

# Chapter 5

## Presentation and analysis of data

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The information about the sample households of Silani Village that was surveyed by the investigator, has been grouped in one-way or two-way tables. The one-way tables are expected to several some Socio- Economic characteristics of rural households and are presented in section 5.1. These tables are from 5.1 to 5.5. Table 5.6 contains the distribution of total income of households by sources; and the distribution of total expenditure of households by items is given in table 5.7.

Section 5.2 contains two-way tables pertaining to distribution of households by two attributes. These tables are expected to throw some light on the association of standard of living with other socio-economic attributed of the households. Wherever possible, Chi-Square test has been also been conducted to exhibit these relationships. These tables are from 5.8 to 5.15.

Since Chi-Square test employed here is a non- parametric test and a two-way table allows the study of the relationship between two attributes only, a multiple regression analysis is carried out. The weighted least squares (WLS) estimates of a multiple variable linear probability model are presented and interpreted in section5.3. These estimates are helpful in studying the role of socio-economic factors in the determination of standard of living of households in rural areas.

### 5.1 One- Way Tables

Size of family plays an important role in the saving and investment behaviour of households. The distribution of households included in the sample by size is given in table 5.1. The table shows that the majority (80%) of households have 4 to 6 members in their family. Twelve percent households have 6 to 10 members while only 8 percent households are having one to three members in their family. The average size of family is about 5 members.

Table: 5.1

### Distribution of Households According to Family Size

Family Size	1-3	4-6	6-10	Total
No. of Households	8	80	12	100

Sources: - Primary Survey Conducted in the month of May, 2011

Caste wise distribution of sample households is shown in table 5.2; sixty nine percent of the households in the village belong to General category, while 17% and 14% of households belong to BC and SC categories respectively.

Table: 5.2

### Distribution of Households According to their Caste

Caste	General	BC	SC	Total
No. of Households	69	17	14	100

Sources: - Primary Survey Conducted in the month of May, 2011

Table 5.3 contains the distribution of households by income and expenditure. 49 percent of households of the village earn up to Rs. 5,000 only while 33 percent households earn between Rs. 5,000 to 10,000. While, the rest 18 percent households earn more than Rs.10, 000 per month. The average earning of a typical household per month is about Rs. 5500 per month. Similarly a majority of households (78%) in the village expend up to Rs. 5000 per month only. And about 22 percent expend more than Rs.5000 per month. The average spending by a typical household in the

village is more than Rs. 5012 per month. This shows that by and large the rural households can, on an average, around Rs 500 per month.

Table: 5.3

Distribution of Households According to their Income and Expenditure

Income and Expenditure	No. of Households	
	Income	Expenditure
0-5000	49	78
5000-10000	33	15
Above 10000	18	7
Total	100	100

Sources: - Primary Survey Conducted in the month of May, 2011

The distribution of households according to debt burden is given in table 5.4. Out of about 41 % households that have taken loan 13 (29%) have borrowed up to Rs. 15000 by 16(44%) have borrowed between Rs. 15000 to 30000 and the remaining 22(54%) have borrowed more than Rs.30000. thus a majority of households (59%) are not under debt but those who are under debt carry differential debt burden.

Table 5.4

Distribution of Households According to their Loan Amount

Amount of Loan	No. of Households	Percentage
0-15000	13	29
15000-30000	16	44
Above 30000	22	54
Total	41	100

Sources: - Primary Survey Conducted in the month of May, 2011

The distribution of households according their standard of living is reported in table 5.5. According to the table about 27 percent households belong to the below-normal category, 49 percent have normal standard of living while 24 percent households enjoy above- normal standard of living.

Table 5.5

Distribution of Households According to their Standard of Living

Standard of Living	Below Normal	Normal	Above Normal	Total

No. of Household	27	49	24	100

Sources: - Primary Survey Conducted in the month of May, 2011

The distribution of sample households' income by source has been shown in table 5.6. The table reveals that about 24 percent income is sourced from cultivation of land, followed by 23 percent from employment and 16 percent of the total income comes from wage labour, 10 percent of the income comes from selling milk and milk products. Business activities contribute to the extent of 8 percent while interest income and shop keeping contribute to the tune of 4 percent each. Miscellaneous sources contribute up to 12 percent.

