CHAPTER - V
DATA INTERPRETATION

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5.1 Introduction: -

The research plan reflects the description of statistical technique(s) used for the analysis and interpretation of the data. From the statistical point of view parametric tests are significant and appropriate for testing the trustworthiness of computed sample of statistics and their use is based upon certain assumptions and those are put as under –

(1) When the variables are expressed in interval or ratio scales and are not in nominal or ordinal scales of measurements.

(2) When the population values are normally distributed.

(3) When the samples have equal or nearly equal variances.

(4) When the selection of one case in the sample is not dependent upon the selection of any other.

The assumptions mentioned above have been considered for the tabulation and computation of the data. The parametric tests cover the various statistical procedures for analysis and computation of data. Three Way Analysis of Variance has been chosen as a statistical technique for application since the method facilitates an investigation on the differences and interactions among the different variables of the present study such as socio-economic status, sex, and settlement etc., The chosen technique is advantageous, decisive and makes it possible to assess the interactions between the different variables of the study and to categorize the significance of differences in the means of different variables. Fisher, R.A. and his associates (1963) exemplified that “We together learning how to use the ‘Analysis of Variance’ and perhaps it is worthwhile stating an impression that I have formed the analysis of variance which may be called a statistical method because that is very ambiguous, one is not a mathematical theorem
but a convenient method of arranging the Arithmetic. Moreover, the method can be considered appropriate for computation for the reasons stated under:

(i) It facilitates to summarize a large statistical data precisely and hence the logical content as a whole becomes acceptable.

(ii) The logical process of this method facilitates to reduce the tests of significance between variables to a common form which helps an investigator to draw conclusions based on the significance of the interrelationship between variables.

Analysis of Variance is based on mathematical theorems and the tests of significance are based on the problems of distribution. It is an established method of analysis for a wide range of research problems. The method is preferred in designing and analysing of the research data in various disciplines besides education and economics. The investigator has used the scores of Environmental Education Awareness and Attitude Tests, which the secondary school students of Barak Valley have obtained on the Environmental Education Awareness and Attitude Tests. These scores were dealt with the analysis variance of a (2x2x2) factorial design, in which three variables were taken into account for computational purposes. In this way, the environmental education awareness scores and attitude scores were put in to eight categories in case of both male and female students. For each category, students were selected randomly for the purpose of computation. The environmental education awareness scores and attitude scores of eight categories each of male and female students have been shown below in table.
5.2 Environmental Awareness Test among the Secondary Male Students from Barak Valley under SEBA in terms of SES, Settlement and Academic Achievement

Table 5.1. a. Environmental Education Awareness Test Scores of Male students of High and Low Levels of Socio economic status, Settlement and Academic Achievement.

<table>
<thead>
<tr>
<th>HSES/URB/HA</th>
<th>HSES/URB/LA</th>
<th>HSES/RUR/HA</th>
<th>HSES/RUR/LA</th>
<th>LSES/URB/HA</th>
<th>LSES/URB/LA</th>
<th>LSES/RUR/HA</th>
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<tbody>
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<td>45</td>
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<td>Σ675</td>
<td>Σ402</td>
<td>Σ660</td>
<td>Σ420</td>
<td>Σ709</td>
<td>Σ384</td>
<td>Σ636</td>
<td>Σ408</td>
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</table>

Table 5.1. b. Environmental Education Awareness Test squired Scores of Male students of High and Low Levels of Socio economic status, Settlement and Academic Achievement.

<table>
<thead>
<tr>
<th>HSES/URB/HA</th>
<th>HSES/URB/LA</th>
<th>HSES/RUR/HA</th>
<th>HSES/RUR/LA</th>
<th>LSES/URB/HA</th>
<th>LSES/URB/LA</th>
<th>LSES/RUR/HA</th>
<th>LSES/RUR/LA</th>
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<tbody>
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<td>3969</td>
<td>2304</td>
<td>4761</td>
<td>1521</td>
<td>4356</td>
<td>1296</td>
<td>4761</td>
<td>2025</td>
</tr>
<tr>
<td>5184</td>
<td>2025</td>
<td>3969</td>
<td>2025</td>
<td>6084</td>
<td>729</td>
<td>3969</td>
<td>2304</td>
</tr>
<tr>
<td>4356</td>
<td>1521</td>
<td>3600</td>
<td>1521</td>
<td>5625</td>
<td>1764</td>
<td>4761</td>
<td>1296</td>
</tr>
<tr>
<td>3969</td>
<td>1764</td>
<td>3600</td>
<td>1296</td>
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<td>1764</td>
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<td>1296</td>
</tr>
<tr>
<td>6084</td>
<td>1521</td>
<td>3969</td>
<td>2025</td>
<td>6084</td>
<td>1296</td>
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<td>4356</td>
<td>2025</td>
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<td>1764</td>
<td>3600</td>
<td>1521</td>
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<tr>
<td>5625</td>
<td>1089</td>
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<td>1296</td>
<td>4761</td>
<td>1521</td>
<td>3969</td>
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<td>5184</td>
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<td>4761</td>
<td>2304</td>
<td>5625</td>
<td>1296</td>
<td>3600</td>
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<td>5184</td>
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<tr>
<td>3969</td>
<td>1296</td>
<td>5625</td>
<td>2025</td>
<td>5625</td>
<td>1521</td>
<td>3600</td>
<td>2025</td>
</tr>
<tr>
<td>Σ45909</td>
<td>Σ16326</td>
<td>Σ43794</td>
<td>Σ17802</td>
<td>Σ50581</td>
<td>Σ14976</td>
<td>Σ40554</td>
<td>Σ16830</td>
</tr>
</tbody>
</table>
Computations of the Analysis of Variance:
For computing the results relating to Environmental Awareness Test Scores of Male Students of High and Low Levels of Socio economic status, Settlement and Academic Achievement, table: 5-1 (a) & (b) were used. The main steps of calculation are shown as under:

1. General Correction = \( \frac{(\sum x)^2}{N} = \frac{(4294)^2}{80} \)

\[ \frac{18438436}{80} = 230480.45 \]

2. T.S.S.
\( = \sum x^2 - \frac{(\sum x)^2}{N} \)
\[ = 246772 - 230480.45 \]
\[ = 16291.55 \]

3. T.S.S. between (treatments)
\[ = \frac{1}{10} (675^2 + 402^2 + 660^2 + 420^2 + 709^2 + 384^2 + 636^2 + 408^2) - \frac{(\sum x)^2}{N} \]
\[ = \frac{1}{10} (455625 + 161604 + 435600 + 176400 + 502681 + 147456 + 404496 + 166464) - \frac{(\sum x)^2}{N} \]
\[ = \frac{2450326}{10} - \frac{(\sum x)^2}{N} \]
\[ = 245032.6 - 230480.45 \]
\[ = 14552.15 \]

4. Sum of squares within treatments (SS within Means)
\[ = \text{Total SS (within sets)} - \text{SS between Means} \]
\[ = 16291.55 - 14552.15 \]
\[ = 1739.4 \]
a) Main effect between settlement and academic achievements

Table 5.2.

<table>
<thead>
<tr>
<th>Variables</th>
<th>HA</th>
<th>LA</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>HSES</td>
<td>675 + 660 = 1335</td>
<td>402 + 420 = 822</td>
<td>2157</td>
</tr>
<tr>
<td>LSES</td>
<td>709 + 636 = 1345</td>
<td>384 + 408 = 792</td>
<td>2137</td>
</tr>
<tr>
<td>Total</td>
<td>2680</td>
<td>1614</td>
<td>4294</td>
</tr>
</tbody>
</table>

1. TSS between SES & Academic Achievement

\[
\frac{1}{20} \left( 1335^2 + 822^2 + 1345^2 + 792^2 \right) - 230480.45
\]

\[
\frac{1}{20} \left( 1782225 + 675684 + 1809025 + 627264 \right) - 230480.45
\]

\[
\frac{4894198}{20} - 230480.45
\]

\[
244709.9 - 230480.45
\]

\[
14229.45
\]

2. SS between SES

\[
\frac{1}{40} \left( 2157^2 + 2137^2 \right) - 230480.45
\]

\[
\frac{1}{40} \left( 4652649 + 4566769 \right) - 230480.45
\]

\[
\frac{9219418}{40} - 230480.45
\]

\[
230485.45 - 230480.45
\]

\[
5
\]
3. SS between Academic Achievements
   
   \[
   \begin{align*}
   1 & = \frac{1}{40} \left( 2680^2 + 1614^2 \right) - 230480.45 \\
   & = \frac{1}{40} \left( 7182400 + 2604996 \right) - 230480.45 \\
   & = \frac{9787396}{40} - 230480.45 \\
   & = 244684.9 - 230480.45 \\
   & = 14204.45
   \end{align*}
   \]

