This study was 1676 responses for the used.

MULTIVARIATE ANALYSIS

The purpose of this study was to test the null hypothesis that certain characteristics of the farmers and demographic factors of the respondents have no effect on the importance that respondents attribute to the purchasing decision factors. Multivariate analysis is more appropriate than the traditional Univariate analysis since it consider the interdependency among these factors. A single multivariate analysis with many dependent variables incurs much less risk of committing a type I Error that does several Univariate analyses with one dependent variable each. For both heuristic and rigorous discussions of the appropriate application of multivariate analysis. (Harries and Morrison).

In the first part of the analysis five demographic factors is treated as independent variables. These are 1) Farmers Age, 2) Farmers Landholding, 3) Famers Annual Income from Agricultural, 4) Regions, 5) Farmers Education qualification. Each of these variables is discrete.

The first step is to determine if any overall relationship exists between the decision factors and the five independent variables are discrete, multivariate analysis of variance (MANOVA) is most appropriate. For categorical variable independent treatments, a MANOVA is performed. Such a test indicated the amount of variation in the dependent

variables, explained by the k treatments. If one of the k treatments is age, for example, MANOVA will indicate (at a given level of significance) if a farmers age influence his purchase decision of seeds.

At this point the analysis will indicate which independent treatment variables have a significant effect on the overall weighting, and, for those which are significant, which levels of the treatment have a significant effect on the overall weighting of factors. This knowledge in itself tells a great deal about the factors influencing an individual's decisions, but the analyst may want to know if this significant effect on the overall weighting is focused on any particular decision factor or group of factors. To this end, range tests-univariate or multivariate-may be used on each of the decision-making factors.

As noted earlier, the survey also included a sample of farmers. This groups was asked to rate the importance of each factor in the farmer's decision making process. Given these data, it is possible to test the null hypothesis that there are no significant differences between farmers perception of the importance of each decision-making factor in the decision- making process. To test this hypothesis, a one-way MANOVA is performed in which the single treatment includes all factors.

DATA ANALYSIS

Table 2: Number of Observation in Each Level of the Five Independent Variables

Variable	Response	Class	Number of Observation
Age	1	15 - 30 years	215
	2	31- 40 Years	604
	3	41 - 60 Years	649
	4	Above 60 Years	208
		Total	**1676**
Land holding	1	Less than 5 acres	414
	2	6 to 15 acres	657
	3	16 to 30 acres	463
	4	31 to 50 acres	119
	5	More than 50 acres	23
		Total	**1676**
Annual income from agricultural	1	Up to Rs. 50,000	418
	2	Rs. 50,001 – Rs. 1,00,000	518
	3	Rs. 1,00,001 – Rs. 5,00,000	551
	4	More than Rs. 5,00,000	189
		Total	**1676**
Region	1	North Gujarat	284
	2	Central Gujarat	460
	3	South Gujarat	102
	4	Kachchh	100
	5	Saurashtra	730
		Total	**1676**
Education qualification	1	ill-literate	652
	2	Primary School	748
	3	Secondary School	241
	4	Graduation	32
	5	Post-Graduation	3
		Total	**1676**

(Source: Primary Data)

Table 3: Mean Responses to Eight Factors by Levels of Independent Variables

Decision factors	Overall Means	Age				Land holding				
		1	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**5**
Brand loyalty	8.65	8.60	8.60	8.41	8.48	8.04	8.41	8.86	9.25	9.13
Relationship with suppliers	7.63	7.12	7.20	7.77	7.71	7.21	7.33	7.75	8.14	7.35
Timely supply	7.27	7.44	7.03	7.20	7.71	7.25	7.13	7.25	7.63	7.43
Proximity of point of purchase	6.91	6.37	6.53	6.91	7.12	6.64	6.59	6.83	7.16	7.91
Credit facility	6.75	6.75	6.58	6.68	7.48	6.85	6.74	6.68	6.72	6.87
Cost consideration	7.08	6.94	6.72	7.09	7.66	7.28	6.89	6.87	7.14	7.39
Quality seed material	6.91	6.73	6.54	7.08	7.12	6.61	6.76	7.06	7.39	6.35
Provision for technical guidance	5.37	5.04	5.19	5.52	5.10	4.92	5.31	5.45	5.88	4.87