Table 5.6

Source wise Distribution of Income of All the Households

Source of Income	Income	Percentage
Cultivation of Land	200500	24
Milk Selling	80000	10

Services	190900	23
Labour	128600	16
Business	64000	8
Interest Income	30000	4
Shopkeeper	33000	4
Miscellaneous	98000	12
Total	825000	100

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Sources: - Primary Survey Conducted in the month of May, 2011

Item wise distribution of total expenditure of all households has been shown in table 5.7. The table reveals that the households of village Silani spend their income on nine items which can be listed as food grain, vegetable, milk, clothes, education, health, fuel, housing and miscellaneous expenditures. According to the information given in the table, 17 percent is spent on food grains, only 6 percent on vegetables, 19 percent on milk and milk products, 10 percent on clothes, 19 percent on education and 8 on health. Fuel account and housing account for about 4 percent each and the remaining is spent on miscellaneous items that are consumed or maintained in the household. Thus food constitutes the major (42%) expenditure items followed by education/ clothes and health.

Table 5.7

Distribution of total expenditure of all the households.

Items	Total Expenditure	Percentage
Food grains	89200	17
Vegetable	31500	6
Milk Items	100200	19
Clothes	51950	10
Education	100030	19
Health	44309	8
Fuel	19540	4
Housing	23470	4
Miscellaneous exp.	65940	13
Total	526139	100

## 5.2 Two-Way Tables

The distribution of households by caste and level of standard of living is given in table 5.8. The table shows that out of 69 households that belong to the general category, a majority 40 (58%) are having normal standard of living while 14(20%) are enjoy below normal living standard and the remaining 15(22%) are having above-normal living standard. Out of 17 BC category households, 6(35%) are having below-normal while 7(41%) and 4(24%) households are having normal and above-normal standard of living. Out of 14 households that belongs to the SC category a majority 7(50%) belongs to the below-normal category of living standard. While 2(14%) and 5(36%) of them are having normal and above-normal standard of living.

To know whether there exists any association between the caste and level of living standard, a Corrected Chi- Square test was employed. The null hypothesis of no association between the two attributes of the households could not be rejected as the computed value (7.36) of corrected Chi-Square statistic for 4 degree of freedom was found to be less than the tabulated value (9.488) at 5 percent level of significance. Thus, it can be concluded that the level of living standard has no association or relationship with the caste of a household.

Table: 5.8

Distribution of Household by Caste and Standard Opinion

Caste	Standard of living			Total
	Below normal	Normal	Above normal	

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General	14 (20)	40 (58)	15 (22)	69
BC	6 (35)	7 (41)	4 (24)	17
SC	7 (50)	2 (14)	5 (36)	14
Total	27	49	24	100

Sources: - Primary Survey Conducted in the month of May, 2011

(.) Brackets Contain Percentage

The distribution of households according to the income and the standard of living has been given in table 5.9. The table shows that out of 65 households that have income up to Rs.8000, a majority 37(57%) have normal and 20(31%) are having below normal level of living standard. While the remaining 8(12%) belongs to the above- normal level of living standard. Out of 35 households that earn between Rs.8000 and Rs. 16000, 16(46%) are enjoying above- normal standard of living, while 12(24%) and 7(20%) are having below- normal and normal level of living standard respectively.

Also a hypothesis of no relationship between level of income of the households and their level of living standard was rejected on the basis of Chi square test, as the calculated value (10.46) is greater than the tabulated value (9.21), at 1 percent level of significance for 2 degree of freedom. Thus, income of households plays a role in the determination of its living standard.