3. Interaction between SES and Academic Achievement = TSS – SS between SES – SS between Academic Achievements
   
   \[
   \begin{align*}
   & = 14229.45 - 5 - 14204.45 \\
   & = 20
   \end{align*}
   \]

b) Main effect between Settlement and Academic Achievements

<table>
<thead>
<tr>
<th>Settlement</th>
<th>Variables</th>
<th>HA</th>
<th>LA</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural</td>
<td>660 + 636=1296</td>
<td>420 + 408=828</td>
<td>2124</td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>675 + 709=1384</td>
<td>402 + 384=786</td>
<td>2170</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>2680</td>
<td>1614</td>
<td>4294</td>
<td></td>
</tr>
</tbody>
</table>

1. TSS between Settlement and Academic Achievements
   
   \[
   \begin{align*}
   & = \frac{1}{20} \left( 1296^2 + 828^2 + 1384^2 + 786^2 \right) - 230480.45 \\
   & = \frac{1}{20} \left( 1679616 + 685584 + 1915456 + 617796 \right) - 230480.45 \\
   & = 244922.6 - 230480.45 \\
   & = 14442.15
   \end{align*}
   \]
2. SS between Settlements

\[
\begin{align*}
&= \frac{1}{40} \left( (2124^2 + 2170^2) - 230480.45 \right) \\
&= \frac{4511376 + 4708900}{40} - 230480.45 \\
&= 230506.9 - 230480.45 \\
&= 26.45
\end{align*}
\]

3. SS between Academic Achievements

\[
\begin{align*}
&= \frac{1}{40} \left( (2680^2 + 1614^2) - 230480.45 \right) \\
&= \frac{7182400 + 2604996}{40} - 230480.45 \\
&= 244684.9 - 230480.45 \\
&= 14204.45
\end{align*}
\]

4. Interaction between Settlement and Academic Achievements = TSS – SS between Settlement - SS between Academic Achievements

\[
= 14442.15 - 26.45 - 14204.45
= 211.25
\]

(c) Main effect between Settlement and SES

<table>
<thead>
<tr>
<th>Settlement</th>
<th>Variables</th>
<th>HSES</th>
<th>LSES</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural</td>
<td></td>
<td>660 + 420=1080</td>
<td>636 + 408=1044</td>
<td>2124</td>
</tr>
</tbody>
</table>
1. TSS between Settlement and SES

\[
\frac{1}{20} \left( 1080^2 + 1044^2 + 1077^2 + 1093^2 \right) - 230480.45
\]

\[
= \frac{1166400 + 1089936 + 1159929 + 1194649}{20} - 230480.45
\]

\[
= \frac{4610914}{20} - 230480.45
\]

\[
= 230545.7 - 230480.45
\]

\[
= 65.25
\]

2. SS between Settlement

\[
\frac{1}{40} \left( 2124^2 + 2170^2 \right) - 230480.45
\]

\[
= \frac{4511376 + 4708900}{40} - 230480.45
\]

\[
= 230506.9 - 230480.45
\]

\[
= 26.45
\]

3. SS between SES

\[
\frac{1}{40} \left( 2157^2 + 2137^2 \right) - 230480.45
\]

\[
= \frac{4652649 + 4566769}{40} - 230480.45
\]

\[
= 230485.45 - 230480.45
\]

\[
= 5
\]

4. Interaction between Settlement and SES = TSS – SS between Settlement – SS between SES.

\[
= 65.25 - 26.45 - 5
\]

\[
= 33.8
\]
Table 5.5: Summary of analysis of Environmental Awareness Test Scores of Male Students of High and Low Levels of Socio-economic status, Settlement and Academic Achievements.

<table>
<thead>
<tr>
<th>Sl No</th>
<th>Source of Variation</th>
<th>Sum of Square</th>
<th>d.f.</th>
<th>Mean Squares</th>
<th>F-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SES (A)</td>
<td>5</td>
<td>1</td>
<td>5</td>
<td>0.206</td>
</tr>
<tr>
<td>2</td>
<td>Achievements (B)</td>
<td>14204.45</td>
<td>1</td>
<td>14204.45</td>
<td>587.93</td>
</tr>
<tr>
<td>3</td>
<td>Settlement (C)</td>
<td>26.45</td>
<td>1</td>
<td>26.45</td>
<td>1.09</td>
</tr>
<tr>
<td>4</td>
<td>A x B</td>
<td>20</td>
<td>1</td>
<td>20</td>
<td>0.827</td>
</tr>
<tr>
<td>5</td>
<td>B x C</td>
<td>211.25</td>
<td>1</td>
<td>211.25</td>
<td>8.74</td>
</tr>
<tr>
<td>6</td>
<td>A x C</td>
<td>33.8</td>
<td>1</td>
<td>33.8</td>
<td>1.39</td>
</tr>
<tr>
<td>7</td>
<td>A x B x C</td>
<td>51.2</td>
<td>1</td>
<td>51.2</td>
<td>2.11</td>
</tr>
<tr>
<td>8</td>
<td>Treatment within Set</td>
<td>1739.4</td>
<td>72</td>
<td><strong>24.16</strong></td>
<td></td>
</tr>
</tbody>
</table>

TSS = 14552.15 – 5 – 14204.45 – 26.45 – 20 – 211.25 – 33.8 = 51.2 (A x B x C)

I. The above table 5.5 reveals that the computed ‘F’ value was found 0.206 relating to the variable Socio-economic status, which is, lesser than the table ‘F’ value (3.98) for 1/72 d.f. at .05 level of confidence. It means the mean scores of awareness towards environmental education among the students belonging to high and low groups of socio-economic group do not differ significantly. The hypothesis is retained and interpreted that the socio-economic status as one of the variable does not influence the awareness among male students.

II. It is indicated in Table 5.5 – that the obtained ‘F’ value is 587.93 regarding the variable achievement, which is higher than the table ‘F’ value (3.98) for 1/72 d.f. at .05 level. It means the mean scores of awareness of high and low levels of achievement of students do differ significantly. Therefore, the hypothesis has been rejected and interpreted that achievement does influence the awareness on environmental education among the secondary school students.
III. Table 5.5. shows that the computed ‘F’ Value came out to be 1.09 regarding the settlement variable whereas the table ‘F’ value is 3.98 for 1/72 d.f. at .05 level. The obtained ‘F’ value (1.09) is less than the table value 3.98. Hence, it is concluded that the mean scores of awareness on environmental education among rural and urban male students do not differ significantly. In view of this, the hypothesis is retained and interpreted that the variable settlement, does not influence the awareness on environmental education among the students.

IV. Further, the table 5.5..indicates that the obtained ‘F’ values of interactions between socio-economic status, Achievement and settlement, were found 0.206, 587.93, 1.09, and 51.2 respectively, which are lesser than the criterion F’ value (3.98) for 1/72 d.f. at .05 level of confidence. Hence, the hypothesis is retained and interpreted that the interaction between variables like socio-economic status, and settlement and achievement is not significant.

5.3. Environmental Awareness Test among Secondary Female Students of Barak Valley under SEBA in terms of SES, Settlement and Academic Achievement

Table 5.6.a. Environmental Awareness Test Scores of Female students of High and Low Levels of Socio economic status, Settlement and Academic Achievement.

<table>
<thead>
<tr>
<th>HSES/ FEM/ URB/H</th>
<th>HSES/ FEM/ RUR/H</th>
<th>HSES/ FEM/ RUR/LA</th>
<th>LSES/ FEM/ URB/H</th>
<th>LSES/ FEM/ RUR/LA</th>
<th>LSES/ FEM/ RUR/H</th>
<th>LSES/ FEM/ RUR/LA</th>
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</thead>
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<td>Σ390</td>
<td>Σ632</td>
</tr>
</tbody>
</table>

136
Table 5.6.b. Environmental Awareness Test Squired Scores of Female students of High and Low Levels of Socio economic status, Settlement and Academic Achievement.

