CHAPTER – 4

Data analysis and Interpretation

Chapter –4

Data analysis and Interpretation

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CHAPTER NO.4

DATA ANALYSIS AND INTERPRETATION

4.1 Introduction

The data is analyzed as per the research design. Demographic data of farmers is analyzed by percentage method. Data regarding farmer's attitude towards reliability of information sources is analyzed using weighted average method.

Data about farmer's preferences towards various variables is analyzed by using mean, standard deviation.

Hypotheses are tested with t- test.

4.2 Data Analysis

Analyzed data is presented in following manner

Part-I

1. Demographic classification of respondents
    1. Age wise distribution of the respondents
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    3. Landholding pattern of respondents

Part-II

1. Data analysis about farmer's attitude towards reliability of information sources

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Part-IV

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Part –I

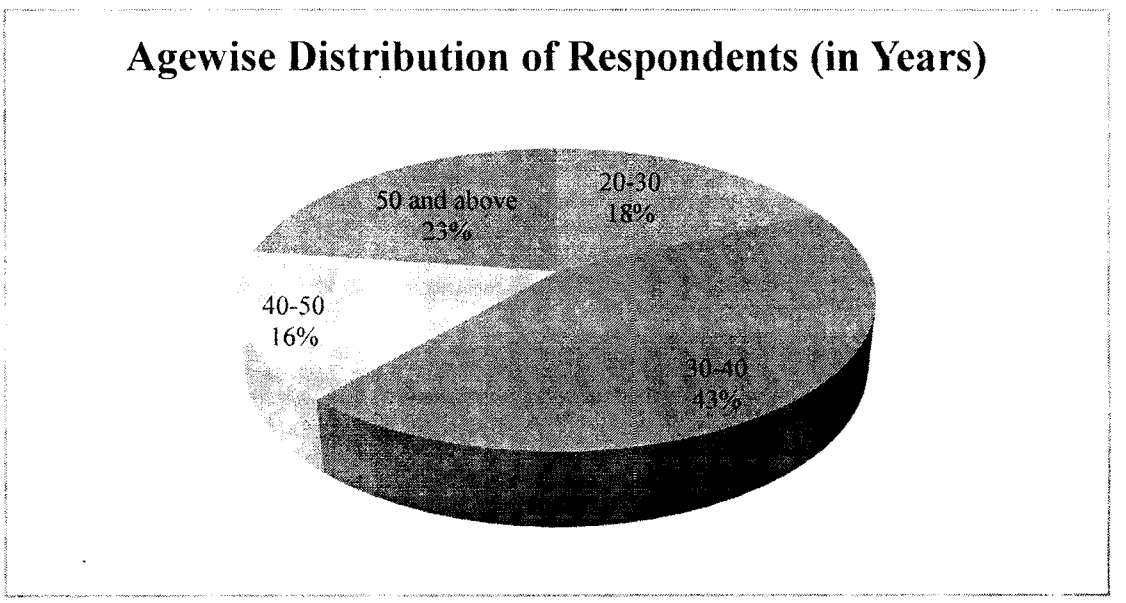
Presentation of Demographic Data of Farmers Using Percentage Method.

Table No.4.1.1

AGEWISE DISTRIBUTION OF RESPONDENTS

Age Group (in years.)	No. of Respondents	Percentage
20-30	33	18
30-40	80	43
40-50	29	16
50 and above	42	23
Total	**184**	**100**

