CHAPTER - III

METHODOLOGY

This chapter deals with the description of the study area, sampling procedure adopted, method of survey, nature and sources of data and various tools and techniques employed for analyzing the data.

3.1 Area of the study
3.2 Data collection
3.3 Sample selection
3.4 Analytical tools and techniques

3.1 DESCRIPTION OF THE STUDY AREA

Saurashtra is primarily known as a region in western part of India and people in the region speaks Gujarati language. Saurashtra is a language in South India spoken by Suarshtrian community. “Saurashtra” is a geographical region situated in Gujarat’s semicircular area located North West of Arabian Sea. Politically “Saurashtra” is comprised of one districts namely, Amreli Major Crops produced in the area are wheat, oilseeds, cotton, onion, garlic, mango, coriander, banana and brinjal.

Fig. 3.1 Map of Saurashtra in Amreli district
Methodology

The methodology adopted for evaluation of the present study is described under following heading.

3.2 DATA COLLECTION:

3.2.1 Types of data:
The data was collected from both primary sources and secondary sources.

3.2.2 Sources of data

- Primary data
  The primary data was collected with the help of the well prepared questionnaires by taking the responses of the farmers and dealers. Primary data was collected on various variable of expectation and fulfilment level of farmers and dealers.

- Secondary data:
  The secondary data and other relevant information for the study during the year from 2007 to 2016 gathered from the company annual report, books, internet, research paper, official website of the organizations.

3.2.3 Data collection method

- Personal survey was used to collect the data through structured questionnaire.

3.3 Sample selection:
Multi stage sampling technique will be adopted as per the objectives of the study in the first stage of sampling three Talukas from Amreli district will be selected, then five dealers from 3 Talukas level in this way total 15 dealers will be selected. At the second stage eight farmers per dealer will be selected. Hence, all total 120 farmers will be selected for the study purpose.

Table: 3.1 Basic information of survey area and size of sample.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Details</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Total talukas</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>Total dealers (5 per taluka)</td>
<td>15</td>
</tr>
<tr>
<td>3</td>
<td>Total farmers (8 per dealer)</td>
<td>120</td>
</tr>
</tbody>
</table>
3.4 ANALYTICAL TOOLS AND TECHNIQUES EMPLOYED IN THE STUDY

The simple tabular analysis, percentage, Quadratic Function, Chi-Square Test, Regression model, Compound growth rate, Measurement of Instability, Garret’s ranking method, graphical presentations were used. In addition to following statistical tool was also be used.

3.4.1. Pattern of fertilizer use on major crops

Simple percentage and averages was worked out to study the fertilizer use pattern.

3.4.2 Chi-Square Test

Chi-Square test was used to find out whether there was any association between awareness and general characteristics of the sample respondent the formula used to find out Chi-Square test is presented below. (Kavitha, 2012)

\[ \chi^2 = \sum \frac{(O-E)^2}{E} \] ............................... (3.1)

Where,  
\( O = \) Observed frequency  
\( E = \) Expected frequency

3.4.3 Compound growth rate

The compound growth rate of selling of urea fertilizer will be computed for the Amreli district by using following exponential functional.

\[ Y = ab^t e_t \]

Where,  
\( Y = \) Selling of urea fertilizer  
\( a = \) Constant/intercept  
\( t = \) Time variable  
\( b = \) Regression coefficient  
\( e_t = \) Error term
The compound growth rate will be obtained using logarithmic form of the equation as below:

$$\log Y_t = \log a + t \log b + \log e_t$$

Where,

- $Y_t$ = Selling of urea fertilizer
- $t$ = Time period in year (1, 2… n)
- $b$ = Slope

Then the present compound growth rate ($g$) will be computed by using the relationship:

$$g = (\text{Antilog of } \log b - 1) \times 100$$

Where, $g$ = Compound growth rate per annum in per cent.

### 3.4.4 Measurement of Instability

Measurement of Instability = $CV \times (1-R^2)\frac{1}{2}$

Where,

- $CV$ = Coefficient of variation Per cent
- $R^2$ = Coefficient of determination from a time-trend regression adjusted by the number of degrees of freedom

### 3.4.5 Regression model for use to factors influencing farmers in purchase

$$Y = B_0 + B_1X_1 + B_2X_2 + B_3X_3 + B_4X_4 + B_5X_5 + B_6X_6 + B_7X_7 + B_8X_8 + U$$

Where,

- $Y$ = Quantity of NPK liquid bio-Fertilizer purchased
- $B_0$ = Intercept
- $B_1$ to $B_8$ = Coefficient to be estimated
- $X_1$ = Age (Years)
- $X_2$ = Education (Years)
- $X_3$ = Land holding (vigha)
- $X_4$ = Quality of NPK liquid (Scale)
Methodology

\[ X_5 = \text{Income (Rs. / Annual)} \]
\[ X_6 = \text{Irrigation facilities (Scale)} \]
\[ X_7 = \text{Peer group influence (Scale)} \]
\[ X_8 = \text{Price (Scale)} \]
\[ U = \text{Error term} \]

Where,

A four point scale was constructed to measure the independent variable \( X_4 \) i.e. Quality of NPK liquid,

\[ \text{i.e., 1-Dissatisfy} \]
\[ \text{2-Moderately Satisfy} \]
\[ \text{3-Satisfy} \]
\[ \text{4-Higher satisfy} \]

3.4.6 Garrett’s ranking method using for competitive advantages and marketing constraints

Garrett’s ranking method will be used to rank the problems. The rank will be given by respondent to particular constrain. The orders of merit thus given by the respondents will be converted into ranks using the following formula:

\[
\text{Per cent position} = 100 \left( \frac{R_{ij} - 0.5}{N_j} \right)
\]

Where,

\[ R_{ij} = \text{Rank given for ith factor by jth individual.} \]
\[ N_j = \text{Number of factors ranked by the jth individual.} \]

By referring to the Garrett’s table, the per cent positions estimated will be converted into scores. Thus for each factor the scores of the various respondents will be added and then mean values will be estimated. The attributes with the highest value will be considered as the most important one and the other followed in order.