Chapter: 7 – Testing of Hypothesis
CHAPTER 7
HYPOTHESIS TESTING

7.1 HYPOTHESIS :-

The present study intends to study the Cost-Effectiveness of sugar factories in the Co-operative Sector in the Western Maharashtra. The topic was selected because it is an established fact that the sugar co-operatives in the state of Maharashtra have played an important role in the socio-economic development of the rural areas of the State. They have been instrumental in bringing out a change in the rural economy of the State and have been largely responsible for improving the standard of living in the rural population. The sugar co-operatives have also undertaken social projects like rural hospitals, construction of roads in the rural areas, irrigation schemes, helping the farmers for increasing the yield per hectar etc. The sugar industry in the state has generated employment for over 15 lakh persons and nearly 25 lakh families are dependent on them. Many sugar co-operatives from the state have established ancillary units based on the by-products of the sugar manufacturing process and these ancillary units have contributed to the overall growth.

However some noteworthy defects have been noticed in the functioning of these sugar co-operatives. It has been observed that the sugar industry progressed well till about mid eighties, but thereafter they began to face difficulties. It was also observed that the decision-making at the corporate level is based on arbitrary methods and not based on scientific cost-benefit study. For routine decision making this may not make any difference but when major capital
investment decisions are taken, the sugar co-operatives come in
trouble due to decisions based not on scientific cost-benefit study. As a
result of this many sugar co-operatives in the state have come in
trouble and are suffering from huge losses in the last couple of years.
It was reported by the Officials of the Sugar Commissionarate, Pune
that 14 of the 179 co-operative sugar factories in the state are in the
process of liquidation and another 56 are sick units. The accumulated
losses of these sugar factories are more than Rs 1800 Crores.

The sugar co-operatives in the state have done commendable
work in the last several years and it was thought that their problems
should be identified and studied in depth and concrete suggestions
should be offered for the solution of the same. With this objective in
mind the present study was carried out.

In order to sharpen the focus of the study, it was necessary to
crystalise the objectives of this study. After careful perusal of the
background material and detailed discussion with Officials of the
Sugar co-operatives, Officials of the Commissionarate of Sugar,
Practicing Professionals and Academicians and Researchers, the
following objectives were formulated for the study.
1. To list out the technical parameters for assessing the effectiveness of
   sugar co-operatives.
2. To study the cost structure of the sugar co-operatives in Western
   Maharashtra.
3. To identify and assess the profitability of by-products and its
   implications on the overall profitability of the sugar factories.
4. To review the accounting methods used for by-product accounting.

To conduct a systematic study with reference to the objectives stated
above, the following hypotheses were formulated. These are based on
a detailed study of the background literature, discussions with experts and professional experience of the Researcher.

1. The growth of the co-operative sugar factories is accelerated or retarded due to the Government policies.

2. For assessing the effectiveness of sugar factories, existing parameters are not sufficient or they do not exist.

3. The policies of sugar factories regarding by-products, are affecting the overall profitability of the sugar factories.

   This hypotheses is sub divided into the following

   a) There is difference in the average material cost of the factories with by-products and without by-products.

   b) There is a significant difference in the average conversion cost of the factories with by-products and without by-products.

   c) There is a significant difference in the average interest component in the total cost of the factories with by-products and without by-products.

   d) There is a significant difference between average surplus of the factories with by-products and without by-products.

4. The profitability of by-products, joint products and multi products of sugar co-operatives are not assessed either scientifically or assessed crudely by using any thumb rule.

   5. The decision-making regarding the utilization of by-products is arbitrary and not based on the profit center concept.

7.2. Testing Of Hypotheses:

7.2.1 Collection Of Information:

For testing the hypotheses, the Researcher collected information about the relevant issues from the primary and secondary sources. The primary sources include, visits to the factory selected for the study,
personal discussions with the officers of the concerned sugar co-operatives, discussions with Government officers including the Commissioner of Sugar, Maharashtra, President of the National Federation of Sugar Co-operatives, New Delhi, Auditors in the Department of Co-operation, Maharashtra State, Cost Auditors of the Sugar Factories registered under the Companies Act 1956, Academicians and Research Scholars in the area of sugar. The secondary sources include the Annual Reports of the concerned sugar factories, the RT 8 C Returns filed by the factories, various journals and magazines devoted for the sugar industry, publications of the Vasantdada Institute of Sugar, Pune, Sugar year book published by the Anekant Prakashan, Jaishingpur, Maharashtra.