<table>
<thead>
<tr>
<th>HSES/ FEM/ URB/HA</th>
<th>HSES/ FEM/ URB/LA</th>
<th>HSES/ FEM/ RUR/HA</th>
<th>HSES/ FEM/ RUR/LA</th>
<th>LSES/ FEM/ URB/HA</th>
<th>LSES/ FEM/ RUR/LA</th>
<th>LSES/ FEM/ URB/LA</th>
<th>LSES/ FEM/ RUR/LA</th>
</tr>
</thead>
<tbody>
<tr>
<td>4356</td>
<td>2025</td>
<td>3969</td>
<td>1764</td>
<td>3969</td>
<td>2025</td>
<td>3600</td>
<td>2304</td>
</tr>
<tr>
<td>3600</td>
<td>2304</td>
<td>5625</td>
<td>1296</td>
<td>3969</td>
<td>3969</td>
<td>2304</td>
<td>2304</td>
</tr>
<tr>
<td>4356</td>
<td>2025</td>
<td>3969</td>
<td>1521</td>
<td>4356</td>
<td>1296</td>
<td>4356</td>
<td>1296</td>
</tr>
<tr>
<td>5184</td>
<td>2304</td>
<td>3600</td>
<td>2025</td>
<td>3600</td>
<td>1089</td>
<td>3969</td>
<td>2025</td>
</tr>
<tr>
<td>6084</td>
<td>2025</td>
<td>3600</td>
<td>1521</td>
<td>4761</td>
<td>1764</td>
<td>4356</td>
<td>1521</td>
</tr>
<tr>
<td>4356</td>
<td>1296</td>
<td>4761</td>
<td>1764</td>
<td>4356</td>
<td>1089</td>
<td>3600</td>
<td>2025</td>
</tr>
<tr>
<td>3969</td>
<td>1521</td>
<td>3600</td>
<td>1521</td>
<td>4356</td>
<td>2304</td>
<td>3600</td>
<td>1296</td>
</tr>
<tr>
<td>3600</td>
<td>1764</td>
<td>4356</td>
<td>1521</td>
<td>3969</td>
<td>1296</td>
<td>3600</td>
<td>1089</td>
</tr>
<tr>
<td>4761</td>
<td>1521</td>
<td>3969</td>
<td>1296</td>
<td>4761</td>
<td>2025</td>
<td>4096</td>
<td>1521</td>
</tr>
<tr>
<td>5184</td>
<td>1296</td>
<td>5625</td>
<td>2116</td>
<td>4761</td>
<td>1296</td>
<td>4900</td>
<td>1521</td>
</tr>
</tbody>
</table>

Σ45450  Σ18081  Σ43074  Σ16345  Σ42858  Σ15480  Σ40046  Σ16902

For computing the results relating to Environmental Awareness Test Scores of female Students of High and Low Levels of Socio economic status, Settlement and Academic Achievement, table: 5-2 (a) & (b) were used. The main steps of calculation are shown as under:

1. General Correction

\[ \frac{(\Sigma x)^2}{N} = \frac{(4236)^2}{80} \]

\[ = \frac{17943696}{80} = 224296.2 \]

2. T.S.S.

\[ = \Sigma x^2 - \frac{(\Sigma x)^2}{N} \]

\[ = 238236 - 224296.2 \]

\[ = 13939.8 \]
3. T.S.S. between (treatments)

\[
\begin{align*}
1 & = \frac{1}{10} \left( 672^2 + 423^2 + 654^2 + 403^2 + 654^2 + 390^2 + 632^2 + 408^2 \right) - \frac{(\sum x)^2}{N} \\
& = \frac{1}{10} \left( 451584+178929+427716+162409+427716+152100+399424+166464+ \right) - \frac{(\sum x)^2}{N} \\
& = \frac{2366342}{10} = 236634.2 \\
& = 236634.2 - 224296.2 \\
& = 12338
\end{align*}
\]

4. Sum of squares within treatments (SS within Means)

\[
\begin{align*}
&= \text{Total SS (within sets)} - \text{SS between Means} \\
&= 13939.8 - 12338 \\
&= 1601.8
\end{align*}
\]

a) Main effect between SES and academic achievements

<table>
<thead>
<tr>
<th>(SES)</th>
<th>HA</th>
<th>LA</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>HSES</td>
<td>672 + 654=1326</td>
<td>423 + 403=826</td>
<td>2152</td>
</tr>
<tr>
<td>LSES</td>
<td>654 + 632=1286</td>
<td>390 + 408=798</td>
<td>2084</td>
</tr>
<tr>
<td>Total</td>
<td>2612</td>
<td>1624</td>
<td>4236</td>
</tr>
</tbody>
</table>

**Table: 5.7. (Academic Achievements)**
1. TSS between SES & Academic Achievement
   \[
   \frac{1}{20} \left( 1326^2 + 826^2 + 1286^2 + 798^2 \right) - 224296.2
   \]
   \[
   = \frac{1}{20} \left( 1758276 + 682276 + 1653796 + 636804 \right) - 224296.2
   \]
   \[
   = \frac{4731152}{20} - 224296.2
   \]
   \[
   = 236557.6 - 224296.2
   \]
   \[
   = 12261.4
   \]

2. SS between SES
   \[
   \frac{1}{40} \left( 2152^2 + 2084^2 \right) - 224296.2
   \]
   \[
   = \frac{1}{40} \left( 4631104 + 4343056 \right) - 224296.2
   \]
   \[
   = \frac{8974160}{40} - 224296.2
   \]
   \[
   = 224354 - 224296.2
   \]
   \[
   = 57.5
   \]

3. SS between Academic Achievements
   \[
   \frac{1}{40} \left( 2612^2 + 1624^2 \right) - 224296.2
   \]
   \[
   = \frac{1}{40} \left( 6822544 + 2637376 \right) - 224296.2
   \]
   \[
   = \frac{9459920}{40} - 224296.2
   \]
   \[
   = 236498 - 224296.2
   \]
   \[
   = 12201.8
   \]
Interaction between SES and Academic Achievement = TSS – SS between SES – SS between Academic Achievements

\[= 12261.4 - 57.5 - 12201.8\]

\[= 2.1\]  

b) Main effect between Settlement and Academic Achievements

**Table: 5.8.**

<table>
<thead>
<tr>
<th>Settlement</th>
<th>Variables</th>
<th>HA</th>
<th>LA</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural</td>
<td>654 + 632 = 1286</td>
<td>403 + 408 = 811</td>
<td>2097</td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>672 + 654 = 1326</td>
<td>423 + 390 = 813</td>
<td>2139</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>2612</td>
<td>1624</td>
<td>4236</td>
<td></td>
</tr>
</tbody>
</table>

1. TSS between Settlement and Academic Achievements

\[= \frac{1}{20} \left( 1286^2 + 811^2 + 1326^2 + 813^2 \right) - \]

\[= \frac{1}{20} \left( 1653796 + 657721 + 1758276 + 660969 \right) = 236538.1\]

\[= 236538.1 - 224296.2\]

\[= 12241.9\]

2. SS between Settlements

\[= \frac{1}{40} \left( 2097^2 + 2139^2 \right) - 224296.2\]

\[= \frac{4397409 + 4575321}{40} - 224296.2\]

\[= 224318.25 - 224296.2\]

\[= 22.05\]
3. SS between Academic Achievements

\[
\begin{align*}
&= \frac{1}{40} \left( 2612^2 + 1624^2 \right) - 224296.2 \\
&= \frac{6822544 + 2637376}{40} - 224296.2 \\
&= 236498 - 224296.2 \\
&= 12201.8
\end{align*}
\]

Interaction between Settlement and Academic Achievements = TSS – SS between Settlement - SS between Academic Achievements

\[
= 12241.9 - 22.05 - 12201.8 \\
= 18.5
\]

c) Main effect between Settlement and socio economic status

**Table: 5.9.**

<table>
<thead>
<tr>
<th>Settlement</th>
<th>Variables</th>
<th>HSES</th>
<th>LSES</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural</td>
<td>654+403=1057</td>
<td>632+408=1040</td>
<td>2097</td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>672+423=1095</td>
<td>654+390=1044</td>
<td>2139</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>2152</td>
<td>2084</td>
<td>4236</td>
<td></td>
</tr>
</tbody>
</table>

1. TSS between Settlement and SES

\[
\begin{align*}
&= \frac{1}{20} \left( 1057^2 + 1040^2 + 1095^2 + 1044^2 \right) - \\
&= \frac{1117249 + 1081600 + 1199025 + 1089936}{20} \\
&= \frac{4487810}{20} = 224390.5 \\
&= 224390.5 - 224296.2 \\
&= 94.3
\end{align*}
\]

141
2. SS between Settlements
\[
\begin{align*}
&= \frac{1}{40} \left( 20972 + 2139^2 \right) - 224296.2 \\
&= \frac{4397409 + 4575321}{40} - 224296.2 \\
&= 224318.25 - 224296.2 \\
&= 22.05
\end{align*}
\]

3. SS between SES
\[
\begin{align*}
&= \frac{1}{40} \left( 2152^2 + 2084^2 \right) - 224296.2 \\
&= \frac{4631104 + 4343056}{40} - 224296.2 \\
&= 224354 - 224296.2 \\
&= 57.8
\end{align*}
\]

4. Interaction between Settlement and SES = TSS – SS between Settlement– SS between SES.
\[
= 94.3 - 22.05 - 57.8
\]
\[
= 14.45
\]

Table 5.10. Summary of analysis of Environmental Awareness Test Scores of Female Students of High and Low Levels of Socioeconomic Status, Settlement and Academic Achievements.