(Source: Primary Data)

Table 3: Continue…

Decision factors	Income				Region					Education				
	1	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
Brand loyalty	7.81	8.48	8.96	8.85	8.29	8.42	9.68	8.33	8.52	8.87	8.30	8.17	8.84	9.67
Relationship with suppliers	7.41	7.23	7.72	7.57	7.71	7.53	7.61	8.37	7.21	7.45	7.40	7.73	7.66	9.33
Timely supply	6.94	7.11	7.42	7.68	7.88	7.02	5.81	7.53	7.28	7.54	7.05	6.99	6.97	8.00
Proximity of point of purchase	6.74	6.62	6.76	6.91	6.86	6.58	6.12	7.83	6.71	6.76	6.66	6.78	7.09	8.33
Credit facility	6.71	6.51	6.94	6.96	7.92	6.75	6.64	6.86	6.30	6.99	6.52	6.81	6.94	5.00
Cost consideration	7.11	6.67	7.07	7.49	8.09	7.07	7.75	7.02	6.44	7.33	6.79	6.85	6.63	6.67
Quality seed material	6.45	6.63	7.05	7.71	7.93	6.99	6.98	6.54	6.35	7.05	6.74	6.62	6.69	7.67
Provision for technical guidance	4.90	5.57	5.52	4.70	4.70	5.72	7.51	5.41	4.91	5.40	5.22	5.14	5.63	6.00

(Source: Primary Data)

Table 2 indicates the distribution of observations among the various levels of the 5 independent variables. Table 3 gives the mean response to each factor for each class of each independent variable. The object of the following analysis is to determine if there are any statistical differences among these means.

First, which, if any, of the five independent variables lead to a significant difference in responses?

Table 4: MANOVA Test for Farmer's Importance on Purchasing Factors

MULTIVARIATE TESTS[c]						
Effect		**Value**	**F**	**Hypothesis df**	**Error df**	**Sig.**
Intercept	Pillai's Trace	.556	258.750[a]	8.000	1650.000	.000
	Wilks' Lambda	.444	258.750[a]	8.000	1650.000	.000
	Hotelling's Trace	1.255	258.750[a]	8.000	1650.000	.000
	Roy's Largest Root	1.255	258.750[a]	8.000	1650.000	.000
Age	Pillai's Trace	.043	3.034	24.000	4956.000	.000
	Wilks' Lambda	**.957**	**3.044**	**24.000**	**4786.103**	**.000**
	Hotelling's Trace	.044	3.053	24.000	4946.000	.000
	Roy's Largest Root	.030	6.276[b]	8.000	1652.000	.000
Landholding	Pillai's Trace	.074	3.905	32.000	6612.000	.000
	Wilks' Lambda	**.927**	**3.944**	**32.000**	**6086.495**	**.000**
	Hotelling's Trace	.077	3.977	32.000	6594.000	.000
	Roy's Largest Root	.054	11.113[b]	8.000	1653.000	.000

Table 4: Contd					
Effect		**Value**	**F**	**Hypothesis df**	**Error df**	**Sig.**
Income	Pillai's Trace	.092	6.519	24.000	4956.000	.000
	Wilks' Lambda	**.910**	**6.567**	**24.000**	**4786.103**	**.000**
	Hotelling's Trace	.096	6.609	24.000	4946.000	.000
	Roy's Largest Root	.062	12.819[b]	8.000	1652.000	.000
Region	Pillai's Trace	.250	13.762	32.000	6612.000	.000
	Wilks' Lambda	**.767**	**14.217**	**32.000**	**6086.495**	**.000**
	Hotelling's Trace	.284	14.606	32.000	6594.000	.000
	Roy's Largest Root	.177	36.673[b]	8.000	1653.000	.000
Education qualification	Pillai's Trace	.052	2.740	32.000	6612.000	.000
	Wilks' Lambda	**.948**	**2.764**	**32.000**	**6086.495**	**.000**
	Hotelling's Trace	.054	2.786	32.000	6594.000	.000
	Roy's Largest Root	.042	8.680[b]	8.000	1653.000	.000
a. Exact statistic						
b. The statistic is an upper bound on F that yields a lower bound on the significance level.						
c. Design: Intercept + Age + Landholding + Income + Region + Education qualification						

(Source: Primary Data)

The above table is the MANOVA using the wilks's Lambda test. Using an alpha level of.05. It can be clear from the above table that all independent variables or demographic factors influencing on purchasing decision of seeds in rural areas farmers. Because $P < 0.01$ means that null hypothesis may be rejected. Hence, there are significant differences between farmers perception of the importance of each decision- making factor in the decision- making process.

