APPENDIX I

“A Study of Regulatory Mechanism and Functioning of Warehouses for Agricultural Produce in South-Western Maharashtra”

QUESTIONNAIRE

(Prescribed Authority)

( Please put a tick mark ( √ ) against the answers if choice is given )

1. How many new applicants were not granted warehouse license for non fulfillment of terms and conditions for grant of license for licensing years from 2000-2001 to 2007-2008?
2. How many applicants of warehouse license, who after expiry of the license period, applied for renewal of license, but did not receive renewal because of some reason in the period from 2000-2001 to 2007-2008?
3. How many warehouse licenses were revoked by you in the period from 2001 to 2008?
4. How many duplicate license that were issued by you in the period from 2000-2001 to 2007-2008?
5. How many times board of arbitrators need to be formed to solve the conflict between warehouseman, weighers, samplers and graders and depositors in the period from 2001 to 2008?
6. Provide the number of warehouse license that were renewed at right time in the period from 2000-2001 to 2007-2008.
7. Provide the number of warehouse license that were returned to you after it’s expiry or revocation.
8. Provide the information of issuance of warehouse license and the amount of warehouse license fees gathered by you as per the storage capacity permitted for the period 2001-02 to 2007-08.
9. Provide the information of the number of licensed warehouse in the years from 2001-2002 to 2007-2008, who had deposited security deposit with you for getting warehouse license.
10. How many complaints registered in your office against warehouseman for not caring the goods kept in warehouse properly and for its loss, in the period from 2001 to 2008?
11. Have you maintained list of insurance companies to provide to the licensed warehouses?

Yes ☐  No ☐

12. Have you published names of the licensed warehouses regularly in the Official Gazette?

Yes ☐  No ☐
QUESTIONNAIRE

(Warehouse Manager)

(Please put a tick mark ( √ ) against the answers if choice is given)

1. Name of the Warehouse-

2. Capacity of the Warehouse-
   a. In metric tonnes-
   b. In cubic ft./cubic mt.

3. At the time of granting the new license and thereafter at the time of renewal, for how many years from 2000-2001 to 2007-2008 your warehouse was inspected by the prescribed authority?

4. Have you ever been inspected by prescribed authority for the conduct of the business of warehousing after grant of the license and before it’s expiry? (as a midterm inspection)
   Yes [ ] No [ ]
   If ‘yes’ for how many years from year 2001 to 2008.

5. Which of the different records are maintained in your warehouse?
   a. Stock register [ ]
   b. Ledger for depositors [ ]
   c. Insurance register [ ]

6. Provide number of Auction sales of goods deteriorated or about to deteriorate in the warehouse and what is the procedure adopted to deal with it?

7. Whether the weighers, samplers and graders associated with your warehouse have taken license from the prescribed authority?
   Yes [ ] No [ ]
   If ‘yes’ then for how many years from 2000 to 2008?

8. Whether the licensed weighers, samples and graders working in your warehouse, applied for their renewal of license, at least one month before its expiry?

9. Whether weighers, samplers and graders or a warehouseman working instead of them, maintained books and records in the form no.14 as prescribed in the Bombay Warehouse Rules 1960?
   Yes [ ] No [ ]
10. Whether a badge is wore by weighers, samplers and graders working in your warehouse while at work?

11. Provide the number of cases of suspension or revocation of license of weighers, samplers & graders associated with your warehouse that had taken place in the period from year 2000 to 2008.

12. If licensed weighers, samplers, & graders were working with your warehouse, then whether they had returned their license, after expiry or revocation?
   Yes ☐  No ☐

13. Whether weights and measures are inspected and approved by the prescribed authority from time to time?
   Yes ☐  No ☐

14. Do you insure goods/ commodities kept in your warehouse against various risks?
   Yes ☐  No ☐

15. If ‘Yes’ what is the percentage of goods that had been insured under following compulsory and non-compulsory risk factors?
   a. Fire ☐  b. Burglary ☐  c Flood ☐  d. Riots ☐

16. If you are allowing part delivery of goods kept in the warehouse, then for how many years from 2001 to 2008 you allowed it?