<table>
<thead>
<tr>
<th>Sl No</th>
<th>Source of Variation</th>
<th>Sum of Square</th>
<th>d.f.</th>
<th>Mean Squares</th>
<th>F-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SES (A)</td>
<td>57.5</td>
<td>1</td>
<td>57.5</td>
<td>2.80</td>
</tr>
<tr>
<td>2</td>
<td>Achievements (B)</td>
<td>12201.8</td>
<td>1</td>
<td>12201.8</td>
<td>59.51</td>
</tr>
<tr>
<td>3</td>
<td>Settlement (C)</td>
<td>22.05</td>
<td>1</td>
<td>22.05</td>
<td>1.07</td>
</tr>
<tr>
<td>4</td>
<td>A x B</td>
<td>2.1</td>
<td>1</td>
<td>2.1</td>
<td>0.10</td>
</tr>
<tr>
<td>5</td>
<td>B x C</td>
<td>18.5</td>
<td>1</td>
<td>18.5</td>
<td>0.90</td>
</tr>
<tr>
<td>6</td>
<td>A x C</td>
<td>14.45</td>
<td>1</td>
<td>14.45</td>
<td>0.70</td>
</tr>
<tr>
<td>7</td>
<td>A x B x C</td>
<td>21.55</td>
<td>1</td>
<td>21.2</td>
<td>1.49</td>
</tr>
<tr>
<td>8</td>
<td>Treatment within Set</td>
<td>1601.8</td>
<td>72</td>
<td>20.53</td>
<td></td>
</tr>
</tbody>
</table>

\[
TSS = 12338 - 57.5 - 12201.8 - 22.05 - 2.1 - 18.5 - 14.5 = 21.55 \text{ (A x B x C)}
\]
I. The Table. 5.10 – reveals that the computed ‘F’ value was found 2.80 relating to the variable Socio economic status of female students, which is, lesser than the table ‘F’ value (3.98) for 1/72 d.f. at .05 level of confidence. It means the mean scores of awareness towards environmental education among the female students belonging to high and low groups of socio economic group do not differ significantly. The hypothesis is retained and interpreted that the socio economic status as one of the variable does not influence the awareness among the female students.

II. It is indicated in Table: 5.10, that the obtained ‘F’ value is 59.51 regarding the variable achievement, which is higher than the table ‘F’ value (3.98) for 1/72 d.f. at .05 level. It means the mean scores of awareness of high and low levels of achievement of students do differ significantly. Therefore, the hypothesis has been rejected and interpreted that achievement does influence the awareness scores towards environmental education among female students.

III. Table: 5.10. shows that the computed ‘F’ Value came out to be 1.07 regarding the variable settlement, whereas the table ‘F’ value is 3.98 for 1/72 d.f. at .05 level. Here, the obtained ‘F’ value (1.07) is lesser than the table value 3.98. Hence, it is concluded that the mean scores of awareness towards environmental education among rural and urban female students do not differ significantly. In view of this, the hypothesis is retained and interpreted that the variable settlement, does not influence the awareness towards environmental education among the female students.

IV. Further, the Table: 5.10..indicates that the obtained ‘F’ values of interactions between socio-economic status, Achievement and settlement, were found 0.10, 0.90, 0.70, and 1.49 respectively, which are far below the criterion F’ value (3.98) for 1/72 d.f. at .05 level of confidence. Hence, the hypothesis is retained and interpreted that the interaction between variables like socio-economic status, settlement and achievement is not significant.
5.4. Environmental Attitude Test among Secondary Male Students of Barak Valley under SEBA in terms of SES, Settlement and Academic Achievements

Table 5.11.a. Environmental Attitude Test Scores of Male students of High and Low Levels of Socio economic status, Settlement and Academic Achievement.

<table>
<thead>
<tr>
<th>HSES/MALE/URB/HAI</th>
<th>HSES/MALE/URB/LA</th>
<th>HSES/MALE/RUR/HAI</th>
<th>HSES/MALE/RUR/LA</th>
<th>LSES/MALE/URB/HAI</th>
<th>LSES/MALE/URB/LA</th>
<th>LSES/MALE/RUR/HAI</th>
<th>LSES/MALE/RUR/LA</th>
</tr>
</thead>
<tbody>
<tr>
<td>107</td>
<td>49</td>
<td>93</td>
<td>56</td>
<td>82</td>
<td>45</td>
<td>79</td>
<td>55</td>
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<tr>
<td>96</td>
<td>60</td>
<td>84</td>
<td>48</td>
<td>84</td>
<td>59</td>
<td>86</td>
<td>59</td>
</tr>
<tr>
<td>84</td>
<td>56</td>
<td>84</td>
<td>52</td>
<td>79</td>
<td>60</td>
<td>97</td>
<td>56</td>
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<tr>
<td>97</td>
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<td>80</td>
<td>55</td>
<td>78</td>
<td>45</td>
<td>80</td>
<td>55</td>
</tr>
<tr>
<td>83</td>
<td>45</td>
<td>78</td>
<td>59</td>
<td>83</td>
<td>54</td>
<td>87</td>
<td>54</td>
</tr>
<tr>
<td>86</td>
<td>45</td>
<td>80</td>
<td>45</td>
<td>91</td>
<td>59</td>
<td>83</td>
<td>58</td>
</tr>
<tr>
<td>80</td>
<td>51</td>
<td>83</td>
<td>56</td>
<td>89</td>
<td>60</td>
<td>76</td>
<td>54</td>
</tr>
<tr>
<td>89</td>
<td>60</td>
<td>75</td>
<td>58</td>
<td>75</td>
<td>45</td>
<td>93</td>
<td>45</td>
</tr>
<tr>
<td>80</td>
<td>54</td>
<td>75</td>
<td>60</td>
<td>79</td>
<td>56</td>
<td>89</td>
<td>55</td>
</tr>
<tr>
<td>81</td>
<td>45</td>
<td>87</td>
<td>55</td>
<td>79</td>
<td>45</td>
<td>79</td>
<td>45</td>
</tr>
<tr>
<td>Σ883</td>
<td>Σ524</td>
<td>Σ819</td>
<td>Σ544</td>
<td>Σ819</td>
<td>Σ528</td>
<td>Σ849</td>
<td>Σ536</td>
</tr>
</tbody>
</table>

Table 5.11.b. Environmental Attitude Test Squired Scores of Male students of High and Low Levels of Socio economic status, Settlement and Academic Achievement.

