

CHAPTER-5

Research Methodology

In this chapter discussion on the methodology has been made to understand the concepts, methods and techniques, which are utilized to design the study, collect the information, analyse the data and interpret the findings For revelation of truth and formulation of theories, the entire discussion for easy understanding has been made the following sub-heads.

- A. Locale of research
- B. Sampling design
- C. Pilot Study
- D. Variables and their measurements
- E. Methods of data collection
- F. Statistical tools used for analysis of data analysis.

A. Locale of Research

The present study was conducted in districts Chakdaha. The village Rautari of Chakdaha block in Nadia district of the state West Bengal were selected for the study.

- The characters and the factors under study have been well discernible to this area.
- The researcher's close familiarity with respect to area, people, officials and local dialects.
- The ample opportunity to generate relevant data due to the close proximity of the area with the research and extension wing of the state Agriculture;
- The highly cooperative, responsive respondents;
- The prevalence of the characters under study has been observed to get relevant information;
- Experienced, well versed. venturesome and risk bearing farm entrepreneurs;
- Easy accessibility of the area;

B. Sampling design

Purposive as well as simple random sampling techniques were adopted for the study. For selection of state, district. block and gram panchayat purposive sampling techniques was adopted because the area was ideal for entrepreneurship study, convenient searcher to access and having the infrastructural facilities and in case of selection of villages and respondents simple random sampling technique was taken up.

C. Pilot Study

Before taking up fieldwork a pilot study, was conducted to understand the area, its people, institution, communication and extension system and the knowledge perception and attitude of the people towards farm entrepreneurship concept.

Sampling technique and Sampling Design

Step	Items	Level	Approach
1	State	West Bengal	Purposive
2	District	Nadia	Purposive
3	Subdivision	Kalyani	Purposive
4	Block	Chakdaha	Purposive
5	Gram Panchayat	Rautari	Purposive
6	Village	Rautari	Random
7	Respondents	60	Random
Total No. of Respondents: 60			

D. Variable and their measurements

After reviewing various literature related to the field of study and consultation with the respected chairman of Advisory Committee and other experts, a list of variables was prepared. On the basis of the selected variables, a schedule was constructed.

1) Independent Variables

I. No.	Variables	Notation	Score
1	Age	X1	Chronological age
2	Education	X2	Year of Schooling
3	Family size	X3	Number of family members
4	Income	X4	Family income/head
5	Size of Holding	X5	Bigha (Homestead + cultivable)
6	Economic Land	X6	Economicland(cultivated)
7	Electric Consumption	X7	Rs. Per month

8	Fuel Consumption	X8	Rs. Per month
9	Market Interaction	X9	No of visit/month
10	Group Interaction	X10	1-10 scale
11	Distance Matrix	X11	1-10 scale
12	Orientation towards competition	X12	1-10 scale
13	Marketing Orientation	X13	1-10 scale
14	Decision Matrix purchase	X14a	1-10 scale
15	Decision Matrix Bank	X14b	1-10 scale
16	Decision Matrix Enterprise	X14c	1-10 scale
17	Idea Exchange Index Enterprise	X15a	1-10 scale
18	Idea Exchange Index Health	X15b	1-10 scale
19	Idea Exchange Index Education	X15c	1-10 scale

- i. **Age (x1):** In all societies, age is one of the most important determinants of social status and SOCI role of the individual. It is said that young farmers are more inclined to the change than the aged farmer who usual; slick lo their traditionally bound old practices. In the present study, age of the respondent was measured on the basis of their chronological age at the time of investigation.
- ii. **Education (x2):** Education is instrumental in building personality structure and helps in changing one's behavior in social life. Education may be conceptualized as the amount of formal schooling attained/literacy acquired by the responded.

- iii. **Family size (x3):** Total number of adult and minor family member present in a family.
- iv. **Income (x4):** The Annual income of a person is an important parameter to assess the economic status of the person in the society. Total income from farm and off-farm sources earned by the unit of Family in a year. Annual income has been scored as family income/month/family size.
- v. **Size of Holding (x5):** The amount of land owned by a person is an important parameter to assess the economic status of the person in the society. The attribute size of holding had been measured by addition of homestead and cultivable land in Bigha.
- vi. **Economic Land (x6):** The amount of Operational Land owned by a person is an important parameter to assess. The economic status of the person in the society. The attribute economic land had been measured by land on which cultivation of crops is being carried out by the farmers.
- vii. **Electric Consumption(x7):** = Electricity consumption (cost of total units in Rs) in a month of a farm family.
- viii. **Fuel Consumption (x8):** = Consumption of diesel, petrol and kerosene oil in a month (Costs of total units of diesel, petrol, kerosene).
- ix. **Market Interaction (x9):** = Frequency of visit to market (how many times in a month)

- x. **Group Interaction (x10)** = How often a farmer or entrepreneur interacts with panchayat leader.