Chart No.4.1.1



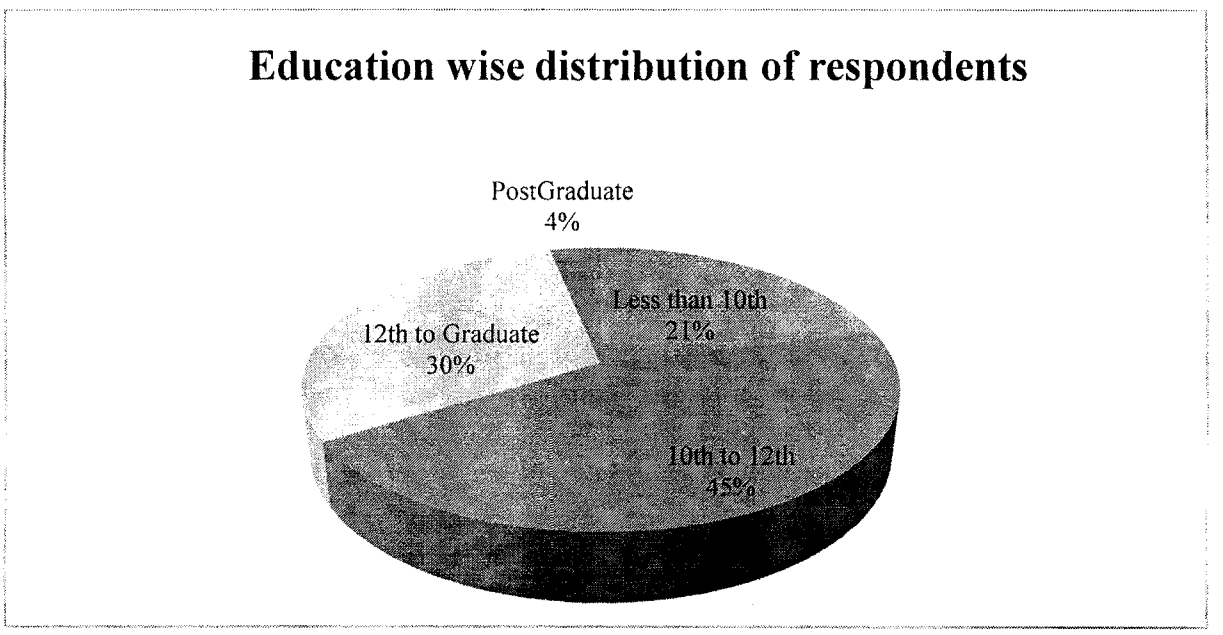
The table and chart no. 4.1.1 reveals that maximum no. of farmers i.e 80 (43 percent) are from age group 30-40 years while minimum i.e. 29(16 percent) are from age group 40-50 years. There are 33 no. of farmers (18 percent) from lowest age group i.e.20-30 years. 42 (23percent) farmers belong to age group 50 years and above.

Table No.4.1.2

EDUCATIONAL QUALIFICATION WISE DISTRIBUTION OF RESPONDENTS

Educational qualifications	No. of Respondents	Percentage
Less than 10^{th}	39	21
10^{th} to 12^{th}	83	45
12^{th} to Graduate	56	30
Post Graduate	6	4
Total	**184**	**100**

Chart No.4.1.2



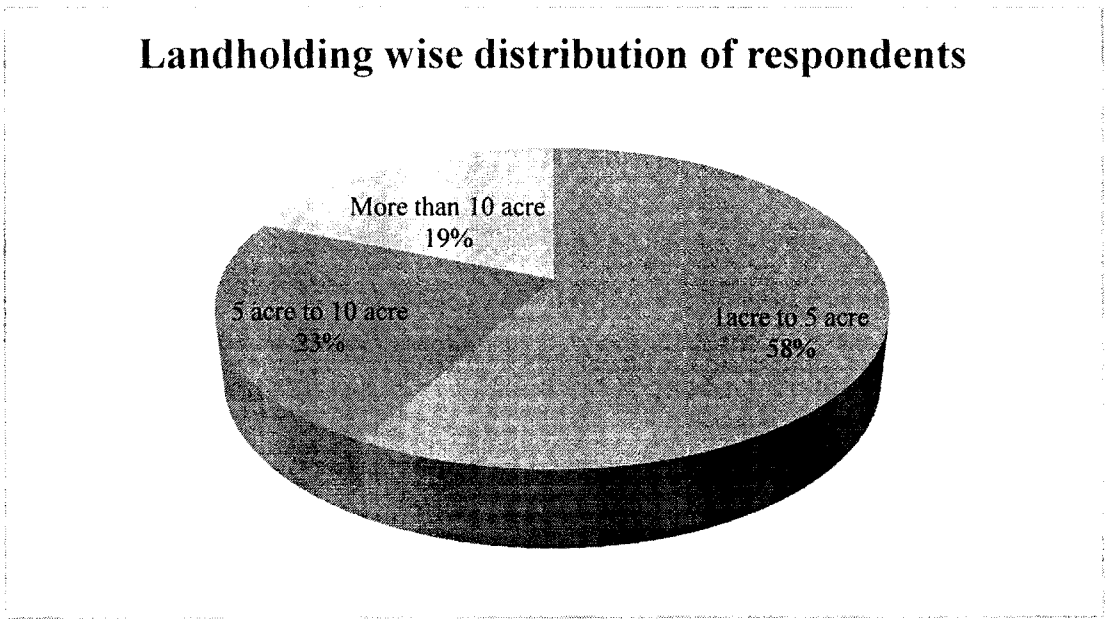
The table and chart no. 4.1.2 reveals that out of 184 famers, 39 (21percent) farmers have taken education upto less than 10th class. There are 83(45 percent) farmers who have taken education up to 12^{th} class. 56(30 percent) famers have taken education up to graduation. Only 6 (4 percent) famers have taken their education above post graduation.