<table>
<thead>
<tr>
<th>HSES/MALE/URB/HAI</th>
<th>HSES/MALE/URB/LA</th>
<th>HSES/MALE/RUR/HAI</th>
<th>HSES/MALE/RUR/LA</th>
<th>LSES/MALE/URB/HAI</th>
<th>LSES/MALE/URB/LA</th>
<th>LSES/MALE/RUR/HAI</th>
<th>LSES/MALE/RUR/LA</th>
</tr>
</thead>
<tbody>
<tr>
<td>9409</td>
<td>2401</td>
<td>8649</td>
<td>3136</td>
<td>6724</td>
<td>2025</td>
<td>6241</td>
<td>3025</td>
</tr>
<tr>
<td>9216</td>
<td>3600</td>
<td>7056</td>
<td>2304</td>
<td>7056</td>
<td>3481</td>
<td>7396</td>
<td>3481</td>
</tr>
<tr>
<td>7056</td>
<td>3136</td>
<td>7056</td>
<td>2704</td>
<td>6241</td>
<td>3600</td>
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<td>3136</td>
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<tr>
<td>9409</td>
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<td>2025</td>
<td>6400</td>
<td>3025</td>
</tr>
<tr>
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<td>2916</td>
</tr>
<tr>
<td>7396</td>
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<td>6400</td>
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<td>8649</td>
<td>2025</td>
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<tr>
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<td>5625</td>
<td>3600</td>
<td>6241</td>
<td>3136</td>
<td>7921</td>
<td>3025</td>
</tr>
<tr>
<td>6561</td>
<td>2025</td>
<td>7569</td>
<td>3025</td>
<td>6241</td>
<td>2025</td>
<td>6241</td>
<td>2025</td>
</tr>
<tr>
<td>Σ76657</td>
<td>Σ27810</td>
<td>Σ67353</td>
<td>Σ29800</td>
<td>Σ67303</td>
<td>Σ28314</td>
<td>Σ72491</td>
<td>Σ28938</td>
</tr>
</tbody>
</table>
Calculations for the Analysis of Variance:

For computing the results relating to Environmental Attitude Test Scores of Male Students of High and Low Levels of Socio economic status, Settlement and Academic Achievement, table: -1 (a) & (b) were used. The main steps of calculation are shown as under:

1. General Correction

\[
\text{General Correction} = \frac{(\sum x)^2}{N} = \frac{(5502)^2}{80} = \frac{30272004}{80} = 378400.05
\]

2. T.S.S.

\[
\text{T.S.S.} = \sum x^2 - \frac{(\sum x)^2}{N} = 398666 - 378400.05 = 20265.95
\]

3. T.S.S. between (treatments)

\[
\frac{1}{10} \left(883^2 + 524^2 + 819^2 + 544^2 + 819^2 + 528^2 + 849^2 + 536^2\right) - \frac{(\sum x)^2}{N} = \frac{397860.4 - 378400.05}{10} = \frac{397860.4}{10} - 378400.05 = 397860.4 - 378400.05 = 19460.36
\]

4. Sum of squares within treatments (SS within Means)

\[
\text{Total SS (within sets) - SS between Means} = 20265.95 - 19460.36 = 805.59
\]
(a) Main effect between SES and academic achievements

Table: 5.12.

<table>
<thead>
<tr>
<th>A (SES)</th>
<th>Variables</th>
<th>HA</th>
<th>LA</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>HSES</td>
<td>883+819=1702</td>
<td>524+544=1068</td>
<td></td>
<td>2770</td>
</tr>
<tr>
<td>LSES</td>
<td>819+849=1668</td>
<td>528+536=1064</td>
<td></td>
<td>2732</td>
</tr>
<tr>
<td>Total</td>
<td>3370</td>
<td>2132</td>
<td></td>
<td>5502</td>
</tr>
</tbody>
</table>

1. TSS between SES & Academic Achievement

\[
= \frac{1}{20} (1702^2 + 1068^2 + 1668^2 + 1064^2) - 378400.05
\]

\[
= \frac{1}{20} (2896804 + 1140624 + 2782224 + 1132096) - 378400.05
\]

\[
= \frac{7951748}{20} - 378400.05
\]

\[
= 397587.4 - 378400.05
\]

\[
= 19187.35
\]

2. SS between SES

\[
= \frac{1}{40} (2770^2 + 2732^2) - 378400.05
\]

\[
= \frac{1}{40} (7672900 + 7463824) - 378400.05
\]

\[
= \frac{15136724}{40} - 378400.05
\]

\[
= 378148.1 - 378400.05
\]

\[
= 18.05
\]
3. SS between Academic Achievements
\[
\begin{align*}
1 & \quad \frac{1}{40} \left( 3370^2 + 2132^2 \right) - 378400.05 \\
& \quad = \frac{1}{40} \left( 11356900 + 4545424 \right) - 378400.05 \\
& \quad = \frac{15902324}{40} - 378400.05 \\
& \quad = 397558.1 - 378400.05 \\
& \quad = 19158.05
\end{align*}
\]

3. Interaction between SES and Academic Achievement = TSS – SS between SES – SS between Academic Achievements
\[
= 19187.35 – 18.5 – 19158.05 \\
= 10.8
\]

b) Main effect between Settlement and Academic Achievements

<table>
<thead>
<tr>
<th>Settlement</th>
<th>Variables</th>
<th>HA</th>
<th>LA</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural</td>
<td>819+849=1668</td>
<td>544+536=1080</td>
<td>2748</td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>883+819=1702</td>
<td>524+528=1052</td>
<td>2754</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>3370</td>
<td>2132</td>
<td>4892</td>
<td></td>
</tr>
</tbody>
</table>

1. TSS between Settlement and Academic Achievements
\[
\begin{align*}
1 & \quad \frac{1}{20} \left( 1668^2 + 1080^2 + 1702^2 + 1052^2 \right) - 378400.05 \\
& \quad = \frac{1}{20} \left( 2782224 + 1166400 + 2896804 + 1106704 \right) - 378400.05 \\
& \quad = 397606.6 - 378400.05 \\
& \quad = 19206.55
\end{align*}
\]
2. SS between Settlements

\[ \frac{1}{40} \left( 2748^2 + 2754^2 \right) - 378400.05 \]

\[ \frac{7551504 + 7584516}{40} - 378400.05 \]

\[ = 378400.5 - 378400.05 \]

\[ = 0 \]

3. SS between Academic Achievements

\[ \frac{1}{40} \left( 3370^2 + 2132^2 \right) - 378400.05 \]

\[ \frac{11356900 + 4545424}{40} - 378400.05 \]

\[ = 397558.1 - 378400.05 \]

\[ = 19158.05 \]

4. Interaction between Settlement and Academic Achievements = TSS – SS between Settlement - SS between Academic Achievements

\[ = 19206.55 – 0 – 19158.05 \]

\[ = 48.5 \]

c) Main effect between Settlement and SES

**Table: 5.14.**

<table>
<thead>
<tr>
<th>Settlement</th>
<th>Variables</th>
<th>HSES</th>
<th>LSES</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural</td>
<td></td>
<td>819+544=1363</td>
<td>849+536=1385</td>
<td>2748</td>
</tr>
<tr>
<td>Urban</td>
<td></td>
<td>883+524=1407</td>
<td>819+528=1347</td>
<td>2754</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>2770</td>
<td>2732</td>
<td>5502</td>
</tr>
</tbody>
</table>
1. TSS between Settlement and SES

\[
\frac{1}{20} \left( 1363^2 + 1385^2 + 1407^2 + 1347^2 \right) - 378400.05
\]

\[
= \frac{1857769 + 1918225 + 1979649 + 1814409}{20} - 378400.05
\]

\[
= 378502.6 - 378400.05
\]

\[
= 102.55
\]

2. SS between Settlement

\[
\frac{1}{40} \left( 2748^2 + 2754^2 \right) - 378400.05
\]

\[
= \frac{7551504 + 7584516}{40} - 378400.05
\]

\[
= 378475.5 - 378400.05
\]

\[
= 75.45
\]

3. SS between SES

\[
\frac{1}{40} \left( 2770^2 + 2732^2 \right) - 378400.05
\]

\[
= \frac{7672900 + 7463824}{40} - 378400.05
\]

\[
= 378418.1 - 378400.05
\]

\[
= 18.05
\]

4. Interaction between Settlement and SES = TSS – SS between Settlement – SS between SES.

\[
= 102.55 - 75.45 - 18.05
\]

\[
= 9.05
\]
The Summary of Analysis of Variance of Environmental Attitude Test Scores of Male Students of High and Low Levels of Socio economic status, Settlement and Academic Achievement and their interaction has been shown in Table:

Table: 5.15 Summary of analysis of Environmental Attitude Test Scores of Male Students of High and Low Levels of Socio economic status, Settlement and Academic Achievements.