Table: 5.9

Distribution of Household According to their Standard of Living and Income Level

Income	Standard of living			Total
	Below normal	Normal	Above normal	

0-8000	20 (31)	37 (57)	8 (12)	65
8001-16000	7 (20)	12 (24)	16 (46)	35
Total	27	49	24	100

Sources: - Primary Survey Conducted in the month of May, 2011

(.) Brackets contain Percentage

The distribution of households by education level and standard of living is given in table 5.10. The table shows that the 61 households that have studied up to 12<sup>th</sup> class, a majority 36(59%) are having normal standard of living. While 19(31%) and 6(10%) are having below-normal and above-normal respectively. Also, out of the 29 households that have studied beyond 12<sup>th</sup> class 18(46%) are enjoying above-normal living standard while 8(21%) and 13(33%) are having below-normal and normal standard of living respectively.

To see whether education of a household plays any role in the determination of its living standard a Chi-Square test was employed. The null hypothesis of no association between education and the level of standard of living was rejected at 1percent level of significance, as the calculated value (17.23) of Chi-Square exceeded the tabulated value (9.21) for 2 degree of freedom and 1 percent of level of significance. Thus, education appears to play an important role in the determination of households' living standard.

Table: 5.10

Distribution of Households by Education Level and Standard of Living

Education	Standard of living			Total
	Below normal	Normal	Above normal	
Up to 12 <sup>th</sup>	19 (31)	36 (59)	6 (10)	61

Above 12 <sup>th</sup>	8	13	18	39
	(21)	(33)	(46)	
Total	27	49	24	100

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Sources: - Primary Survey Conducted in the month of May, 2011

(.) Brackets Contain Percentage

Households' distribution by size of family and standard of living is reported in table 5.11. The table reveals that out of the 8 households that have family size up to 3 members, 3(38%) are having normal living standard, 1(12%) is in the category of below-normal and the majority 4(50%) are having above-normal standard of living. Similarly, out of the 80 households that have a family size of 4 to 6 members, 43(54%) are having normal standard of living while 19(24%) and 18(22%) are respectively having below-normal and above-normal standard of living respectively. Also out of the 12 remaining households that have family size between 6 to 10 members, 7(58%) fall in category of below-normal standard of living while 3(25%) and 2(17%) are having normal and above-normal standard of living. Since size of family size, its composition and dependency ration are important factors into the determination of the households under consideration, it is instructive to investigate, this with the help of a Chi-Square test. The null hypothesis of no relationship could not be rejected as the calculated value (6.34) is less than the tabulated value (9.49) for 4 degree of freedom and 5 percent level of significance.

Table: 5.11

Size of Family and Level of Standard of Households

Size of family	Standard of living			Total
	Below normal	Normal	Above normal	

0-3	1 (12)	3 (38)	4 (50)	8
4-6	19 (24)	43 (54)	18 (22)	80
6-10	7 (58)	3 (25)	2 (17)	12
Total	27	49	24	100

Sources: - Primary Survey Conducted in the month of May, 2011

(.) Brackets contain Percentage

The distribution of households by size of land and living standard is presented in table 5.12. Out of 40 households whose holding size is up to 2 Acres, majority 27(68%) of them are having normal living standard, while 7(17%) and 6(15%) are having below- normal and above- normal standard of living respectively. Of the 26 households that own land between 2 to 4 Acres, a majority 15(58%) are in the category of normal living standard, while the remaining 1(4%) and 10(38%) are having below-normal and above- normal standard of living respectively. Out of the 12 households that have 4 to 6 Acres of land, a majority 8(67%) are enjoying above-normal standard of living and other 4(33%) are having normal living standard.

Table: 5.12

Distribution of Household According to Size of Land and Standard of Living

Size of Land Acres	Standard of living			Total
	Below normal	Normal	Above normal	

0-2	7 (17)	27 (68)	6 (15)	40
2.1-4	1 (4)	15 (58)	10 (38)	26
4.1-6	0 (0)	4 (33)	8 (67)	12
Total	8 (10)	46 (59)	24 (31)	78

Sources: - Primary Survey Conducted in the month of May, 2011

(.) Brackets Contain Percentage

The distribution of households by type of houses and standard of living is shown in table 5.13. Out of 22 households that have Kachha house, a majority 13(65%) belong to the below-normal category while another 7(35%) having Kachha house belong to normal standard of living. None of the households having Kachha house belong to above-normal standard of living, Out of 31 households that have semi-pacca house. 13(39%), 11(34%) and 9(27%) are having normal, above-normal and below-normal standard of living respectively, and out of 47 that have Pacca houses 8(67%) have above-normal and 4(33%) have normal standard of living. None of the households that have Pacca house belongs to below-normal standard of living.