Table No. 4.1.3

LANDHOLDING WISE DISTRIBUTION OF RESPONDENTS

Land Holding	No. of Respondents	Percentage
1acre to 5 acre	106	58
5 acre to 10 acre	42	23
More than 10 acre	36	19
Total	**184**	**100**

Chart No.4.1.3



It can be seen from the table and chart no.4.1.3 above that out of the sample respondents' majority i.e 106 (58 percent) farmers having landholding 1 acre to 5 acre. 42 farmers (23 percent) have landholding that ranges between 5 acres to 10 acres. 36 farmers (19 percent) having landholding more than 10 acres.

Part –II

Data analysis regarding farmer's attitude towards reliability of various information sources.

To check the farmer's attitude towards the reliability of various information sources, researcher used weighted average method. An average in which each quantity to be averaged is assigned a weight. These weightings determine the relative importance of each quantity on the average. On the basis of this relative importance ranks are assigned to variables.

To check the farmer's attitude towards the reliability of various information sources, researcher used weighted average method.

Table No.4.2.1

RANK GIVEN TO THE INFORMATION SOURCES

Sr. No	Sources of Information	Weighted Average	Rank
1	Progressive farmers	88.33	4
2	Co Farmers	89.5	1
3	Relatives	75	9
4	Krishi Sevak	76.33	8
5	Agriculture service centers	84	6
6	Taluka Agriculture Office	64	11
7	Agriculture Scientists	62.16	12
8	Krishi Vigyan Kendra	61.33	14
9	Agriculture Research Stations	62.16	12
10	Agriculture Universities	64.83	10
11	Agricultural Exhibitions	89	2
12	Newspaper	88.5	3
13	Television	88.33	4
14	Radio	82.83	7

It can be observed from the table no.4.2.1 above, that farmers showed more reliability towards the information received from Co-farmers with weighted average score 89.5. Next to Co-farmers, farmers showed reliability towards information received through Agricultural Exhibitions with weighted average score 89. It can be seen that media also proved as a reliable information source to farmers. Towards Television, Newspaper and Radio, farmers showed reliability with weighted average 88.5, 88.33 and 82.83 respectively. Famers also

showed reliability towards the information they receive through Progressive Farmers with weighted average score 88.33.

Farmers also showed reliability towards the Agriculture Service Centers with weighted average score 84 and towards Relatives with 75. Farmers showed less reliability towards Krishi Sevak with weighted average score 76.33. Farmers showed less reliability towards Taluka Agriculture Office, Agriculture Scientists, Krishi Vigyan Kendra, Agriculture Research Stations and Agriculture Universities with weighted average scores 64, 62.16, 61.33, 62.16, and 64.83 respectively. The reason may be many of the farmers do not have any experience about these information sources.

Part –III

Data analysis regarding importance given by the farmers to various factors while purchasing agri inputs.

For analyzing the importance given by farmers to various factors Mean and Standard deviation method is used.

Mean gives an indication of the average of a set of data. Here, variable with higher mean indicates greater importance is given to this variable by the respondents.

Standard deviation allows comparing two sets of data to see how far they differ from the mean. The variable with a low standard deviation indicates that the data points tend to be very close to the mean, whereas high standard deviation indicates that the data points are spread out over a large range of values.

A) Common Important Factors while purchasing agri-inputs, viz, Seed, Fertilizer and Plant Protecting Chemicals.

