

CHAPTER VII: LEADERS AND NON-LEADERS - A QUEST FOR DISCRIMINATION.

Demographic, socio-economic and a few rational aspects of rural leaders elected from three gram Panchayats of Cooch Behar district have been analysed in detail in Chapter-VI. On some aspects, a comparison has also been made between leaders and non-leaders. Now the question comes as to whether there is any difference between leaders and the non-leaders so far as demographic, socio-economic and rationality factors are in question. If the answer is in affirmative, the next question comes as what are the parameters by which one can distinguish leaders from the non-leaders (common people). The present Chapter is devoted to identifying those parameters and estimating their individual contributions towards distinguishing leaders from the non-leaders. Sixty-two out of two hundred fifty non-leader households (every fourth of 250) and sixty-seven leader households have been chosen for this classificatory analysis.

7.1: Selection of variables:

Both qualitative and quantitative characteristics of the sample households have been considered for the present analysis. It is presumed that a leader generally belongs to higher age group with relatively good educational background of himself and his family. In view of this, age and education of a leader and educational status of his family are assumed to have at higher levels than that of their non-leader counterparts. Based on above presumption of higher values on

three scores, the occupation of the leaders and the members of their families might have been at higher level. Land, being the single most important asset in the rural areas, the possession of land by a sample household has been considered as an alternative measure of economic status of the household in question. But one may raise question as to if a surplus-earning family utilises the surplus for purchasing consumer durables and other assets rather than purchase of land, the measure of economic status by land loses its relevance. In view of this, the variable material possession of the household has been taken into account. Similarly, social characteristics like access to institutional loan, personal relations with high officials, information awareness, extent of cosmopolitaness (i.e., the contact of the family with places outside the village) and house-pattern have also been taken into consideration. It is presumed also that the social variables like family type and family size have some bearing on differentiation between the families of leaders and non-leaders. The variable 'total landholding of the family' is also taken into consideration in addition to per capita landholding. This is done because of the fact that in rural areas large-sized families with a considerable amount of landholding is presumed to occupy an influential position. The details of the variables considered are presented hereunder.

X1: Age-

Actual age.

X2: Education of leader/non-leader:

Illiterate-0, Upto Class V-1, Upto Class X-2, Matriculate/H.S./Madhyamik-3, Below Graduation but above H.S.-4, Graduation-5, Post-Graduation-6, B.E./M.B.B.S.-7.

- X3: Education of family (Total Score): Scoring pattern as above.
- X4: Occupation of Leader/Head of the family: Labourer-1, Sharecropper-2, Bidi and other worker-3, Agriculture (Small)-4, Business(Small)-5, Agriculture(Big)-6, Business(Big)-7, Service-8.
- X5: Occupation of family (Total Score): Scoring pattern as above.
- X6: Per capita landholding: Actual.
- X7: Per capita income: Actual.
- X8: Access to institutional loan: Loan availed-1, Loan not availed-2.
- X9: House pattern: No house-0, Hut-1, Kuchha house-2, Mixed house-3, Pucca(Brick) house-4, Electricity-5, Mansion-6.
- X10: Material possession: Nil-0, Cycle/Bullock Cart/Radio-1, Pump set-2, T.V./Motor cycle/Scooter-3, Tractor-4.
- X11: Family type: Nuclear-0, Joint-1.
- X12: Extent of cosmopolitaness(Total Score): Frequent-3, Often-2, Rare-1, Never-0.
- X13: Personal relation with high officials (Total Score): Yes-1, No-0.
- X14: Information awareness (Total Score): Regular-3, Often-2, Rare-1, Never-0.
- X15: Total landholding of the family: Actual.
- X16: No. of adult members of the family: Actual.

7.2: Analytical Model:

To identify the discriminating factors keeping in view a classificatory analysis of the type linear multiple discriminate function approach seems to be purposeful.¹ Theoretically, two groups of nearly equal size are required for the application of the linear multiple discriminant function. This is the reason why every fourth

sample household from non-leader groups have been selected in order to make the sample nearly of equal size with that of the leader group of households. With the Discriminant Function, it is possible to find out a set of linear combination of variables which can effectively discriminate the two groups - leaders and non-leaders. The Discriminant Function used for the present analysis is as follows:

$$Z = 11 \times X1 + 12 \times X2 + 13 \times X3 + 14 \times X4 + 15 \times X5 + 16 \times X6 + 17 \times X7 + 18 \times X8 + 19 \times X9 + 110 \times X10 + 111 \times X11 + 112 \times X12 + 113 \times X13 + 114 \times X14 + 115 \times X15 + 116 \times X16.$$

Where, Z = Total discriminating score of each household,

X1= Age

X2= Education of leader/ non-leader,

X3= Education of the family,

X4= Occupation of leader/ head of the family,

X5= Occupation of the family,

X6= Per capita landholding,

X7= Per capita income,

X8= Access to institutional loan,

X9= House pattern,

X10= Material possession,

X11= Family type,

X12= Extent of cosmopolitaness,

X13= Personal relation with high officials,

X14= Information awareness,

X15= Total landholding of the family,

16= No. of adult members of the family,

l_p (p= 1,2,3.....16) are the coefficients of the linear discriminant function.