The proforma prescribed by the Cost Accounting Record Rules (1997) prescribed by the Ministry of Finance Central Government. (As per Annexure 1 ) are utilized for transferring the data available in the Annual Reports to the Cost Accounting formats.

7.2.2 HYPOTHESES TESTING:-

The following are the findings of the survey and the testing of the hypotheses.

7.2.21 Hypothesis One :-

The growth of the sugar co-operatives is accelerated or retarded due to the Government policies.

In this regard, the Government policies in the pre-independence and post-independence era are reviewed in the following paragraphs.
7.2.22 Pre-Independence Era :-

In India the sugar production commenced in 1920s but it got industry status in late 1920s when India had 29 sugar mills producing just 100000 tons of sugar. Due to the demand of the sugar industry for the protection from the imported sugar, the Sugar Industry Protection Act was passed in the year 1932 and the country became self sufficient in the year 1935. Also cane pricing Act was passed in the same year to provide good cane prices to the farmers. This was followed by land reforms putting ceiling on land holdings to protect small farmers, formation of cane growers co-operatives and setting up sugar mills jointly with farmers called as the co-operative mills on ownership and sharing basis. Today this sector produces about 60 % of the total production of sugar in the country.

Due to all these proactive measures, the sugar industry progressed in a spectacular manner and from the 32 mills in the year 1931-32, the number of units rose to 130 by 1934-35 and the production also rose from .17 M.T. to .95 M.T.

7.2.23 Post Independence Era :-

At the beginning of the first five-year plan i.e. 1950-51 there were 139 sugar factories with installed capacity of 16.7 tons and the actual sugar production of 11 lakh tons. By the year 2002-03 there are 531 sugar factories in India out of which 67 are in the public sector, 167 in the private sector and 297 in the co-operative sector. Thus the growth rate is nearly 400 % during the planning period of about 53 years.

The main reason behind this impressive growth has been the supportive policy followed by the Governments at the Center and also at the State level. The Government has been helping the industry in
various ways. Some of the policies of the Government are mentioned in the following paragraphs.

a) For ensuring smooth supply of the sugarcane to the factories, the Government prescribes geographical area for each factory. The concerned factory is able to crush sugarcane only from that area. Thus it is ensured that there will not be unhealthy competition amongst the factories for attracting the sugarcane from other areas by paying higher cane price.

b) The Government has been encouraging the factories to set up ancillary units based on the by-products like the distillery, paper mills, fertilizer plants and other units like eco-boards, particle boards etc. In the state of Maharashtra, 47 sugar factories have established distilleries, 8 factories have established projects based on bagasse, 16 factories have established Ethanol projects based on the molasses and 7 factories have established Co-generation projects based on the bagasse. These factories are able to generate surplus from these units, which is affecting their profitability in a positive manner.

C) The Government follows a Monthly Release Scheme for the sugar factories, which ensures regulated supply of sugar in the market. The monthly release quota is decided for each of the factory and the factory is allowed to sale only that much of the sugar in the market. This ensures that there is no excess supply of sugar in the market the factories are able to get the remunerative prices for the sugar. In the past when this policy was abolished for certain period of time and the sugar was totally decontrolled, there was an unprecedented growth in the supply of sugar and the sugar prices crashed. Due to this disaster, the Government has restored this system and thus the sugar factories have benefited from the same. However, this policy has the other side
also as there is a huge stockpiling of sugar with the factories which has resulted in heavy borrowing for working capital purpose.

D) Levy Sugar: - In India there is a dual pricing policy for the sugar. The Government prescribes certain percentage of sugar to be sold from the Public Distribution System and the balance of the sugar is to be sold in the open market. For implementing this policy, the Government prescribes percentage of sugar to be sold to the Government by each of the factories at a price fixed by the Government. The price can be below the cost of production also. The system of levy sugar was long being resisted by the factories as they claim that one of the main reason behind the sickness is the dual pricing policy.

Recently the Government has taken a decision of reducing the proportion of the levy sugar to be sold to the Government. The percentage has been brought down to 10% of the sugar produced from the earlier percentage of 15%. This has further helped the industry to sell more quantity of sugar at competitive prices.