Table 5: Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	Brand loyalty	800.992[a]	18	44.500	10.712	.000
	Relationship with suppliers	484.530[b]	18	26.918	6.041	.000
	Timely supply	672.838[c]	18	37.380	7.770	.000
	Proximity of point of purchase	352.402[d]	18	19.578	3.679	.000
	Credit facility	667.857[e]	18	37.103	6.155	.000
	Cost consideration	880.411[f]	18	48.912	7.805	.000
	Quality seed material	918.685[g]	18	51.038	8.208	.000
	Provision for technical guidance	1344.860[h]	18	74.714	11.085	.000
Intercept	Brand loyalty	4730.254	1	4730.254	1138.638	.000
	Relationship with suppliers	3838.626	1	3838.626	861.454	.000
	Timely supply	2905.668	1	2905.668	603.990	.000
	Proximity of point of purchase	3225.140	1	3225.140	606.135	.000
	Credit facility	2429.652	1	2429.652	403.081	.000
	Cost consideration	2908.063	1	2908.063	464.067	.000
	Quality seed material	2732.587	1	2732.587	439.445	.000
	Provision for technical guidance	1996.293	1	1996.293	296.188	.000
Age	**Brand loyalty**	**21.789**	**3**	**7.263**	**1.748**	**.155**
	Relationship with suppliers	124.434	3	41.478	9.308	.000
	Timely supply	48.540	3	16.180	3.363	.018
	Proximity of point of purchase	89.641	3	29.880	5.616	.001
	Credit facility	**15.216**	**3**	**5.072**	**.841**	**.471**
	Cost consideration	**41.425**	**3**	**13.808**	**2.204**	**.086**
	Quality seed material	91.114	3	30.371	4.884	.002
	Provision for technical guidance	**47.609**	**3**	**15.870**	**2.355**	**.070**

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Table 5: Contd						
Landholding	Brand loyalty	52.596	4	13.149	3.165	.013
	Relationship with suppliers	102.595	4	25.649	5.756	.000
	Timely supply	125.191	4	31.298	6.506	.000
	Proximity of point of purchase	**40.977**	**4**	**10.244**	**1.925**	**.104**
	Credit facility	**40.643**	**4**	**10.161**	**1.686**	**.151**
	Cost consideration	82.876	4	20.719	3.306	.010
	Quality seed material	69.551	4	17.388	2.796	.025
	Provision for technical guidance	162.074	4	40.519	6.012	.000
Agricultural Income	Brand loyalty	158.573	3	52.858	12.724	.000
	Relationship with suppliers	48.020	3	16.007	3.592	.013
	Timely supply	191.959	3	63.986	13.301	.000
	Proximity of point of purchase	**8.584**	**3**	**2.861**	**.538**	**.656**
	Credit facility	54.556	3	18.185	3.017	.029
	Cost consideration	77.777	3	25.926	4.137	.006
	Quality seed material	129.954	3	43.318	6.966	.000
	Provision for technical guidance	218.922	3	72.974	10.827	.000
Region	Brand loyalty	216.968	4	54.242	13.057	.000
	Relationship with suppliers	122.330	4	30.582	6.863	.000
	Timely supply	291.386	4	72.847	15.142	.000
	Proximity of point of purchase	150.612	4	37.653	7.077	.000
	Credit facility	356.976	4	89.244	14.806	.000
	Cost consideration	466.720	4	116.680	18.620	.000
	Quality seed material	436.748	4	109.187	17.559	.000
	Provision for technical guidance	909.913	4	227.478	33.751	.000
Education Qualification	Brand loyalty	195.828	4	48.957	11.785	.000
	Relationship with suppliers	**26.020**	**4**	**6.505**	**1.460**	**.212**
	Timely supply	70.384	4	17.596	3.658	.006
	Proximity of point of purchase	**11.807**	**4**	**2.952**	**.555**	**.696**
	Credit facility	**53.618**	**4**	**13.405**	**2.224**	**.064**
	Cost consideration	94.545	4	23.636	3.772	.005
	Quality seed material	**45.594**	**4**	**11.398**	**1.833**	**.120**
	Provision for technical guidance	113.256	4	28.314	4.201	.002
Error	Brand loyalty	6883.692	1657	4.154		
	Relationship with suppliers	7383.563	1657	4.456		
	Timely supply	7971.477	1657	4.811		
	Proximity of point of purchase	8816.617	1657	5.321		
	Credit facility	9987.892	1657	6.028		
	Cost consideration	10383.551	1657	6.266		
	Quality seed material	10303.670	1657	6.218		
	Provision for technical guidance	11168.096	1657	6.740		
Total	Brand loyalty	129167.000	1676			
	Relationship with suppliers	101559.000	1676			
	Timely supply	96348.000	1676			
	Proximity of point of purchase	85060.000	1676			
	Credit facility	87032.000	1676			
	Cost consideration	93500.000	1676			
	Quality seed material	89733.000	1676			
	Provision for technical guidance	59361.000	1676			