Table No.4.3.1

COMMON IMPORTANT FACTORS WHILE PURCHASING AGRI-INPUTS

Factors	Mean	Standard Deviation
Price	2.74	0.44
Brand	1.69	0.67
Availability	2.14	0.74
Credit	1.35	0.56
Dealer Relation	1.29	0.47

The farmers were asked to rate the factors on the basis of their importance while purchasing agri inputs viz, Seeds, Fertilizers and Plant Protecting Chemicals. It can be seen from the table no. 4.3.1, that maximum importance was given to 'Price' by the farmers with mean score of 2.74. 'Availability' was given next importance with mean score 2.14. Next to Price and Availability, farmers gave importance to 'Brand' of agri-input with mean score 1.69. Farmers gave less importance to 'Credit' facility and 'Dealer Relation' with mean scores 1.35 and 1.29 respectively.

B) Important Factors while purchasing agri-input, Seed.

Table No.4.3.2

IMPORTANT FACTORS WHILE PURCHASING AGRI-INPUT, SEED

Factors	Mean	Standard Deviation
Purity	2.01	0.76
High Yielding Variety	3.00	00

The farmers were asked to rate the factors on the basis of their importance while purchasing agri input 'Seed'. It can be seen from the table no.4.3.2 that all the farmers gave importance to 'High yielding variety' with mean score of 3.00. 'Purity' was given next importance with mean score 2.01.

C) Important Factors while purchasing agri-input, Fertilizers

Table No.4.3.3

IMPORTANT FACTORS WHILE PURCHASING AGRI-INPUT, FERTILIZERS

Factors	Mean	Standard Deviation
Fertilizers that Fulfill Soil Nutrient Requirement	2.47	0.58
According to Crop Type Requirement	3.00	0
Disease Resistance Power of Fertilizers	1.67	0.63

The farmers were asked to rate the factors on the basis of their importance while purchasing agri input, 'Fertilizers'. It can be seen from the table no.4.3.3 that maximum importance was given to selecting the fertilizer 'According to Crop Type Requirement' by the farmers with mean score of 3.00.Next importance was given to selecting 'Fertilizers that Fulfill Soil Nutrient Requirement' with mean score 2.47.Choosing fertilizer with 'Disease Resistance Power' was given lesser importance with mean score 1.67.

D) Important Factors while purchasing agri-input, Plant Protecting Chemicals

Table No.4.3.4

IMPORTANT FACTORS WHILE PURCHASING AGRI-INPUT, PLANT PROTECTING CHEMICALS

Factors	Mean	Standard Deviation
Certified Plant Protecting Chemical	1.63	0.63
Less Toxic Plant Protecting Chemical	1.82	0.79
Easy and Safe to use Plant Protecting Chemical	2.14	0.72

The farmers were asked to rate the factors on the basis of their importance while purchasing agri input 'Plant Protecting Chemicals'. It can be seen from the table no.4.3.4, that maximum importance was given to plant protecting chemicals which are 'Easy and Safe to Use' by the farmers with mean score of 2.14. Farmers gave importance to selecting 'Less Toxic Plant Protecting Chemical' with mean score of 1.82.Farmers gave less importance to selecting 'Certified Plant Protecting Chemical' with mean score of 1.63.

Part-IV

Hypothesis Testing

Hypotheses are formed and tested using t-test to check the impact of age, educational qualification and landholding of farmers on agri-input buying behaviour of farmers.

A t-test is an inferential test that determines if there is a significant difference between the means of two data sets. In other words, a t-test decides if the two data sets come from the same population or from different populations.

The independent samples t-test is used to test the hypothesis that the difference between the means of two samples is equal to 0; this hypothesis is therefore called the null hypothesis. The table displays the difference between the two means, and the 5% level of significance. Next follow the test statistic t, the Degrees of Freedom (DF) and the two-tailed probability P. When the P-value is less than the conventional 0.05, the null hypothesis is rejected and the conclusion is that the two means do indeed differ significantly.

Hypothesis No. 1

1. Farmer's preferences towards buying variables changes with their age.

This hypothesis is tested as follows

Age and preferences towards variables

The hypothesis is set on the basis of Age group

H_0: There is no significant difference between the age of farmers and their buying preferences

H_1: There is significant difference between the age of farmers and their buying preferences.

i. Farmers from age group 20 years to 30 years and 30 years to 40 years show similar preferences towards buying variables.