From the above discussion it is evident that the progress of the sugar industry has been accelerated due to the aforesaid supportive policies of the Government.

However it has also been observed that there are some negative implications also of the Government's policy on the overall sugar industry and these aspects have been discussed in the following paragraphs.

a) Liberalisation :- After the liberalization of the economy, the Government has relaxed the norms for establishing a sugar factory. According to earlier norm, the minimum distance between the two sugar factories was prescribed as 25 kilometers, now the distance
prescribed is 15 kilometers. Another important relaxation given is in the minimum capacity of crushing sugarcane per day. As per the earlier norm it was prescribed as 2500 tons per day, now it has been reduced to 1250 tons per day. These relaxations have resulted in proliferation in the sugar factories. In Maharashtra alone, permission has been granted to 27 new sugar factories. At present there are 179 sugar factories in Maharashtra and out of this 13 factories are being liquidated. According to the Commissioner of Sugar's Report, another 56 sugar co-operatives are on the list of sick units as their net worth is negative. It is feared that in the season of 2004-05, nearly 100 sugar factories in the State will not be able to start their crushing season due to lack of sugarcane. In this situation if new sugar factories are started without bothering for the availability of the sugarcane, there will be disastrous effect on the existing sugar factories and the sickness will further grow.

b) Statutory Minimum Price :- In India, the Central Government announces the Statutory Minimum Price to be paid by the sugar factories to the sugarcane growers. This price is linked to the recovery percentage of sugar. The factories have to pay this price in spite of their financial position. In other countries in the world like Australia, the minimum price to be paid is fixed by the Government, but if the factories are not able to make the payment of the same, the difference is borne by the Government. In India there is no such mechanism and therefore the sugar factories come in trouble due to the payment of such price.
Conclusion: In view of the above discussion, it is evident that the growth of the sugar factory is accelerated or retarded by the policies of the Government and thus the hypotheses is proved.

7.3 Hypotheses Two: -
For assessing the effectiveness of the sugar factories, existing parameters are not sufficient or they do not exist.
On the basis of the literature available on this subject, the Researcher observes that at present there are parameters for assessing the effectiveness of the sugar factories performance. The parameters existing at present can be grouped in the two following categories.

7.3.1 Technical Performance: -
For assessing the technical performance of the sugar factories, there are parameters prescribed by the Central Government. These parameters are discussed in detail in the Chapter Four of the present study.

7.3.2 Financial Performance: -
For assessing the financial performance, a tool of Ratio Analysis can be used for the sugar factories. Important ratios used for judging the performance are discussed in detail in the Chapter Five of the present study.

Thus, the researcher concludes that sufficient technical parameters and parameters for assessment of cost effectiveness of co-operative sugar factories are available. Despite this these tools are not used due to lack of scientific management systems and professional employees. It can be observed that the sugar co-operatives are not established for social benefits but for the private use to satisfy political and social aspirations.
It is significant to note that the Government of Maharashtra has made it compulsory to all the sugar co-operatives in the state to maintain cost accounting records and to conduct cost and performance audit every year from 2002-2003. The compliance of this statutory provision will ensure proper recording of the costs for arriving at the exact cost of production.

Thus the hypothesis that existing parameters for assessing the effectiveness are not sufficient or they do not exist, is rejected.

7.4 Hypotheses Three: -

The policies of sugar factories regarding the by-products are affecting the overall profitability of the sugar factories.

For testing this hypotheses, the Researcher has surveyed total 10 factories, out of which 7 factories were with by-products and 3 were without by-products. The following analysis was conducted.

a) Cost Structure: - The cost structure of the factories under study was analysed with regards to the following key variables.

   i) Material Cost
   ii) Conversion Cost without Interest
   iii) Interest
   iv) Surplus

Observations :- The observations regarding the cost behavioural pattern of the above variables are summarized in the following paragraphs.

The total factories were divided in two control groups. The first group consists of factories having ancillary units based on the by-products
and second group consists of the factories which do not have ancillary units.

The cost component was divided into raw material cost, conversion cost and interest paid on loans. It was of interest to know whether the average cost of these components significantly differ in two control groups or not. To test this for each factory average cost considering four years data has been calculated and then a ‘t’ test has been applied to test the difference between means, where statistics ‘t’ is,

\[
\text{Difference between means} = \frac{\text{Means 1} - \text{Means 2}}{\text{S.E.}}
\]

S. E. = Standard Error

Following results are obtained from the ‘t’ test.