The method seeks to find out the values of coefficients (l_p 's) such that the squared difference between the mean Z - score for the other group is as large as possible in relation to the variation of Z -score within the groups.

The discrimination of the value of co-efficients (l_p 's) necessitates the solution of the following six equations shown in matrix notation.

$$S L = D$$

$$\begin{array}{rcccl}
 S = & s1.1 & s1.2 & \dots & s1.p & L = & 11 & \text{and } D = & d1 \\
 & s2.1 & s2.2 & \dots & s2.p & & 12 & & d2 \\
 & \dots & \dots & \dots & \dots & & \dots & & \dots \\
 & \dots & \dots & \dots & \dots & & \dots & & \dots \\
 & sp.1 & sp.2 & \dots & sp.p & & 1p & & dp
 \end{array}$$

Where,

$P= 16$; $\text{'lp } \times \text{'}$ is the vector of the coefficients of the discriminant function; $\text{'sp } \times \text{'}$ is the pooled dispersion matrix and $\text{'Dp } \times \text{'}$ is the vector of the elements representing differences between the means of the two groups.

The discriminant function thus obtained is subjected to test of significance in order to examine whether the variables considered together are effectively discriminating the leaders and the non-leaders. The Mahalanobis D^2 statistic has been used to measure the distance between the two groups. The D^2 statistic is transformed into F statistic of the following form in order to examine whether the two groups are different from each other.

$$F = \frac{N_a N_b (N_a + N_b - P - 1)}{P(N_a + N_b) (N_a + N_b - 2)} D^2$$

Where,

$$D^2 = \sum_{i=1}^P \sum_{k=1}^P c_{ik} d_i d_k = \sum_{i=1}^P l_i l_i d_i ;$$

c_{ik} = (i,k) th element of the inverted matrix of S.

P = Number of factors = 16.

N_a = Number of observations in the leader group = 67

N_b = Number of observations in the non-leader group = 62 .

The value of observed F is compared with that of tabulated F with (P) and $(N_a + N_b - p - 1)$ degrees of freedom at 5 per cent level of significance.

The results of the multiple linear discriminant function is shown in table 7.1. It is revealed from table that the function is highly significant statistically even at 1% level of probability. It indicates that the function is aptly discriminating the sample households into two different groups, that is the leaders and the non-leaders.

Now, the question comes as to whether the above function is able to discriminate all leaders and non-leaders considered into two different groups. It necessitates to work out total discriminating score (Z-score) for each individual respondent, both leader and non-leader groups in order to find out the extent of misclassification of the sample households. Results delineating the extent of misclassification are presented in Table 7.2. An individual Z- score under leader group exhibiting lower and the individual exhibiting Z-score under non-leader group showing higher than mean value of Z has been considered as misclassified

Table 7.1: Linear discriminant function classifying the leaders and non-leader groups.

Sl. No.	Discriminating factor		Coefficients of discriminating factor (Discriminating weight)	t-value of discriminating coefficients	R ²	\bar{R}^2	F value with (16,112) df
1.	Age of leader / head of the family	(X1)	0.0033	0.31	0.5819	0.5222	9.7432**
2.	Education of the leader / head of family	(X2)	0.0090	0.087			
3.	Education of the family	(X3)	0.015	0.539			
4.	Occupation of the leader / head of the family	(X4)	-0.0256	0.695			
5.	Occupation of the family	(X5)	0.0914	3.375**			
6.	Per capita landholding	(X6)	-0.3116	0.689			
7.	Per capita income	(X7)	-0.0000	0.268			
8.	Access to institutional loan	(X8)	0.0776	0.362			
9.	House pattern	(X9)	0.0447	0.676			
10.	Material possession	(X10)	-0.0918	0.891			
11.	Family type	(X11)	0.7533	2.837**			
12.	Extent of cosmopolitaness	(X12)	0.0902	2.108*			
13.	Personal relation with high officials	(X13)	0.0642	0.736			
14.	Information awareness	(X14)	0.0689	1.381			
15.	Total landholding of the family	(X15)	0.1251	1.810			
16.	No. of adult members	(X16)	-0.3280	3.910**			

N.B.: 1) ** stands for statistically significant at 1 per cent level of probability

2) * denotes statistically significant at 5 per cent level of probability.

Table 7.2: Extent of misclassification of respondents classified into leader and non-leader groups.

Sl. No.	Sl. No. of the sample	Value of the total discriminating score (Z)	Mean value of 'Z'	Pooled group mean of 'Z'	Misclassification (in per cent)
		LEADER GROUP			
1.	9	- 0.4305	0.8678	-0.0024	12 X 100 / 67 = 17.91
2.	12	- 0.2089			
3.	16	- 0.0814			
4.	21	- 0.7072			
5.	23	- 0.1160			
6.	40	- 0.0600			
7.	45	- 0.1744			
8.	51	- 1.1854			
9.	53	- 0.2590			
10.	57	- 0.0300			
11.	58	- 0.0154			
12.	67	- 0.0192			
		NON-LEADER GROUP			
1.	19	0.2398	-0.9429		5 X 100 / 62 = 8.06
2.	32	0.6988			
3.	36	0.7255			
4.	49	0.4784			
5.	51	0.0142			

Table 7.3: Reconstituted linear discriminant function classifying into leader and non-leader groups.