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
		Table 5: Contd				
Corrected Total	Brand loyalty	7684.684	1675			
	Relationship with suppliers	7868.092	1675			
	Timely supply	8644.315	1675			
	Proximity of point of purchase	9169.019	1675			
	Credit facility	10655.749	1675			
	Cost consideration	11263.962	1675			
	Quality seed material	11222.355	1675			
	Provision for technical guidance	12512.956	1675			

a. R Squared =.104 (Adjusted R Squared =.095)
b. R Squared =.062 (Adjusted R Squared =.051)
c. R Squared =.078 (Adjusted R Squared =.068)
d. R Squared =.038 (Adjusted R Squared =.028)
e. R Squared =.063 (Adjusted R Squared =.052)
f. R Squared =.078 (Adjusted R Squared =.068)
g. R Squared =.082 (Adjusted R Squared =.072)
h. R Squared =.107 (Adjusted R Squared =.098)

(Source: Primary Data)

The above table shown that the between subject factors displays the independent variable levels. Here there are five independent variables with eight levels. Type III sum of squares can be used in models where there are uneven group sizes, although there needs to be at least one participant in each cell. It calculates the sum of squares after the independent variables have all been adjusted for the inclusion of all other independent variables in the model.

AGE

The factors such as brand loyalty, Credit facility, Cost consideration and provision for technical guidance more than 0.05 under the independent variable have age group. It means that these four dependent factors statically insignificant effect on purchasing decision of seeds in especially for age group.

LANDHOLDING

The factors such as Proximity of point of purchase and Credit facility more than 0.05 under the independent variable have landholding pattern. These are two dependent factors statistically insignificant effect on purchasing decision of seeds.

AGRICULTURAL INCOME

The factors Proximity of point of purchase more than 0.05 under the independent variable is agriculture income. It means that this factor statistically insignificant effect on purchase decision of seeds.

EDUCATION QUALIFICATION

The factors such as Relationship with suppliers, Proximity of point of purchase, Credit facility and Quality seed material more than 0.05 under the independent variable have education qualification. It means that these factors statically insignificant effect on purchase decision of seeds.

CONCLUSIONS

This paper tried multivariate analysis for purchasing decision of seeds in rural areas of Gujarat. Based on the central tendency after the MANOVA model was carried out the check the between dependent and independent factors main effect of farmers decision making process for purchase seeds. The study found that age, landholding pattern, agricultural income, region and education qualification are statically significant differ under the MANOVA test. The all level of importance factors are quite effect on purchase decision of seeds. Hence, we able to reject the null hypothesis that farmers purchase decision of seeds. The concluded that subject wise effect on seeds purchasing decision somewhat factors more than 0.05, only those factors have been unimportant for decision making process.

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