Material Cost (as percentage of total)

<table>
<thead>
<tr>
<th>Factories with by-product</th>
<th>Year</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>98-99</td>
<td>64.27</td>
<td>73.72</td>
<td>69.24</td>
<td>72.46</td>
<td>70.52</td>
<td>67.14</td>
<td>66.46</td>
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<tr>
<td></td>
<td>99-00</td>
<td>61.91</td>
<td>68.03</td>
<td>66.71</td>
<td>75.58</td>
<td>70.38</td>
<td>69.00</td>
<td>66.20</td>
</tr>
<tr>
<td></td>
<td>00-01</td>
<td>65.31</td>
<td>62.97</td>
<td>66.90</td>
<td>75.30</td>
<td>69.75</td>
<td>69.05</td>
<td>72.73</td>
</tr>
<tr>
<td></td>
<td>01-02</td>
<td>64.89</td>
<td>63.03</td>
<td>59.20</td>
<td>70.61</td>
<td>68.53</td>
<td>62.39</td>
<td>65.98</td>
</tr>
<tr>
<td>Average</td>
<td></td>
<td>64.09</td>
<td>66.94</td>
<td>65.52</td>
<td>73.48</td>
<td>69.67</td>
<td>66.90</td>
<td>67.84</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Factories without by-product</th>
<th>Year</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>98-99</td>
<td>64.29</td>
<td>67.20</td>
<td>67.03</td>
</tr>
<tr>
<td></td>
<td>99-00</td>
<td>57.92</td>
<td>66.27</td>
<td>67.12</td>
</tr>
<tr>
<td></td>
<td>00-01</td>
<td>68.18</td>
<td>65.13</td>
<td>67.49</td>
</tr>
<tr>
<td></td>
<td>01-02</td>
<td>59.46</td>
<td>61.37</td>
<td>65.00</td>
</tr>
<tr>
<td>Average</td>
<td></td>
<td>62.46</td>
<td>64.99</td>
<td>66.66</td>
</tr>
</tbody>
</table>
Hypothesis: Average material cost in two control groups is same

\[ H_0 = m_1 = m_2 \]

Alternate Hypothesis: There is a difference in average material cost in two groups. Now the test statistics

\[
't' = \frac{3.07}{2.167} = 1.416
\]

Table value of ‘t’ is 2.306, therefore ‘t’ = 1.416 < 2.306

Therefore, we accept \( H_0 \). Hence there is not difference in average material cost in two control groups.

Conversion Cost (As percentage of total cost)

<table>
<thead>
<tr>
<th>Factories with by-product</th>
<th>Year</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>98-99</td>
<td>28.83</td>
<td>18.56</td>
<td>21.46</td>
<td>22.04</td>
<td>22.22</td>
<td>21.52</td>
<td>28.00</td>
<td></td>
</tr>
<tr>
<td>99-00</td>
<td>30.28</td>
<td>25.06</td>
<td>25.09</td>
<td>19.80</td>
<td>21.02</td>
<td>21.31</td>
<td>29.08</td>
<td></td>
</tr>
<tr>
<td>00-01</td>
<td>25.57</td>
<td>27.03</td>
<td>24.14</td>
<td>18.87</td>
<td>20.25</td>
<td>21.04</td>
<td>20.00</td>
<td></td>
</tr>
<tr>
<td>01-02</td>
<td>21.86</td>
<td>25.86</td>
<td>27.41</td>
<td>20.97</td>
<td>20.91</td>
<td>25.82</td>
<td>21.89</td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td>26.63</td>
<td>24.12</td>
<td>24.52</td>
<td>20.42</td>
<td>21.1</td>
<td>22.42</td>
<td>24.74</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Factories without by-product</th>
<th>Year</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>98-99</td>
<td>29.80</td>
<td>23.56</td>
<td>21.32</td>
<td></td>
</tr>
<tr>
<td>99-00</td>
<td>30.30</td>
<td>24.27</td>
<td>22.29</td>
<td></td>
</tr>
<tr>
<td>00-01</td>
<td>20.77</td>
<td>24.42</td>
<td>22.13</td>
<td></td>
</tr>
<tr>
<td>01-02</td>
<td>23.33</td>
<td>25.56</td>
<td>21.85</td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td>26.65</td>
<td>24.45</td>
<td>21.89</td>
<td></td>
</tr>
</tbody>
</table>

Hypothesis: the average of conversion cost for two control groups is equal.

