

Chapter IV

Methodology

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4.1 Introduction

This Chapter is the backbone to the research paper and gives an overall view of the research methodology behind the research. Research methodology is a systematic way to solve a problem, and it is a science of studying how research is to be carried out. It is also defined as the study of the methods by which knowledge is gained and its aim to give the work plan of research (S. Rajasekar, P. Philominathan, 2013). In order to achieve research objectives a survey was conducted in Sarva Shiksha mission, Jalpaiguri Educational District which includes the rural areas of Jalpaiguri district as well as entire area under Jalpaiguri Municipality. The sampling framework, methods of data collection and tools used for analysis are discussed in this chapter. The study was undertaken in the context of Midday meal and civil works in the Jalpaiguri municipality (urban) and Rajganj block (rural)

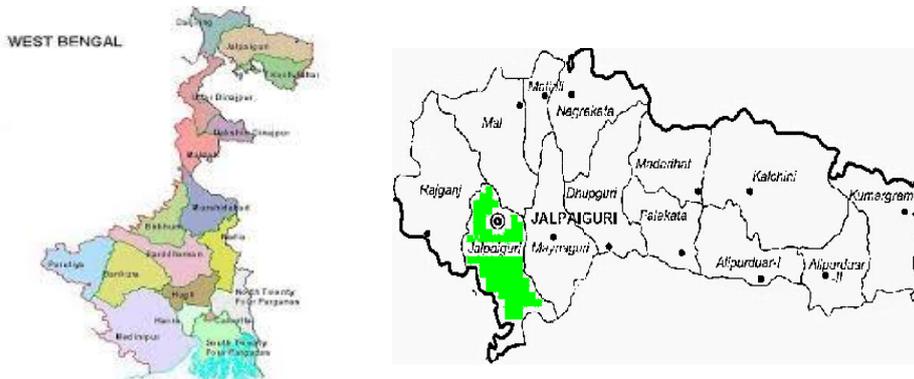
4.2 Sampling Unit

The district Jalpaiguri in the state of West Bengal, India is considered for the present study, and it is the largest district of North Bengal. The district has two subdivisions; Jalpaiguri Sadar, and Malbazar. The district is surrounded by international borders with Bhutan and Bangladesh in the north and south respectively and district borders with Darjeeling hills in the west and northwest and Alipurduar district CoochBehar district on the east. The total area of Jalpaiguri district is 3044 sq km. According to 2011 census, this district has a population of 3,869,675 and population density of 622/km.⁸

	2005-06	2013-14
Primary schools	West Bengal	76969
	Rural	65692
	% of school in rural area	85.34
	Jalpaiguri	3849
	Rural	3511
	% of school in rural area	91.21

⁸ <https://www.mapsofindia.com/maps/westbengal/districts/jalpaiguri.htm>

Figure -4.1 Geographical Map of Jalpaiguri



The Following units of jalpaiguri Municipality(Urban) and Rajganj Block had constituted sampling units

- Jalpaiguri Municipality 12 Municipality Wards (1,5,8,10,11,12,,14,15,16,17,18,20,)
- Rajganj Block :Five Villages are selected (Panikauri,Sukhani, Mantadari, Shikarpur and Balaigach)

4.3 Criteria for selection

Jalpaiguri district consist of seven subdivision -Jalpaiguri Sadar, Malbazar, Dhupguri ,Rajgan, Mayanaguri , Metali Nagrakata. There are as many 3849 primary schools, including both Government Schools (3157) and Private schools (692). The midday meal is operating in most of the Government Schools only. In Jalpaiguri Sadar 40 schools have been selected out of 305 schools .Rajganj rural consists of 12 villages, out of the five villages were selected randomly in the first stage namely Panikauri, Sukhani, Mantadari, Shikarpur and Balaigach . All the selected villages are having a literacy rate between 65 percent to 70 percent . The survey covered five villages in Rajganj Block. At the second stage, eight primary schools were randomly selected from each village. From each school, five children were randomly selected studying in class I to V. Headmaster and two teacher from each school was also interviewed.

For the study in Jalpaiguri Municipality,there are 26 municipality wards Out of these, twelve municipality wards were taken for study, in the first stage..Out of this, twelve municipalities,

3 to 4 schools were selected randomly in the second stage. There was a total 180 student sample from 40 schools, 3-4 students from each school were selected studying in class I to V. In addition to that, 40 head teachers along with two assistant teachers were selected.

