CHAPTER III
METHODOLOGY

This chapter deals with the methodology which comprises selection of the study area, types of data and information used, sampling techniques and tools used for analysis of data. It is divided in the following sub title:

3.1 Sample Size
3.2 Type of Data
3.3 Statistical Analysis

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

3.1 Sample Size

A sample of 100 farmers was selected randomly from total samples arrived in the laboratory for testing. Location The present study is confined Junagadh district. The present study was carried out during the year 2016. Junagadh district is located on 20.44-21.40 north latitude and 69.4-71.05 east longitude. This district’s total area as per new district division is 8881.8 sq.k.m. As per administrative view this district is divided in three divisions Junagadh, keshod and veraval. It is made-up of 14 talukas. Total rural population is 17.36 lakh, while urban population is 7.12 lakh. Major crops are oil seeds, arenda, juvar, mililet, cotton seeds, sugarcane, wheat, shingoda, jeera etc.
3.2 Type of Data

The study involved the utilization of tools for information assimilation. The primary data of sex, age, education qualification, marital status, occupation, income, size of land holding, type of farming and experience in farming were collected through farmers by using well-structured questionnaires given in Annexure C and Annexure D. Secondary data from reliable sources such as government website, journals, annual reports of laboratory and laboratory records was also be used for the completion of the study.

3.3 Statistical Analysis

The statistical tools which used for present study are given below.

3.3.1 Tabular Analysis

The cost of establishment analyse by collecting secondary data. The cost include,

- Fixed cost (building, land, machinery cost etc.)
- Variable cost (wages, salary, depreciation on assets, electricity etc.)

The customer profile also analysed by using tabular analysis and pie chart

Table 3.1 Statement of establishment cost of Food Testing Laboratory

<table>
<thead>
<tr>
<th>Fixed cost</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land</td>
<td></td>
</tr>
<tr>
<td>Building</td>
<td></td>
</tr>
<tr>
<td>Machinery</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
</tr>
</tbody>
</table>

3.3.2 Quadratic trend Analysis

A quadratic trend is one that displays concavity, a single bend either upward or downward. (Anon, 2007)

Formula of quadratic trend given below

\[ ax^2 + bx + c = 0 \]

Where, \( x \) = unknown,
\( a, b, \) and \( c \) = known numbers
3.3.3 Net Present Value Method

The NPV measures the profitability of investment. If the NPV is positive, it measures the increasing in wealth. For a firm, this means that the size of positive NPV measures the increase in the value of firm resulting from in investment. In order to calculate the NPV, the interest rate used for discounting the cash flows needs to be determined. (Bjornsdottir, 2010)

\[ NPV = \frac{A_0}{(1+i)^0} + \frac{A_1}{(1+i)^1} + \ldots + \frac{A_N}{(1+i)^N} - A_0 \]

\[ = \sum_{n=0}^{N} \frac{A_n}{(1+i)^n} \]

Where, \( A_n \) = Net cash flow at the end of period \( n \);

\( i \) = MARR (Minimum attractive rate of return)

\( N \) = Service life of the project.

3.3.4 Internal Rate of Return Method

IRR calculations are commonly used to evaluate the desirability of investments or projects. The higher a project's IRR, the more desirable it is to undertake the project. Assuming all projects require the same amount of up-front investment, the project with the highest IRR would be considered the best and undertaken first. Internal rate of return is a concept based on the return on investment capital in terms of a project investment. The equation given below. (Bjornsdottir ,2010)

\[ NPV(i^*) = \sum_{n=0}^{N} \frac{A_n}{(1+i)^n} = 0 \]

3.3.5 Ratio Analysis

Ratio analysis is indispensable part of interpretation of results revealed by the financial statement statements. It provides users with crucial financial information and points out the areas which require investigation. Ratio analysis is technique which involves regrouping of data by application of arithmetical relationships , through its interpretation is a complex matter.
Methodology

Profit ratio is a measure of unit profit that excludes interest and income expenses. The equation given below. (Anon., 2014)

\[
\text{Profit ratio} = \frac{\text{Profit}}{\text{Sales}} \times 100
\]

Working capital ratio is the relative proportion of an entity’s current assets to its current liabilities. The equation given below. (Anon., 2014)

\[
\text{Working capital ratio} = \frac{\text{Current assets}}{\text{Current liabilities}}
\]

3.3.6 Break Even Point Method

The purpose of break-even analysis formula is to calculate the amount of sales that equates revenues, also known as profits, after the fixed and variable cost are met. Equation of break even point (Eloit et al. 2015)

\[
\text{Break even point} = \frac{\text{Fixed cost}}{\text{Contribution margin per unit}}
\]