Alternate hypothesis: There is significant difference between the average conversion costs in two groups.
The test statistics is,

\[
\text{difference between means} \\
't' = \frac{\text{S.E.}}{S.E.}
\]

S. E. = Standard Error

\[
0.71 \\
't' = \frac{0.25}{2.795}
\]

Table value of ‘t’ is 2.306, therefore ‘t’ = 0.25 < 2.306

There is no significance difference in average conversion cost in two control groups.

Interest on Loan (As percentage of total cost)

<table>
<thead>
<tr>
<th>Year</th>
<th>Factory 1</th>
<th>Factory 2</th>
<th>Factory 3</th>
<th>Factory 4</th>
<th>Factory 5</th>
<th>Factory 6</th>
<th>Factory 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>98-99</td>
<td>6.89</td>
<td>7.71</td>
<td>9.91</td>
<td>5.49</td>
<td>7.75</td>
<td>11.33</td>
<td>5.5</td>
</tr>
<tr>
<td>99-00</td>
<td>7.80</td>
<td>6.80</td>
<td>8.19</td>
<td>4.61</td>
<td>8.59</td>
<td>9.49</td>
<td>4.00</td>
</tr>
<tr>
<td>00-01</td>
<td>9.10</td>
<td>9.98</td>
<td>8.95</td>
<td>5.81</td>
<td>9.96</td>
<td>9.90</td>
<td>7.20</td>
</tr>
<tr>
<td>01-02</td>
<td>13.24</td>
<td>11.10</td>
<td>13.97</td>
<td>8.41</td>
<td>10.68</td>
<td>11.43</td>
<td>12.12</td>
</tr>
<tr>
<td>Average</td>
<td>9.25</td>
<td>8.89</td>
<td>9.92</td>
<td>6.08</td>
<td>9.25</td>
<td>10.83</td>
<td>7.72</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>Factory 1</th>
<th>Factory 2</th>
<th>Factory 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>98-99</td>
<td>5.89</td>
<td>9.24</td>
<td>11.63</td>
</tr>
<tr>
<td>99-00</td>
<td>11.75</td>
<td>9.44</td>
<td>10.58</td>
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<tr>
<td>00-01</td>
<td>11.03</td>
<td>10.44</td>
<td>10.37</td>
</tr>
<tr>
<td>01-02</td>
<td>17.20</td>
<td>13.06</td>
<td>13.14</td>
</tr>
<tr>
<td>Average</td>
<td>11.46</td>
<td>10.54</td>
<td>11.43</td>
</tr>
</tbody>
</table>

Hypothesis: Average interest of the total cost for two groups is equal

Alternate Hypothesis: There is significant difference in average interest component in the total cost.
The test statistics is,

Difference between means
\[ t' = \frac{\text{Difference}}{\text{S.E.}} \]

S. E. = Standard Error

\[ 2.41 \]

\[ t' = \frac{2.35}{1.02} \]

Table value of ‘t’ is 2.306, therefore ‘t’ = 2.35 > 2.306

Therefore hypothesis is rejected, which means there is significant difference in average percentage of interest paid on loan. Further we observe that percentage of interest paid component is more in case of factories without by-products than the factories with by-products. This indicates factories with by-product are able to keep interest component in total cost less as compared with the factories without by-products.

At the same time it is interesting to observe percentage component of interest over a period of 4 years for both the control groups. It has been observed that the percentage of the ‘interest paid on loan’ is increasing within a study period i.e. from 1998-99 to 2001-2002. In each factory irrespective of whether it is with or without by-product.

**Surplus**

As factories with by-products tend to have less percentage of total cost as compared with factories without by-products. It is worth to observe the differences in surplus amount.