Table: 5.13

## Distribution of Household According to House Type and Standard of Living

House Type	Standard of living			Total
	Below normal	Normal	Above normal	
Kachcha	13 (65)	7 (35)	0 (0)	22
Semi Pacca	9 (27)	13 (39)	11 (34)	31
Pacca	5 (10)	29 (62)	13 (28)	47
Total	27	49	24	100

Sources: - Primary Survey Conducted in the month of May, 2011

(.) Brackets contain Percentage

Distribution of households according to the size of house and standard of living has been shown in table 5.14. The table shows that out of 32 households that have up to 150 square feet house, 14(44%) , 13(41%) and 5(15%) are having below-normal, normal and above-normal standard of living respectively. Out of 37 who own houses of size 150 to 3000 square feet a majority 23(62%) are having normal, 8(22%) are having below- normal and other 6(16%) are having above-normal standard of living. Out of the 31 that have house of size 300 to 450 square feet, 5(16%), 13(42%) and 13(42%) are having below- normal, normal and above-normal standard of living. Thus null hypothesis of no association between the size of house and the standard of living was rejected at 5 percent level of significance as the calculated value (13.13) is higher than the tabulated value (9.49). Thus the size of houses and level of living standard are related with each other.

Table 5.14

## Distribution of Household According to Size of House and Standard of Living

Size of House	Standard of living			Total
	Below normal	Normal	Above normal	
0-150	14 (44)	13 (41)	5 (15)	32
151-300	8 (22)	23 (62)	6 (16)	37
301-450	5 (16)	13 (42)	13 (42)	31
Total	24	49	24	100

Sources: - Primary Survey Conducted in the month of May, 2011

(.)

Brackets Contain Percentage

Standard of living and occupation wise distribution of households is given in table 5.15. The table reveals that out of the 51 households that are agriculturist 15(29%), 22(44%) and 14(27%) are having respectively below-normal, normal and above-normal standard of living respectively. Of the 49 who are not engaged in agricultural profession, a majority 27(55%) are having normal, 12(25%) are having below-normal and 10(20%) are having above-normal standard of living respectively. A null hypothesis of no relationship between occupation and level of living standard could not be rejected as the calculated value (1.44) of Chi-square statistics is smaller than the tabulated value (5.99) for 2 degree of freedom at 5 percent level of significance. Thus, there is no association between living standard and occupation of a household as per the Chi-square test applied to the sample observations.

Table: 5.15

Distribution of Household According to Occupation and Standard of Living

Occupation	Standard of living			Total
	Below normal	Normal	Above normal	
Agriculture	15 (29)	22 (44)	14 (27)	51
Non-Agriculture	12 (25)	27 (55)	10 (20)	49
Total	27	49	24	100

Sources: - Primary Survey Conducted in the month of May, 2011

(.) Brackets contain Percentage

### 5.3 Determinants of standard of living

We tested a number of hypotheses about the pair wise relationship or association of standard of living, on one hand and socio-economic factors such as size of family, education level, and income of the households, occupation and caste of the households, on other hand with the help of Chi-Square test. But the scope of Chi-Square test is limited in the sense that it is a nonparametric test and tells about only the association between pair of attributes. It does not tell about the causation and magnitude of association between different factors. It is also possible that the presence or absence of association between two attributes as exhibited by Chi-Square test may be due to some third factor. It is, therefore, better to study the effect of the factors simultaneously.