Thus 180 students, 40 head teachers, 80 assistant teachers from Rajganj Block and 180 students, 40 head teachers, 80 assistant teachers from Jalpaiguri municipality were selected for the study. Thus, 360 students, 160 assistant teachers and 80 head teachers were the total samples for the study. 80 parents were interviewed from each sample. Altogether 760 respondents were interviewed for the study. From the data collected from different schools through questionnaire from students, headmaster and parents, the detail analysis in respect of each category has been discussed below.

Table 4.2 Details of Sample wards and Villages

Block	Name of sampling Unit	Total population	Male	Female	Child population of Total population (0-8 Yeras)	literacy Rate	Average literacy Rate
Rajganj	Panikauri	6613	3386	3227	13.34	62.75	India 74.04 West Bengal 76.20 Jalpaiguri 82.39
	Sukhani	35276	18153	17123	12.65	75.24	
	Mantadari	5362	2728	2634	14.3	67.33	
	Shikarpur	19437	9969	9468	11.87	68.6	
	Balaigach	1383	713	670	12.22	75.83	
	Average	13614.20	6989.80	6624.40	12.88	69.95	
Jalpaiguri Municipality	Ward No 1	6705	3782	2923	8	87	
	Ward No-5	3451	1684	1767	6	96	
	Ward no-8	3601	1733	1868	7	93	
	ward no-10	4578	2179	2399	6	96	
	ward No-11	5625	2807	2818	7	96	
	Ward No-12	4247	2079	2168	10	85	
	Ward No-14	4827	2441	2386	7	94	
	Ward No-15	3081	1497	1584	7	95	
	Ward No-17	3617	1747	1870	7	94	
	Ward No-16	3451	1684	1767	7	96	
	Ward No-18	3179	1521	1658	6	98	
Ward No-20	4094	2067	2027	7	96		
	Average	4204.67	2101.75	2102.92	7.08	93.83	

Source - 2011 census

While selecting the sample area from the state, the selecting criteria were literacy rate as the considering parameter. The present literacy rate of Jalpaiguri 82.39% which is higher than west Bengal average rate as well as the national average. Ward No 18 and 20 are the most literate ward in the municipality, with literacy rate 98%, followed by ward No. 16, 5, 10, 11

(96 percent), ward no.4 (95 percent), ward no 5,14 (94 percent) and ward no 1 (87 percent) and all these wards have more than 85% of the total population are literate. On the other hand, Sukhani has a literate population 62.75 and Panikauri at the bottom with only 62.75 percent. Mantadari, Shikarpur and Balaigach are also in this category with 60-70 percent literate population, which is below than State and as well as Nation average. So these units have been taken as a sample to access the impact of MDM in SSA and also to make a review of infrastructure facilities on improving the attendance, enrolment

4.4 Sampling Size and Sampling Techniques

4.4.1 Selection of Schools

For the study, only primary schools have been covered under the survey, and For research, proportionate stratified random sampling was used. The school with a minimum of 50 students and 2 teachers were selected. All the Govt schools and Govt. Aided schools in these districts were covered under the study. The sample consists of 10% of total population (in the age 6-14

Table 4.3 Details about Sample schools surveyed

Block	Village/Area	Number of Primary schools surveyed	total number of schools surveyed	All total number of schools surveyed
Rajganj	Panikauri	8	40	80
	Sukhani	8		
	Mantadari	8		
	Shikarpur	8		
	Balaigach	8		
Jalpaiguri Municipality	Ward No 1	3	40	
	Ward No-5	3		
	Ward no-8	3		
	ward no-10	4		
	ward No-11	3		
	Ward No-12	4		
	Ward No-14	3		
	Ward No-15	3		
	Ward No-17	3		
	Ward No-16	3		
	Ward No-18	4		
	Ward No-20	4		

4.4.2 Selection of students

From Jalpaiguri Municipality and Rajganj Block 5 to 3 students were selected from each school. A total of 360 (180 from Rajganj and 180 from Jalpaiguri) primary school children were surveyed from 80 schools (40 from Rajganj and 40 from Jalpaiguri) that are availing the benefit of MDM and school infrastructure facilities.