Table No.4.4.1

t- TEST BETWEEN AGE GROUP 20 YRS. TO 30 YRS. AND 30 YRS. TO 40 YRS.

t-Test: Two-Sample Assuming Equal Variances		
	Variable 1	Variable 2
Mean	2.11421903	2.066346088
Variance	0.02889095	0.025577621
Observations	33	80
Pooled Variance	0.026532815	
Hypothesized Mean Difference	0	
df	111	
t Stat	1.420565307	
P(T<=t) one-tail	0.079123056	
t Critical one-tail	1.658697266	
P(T<=t) two-tail	0.158246112	
t Critical two-tail	1.981566695	

As shcwn in the table no.4.4.1, the critical value of't' for 111 d.f. at 5 % level of significance for two – tailed test is 1.981. P value is greater than 0.05 and calculated value of't' is less than critical value of't', it is not significant. Hence null hypothesis is accepted and it is concluded that there is no significant difference between preferences towards buying variables between farmers from age group 20 years to 30 years and 30 years to 40 years.

ii. Farmers from age group 30 years to 40 years and 40 years to 50 years show similar preferences towards buying variables.

Table No.4.4.2

t- TEST BETWEEN AGE GROUP 30 YRS. TO 40 YRS. AND 40 YRS. TO 50 YRS.

t-Test: Two-Sample Assuming Equal Variances		
	Variable 1	Variable 2
Mean	2.066346088	2.087533069
Variance	0.025577621	0.03369568
Observations	80	29
Pooled Variance	0.027701973	
Hypothesized Mean Difference	0	
df	107	
t Stat	-0.587279013	
P(T<=t) one-tail	0.279126779	
t Critical one-tail	1.659219312	
P(T<=t) two-tail	0.558253557	
t Critical two-tail	1.982383312	

As shown in the table no.4.4.2, the critical value of 't' for 107 d.f. at 5 % level of significance for two –tailed test is 1.982. P value is greater than 0.05 and calculated value of 't' is -0.5872. Hence null hypothesis is accepted at 5 % level of significance and it is concluded that there is no significant difference between preferences towards buying variables between farmers from age group 30 years to 40 years and 40 years to 50 years.

iii. Farmers from age group 40 years to 50 years and 50 years and above show similar preferences towards buying variables.

Table No.4.4.3

t- TEST BETWEEN AGE GROUP 40 YRS. TO 50 YRS. AND 50 YRS. AND ABOVE

t-Test: Two-Sample Assuming Equal Variances		
	Variable 1	Variable 2
Mean	2.087533069	2.0604395
Variance	0.03369568	0.035080234
Observations	29	42
Pooled Variance	0.034518386	
Hypothesized Mean Difference	0	
df	69	
t Stat	0.603997925	
P(T<=t) one-tail	0.273912891	
t Critical one-tail	1.667238549	
P(T<=t) two-tail	0.547825782	
t Critical two-tail	1.99494539	

As shown in the table no.4.4.3, the critical value of't' for 69 d.f. at 5 % level of significance for two –tailed test is 1.994. P value is greater than 0.05 and calculated value of't' is less than critical value of 't', it is not significant .Hence null hypothesis is accepted at 5 % level of significance and it is concluded that there is no significant difference between preferences towards buying variables between farmers from age group 40 years to 50 years and 50 years and above.

iv. Farmers from age group 20 years to 30 years and 50years and above show similar preferences towards buying variables

Table No.4.4.4

t- TEST BETWEEN AGE GROUP 20 YRS. TO 30 YRS. AND 50 YRS. AND ABOVE

t-Test: Two-Sample Assuming Equal Variances		
	Variable 1	Variable 2
Mean	2.11421903	2.0604395
Variance	0.02889095	0.035080234
Observations	33	42
Pooled Variance	0.032367123	
Hypothesized Mean Difference	0	
df	73	
t Stat	1.285037906	
P(T<=t) one-tail	0.101420685	
t Critical one-tail	1.665996224	
P(T<=t) two-tail	0.202841371	
t Critical two-tail	1.992997097	

As shown in the table no.4.4.4, the critical value of't' for 73 d.f. at 5 % level of significance for two tailed test is 1.992. P value is greater than 0.05 and calculated't' is less than critical value of 't', it is not significant. Hence null hypothesis is accepted at 5 % level of significance and it is concluded that there is no significant difference between preferences towards buying variables between farmers from age group 20 years to 30 years and 50years and above.