Regression analysis is a better way to know the influence of various Socio-Economic factors on the standard of living. Since standard of living is a qualitative variable, we redefine the standard of living as binary variable taking value one when a household belongs to above-normal standard of living and zero for normal and below-normal living standard. For studying the relationship between such a binary variable and socio-economic factors, we specify a linear probability model as;

$$P = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + u \quad \dots\dots\dots (1)$$

Where P denotes the probability of a household to belong to above-normal living standard, X<sub>1</sub> denotes size of family, X<sub>2</sub> represents education level which is a dummy variable and takes value 1 for above 12<sup>th</sup> class and 0 for up to 12<sup>th</sup> class, X<sub>3</sub> is the actual income of the household, X<sub>4</sub> represents occupation and is a dummy variable taking value 1 for farming and zero for non farming households, X<sub>5</sub> represents caste of the households and is used as a dummy variable which is equal to, one, for general category, and zero for BC or SC category.

But the LPM model has number of well known limitations. One of the most important limitation is that of heteroscedasticity i.e.; the variance of the disturbance term is not constant, and variance of the disturbance term is P (1-P). The presence of the heteroscedasticity renders the estimates inefficient. To solve the problem of heteroscedasticity, a method of Weighted Least Squares (WLS) is employed in two steps. In the first, OLS is applied to equation (1) and the predicted values P\* of P are found. In the second step we define

$$w_i = \sqrt{p_i * (1 - p_i *)}$$

And estimate the following transformed model by OLS method. The transformed model is,

$$\frac{p}{\sqrt{w_i}} = \beta_0 \frac{1}{\sqrt{w_i}} + \beta_1 \frac{x_1}{\sqrt{w_i}} + \beta_2 \frac{x_2}{\sqrt{w_i}} + \beta_3 \frac{x_3}{\sqrt{w_i}} + \beta_4 \frac{x_4}{\sqrt{w_i}} + \beta_5 \frac{x_5}{\sqrt{w_i}} + \frac{u_i}{\sqrt{w_i}} \dots (2)$$

It can be verified that the transformed disturbance term ( $\frac{u_i}{\sqrt{w_i}}$ ) is homoscedastic. The transformed equation (2) is estimated by applying OLS. The OLS when applied to the transformed equation(2) is called Weighted Least Squares Method and estimates of the coefficient so obtained are called Weighted Least Squares (WLS) estimates. The estimates of coefficients, their standard errors, t-statistics and corresponding probabilities are shown in table 5.16.

Table 5.16

## WLS Estimates of Linear Probability Model

Dependent variable P				N=100
Variable	Coefficient	Std. Error	t- statistic	Prob.
X <sub>1</sub>	-0.0139	0.0081	-1.7144	0.089
X <sub>2</sub>	0.1329	0.0213	6.2353	0.000
X <sub>3</sub>	0.0627	0.0032	19.5976	0.000
X <sub>4</sub>	-0.3047	0.0322	-9.4685	0.000
X <sub>5</sub>	-0.002	0.0208	-0.0957	0.924
C	-0.4138	0.2464	-1.6791	0.096
R-squared		0.9847		
Adjusted R squared		0.9839		
F-statistic		1210.245		
Prob.(F-statistic)		0.00		
D-W statistic		1.7635		

Sources: - Primary Survey Conducted in the month of May, 2011

The table shows that socio-economic factors included in the equation explain about 98.5 percent of the variation in the dependent variable and the model gives best fit in the present data set. The value of D-W statistic (1.764) shows that there is no positive auto correlation. Thus, the estimates seem to be robust.

The estimates of the coefficients show that the coefficient of family size is negative and significant at 9 percent level of significance. This shows that the family size affects the living standard adversely. The coefficient of education is positive and highly significant which implies that higher the education of a household, higher is the probability of its moving to higher category of living standard. Again the coefficient of income is positive and highly significant. It signifies the fact that higher the income, higher is the likelihood of a household to enjoy a higher standard of living. The coefficient of occupation is negative and highly significant which implies that the occupation of farming affects the living standard adversely in the rural areas of Haryana. Similarly, the effect of caste on living standard is negative but highly insignificant. The estimate of intercept term is negative but is significant only at 10 percent level of significance. This shows that in absence of these socio-economic factors, the likelihood or the probability of maintaining above-normal standard of living declines. The policy implication of these results is that the standard of living of the rural people can be improved through quality education and raising the income of the rural people.