<table>
<thead>
<tr>
<th>Sl No</th>
<th>Source of Variation</th>
<th>Sum of Square</th>
<th>d.f.</th>
<th>Mean Squares</th>
<th>F-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SES (A)</td>
<td>18.05</td>
<td>1</td>
<td>18.5</td>
<td>1.65</td>
</tr>
<tr>
<td>2</td>
<td>Achievements (B)</td>
<td>19158.05</td>
<td>1</td>
<td>19158.05</td>
<td>1713.6</td>
</tr>
<tr>
<td>3</td>
<td>Settlement (C)</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>A x B</td>
<td>10.8</td>
<td>1</td>
<td>10.8</td>
<td>0.96</td>
</tr>
<tr>
<td>5</td>
<td>B x C</td>
<td>48.5</td>
<td>1</td>
<td>48.5</td>
<td>4.33</td>
</tr>
<tr>
<td>6</td>
<td>A x C</td>
<td>9.05</td>
<td>1</td>
<td>9.05</td>
<td>0.80</td>
</tr>
<tr>
<td>7</td>
<td>A x B x C</td>
<td>215.91</td>
<td>1</td>
<td>215.91</td>
<td>19.31</td>
</tr>
<tr>
<td>8</td>
<td>Treatment within Set</td>
<td>805.59</td>
<td>72</td>
<td>11.18</td>
<td></td>
</tr>
</tbody>
</table>

\[ TSS = 19460.36-18.05-19158.05-10.8-48.5-9.05 = 215.91 \ (A \times B \times C) \]

I. The table. 5.15 — reveals that the computed ‘F’ value was found 1.65 relating to the variable Socio economic status of male students, which is, lesser than the table ‘F’ value (3.98) for 1/72 d.f. at .05 level of confidence. It means the mean scores of awareness towards environmental education among the male students belonging to high and low groups of socio economic group do not differ significantly. The hypothesis is retained and interpreted that the socio economic status as one of the variable does not influence the attitude among the male students.

II. It is indicated in table: 5.15 that the obtained ‘F’ value is 1713.6 regarding the variable achievement, which is higher than the table ‘F’ value (3.98) for 1/72 d.f. at .05 level. It means the mean scores of awareness of high and low levels of achievement of students do differ significantly. Therefore, the hypothesis has been rejected and interpreted that achievement does influence the attitude scores towards environmental education among male students.
III. Table 5.15. shows that the computed ‘F’ Value came out to be 0.1 regarding the settlement variable whereas the table ‘F’ value is 3.98 for 1/72 d.f. at .05 level. Here, the obtained ‘F’ value (0.1) is lesser than the table value 3.98. Hence, it is concluded that the mean scores of awareness towards environmental education among rural and urban male students do not differ significantly. In view of this, the hypothesis is retained and interpreted that the variable settlement, does not influence the attitude towards environmental education among the male students.

Further, the table 5.15. indicates that the obtained ‘F’ values of interactions between socio-economic status, Achievement and settlement, were found 0.96, 4.33, 0.80, and 19.31 respectively, in which the scores of socio economic status and settlement are lesser than the criterion F’ value (3.98) for 1/72 d.f. at .05 level of confidence. But then the scores of achievement and interaction value are higher than the table value. Hence, the hypothesis is retained and interpreted that the interaction between variables like socio-economic status, settlement and achievement is not significant.
5.5. Environmental Attitude Test among Secondary Female Students from Barak Valley under SEBA in terms of SES, Settlements and Academic Achievements

Table 5.16. a. Environmental Attitude Test Scores of Female students of High and Low Levels of Socio economic status, Settlement and Academic Achievement.

<table>
<thead>
<tr>
<th>HSES/ FEM/ URB/HA</th>
<th>HSES/ FEM/ RUR/HA</th>
<th>HSES/ FEM/ URB/LA</th>
<th>LSES/ FEM/ URB/HA</th>
<th>LSES/ FEM/ RUR/HA</th>
<th>LSES/ FEM/ URB/LA</th>
<th>LSES/ FEM/ RUR/HA</th>
<th>LSES/ FEM/ RUR/LA</th>
</tr>
</thead>
<tbody>
<tr>
<td>78</td>
<td>57</td>
<td>78</td>
<td>59</td>
<td>79</td>
<td>57</td>
<td>79</td>
<td>59</td>
</tr>
<tr>
<td>75</td>
<td>54</td>
<td>75</td>
<td>49</td>
<td>78</td>
<td>54</td>
<td>77</td>
<td>55</td>
</tr>
<tr>
<td>78</td>
<td>55</td>
<td>79</td>
<td>54</td>
<td>84</td>
<td>60</td>
<td>79</td>
<td>60</td>
</tr>
<tr>
<td>80</td>
<td>59</td>
<td>87</td>
<td>45</td>
<td>79</td>
<td>55</td>
<td>77</td>
<td>50</td>
</tr>
<tr>
<td>78</td>
<td>45</td>
<td>75</td>
<td>46</td>
<td>107</td>
<td>45</td>
<td>78</td>
<td>48</td>
</tr>
<tr>
<td>80</td>
<td>52</td>
<td>78</td>
<td>54</td>
<td>103</td>
<td>59</td>
<td>79</td>
<td>58</td>
</tr>
<tr>
<td>78</td>
<td>60</td>
<td>79</td>
<td>59</td>
<td>75</td>
<td>54</td>
<td>77</td>
<td>52</td>
</tr>
<tr>
<td>80</td>
<td>47</td>
<td>88</td>
<td>46</td>
<td>78</td>
<td>60</td>
<td>84</td>
<td>56</td>
</tr>
<tr>
<td>80</td>
<td>55</td>
<td>83</td>
<td>48</td>
<td>84</td>
<td>52</td>
<td>77</td>
<td>58</td>
</tr>
<tr>
<td>84</td>
<td>45</td>
<td>76</td>
<td>56</td>
<td>80</td>
<td>57</td>
<td>75</td>
<td>48</td>
</tr>
<tr>
<td>Σ791</td>
<td>Σ529</td>
<td>Σ798</td>
<td>Σ516</td>
<td>Σ847</td>
<td>Σ553</td>
<td>Σ782</td>
<td>Σ544</td>
</tr>
</tbody>
</table>

Table 5.16.b. Environmental Attitude Test Squired Scores of Female students of High and Low Levels of Socio economic status, Settlement and Academic Achievement.

<table>
<thead>
<tr>
<th>HSES/ FEM/ URB/HA</th>
<th>HSES/ FEM/ RUR/HA</th>
<th>HSES/ FEM/ URB/LA</th>
<th>LSES/ FEM/ URB/HA</th>
<th>LSES/ FEM/ RUR/HA</th>
<th>LSES/ FEM/ URB/LA</th>
<th>LSES/ FEM/ RUR/HA</th>
<th>LSES/ FEM/ RUR/LA</th>
</tr>
</thead>
<tbody>
<tr>
<td>6084</td>
<td>3249</td>
<td>6084</td>
<td>3481</td>
<td>6241</td>
<td>3249</td>
<td>6241</td>
<td>3481</td>
</tr>
<tr>
<td>5625</td>
<td>2916</td>
<td>5625</td>
<td>2401</td>
<td>6084</td>
<td>2916</td>
<td>5929</td>
<td>3025</td>
</tr>
<tr>
<td>6084</td>
<td>3025</td>
<td>6241</td>
<td>2916</td>
<td>7056</td>
<td>3600</td>
<td>6241</td>
<td>3600</td>
</tr>
<tr>
<td>6400</td>
<td>3481</td>
<td>7569</td>
<td>2025</td>
<td>6241</td>
<td>3025</td>
<td>5929</td>
<td>2500</td>
</tr>
<tr>
<td>6084</td>
<td>2025</td>
<td>5625</td>
<td>2116</td>
<td>11449</td>
<td>2025</td>
<td>6084</td>
<td>2304</td>
</tr>
<tr>
<td>6400</td>
<td>2704</td>
<td>6084</td>
<td>2916</td>
<td>10609</td>
<td>3481</td>
<td>6241</td>
<td>3364</td>
</tr>
<tr>
<td>6084</td>
<td>3600</td>
<td>6241</td>
<td>3481</td>
<td>5625</td>
<td>2916</td>
<td>5929</td>
<td>2704</td>
</tr>
<tr>
<td>6400</td>
<td>2209</td>
<td>7744</td>
<td>2116</td>
<td>6084</td>
<td>3600</td>
<td>7056</td>
<td>3136</td>
</tr>
<tr>
<td>6400</td>
<td>3025</td>
<td>6889</td>
<td>2304</td>
<td>7056</td>
<td>2704</td>
<td>5929</td>
<td>3364</td>
</tr>
<tr>
<td>7056</td>
<td>2025</td>
<td>5776</td>
<td>3136</td>
<td>6400</td>
<td>3249</td>
<td>5625</td>
<td>2304</td>
</tr>
<tr>
<td>Σ62616</td>
<td>Σ28259</td>
<td>Σ63878</td>
<td>Σ26892</td>
<td>Σ72845</td>
<td>Σ30765</td>
<td>Σ61204</td>
<td>Σ29782</td>
</tr>
</tbody>
</table>
Calculations for the Analysis of Variance:

For computing the results relating to Environmental Attitude Test Scores of female Students of *High and Low Levels of Socio economic status, Settlement and Academic Achievement*, table: - 5.16 (a) & (b) were used. The main steps of calculation are shown as under:

1. General Correction

\[
\text{General Correction} = \frac{(\Sigma x)^2}{N} = \frac{(5360)^2}{80} = \frac{28729600}{80} = 359120
\]

2. T.S.S.

\[
T.S.S. = \Sigma x^2 - \frac{(\Sigma x)^2}{N} = 376242 - 359120 = 17122
\]

3. T.S.S. between (treatments)

\[
T.S.S. \text{ between (treatments)} = \frac{1}{10} \left( 791^2 + 529^2 + 798^2 + 516^2 + 847^2 + 553^2 + 782^2 + 544^2 \right) - \frac{(\Sigma x)^2}{N} = \frac{3739260}{10} = 373926 - 359120 = 14806
\]

4. Sum of squares within treatments (SS within Means)

\[
\text{SS within Means} = \text{Total SS (within sets)} - \text{SS between Means} = 17122 - 14806 = 2316
\]
(a) Main effect between SES and academic achievements

Table: 5.17

<table>
<thead>
<tr>
<th>A (SES)</th>
<th>Variables</th>
<th>HA</th>
<th>LA</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>HSES</td>
<td>791+798=1589</td>
<td>529+516=1045</td>
<td>2634</td>
<td></td>
</tr>
<tr>
<td>LSES</td>
<td>847+782=1629</td>
<td>553+544=1097</td>
<td>2726</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>3218</td>
<td>2142</td>
<td></td>
<td>5360</td>
</tr>
</tbody>
</table>

1. TSS between SES & Academic Achievement

\[
\frac{1}{20} \left( 1589^2 + 1045^2 + 1629^2 + 1097^2 \right) - 359120
\]

\[
= \frac{1}{20} \left( 2524921 + 1092025 + 2653641 + 1203409 \right) - 359120
\]

\[
= \frac{7473996}{20} - 359120
\]

\[
= 373699.8 - 359120
\]

\[
= 14579.8
\]

2. SS between SES

\[
\frac{1}{40} \left( 2634^2 + 2726^2 \right) - 359120
\]

\[
= \frac{1}{40} \left( 6937956 + 7431076 \right) - 359120
\]

\[
= \frac{14369032}{40} - 359120
\]

\[
= 359225.8 - 359120
\]

\[
= 105.8
\]
3. SS between Academic Achievements

\[
= \frac{1}{40} \left( 3218^2 + 2142^2 \right) - 359120
\]

\[
= \frac{1}{40} \left( 1035524 + 4588164 \right) - 359120
\]

\[
= \frac{1494368}{40} - 359120
\]

\[
= 373592.2 - 359120
\]

\[
= 14472.2
\]

3. Interaction between SES and Academic Achievement = TSS - SS between SES - SS between Academic Achievements

\[
= 14579.8 - 105.8 - 14472.2
\]

\[
= 1.8
\]

b) Main effect between Settlement and Academic Achievements

**Table: 5.18**

<table>
<thead>
<tr>
<th>Settlement</th>
<th>HA</th>
<th>LA</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural</td>
<td>798+782=1580</td>
<td>516+544=1060</td>
<td>2640</td>
</tr>
<tr>
<td>Urban</td>
<td>791+847=1638</td>
<td>529+556=1082</td>
<td>2720</td>
</tr>
<tr>
<td>Total</td>
<td>3218</td>
<td>2142</td>
<td>5360</td>
</tr>
</tbody>
</table>

1. TSS between Settlement and Academic Achievements

\[
= \frac{1}{20} \left( 1580^2 + 1060^2 + 1638^2 + 1082^2 \right) - 359120
\]

\[
= \frac{1}{20} \left( 2496400 + 1123600 + 2683044 + 1170724 \right) - 359120
\]

\[
= \frac{7473768}{20}
\]

\[
= 373688.4 - 359120
\]

\[
= 14568.4
\]
2. SS between Settlements

\[
\frac{1}{40} \left( 2640^2 + 2720^2 \right) - 359120 \\
= 6969600 + 7398400 \\
\frac{14368000}{40} - 359120 \\
= 359200 - 359120 \\
= 80
\]

3. SS between Academic Achievements

\[
\frac{1}{40} \left( 3218^2 + 2142^2 \right) - 359120 \\
= \frac{10355524 + 4588164}{40} - 359120 \\
= 373592.2 - 359120 \\
= 14472.2
\]

4. Interaction between Settlement and Academic Achievements = TSS – SS between Settlement - SS between Academic Achievements

\[
= 14568.4 - 80 - 14472.2 \\
= 16.2
\]

a) Main effect between Settlement and SES

Table: 5.19

<table>
<thead>
<tr>
<th>Settlement</th>
<th>HSES</th>
<th>LSES</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural</td>
<td>798+516=1314</td>
<td>782+544=1326</td>
<td>2640</td>
</tr>
<tr>
<td>Urban</td>
<td>791+529=1320</td>
<td>847+553=1400</td>
<td>2720</td>
</tr>
<tr>
<td>Total</td>
<td>2634</td>
<td>2726</td>
<td>5360</td>
</tr>
</tbody>
</table>
1. TSS between Settlement and SES
\[
= \frac{1}{20} \left( 1314^2 + 1326^2 + 1320^2 + 1400^2 \right) - 359120
\]
\[
= \frac{1726596 + 1758276 + 1742400 + 1960000}{20} - 359120
\]
\[
= \frac{7187272}{20} - 359120
\]
\[
= 359363.6 - 359120
\]
\[
= 243.6
\]

2. SS between Settlement
\[
= \frac{1}{40} \left( 2640^2 + 2720^2 \right) - 359120
\]
\[
= \frac{6969600 + 7398400}{40} - 359120
\]
\[
= 359200 - 359120
\]
\[
= 80
\]

3. SS between SES
\[
= \frac{1}{40} \left( 2634^2 + 2726^2 \right) - 359120
\]
\[
= \frac{6937956 + 7431076}{40} - 359120
\]
\[
= 359225.8 - 359120
\]
\[
= 105.8
\]

4. Interaction between Settlement and SES = TSS – SS between Settlement – SS between SES.
\[
= 243.6 - 80 - 105.8
\]
\[
= 25.8
The Summary of analysis of variance of Environmental Attitude Test Scores of Female Students of High and Low Levels of Socio economic status, Settlement and Academic Achievement and their interaction has been shown in Table:

**Table:5.20. Summary of analysis of Environmental Awareness Test Scores of female Students of High and Low Levels of Socio economic status, Settlement and Academic Achievements.**

<table>
<thead>
<tr>
<th>Sl No</th>
<th>Source of Variation</th>
<th>Sum of Square</th>
<th>d.f.</th>
<th>Mean Squares</th>
<th>F-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SES (A)</td>
<td>105.8</td>
<td>1</td>
<td>105.8</td>
<td>3.29</td>
</tr>
<tr>
<td>2</td>
<td>Achievements (B)</td>
<td>14472.2</td>
<td>1</td>
<td>14472.2</td>
<td>450</td>
</tr>
<tr>
<td>3</td>
<td>Settlement (C)</td>
<td>80</td>
<td>1</td>
<td>80</td>
<td>2.49</td>
</tr>
<tr>
<td>4</td>
<td>A x B</td>
<td>1.8</td>
<td>1</td>
<td>1.8</td>
<td>0.056</td>
</tr>
<tr>
<td>5</td>
<td>B x C</td>
<td>16.2</td>
<td>1</td>
<td>16.2</td>
<td>0.50</td>
</tr>
<tr>
<td>6</td>
<td>A x C</td>
<td>25.8</td>
<td>1</td>
<td>25.8</td>
<td>0.77</td>
</tr>
<tr>
<td>7</td>
<td>A x B x C</td>
<td>104.4</td>
<td>1</td>
<td>104.4</td>
<td>3.25</td>
</tr>
<tr>
<td>8</td>
<td>Treatment within Set</td>
<td>2316</td>
<td>72</td>
<td>32.1</td>
<td></td>
</tr>
</tbody>
</table>

**TSS = 14806-105.8-14472-80-1.8-16.2-25.8=104.4 (A x B x C)**

I. The table. 5.20 reveals that the computed ‘F’ value was found 3.29 relating to the attitude of variable Socio economic status of female students, which is, lesser than the table ‘F’ value (3.98) for 1/72 d.f. at .05 level of confidence. It means the mean scores of attitude towards environmental education among the female students belonging to high and low groups of socio economic group do not differ significantly. The hypothesis is retained and interpreted that the socio economic status as one of the variable does not influence the attitude among the female students.
II. It is indicated in table 5.20 that the obtained ‘F’ value is 4.50 regarding the students attitude belonging to variable high and low level of achievement, which is higher than the table ‘F’ value (3.98) for 1/72 d.f. at .05 level. It means the mean scores of attitude of high and low levels of achievement of students do differ significantly. Therefore, the hypothesis has been rejected and interpreted that achievement does influence the attitude scores towards environmental education among female students.