Sl. No.	Discriminating factor	Coefficients of discriminating factor (Discriminating weight)	t-value of discriminating coefficients	R ²	\bar{R}^2	F-value with (6,105) df
5.	Occupation of the family (X5)	0.0815	4.228**	0.7221	0.7062	45.4786**
11.	Family type (X11)	0.9896	3.979**			
12.	Extent of cosmopolitaness (X12)	0.1183	3.542**			
14.	Information awareness (X14)	0.1653	3.842**			
15.	Total landholding of the family (X15)	0.0773	3.152**			
16.	No. of adult members (X16)	0.2657	4.181**			

N.B.: 1) ** stands for statistically significant at 1 per cent level of probability

under the respective group.

Table 7.2 reveals that the extent of misclassification both for leader and non-leader group is not notable, 18 per cent for leaders and 8 per cent for non-leader. However, for further finer analysis, the misclassified households have been eliminated from both groups and discriminant function is constituted based on fifty-five households under leader group and fifty-seven under non-leader group. From the efficiency viewpoint, therefore, the discriminatory analysis based on fully classified sample of both groups appears to be more meaningful. The next question comes to the fore as to which factors have sufficient discriminatory powers in classifying the sample households into two different groups. For this purpose, 'Step-Down' procedure has been adopted in order to eliminate the factors having relatively less discriminating power. The variables of the step with highest value of \bar{R}^2 (Adjusted R^2) of 'Step-Down' process have been selected as the important discriminating variables (factors) for the present analysis. The results thus obtained are shown in table 7.3.

It is observed from table 7.3 that the factors, namely occupation of the family, family type, extent of cosmopolitaness, information awareness, total possession of land and the family size are noticed to have sufficient power in discriminating the sample households into two groups. The respective discriminating coefficients (Discriminating power) are also found to be statistically significant at one per cent level of probability. Thus, one may aptly

Table 7.4: Percentage contribution of the individual discriminating factor to the total distance measured between leaders and non-leaders.

Sl. No.	Discriminating factors	Coefficients of Discriminating factor (li)	t- value of coefficients	Mean difference (di)	t-value of Mean difference	Coefficients multiplied by Mean difference (li X di)	Per cent contribution
1.	Occupation of family (X5)	0.0815	4.228 **	9.805	10.120 **	0.800	
2.	Family type (X11)	0.9896	3.979 **	0.416	5.061 **	0.412	
3.	Extent of cosmopolitaness (X12)	0.1183	3.542 **	5.070	11.200 **	0.600	
4.	Information awareness (X14)	0.1653	3.842 **	4.010	9.850 **	0.663	
5.	Total landholding of family (X15)	0.0773	3.152 **	4.860	6.870 **	0.376	
6.	No. of adult members (X16)	-0.2657	4.181 **	0.820	2.323 **	-0.218	
						2.663	100.00

N.B.: ** Stands for statistically significant at 1 per cent level.

classify a household on the basis of the above six parameters whether that will belong to leader and non-leader group.

To work out the relative contribution of individual factors to total variability between the two groups, table 7.4 is prepared and presented hereunder. It is noted in the table 7.4 that the group mean difference of each of the six factors is statistically significant at one per cent level of probability. A close look to the relative contribution of individual factor to total between group variability, one may assert that the factors, namely the occupational status of family, information awareness level, extent of cosmopolitaness, family type and the total landholding of family are the important discriminating factors in classifying a household into leader and non-leader group.

7.3: Conclusion:

Thus, it emerges that both two types of variables - social and economic has played a very vital role in making a leader. The variable 'occupation of the family', for example, has 30.38 per cent contribution to the total distance measured between the leader and the non-leader families. The 'total landholding of the family' is another economic variable which has 14.28 per cent contribution. Among the social variables, family type has 15.65 per cent contribution, which shows clearly the significant role played by the joint families in making a leader. The contribution of the related variable 'No. of adult members' may also be judged in the light of the above. Likewise, 'extent of cosmopolitaness' and 'information

awareness' have played a very positive role in differentiating a leader and a non-leader in the rural nexus of Cooch Behar.

NOTES AND REFERENCES:

1. The application of Discriminant function has been done in many studies in social sciences, the references are:
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 - b) Pandey, U.K. and Muralidharan.M.A., An Application of Discriminant Function in Agricultural Finance, Indian Journal Of Agricultural Economics, Vol.XXXII, No.2, April-June, 1977.
 - c) George, P.T., Namasivayam, D., and Ramchandraiah, G.; Application of Discriminant Function In The Farmers' Repayment Performance: A Study In Chingleput District, Tamil Nadu, Journal Of Rural Development, Vol.3, No.3; May,1984.
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