CHAPTER - III

METHODOLOGY

3.1 DESCRIPTION OF THE STUDY AREA

Junagadh district is located in western Gujarat. The geographical location of Junagadh district is 20.44 degree to 21.40 degree North (Latitude) and 69.40 degree to 71.05 degree East (Longitude). The maximum temperature of this place is 42 degree centigrade and the minimum temperature is 10 degree centigrade. The total area of the district is 8,846 sq. km. As per 2001 census, the population of Junagadh district is 24,48,173 with population density of 277 persons per sq. km. There are six main rivers which flow through the district which are Ojhat, Uben, Hiran, Raval, Madhuvanti and Machhoundri. The average rainfall of Junagadh district is 787 mm. Junagadh district is located in western Gujarat and is surrounded by Arabian Sea to its South. The district is divided into 14 talukas of which major ones include Junagadh, Manavadar, Keshod, Vanthli, and Mendarda. (Anonymous, 2015d)

Fig. 3.1: Map of Junagadh district
3.2 SAMPLING TECHNIQUE

A multi stage sampling technique was adopted. In the first stage Junagadh district is selected purposively, because many more wheat grower in the district. In the second stage four talukas namely Keshod, Vanthli, Manavadar and Mendard form Junagadh district were selected randomly and in the third stage of sampling, five dealers from each taluka was selected randomly, total 20 dealers was selected. In sixth stage five villages from each talukas and five wheat growers from each village was selected purposively as out of total sample size of 100 wheat growers, 50 farmers was Zura users and 50 was other herbicide users.

3.3 NATURE AND SOURCES OF DATA

The data was collected from both primary sources and secondary sources.

3.3.1 Sources of data

- **Primary data**

  The primary data regarding name, age, village, education, land holding, annual income, farming experience, source of irrigation, was collected with the help of the well prepared questionnaire by taking the responses of the farmers. The data regarding marketing cost, marketing margin, of dealers and distributors was collected from dealers or distributors of the company with the help of the well prepared questionnaire and personnel interview.

- **Secondary data:**

  The secondary data regarding company profile and products was collected from company's website and annual report of the company

3.3.2 Data collection method

  Personal survey was used to collect the data through well prepared questionnaire.

3.4 STATISTICAL ANALYSIS

  For the socio-economic analysis of the respondents, tabular analysis is used. Other models like, Garret ranking technique, multiple linear discriminant analysis and marketing efficiency was worked out according to the objectives.
3.4.1. Discriminant analysis:

Leniar Discriminant analysis was used to study the factors discriminating the Zura users from other herbicide user.

The variables selected for discriminant analysis are:

- \( X_1 \) - Age of respondents (years)
- \( X_2 \) - Result of herbicide
- \( X_3 \) - Land holding (hectares)
- \( X_4 \) - Availability of herbicide
- \( X_5 \) - Price (Rupees)
- \( X_6 \) - Cost of herbicide per hectares (Rupees)
- \( X_7 \) - Source of irrigation
- \( X_8 \) - Appropriate packaging

The discriminant function of the following form was used:

\[
Z = L_1 X_1 + L_2 X_2 + L_3 X_3 + \cdots + L_8 X_8
\]

Where,

- \( Z \) = Composite discriminant score for the two groups.
- \( X_i \)'s = Variable selected to discriminate the groups.
- \( L_i \)'s = Discriminant coefficients.
- \( S \) = D

Where,

\[
S = \begin{pmatrix}
S_{11} & S_{12} & \cdots & S_{1k} \\
S_{21} & S_{22} & \cdots & S_{2k} \\
\vdots & \vdots & \ddots & \vdots \\
S_{k1} & S_{k2} & \cdots & S_{kk}
\end{pmatrix}
\]

\[
I = \begin{pmatrix}
L_1 \\
L_2 \\
\vdots \\
L_k
\end{pmatrix}
\]

and \( D = \begin{pmatrix}
d_1 \\
d_2 \\
\vdots \\
d_k
\end{pmatrix} \)
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Where,

\( K \) = Number of Variables

\( L_k \) = Vector of coefficient of discriminant function

\( S \) = Pooled dispersion matrix, and

\( D \) = Vector of difference between the mean value of different characteristics for the two groups.

Statistic ‘F’ was computed as under:

\[
F = \frac{N_a N_b \left( N_a + N_b - P - 1 \right)}{P \left( N_a + N_b \right) \left( N_a + N_b - 2 \right)} \times D^2
\]

\( P \) is the number of variables considered in the function. The value of ‘F’ was tested for its significance at \( P \) and \( (N_a + N_b - P - 1) \) degrees of freedom. (Jha, 2015)

3.4.2 Marketing efficiency:

3.4.2.1 Marketing cost:

It is the total cost incurred on marketing either in cash or in kind by producer and of various intermediaries involved in movement of Zura till it reaches the ultimate consumer.

\[
C = C_f + C_{m1} + C_{m2} + \ldots \ldots C_{mi} + \ldots \ldots C_{mn}
\]

Where,

\( C \) = Total cost of marketing of the commodity.

\( C_f \) = Cost incurred by the producer on marketing

\( C_{mi} \) = Cost incurred by the \( i^{th} \) middleman.

\( i = 1 \) to \( n \)

3.4.2.2 Marketing margin:

It is the difference between the total payments (costs + purchase price) and receipts (sales price) of the middlemen.

Marketing margin of \( i^{th} \) middlemen = \( P_{ri} - (P_{pi} + C_{mi}) \)
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Where,

\( P_n \) = Sales price of \( i^{th} \) middlemen

\( P_{pi} \) = Purchase price of the \( i^{th} \) middlemen

\( C_{mi} \) = Cost incurred on marketing by the \( i^{th} \) middlemen

3.4.2.3 Price spread:

In the marketing of agricultural input, the difference between the price paid by the consumer and the price received by the producer per unit of commodity is known as price spread. In other words, price spread is the summation of total marketing cost incurred and total marketing margin obtained by various marketing intermediaries per unit of commodity in a particular marketing channel.

**Price spread = Total marketing cost + Total marketing margin**

3.4.2.4 Marketing efficiency:

Marketing efficiency is the ratio of the total value of good marketed to the total marketing cost. The higher the ratio, higher is the efficiency. In this study the marketing efficiency of Zura will be measured by Shepherds formula as follows.

\[
ME = 100 - \frac{Total\ Marketing\ Cost}{Total\ Value\ of\ Products\ Marketed} \times 100
\]

3.4.3 The garret ranking technique:

The garret ranking technique was used to find out the constraints faced by dealers in selling of Zura.

Rank will be calculated through following formula.

\[
100 \times (R_{ij} - 0.5)
\]

Per cent position = \( \frac{100 \times (R_{ij} - 0.5)}{N_j} \)

Where,

\( R_{ij} \) = Rank given to the \( i^{th} \) attribute by the \( j^{th} \) individual

\( N_j \) = Number of attributes ranked by the \( j^{th} \) individual
With reference to the Garrett’s table, the per cent positions was converted into scores. Thus for each factor the scores of the various respondents was added and then mean values was estimated. The attributes with the highest value is considered as the most important one and the other follow in order.