Hypothesis No. 2

1 Farmer's preferences towards buying variables changes with their educational qualification.

This hypothesis is tested as follows
Education and preferences towards variables

The hypothesis is set on the basis of Educational Qualification

H_0: There is no significant difference between the education of farmers and their buying preferences

H_1: There is significant difference between the education of farmers and their buying preferences

i. Farmers from education group less than 10^{th} and 10^{th} to 12^{th}show similar preferences towards buying variables.

Table No.4.4.5

t- TEST BETWEEN EDUCATION GROUP LESS THAN 10^{TH}"AND 10^{TH} TO 12^{TH}

t-Test: Two-Sample Assuming Equal Variances		
	Variable 1	Variable 2
Mean	2.10650888	2.053753475
Variance	0.03413746	0.024496311
Observations	39	83
Pooled Variance	0.02754934	
Hypothesized Mean Difference	0	
df	120	
t Stat	1.6372038	
P(T<=t) one-tail	0.05210386	
t Critical one-tail	1.6576509	
P(T<=t) two-tail	0.10420773	
t Critical two-tail	1.97993038	

As shown in the table no.4.4.5, the critical value of't' for 120 d.f. at 5 % level of significance for two tailed test is 1.979. P value is greater than 0.05 and calculated't' is less than critical value of't', it is not significant. Hence null hypothesis is accepted at 5 % level of significance and it is concluded that there is no significant difference between preferences towards buying variables between farmers from education group less than 10^{th} and 10^{th} to 12^{th}.

ii. Farmers from education group 10^{th} to 12^{th} and 12^{th} to graduate show similar preferences towards buying variables.

Table No.4.4.6

t- TEST BETWEEN EDUCATION GROUP 10^{TH} TO 12^{TH} AND 12^{TH} TO GRADUATE

t-Test: Two-Sample Assuming Equal Variances		
	Variable 1	Variable 2
Mean	2.05375348	2.074175824
Variance	0.02449631	0.032267732
Observations	83	56
Pooled Variance	0.02761622	
Hypothesized Mean Difference	0	
df	137	
t Stat	-0.71063925	
P(T<=t) one-tail	0.23925792	
t Critical one-tail	1.65605208	
P(T<=t) two-tail	0.47851584	
t Critical two-tail	1.97743118	

As shown in the table no.4.4.6, the critical value of't' for 137 d.f. at 5 % level of significance for two - tailed test is 1.977. P value is greater than 0.05 and calculated't' is -0.710, it is not significant. Hence null hypothesis is accepted at 5 % level of significance and it is concluded that there is no significant difference between preferences towards buying variables between farmers from education group 10^{th} to 12^{th} and 12^{th} to graduate.

iii. Farmers from education group 12th to graduate and Post Graduate show similar preferences towards buying variables.

Table No.4.4.7

t- TEST BETWEEN EDUCATION GROUP 12TH TO GRADUATE AND POST GRADUATE

t-Test: Two-Sample Assuming Equal Variances		
	Variable 1	Variable 2
Mean	2.07417582	2.230769231
Variance	0.03226773	0.018934911
Observations	56	6
Pooled Variance	0.03115666	
Hypothesized Mean Difference	0	
df	60	
t Stat	-2.06524601	
P(T<=t) one-tail	0.02161399	
t Critical one-tail	1.67064887	
P(T<=t) two-tail	0.04322797	
t Critical two-tail	2.0002978	

As shown in the table no.4.4.7, the critical value of't' for 137 d.f. at 5 % level of significance for two - tailed test is 2.000. P value is lesser than 0.05 and calculated't'- 2.065. Hence null hypothesis is rejected at 5 % level of significance and it is concluded that there is significant difference between preferences towards buying variables between farmers from education group 12th to graduate and Post Graduate.

iv. Farmers from education group less than 10^{th} and Post Graduate show similar preferences towards buying variables.

Table No.4.4.8

t- TEST BETWEEN EDUCATION GROUP LESS THAN 10^{TH} AND POST GRADUATE

t-Test: Two-Sample Assuming Equal Variances		
	Variable 1	Variable 2
Mean	2.10650888	2.230769231
Variance	0.03413746	0.018934911
Observations	39	6
Pooled Variance	0.03236972	
Hypothesized Mean Difference	0	
df	43	
t Stat	-1.57494277	
P(T<=t) one-tail	0.0612997	
t Critical one-tail	1.6810707	
P(T<=t) two-tail	0.12259939	
t Critical two-tail	2.01669217	

As shown in the table no.4.4.8, the critical value of 't' for 43 d.f. at 5 % level of significance for two - tailed test is 2.016. P value is greater than 0.05 and calculated't' is - 1.574,it is not significant. Hence null hypothesis is accepted at 5 % level of significance and it is concluded that there is no significant difference between preferences towards buying variables between farmers from education group less than 10^{th} and Post Graduate.