<table>
<thead>
<tr>
<th>Year</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>98-99</td>
<td>6.05</td>
<td>-85.79</td>
<td>4.99</td>
<td>5.34</td>
<td>3.03</td>
<td>2.39</td>
<td>-43.14</td>
</tr>
<tr>
<td>99-00</td>
<td>-97.97</td>
<td>31.79</td>
<td>3.09</td>
<td>5.31</td>
<td>1.39</td>
<td>5.33</td>
<td>-210.30</td>
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<td>00-01</td>
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<td>6.40</td>
<td>4.50</td>
<td>3.32</td>
<td>-190.70</td>
</tr>
<tr>
<td>01-02</td>
<td>-350.76</td>
<td>57.13</td>
<td>3.10</td>
<td>2.41</td>
<td>5.75</td>
<td>5.68</td>
<td>195.80</td>
</tr>
<tr>
<td>Average</td>
<td>-233.72</td>
<td>0.45</td>
<td>4.07</td>
<td>4.87</td>
<td>3.66</td>
<td>4.18</td>
<td>-62.07</td>
</tr>
</tbody>
</table>
Factories without by-product

<table>
<thead>
<tr>
<th>Year</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>98-99</td>
<td>0.05</td>
<td>-69.92</td>
<td>45.14</td>
</tr>
<tr>
<td>99-00</td>
<td>-125.70</td>
<td>0.69</td>
<td>81.60</td>
</tr>
<tr>
<td>00-01</td>
<td>-135.65</td>
<td>0.78</td>
<td>95.40</td>
</tr>
<tr>
<td>01-02</td>
<td>-134.72</td>
<td>0.84</td>
<td>90.24</td>
</tr>
<tr>
<td>Average</td>
<td>-99.14</td>
<td>-16.90</td>
<td>78.09</td>
</tr>
</tbody>
</table>

Hypothesis: There is no significant difference between average surplus of the two control groups.

Alternate Hypothesis: There is significant difference between the average surplus for two control groups.

The test statistics is,

\[
\text{Difference between means} = \frac{t'}{S.E.}
\]

Where

\[
S. E. = \text{Standard Error}
\]

\[
1.89
\]

\[
\frac{t'}{S.E.} = 0.049
\]

Table value of ‘t’ is 2.038, therefore ‘t’ = 0.049 < 2.038

Hence the hypothesis can be accepted. Thus, as far as average surplus is concerned there is no significant difference between two control groups, i.e. factories with and without by-products do not differ as far as surplus is concerned.

However, we observe that the surplus amounts over the study period from 1998-99 to 2001-2002

1) In case of factories with by-products all except one factories show positive values for surplus in the last year, i.e. 2001-02

2) In case of factories without by-products 2 out of 3 show negative average surplus over 4 years and other with marginal surplus of 0.84 Lakhs.
This shows that the factories with by-products tend to enter in positive surplus and may be able to retain the profits in a long run. Nonetheless to validate these observations a longer study period is required.

7.5 Hypotheses Four :-

The profitability of by-products of sugar co-operatives are not assessed either scientifically or assessed crudly by using any thumb rule.

The Researcher observes that the sugar factories with by-products have established three types of units based on their by-products.

i) Paper mills based on the Bagasse

ii) Distillery based on the Molasses

iii) Other Divisions like Fertilisers, chemicals based on the Press Mud.

The Researcher further observes that a detailed Project Report was prepared by each of the units which has started these projects. Further the permission from the Commissioner of Sugar’s office was also obtained.

As regards to the actual performance of these units, it has been observed that the Paper mills are incurring losses continuously and one of the factories under study has closed the same for huge losses. The other factory has also incurred losses in the Paper Mill and the losses are mounting every year.

The Distillery units are earning profits continuously for all the years under observation. The other divisions are also earning profits though their contribution is comparatively small.
Thus on the basis of the available evidence it can be concluded that the profitability of the by-products based units was assessed scientifically by the sugar co-operatives. The hypotheses is thus not proved.

7.6 Hypotheses Five :-

The decision making regarding the utilization of by-products is arbitrary and not based on the profit center concept.

In this case also the available evidence suggests that before establishing the by-products based units, the managements of the respective factories had prepared a detailed project report and obtained the necessary permission of the Government Authorities. This has been confirmed by the Government Authorities also.

This is proved when one looks to the profits earned from the Distillery and the Other Divisions. In case of Paper mills, there has been losses but the losses are due to several deficiencies noticed during this study and not because of the wrong assessment of the Project.

Thus the hypotheses that the decision making regarding the utilization of by-products is arbitrary and not based on the profit center concept is not proved.