Statements	10-point scale
Statements of interaction with Panchayat leader (PL)	
Frequency of Interaction with Farmer interest group	
Frequency of interaction with farmers group development programme.	
Frequency of interaction with social groups(relatives, gossip groups)	

- xi. **Distance Matrix (x11):**

Statements	StatementsDistance from home(km)
Health Centre	
Pacca road	
Market	
Knowledge centre	
Financial institution	

- xi. **Orientation towards Competition (x12):** It is the farmer's orientation to perceive competition, he or she expects to confront.

(Please states whether you strongly agree (9-10), agree (7-8), medium (5-6), disagree (3-4) or strongly disagree (1-2) with the following statements)

Statements	(1-10) scale
1. The key point of success in a enterprise should not be divulged other entrepreneurs	
2. A better yield on comparison to the neighbors bring more prestige.	
3. It is of no use to keep information as what other entrepreneur are doing.	
4. Enterprise competition should be organized for all important enterprises.	

5. Better enterprising provides opportunities for recognition by the extension offers.	
6. It is not good for an entrepreneur to become too ambitious in life.	

xii. **Market Orientation (x13):** Farmers interacting with market in terms of number.

(Please states whether you strongly agree (9-1). agree (T-8), medium (5-6), disagree (3-4) strongly disagree (1-2) with the following statements)

Statement	(1-10) scale
Market news is not useful to an entrepreneur	
A entrepreneur can get good money by grading his product	
Warehouse can help the entrepreneur to get better price of his product	
One should sale his product to the nearest market irrespective of price	
One should purchase his inputs from the shop, where his other relatives purchase	
One should grow those crops, which have more market demand	

xiv.**Dicision Matrix (x14a, x14b, x14 c):** It is the degree of dependency to take important decision.

Decision	Self (3)	Dyad (2)	Group (3)
Purchase			
Bank			
Enterprise			

xv.**Idea Exchange Index (x15a, x15b, x15c):** it is the exchange or shining of ideas with and from the neighbours or interpersonal sources of information on same selected items.

Area	Generated By self (3)	Idea received (2)	Idea borrowed (3)
Enterprise			
Health			
Education			

DEPENDABLE VARIABLES

Y-> Level of entrepreneurship

Ya->Total volume yield/bigha

Yb-> Amount consumed

Yc-> Amount disposable to market (marketable surplus)

Yd-> Amount disposed of (marketed surplus)

Ye-> Cost incurred

Yf-> Market price gained

Yg-> Net return/unit area

5. Methods of Data Collection

a) Preparation of Interview Schedule:

On the basis of the findings of pilot study a preliminary interview schedule was formed with the help of literature review and by the assistance of Chairman of Advisory Committee. The interview schedule consisted of three major parts according to the specific objectives of the study i.e., agro-economic, socio-personal and techno-managerial.

b) Pre-testing of interview Schedule:

Pretesting or preliminary testing is the process of an advance testing of the study design after the schedule/questionnaire has been prepared. The object of pretesting is to detect the discrepancies that have emerged and to remove them after necessary modification in the schedule. It also helps to identify whether the questions are logically, organized the replies could properly recorded in the space provided for or there is any scope for further improvement. After conducting protesting appropriate changes and modification of the interview schedule have been made. The individuals who responded have been excluded in the final sample selected for the study.

c) Techniques of field data collection:

The respondents were personally interviewed during festival vacations (Durga Puja) and summer vacations. The items were asked in Bengali as well as English version in a simple terminology so that the members could understand easily. The entries were done in the schedule by student investigator himself at the time of interview.

6. Statistical tools used for analysis of data

- a) Mean
- b) Standard deviation
- c) Correlation of coefficient
- d) Stepwise multiple regression
- e) Factor Analysis
- f) Canonical covariate analysis

a) Mean:

The mean is the arithmetic average and is the result obtained when the sum of the value of individual in the data is divided by the number of individuals in the data. Mean is a relatively stable measure of central tendency. The mean reflects and is by every score in the distribution.