Hypothesis No. 3

2 Farmer's preferences towards buying variables changes with their landholdings.

This hypothesis is tested as follows
Landholding and preferences towards variables

The hypothesis is set on the basis of Landholding

H_0: There is no significant difference between the farmer's landholding and their buying preferences

H_1: There is significant difference between the farmer's landholding and their buying preferences

i. Farmers with landholding 1acres to 5 acres and farmers with landholding 5 acres to 10 acres show similar preferences towards buying variables.

Table No.4.4.9

t- TEST BETWEEN LANDHOLDING 1ACRES TO 5 ACRES AND LANDHOLDING 5 ACRES TO 10 ACRES

t-Test: Two-Sample Assuming Equal Variances		
	Variable 1	Variable 2
Mean	2.089985486	2.073260073
Variance	0.032062181	0.027407239
Observations	106	42
Pooled Variance	0.030754971	
Hypothesized Mean Difference	0	
df	146	
t Stat	0.523077341	
P(T<=t) one-tail	0.300856689	
t Critical one-tail	1.655357345	
P(T<=t) two-tail	0.601713378	
t Critical two-tail	1.976345623	

As shown in the table no.4.4.9, the critical value of 't' for 146 d.f. at 5 % level of significance for two - tailed test is 1.97. P value is greater than 0.05 and calculated't' is 0.523,it is not significant. Hence null hypothesis is accepted at 5 % level of significance and it is concluded that there is no significant difference between preferences towards buying variables between farmers with landholding 1acres to 5 acres and farmers with landholding 5 acres to 10 acres.

ii. Farmers with landholding 5 acres to 10 acres and farmers with landholding more than 10 acres show similar preferences towards buying variables.

Table No.4.4.10

t- TEST BETWEEN LANDHOLDING 5ACRES TO 10ACRES AND LANDHOLDING MORE THAN 10 ACRES

t-Test: Two-Sample Assuming Equal Variances		
	Variable 1	Variable 2
Mean	2.073260073	2.042735043
Variance	0.027407239	0.02415704
Observations	42	36
Pooled Variance	0.025910437	
Hypothesized Mean Difference	0	
df	76	
t Stat	0.834924747	
P(T<=t) one-tail	0.203188517	
t Critical one-tail	1.665151354	
P(T<=t) two-tail	0.406377034	
t Critical two-tail	1.991672579	

As shown in the table no.4.4.10, the critical value of't' for 76 d.f. at 5 % level of significance for two - tailed test is 1.99. P value is greater than 0.05 and calculated't' is 0.834,it is not significant. Hence null hypothesis is accepted at 5 % level of significance and it is concluded that there is no significant difference between preferences towards buying variables between farmers with landholding 5 acres to 10 acres and farmers with landholding more than 10 acres.

iii. Farmers with landholding 1acres to 5 acres and farmers with landholding more than 10 acres show similar preferences towards buying variables.

Table No.4.4.11

t- TEST BETWEEN LANDHOLDING 1ACRES TO 5 ACRES AND LANDHOLDING MORE THAN 10 ACRES

t-Test: Two-Sample Assuming Equal Variances		
	Variable 1	Variable 2
Mean	2.089985486	2.042735043
Variance	0.032062181	0.02415704
Observations	106	36
Pooled Variance	0.030085895	
Hypothesized Mean Difference	0	
df	140	
t Stat	1.412161702	
P(T<=t) one-tail	0.080060645	
t Critical one-tail	1.655810511	
P(T<=t) two-tail	0.16012129	
t Critical two-tail	1.977053689	

As shown in the table no.4.4.11, the critical value of't' for 140 d.f. at 5 % level of significance for two - tailed test is 1.977. P value is greater than 0.05 and calculated't' is 1.412,it is not significant. Hence null hypothesis is accepted at 5 % level of significance and it is concluded that there is no significant difference between preferences towards buying variables between farmers with landholding 1acres to 5 acres and farmers with landholding more than 10 acres.