Table 4.4 Details about selected primary schools, boys and girls in sample areas

Block	Village/Area	Number of Primry schools surveyed	total number of students surveyed from each school	Gender		Class		All total number of students surveyed
				BOYS	GIRLS	Class 1 to 3	Class 4 to 5	
Rajganj (Rural)	Panikauri	8	40	90	90	120	60	180
	Sukhani	8	40					
	Mantadari	8	40					
	Shikarpur	8	40					
	Balaigach	8	20					
Jalpaiguri Municipality (Urban)	Ward No 1	3	15	90	90	110	70	180
	Ward No-5	3	15					
	Ward no-8	3	15					
	ward no-10	4	15					
	ward No-11	3	15					
	Ward No-12	4	15					
	Ward No-14	3	15					
	Ward No-15	3	15					
	Ward No-17	3	15					
	Ward No-16	3	15					
	Ward No-18	4	15					
	Ward No-20	4	15					

4.4.3 Selection of parents of students

Parents of students were interviewed to study their observation regarding the acceptance and impact of mid day meal. In total 160 parents were interviewed for the research purpose on the basis of their family income.

Table 4.5 Details about selected parents

Block	Village/Area	Gender		All total number of parents surveyed
		Male	Female	
Rajganj (Rural)	Panikauri	12	5	17
	Sukhani	8	5	13
	Mantadari	9	5	14
	Shikarpur	8	5	13
	Balaigach	17	6	23
	Total	54	26	80
Jalpaiguri Municipality (Urban)	Ward No 1	2	7	9
	Ward No-5	3	5	8
	Ward no-8	2	5	7
	ward no-10	3	3	6
	ward No-11	2	4	6
	Ward No-12	2	4	6
	Ward No-14	2	5	7
	Ward No-15	2	2	4
	Ward No-17	2	3	5
	Ward No-16	2	5	7
	Ward No-18	3	5	8
	Ward No-20	2	5	7
	Total	27	53	80

4.4.4 Selection of teachers of students

Teachers of beneficiary students were selected for interview to study the impact of MDM in their attendance, enrolment, retention. In total 80 teachers were selected. (i.e. two teacher from each school).40 head teachers from Jalpaiguri and Rajganj block were selected for the study respectively.

4.5 Pilot Study

Questionnaire construction is an essential step for the research procedure. Before using the questionnaire for substantive research, it is essential to obtain information by pilot testing the questionnaire on a person similar to those who will be asked to complete it as a part of the

substantive research (Donald P. Schwab 1999). Pilot testing helps to identify the errors in assumptions and also identify the items which are difficult to understand. Pilot testing will lead to change the research questionnaire. It will be helpful in increasing response rate, reducing missing data and obtaining a more valid response.

A pilot study was carried out on 15 students, three teachers and three parents each from Jalpaiguri municipality and Rajganj block using Cronbach's alpha. Cronbach's alpha is used to measure the internal consistency of a test. Alpha is an essential concept of evaluation of assessment and questionnaire. Alpha accepted values ranging from 0.70 to .095 (J.Bland and D.Altman,1997). A maximum alpha value 0.90 has been recommended(D.Streiner,2003). The reliability was calculated with Cronbach's Alpha was found to be 86.1%. These values are highly positive and indicated good internal consistency.

The result of the pilot study was not included in the actual study.

4.6 Collection of data

Primary data has been collected from different schools belonged to Jalpaiguri Municipality and Rajgunj Block for achieving research objectives. The investigator visited the different schools personally after taking permission from DPSC Chairman in writing. Subsequently, after obtaining permission from the head teacher, the researcher discussed in details about the quarries and collected the necessary data from students and teachers about the nature and purpose of the study. The researcher had also adopted a different method to attract the children in an interview by proving gift items to them. The collection of data has been completed with the help of pre-designed and self-constructed questionnaires from head teachers, teachers, students and parents. The survey was conducted in Jalpaiguri and Rajganj block from November 2014 to April 2015 and the reference period of the study was from 2013 to 2018. The interview scheduled has covered the information about mid-day meal programme, family income, attendance, ill effects/health problems , enrolment, drop out, Participation in mid-day meal, hygiene factors in MDM, infrastructure and institutional arrangements under the SSA. Though the proforma was in English, it was clearly explained to the students by the researcher.