When the data are expressed in a frequency distribution (grouped), the mean is calculated using the following formula -

$$X = \frac{\sum_{i=1}^N f_i x_i}{N}$$

Where,

x = Mean of the observation.

f_i = Frequency of the class.

x_i = Mid value of the class.

N = Total number of observation

b) Standard deviation: -

Standard deviation (SD) of a set of observation is the square root of the arithmetic mean of the squares of the deviations. The deviations being measured from the arithmetic mean of the distributions. It is commonly denoted by the symbol (Sigma). To measure the average deviation from the standard value of the data standard deviation is used. It is less affected by sampling errors and is a more stable measure of dispersion.

The standard deviation of the data grouped in the form of frequency distribution is computed by using the following formula –

$$S.D. = \sqrt{\frac{\sum_{i=1}^N f_i x_i^2}{N} - \left(\frac{\sum_{i=1}^N f_i x_i}{N}\right)^2}$$

When,

d = Standard deviation

N = totalNo of observation in a particular coll.

X = value of observation in a particular cell

F = Frequency of observation

\bar{X} = mean number of observation

I = any number (e.g. 1, 2, 3) denoting position

c) Coefficient of correlation:

When increase or decrease in one variety is accompanied by an increase or in another variety, the two are said to be correlated and this phenomenon is known as correlation. Correlation coefficient (r) is a measure of the relationship between two variables, which are at the interval or rational level of measurement and are linearly related. A Person product-moment “ r ” is computed by the formula.

$$r_{xy} = \frac{N \sum XY - (\sum X)(\sum Y)}{\sqrt{[N \sum X^2 - (\sum X)^2][N \sum Y^2 - (\sum Y)^2]}}$$

When,

X and Y = Original scores in variables X and Y

N = Number of paired scores

$\sum XY$ = Each X multiplied by its corresponding Y . then summed

$\sum X$ = Sum of X scores

$\sum X^2$ = Each of X squared, then summed

$(\sum X)^2$ = Sum of X score squared

$\sum Y$ = Sum of Y scores

$\sum Y^2$ = Each of Y squared, then summed

$(\sum Y)^2$ = Sum of Y score squared

The range of correlation coefficient is between -1 to +1. This perfect negative correlation +1 perfect positive correlation. A perfect correlation is, however, seldom achieved. A correlation Coefficient to be acceptable should be statistically significant. Otherwise, we say that no significant relationship exist between the variables.

d) Stepwise multiple regression : Stepwise regression is a which provides a means of choosing independent variables that yield the best possible with the fewest independent variables. It permits the user to solve a sequence of one more multiple linear regression problems by stepwise application of the least square method. At each step in the analysis. a variable is added or removed which results in the greatest production in the error sum of squares (Burroughs Corporation 1975).

f) Canonical correlation analysis:

In statistics, canonical-correlation analysis (CCA) is a way of making sense of cross-covariance matrices. If we have two vectors $X = (X_1, \dots, X_n)$ and $Y = (Y_1, \dots, Y_m)$ of random variables, and there are variables, then canonical-

correlation analysis will find linear combinations of the X_i and Y_j which have maximum correlation with each other. Virtually all of the commonly encountered parametric tests of significance can be treated as special cases of canonical-correlation analysis, which is the general procedure for investigating the relationships between two sets of variables. The method was first introduced by Harold Hotelling in 1936.

Given two column vectors $X = (x_1, \dots, x_n)^T$ and $Y = (y_1, \dots, y_m)^T$ of random variables with finite second moments, one may define the cross-covariance $\hat{a}_{xy} = CN(X, Y)$ to be the $n \times m$ matrix whose (i, j) entry is the covariance $CON(r, y)$. In the covariance $CON(r, y)$. In practice, we would estimate the covariance matrix based on sampled data from X and Y (i.e. from a pair of data matrices).

Canonical-correlation analysis seeks vectors a' and b' such that the random variables $a'X$ and $b'Y$ maximize the correlation $p = corr(a'X, b'Y)$. The random variables $U = a'X$ and $V = b'Y$ are the first pair of canonical variables. Then one seeks vectors maximizing the same correlation subject to the constraint that they are to be uncorrelated with the first pair of canonical variables; this gives the second pair of canonical variables. This procedure may be continued up to $\min\{m, n\}$ times.