III. Table 5.20 shows that the computed ‘F’ Value came out to be 2.49 regarding the settlement variable whereas the table ‘F’ value is 3.98 for 1/72 d.f. at .05 level. Here, the obtained ‘F’ value (1.07) is lesser than the table value 3.98. Hence, it is concluded that the mean scores of attitude towards environmental education among rural and urban female students do not differ significantly. In view of this, the hypothesis is retained and interpreted that the variable settlement, does not influence the attitude towards environmental education among the female students.

IV. Further, the table 5.20 indicates that the obtained ‘F’ values of interactions between socio-economic status, Achievement and settlement, were found 0.056, 0.50, 0.77, and 3.25 respectively, which are lesser than the criterion F’ value (3.98) for 1/72 d.f. at .05 level of confidence. Hence, the hypothesis is retained and interpreted that the interaction between variables like socio-economic status, settlement and achievement is not significant.
5.6. Influence of Gender on Environmental Awareness Level of Secondary Students of Barak Valley under SEBA

Table -: 5.21.a
Computation of Mean and SD of Environmental Awareness scores of the Male Students of Barak Valley.

<table>
<thead>
<tr>
<th>Class Intervals</th>
<th>Frequencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>75-79</td>
<td>7</td>
</tr>
<tr>
<td>70-74</td>
<td>6</td>
</tr>
<tr>
<td>65-69</td>
<td>25</td>
</tr>
<tr>
<td>60-64</td>
<td>29</td>
</tr>
<tr>
<td>55-59</td>
<td>9</td>
</tr>
<tr>
<td>50-54</td>
<td>20</td>
</tr>
<tr>
<td>45-49</td>
<td>55</td>
</tr>
<tr>
<td>40-44</td>
<td>40</td>
</tr>
<tr>
<td>35-39</td>
<td>92</td>
</tr>
<tr>
<td>30-34</td>
<td>26</td>
</tr>
<tr>
<td>25-29</td>
<td>3</td>
</tr>
<tr>
<td><strong>N=312</strong></td>
<td></td>
</tr>
</tbody>
</table>
Table 5.21.b Computation of Mean and SD of Environmental Awareness scores of the Female Students of Barak Valley

<table>
<thead>
<tr>
<th>Class Intervals</th>
<th>Frequencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>75-79</td>
<td>4</td>
</tr>
<tr>
<td>70-74</td>
<td>6</td>
</tr>
<tr>
<td>65-69</td>
<td>40</td>
</tr>
<tr>
<td>60-64</td>
<td>45</td>
</tr>
<tr>
<td>55-59</td>
<td>10</td>
</tr>
<tr>
<td>50-54</td>
<td>33</td>
</tr>
<tr>
<td>45-49</td>
<td>64</td>
</tr>
<tr>
<td>40-44</td>
<td>39</td>
</tr>
<tr>
<td>35-39</td>
<td>51</td>
</tr>
<tr>
<td>30-34</td>
<td>19</td>
</tr>
<tr>
<td>25-29</td>
<td>1</td>
</tr>
</tbody>
</table>

N = 312
The table value of ‘t’ for df-622 is 1.97 at .05 level of significance.

**Table: 5.22 Summary of Environmental Awareness Mean Scores, Standard Deviations, and t-value of Secondary school Students of Barak valley.**

<table>
<thead>
<tr>
<th>Groups</th>
<th>N</th>
<th>Mean Scores</th>
<th>SD</th>
<th>SE_{D}</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>312</td>
<td>44.728</td>
<td>5.62</td>
<td></td>
<td>5.96</td>
</tr>
<tr>
<td>Female</td>
<td>312</td>
<td>48.205</td>
<td>8.27</td>
<td>0.583</td>
<td></td>
</tr>
</tbody>
</table>

**Interpretation:** The above Table- reveals that the computed t-value 5.96 is greater than the criterion t-value 1.97 at .05 level of significance for d.f.-312. As the computed t-value 5.96 is significant at .05 level, the hypothesis is rejected. It is evident that there is significant difference in the environmental awareness of male and female students of secondary schools in Barak Valley. The table shows that the mean score (48.205) of the female students of secondary school is greater than the mean score (44.728) of the male students of Barak Valley. Hence, it is concluded that there exists a difference between the environmental awareness of boys and girls of Barak Valley schools under SEBA
5.7. Influence of Gender on Environmental Attitude of Secondary Students of Barak Valley under SEBA

Table -:5.23.a
Computation of Mean and SD of Environmental Attitude scores of the Male Students of Barak Valley.

<table>
<thead>
<tr>
<th>Class Intervals</th>
<th>Frequencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>105-109</td>
<td>3</td>
</tr>
<tr>
<td>100-104</td>
<td>2</td>
</tr>
<tr>
<td>95-99</td>
<td>16</td>
</tr>
<tr>
<td>90-94</td>
<td>7</td>
</tr>
<tr>
<td>85-89</td>
<td>25</td>
</tr>
<tr>
<td>80-84</td>
<td>44</td>
</tr>
<tr>
<td>75-79</td>
<td>61</td>
</tr>
<tr>
<td>70-74</td>
<td>63</td>
</tr>
<tr>
<td>65-69</td>
<td>48</td>
</tr>
<tr>
<td>60-64</td>
<td>19</td>
</tr>
<tr>
<td>55-59</td>
<td>14</td>
</tr>
<tr>
<td>50-54</td>
<td>4</td>
</tr>
<tr>
<td>45-49</td>
<td>6</td>
</tr>
<tr>
<td><strong>N=312</strong></td>
<td></td>
</tr>
</tbody>
</table>
Table 5.23.b
Computation of Mean and SD of Environmental Attitude scores of the Female Students of Barak Valley

<table>
<thead>
<tr>
<th>Class Intervals</th>
<th>Frequencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>105-109</td>
<td>1</td>
</tr>
<tr>
<td>100-104</td>
<td>1</td>
</tr>
<tr>
<td>95-99</td>
<td>2</td>
</tr>
<tr>
<td>90-94</td>
<td>7</td>
</tr>
<tr>
<td>85-89</td>
<td>25</td>
</tr>
<tr>
<td>80-84</td>
<td>30</td>
</tr>
<tr>
<td>75-79</td>
<td>59</td>
</tr>
<tr>
<td>70-74</td>
<td>65</td>
</tr>
<tr>
<td>65-69</td>
<td>45</td>
</tr>
<tr>
<td>60-64</td>
<td>28</td>
</tr>
<tr>
<td>55-59</td>
<td>22</td>
</tr>
<tr>
<td>50-54</td>
<td>10</td>
</tr>
<tr>
<td>45-49</td>
<td>13</td>
</tr>
<tr>
<td>40-44</td>
<td>4</td>
</tr>
</tbody>
</table>

\[ N = 312 \]
The table value of ‘t’ for df-622 is 1.97 at .05 level of significance

Table: 5.24.
Summary of Environmental Attitude Mean Scores, Standard Deviations, and t-value of male and female Students of secondary schools in Barak valley.

<table>
<thead>
<tr>
<th>Groups</th>
<th>N</th>
<th>Mean Scores</th>
<th>SD</th>
<th>SE&lt;sub&gt;D&lt;/sub&gt;</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>312</td>
<td>73.06</td>
<td>9.81</td>
<td>3.06</td>
<td>0.47</td>
</tr>
<tr>
<td>Female</td>
<td>312</td>
<td>74.51</td>
<td>4.304</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Interpretation:** The above Table reveals that the computed t-value 0.47 is smaller than the criterion t-value 1.97 at .05 level of significance for d.f. = 312. As the computed t-value 0.47 is not significant at .05 levels. Therefore the hypothesis is accepted. It is understood that there is no significant difference in the environmental attitude Mean Scores of secondary school boys and girls of Barak Valley in Assam. The table shows that the mean score (74.51) of the Girls of the secondary schools in Barak Valley of Assam is greater than the mean score (73.06) of the boys of Barak Valley in Assam it is marginal and insignificant. Hence, it may be interpreted that there is no difference between the attitude of boys and girls in the case of environmental attitude.