The secondary data has already been collected from different websites, references books, journal, newspapers, magazines Govt. Reports and publications, working papers and Reports from PBSSM (Paschim Banga Sarva Siksha mission)

4.6.1 Questionnaire for students

Data has been collected through questionnaire from the students of Jalpaiguri Municipality (Rural) and Rajganj (Rural) to judge the perception of mid day meal in respect quality, quantity ,regularity and hygiene of mid day meal as well as infrastructure facilities in the school,

4.6.2 Questionnaire for parents

Data has been collected through questionnaire from the parents of students of Jalpaiguri Municipality (Rural) and Rajganj (Rural) to judge the perception of mid day meal.

4.6.3 Questionnaire for teachers

Data has been collected through questionnaire from the teachers of schools from Jalpaiguri Municipality (Rural) and Rajganj (Rural) to judge the effectiveness of SSA in respect of effectiveness of MDM, attendance, enrolment, drop out, improvement in a study, infrastructure facilities and other arrangements of the SSA. The questionnaire includes.

- i) The basic information about the school
- ii) Questions that reflect the effectiveness of MDM. Different questions have been included to check the impact of MDM on students in respect of attendance, drop out, improvement in the study.
- iii) The questions that include infrastructure facilities in the schools in respect of the number of classrooms, drinking water, playground, condition of the classroom, medical check-up,etc.

4.7 Hypothesis Formulation

Hypothesis is defined as a testable statement about empirical relationship between an independent and a dependent variable (Pollock,2009).In other words, hypothesis is an assumption or proposition whose testability is to tested on the basis of compatibility of its

implication with empirical evidence with previous knowledge(Mouly,1963). A hypothesis has greater significance in the research process by explaining the cause-effect relationship and provides a basis for reporting and conclusion. After considering research objectives, the respondents with a different sample are were taken, and hypotheses were designed and formulated from students, teachers and parents. The study was conducted to test the following hypotheses

1. Family income and mid day meal satisfaction are independent in Jalpaiguri Municipality and Rajganj Block, in response to parents.
2. There is no significant association between quantity of MDM and health problem of the children in Jalpaiguri municipality and Rajganj block in response to parents.
3. There is no significant association between MDM satisfaction and attendance in Jalpaiguri municipality and Rajganj block in response to students.
4. There is no significant association between quantity of MDM and health problem of the children in Jalpaiguri municipality and Rajganj block in response to students.
5. Quality of MDM has no significant impact on the overall satisfaction of MDM in response to parents in Jalpaiguri.
6. There is no significant association between location of the school (rural and urban) and an increase in enrolment, reduction in drop out, increase in school attendance, increase in study behaviour, quantity of MDM served, increase in girl's enrolment, quality of MDM & sufficiency of educational and nutritional effect which has an overall impact on SSA, in response of teachers.
7. There is no significant difference for improvement in enrolment, reduction in drop out, improvement in school attendance, improvement in study behaviour, increase in girl's enrolment & sufficiency and nutritional impact after implementation of MDM scheme between Jalpaiguri Municipality(Urban) and Rajganj(Rural).
8. Students of Jalpaiguri Municipality are not satisfied with mid-day meal concerning the taste of the food, not feeling full stomach, timely delivery and the empty stomach.

9. Students of Rajganj block are not satisfied with mid-day meal concerning the taste of the food, not feeling full stomach, timely delivery and an empty stomach.

10. Students of Jalpaiguri municipality who are satisfied with the hygiene of MDM are not influenced by cleanness of dining area, drinking water facilities, illness/health problems, provision of washing hands with soap and cleanness of kitchen store.

11. Students of Rajganj block who are satisfied with the hygiene of MDM are not influenced by cleanness of dining area, drinking water facilities, illness/health problems, provision of washing hands with soap and cleanness of kitchen store

12. There is no relationship between the gender and attendance in schools at Jalpaiguri Municipality and Rajganj block.

13. There is no significant relationship between attendance and the condition of the classroom in Jalpaiguri Municipality and Rajganj block

4.8 Data Analysis Techniques

The statistical tools that are used for the analysis of primary data are discussed below:

- Simple percentage method
- Graphical method
- Cross tabulation
- Chi Square Analysis
- Multiple Regression Analysis.
- T taste

i) Simple percentage Method-To compare between two or more variables from collected data, simple percentage is used.

Percentage=number of response×100÷ Total number of response.

ii) Graphical Method- After collection of all primary data, data are organised, explained and displayed by using different graphical techniques. Graphical techniques include bar charts, histograms and pie charts

iii) Cross Tabulation- A Cross-tabulation (cross) tab is a quantitative research technique for analysing the relationship between two or more variables or groups. It compares results for one or more groups with the results of another. By comparing the variables in this frequency distribution the researcher can study whether an association exist between two attributes or not.

This can be explained by taking two variables gender(g)and any type of menu preferred in a school (m). The values for gender male (mg) and female (fg).The values for m (menu) are yes-prefer mid day meal, and no-do does not prefer mid-day meal in the school. Thus we are going to see if there is a relationship between gender and the mid-day meal menu in the school. In order to do that, segregation is required between the dependent and independent variable. As here, gender influences the preferences of the menu, gender is treated as the independent variable and preference of the menu would be the dependent variable. To confirm the validity of the result, the result can be examined by the Pearson Chi-Square test. For example, if the significance level (α) 0.00023, the confidence level $1-0.00023=.99977$ or 99.97 per cent confident which is good. If we want to check the degree of relationship between two variables, Cramer’s V and contingency co-coefficient are the tools that explain whether strong or weak relationship between them.

iv) Chi Square Analysis- The researcher found that the chi-square test is a quantitative measure used to determine the relationship between two categorical variables. Chi-square (χ^2) test used to determine whether the relationship exists between two random variables. The purpose of hypothesis testing is to determine the relationship or condition. It is also useful to determine the association between two random variables (i.e. expected frequencies and observed frequencies) in respect of dependence (dependent or independent). As it is a non-parametric test, it shows the dependency to assess the significance level between two attributes and LIKERT scale variables

$$\chi^2 = \sum \frac{(O - E)^2}{E}$$

O=observed frequency in each category

E= Expected frequency in the corresponding category

df is the “ degree of freedom” (n-1)

$$\text{Expected frequency (E}^{\text{th}}) = \frac{\text{Sum of the rows} \times \text{sum of the column}}{\text{Total observations}}$$

In chi square degree of freedom can be calculated as $df = (C - 1) \times (r - 1)$

C= number of column in the table

R= number of rows in the table

v) Multiple Regression Analysis- In regression analysis, we are interested in predicting or estimating the linear relationship between two or more variables. Regression analysis clearly indicates the cause and effect relationship. The variable identified as the cause is taken as the independent variable and the variable constituting the effect is taken as the dependent variable. It establishes a functional relationship which is mathematical, showing the dependence of one variable on the other(s). It clearly indicates which one is the dependent variable and which one is the independent variable. The regression coefficient are not symmetric in x and y $b_{yx} \neq b_{xy}$

Regression equation \hat{y}_i . \hat{Y} represents the estimated or the predicted values of y when we put $x=x_i$ in this equation. If we have n pairs of given observation (x_i, y_i) for $i=1,2,3,\dots,n$. In the regression equation a= constant and b is the slope of the regression line. For example relationship between the effective life of the cars (in years) and monthly car insurance premium, where the life of the car is the independent variable and premium is the dependent variable. Multiple regression predicts how multiple independent variables are related to a dependent variable. Multiple regression equation is

For example, the height of the student depends on mother's height, father's height, male or female etc. The beta co-efficient (b) explains how strongly is the independent variable related with the dependent variable. The value R shows the relationship between the observed and predicted values of the dependent variable. The value of R ranges between -1 to +1. The (+) or (-) sign indicated the direction of the relationship. R^2 is the proportion of variation in the dependent variable explained by the regression model, and its value ranges between +1 to -1. A higher value indicates that the model fits the data well. Besides R squared, ANOVA (Analysis of variance) can be used to check how well the model fits the data.

vi) Correlation In this study Karl Pearson Correlation Analysis was used

a) To study whether there was significant correlation between different variables attendance in Jalpaiguri municipality

b) To study whether there was significant correlation between different variables attendance in Rajganj

vii) T taste-Independent sample t taste is used to compare means of different two groups where groups are not dependent on each other. The results of t test indicates whether the difference between two means are larger than expected by chance (Dr.Gabriel,2009).