17. Have you provided concessional rate of storage to cooperative societies to keep deposits in your warehouse?
   Yes ☐  No ☐

18. The kind of warehouse receipt you issue-
   a) Negotiable ☐  b) Non-negotiable ☐  c) Both ☐

19. Have your depositor transferred the warehouse receipt by endorsement to other person?

20. Provide the percentage utilization of warehouse space each year from year 2001 to 2008.

21. What is the method of storage adopted by your warehouse?
   a. Stack method ☐  b. Cross method ☐
   c. No fixed method ☐  d. Any other method ☐
22. What is the method used to pick up the ordered commodities by your warehouse
   a. FIFO
   b. LIFO
   c. Combination of FIFO & LIFO
   d. No fixed method

23. If you have ever tried for productivity improvement, which way you have tried?
   Like-
   a) Use of handy tools & equipments
   b) Use of mechanized material handling equipment
   c) Training to personnel for effective operations
   d) Use of stack card/bin card
   e) Computerisation of office work
   f) Use of Warehouse management software
   g) Other

24. Out of the total goods kept in your warehouse, what is the % of goods pledged per year( % of goods hypothecated) for getting finance by the customer?

25. Have you resorted to increase or decrease in your warehouse storage space ever?
   Yes [ ] No [ ]

26. Have you availed any government scheme for erection/ establishing this warehouse? If yes give details.

27. What is the nature of labour force employed in your warehouse for goods handling?
   a. On contract basis
   b. Salaried on pay role
   c. Partly salaried & partly on contract basis
   d. Arrangement was done by the depositors.

28. Are you keeping your storage capacity reserved for cooperative society or for any other organization?
   Yes [ ] No [ ]
29. How many of the following value adding activities are performed by your warehouse?

   a. Cross docking
   c. Rebagging
   e. Labeling
   g. Standardisation
   
   b. Packaging
   d. Assembling
   f. Grading,
   h. Sorting


QUESTIONNAIRE

(Depositors)

(Please put a tick mark ( √ ) against the answers if choice is given )

1) Name-
2) Occupation-
3) Do you think the location of the present warehouse which you are utilizing is suitable to you?
   a. Yes [ ]
   b. No [ ]
4) For how many times you have availed warehouse facility in last eight years?
5) What is the normal duration of utilization of warehouse by you?
6) Are you aware of the existence of Bombay Warehouse Act & Rules?
   a. Yes [ ]
   b. No [ ]
   If ‘yes’ what are major clauses of the Act you know which you feel protect the interest of the depositors?
7) What is your purpose for storing goods in the warehouse?
   a. For risk minimization (protection from loss to the commodities)
   b. For value appreciation
   c. For getting immediate finance
   d. Inadequate space for storage
   e. To maintain constant supply (raw materials) to production.
   f. Other
8) Have you availed loan facility on the goods kept in the warehouse?
   a. Yes [ ]
   b. No [ ]
   If ‘yes’ what is the percentage of it?
9) What is the average value appreciation you have received after storing your goods in the warehouse?
   a. Received loss
   b. No loss, no profit
   c. Up to 5%
   d. More than 5% & up to 10%
   e. More than 10% & up to 15%
   f. More than 15% & up to 20%
   g. More than 20% & up to 25%
10) Is there any alternative warehouse choice available to you in your locality/nearby area?
   a. Yes ☐
   b. No ☐

11) How do you rate your satisfaction regarding the warehouse you are using now?
   a. Fully satisfied ☐
   b. Not fully satisfied ☐

12) If you are not fully satisfied what are the reasons of your non satisfaction like-
   a) Time loss/waiting/excess time taken by the warehouse management for completing the transaction. ☐
   b) High handling cost/labour cost accrued ☐
   c) Improper handling of goods while taking out (unloading) from transport carriers to warehouse and vice versa. ☐
   d) Non satisfaction resulting due to gradation of the goods done in warehouse. ☐
   e) Non availability of the required (demanded) space for storage on many occasions- ☐
   f) Lack of pro-active role played or lack of tie-up between warehouse management and the financial institutions for facilitating finance easily to the customers- ☐
   g) Additional fumigation charges taken by the warehouseman ☐
   h) Loss to the depositors goods due to improper care by the warehouse management while the goods was in storage ☐
   i) Improper value of the goods mentioned by the warehouseman on warehouse receipt ☐
   j) Rent levied by the warehouse was high compared to the gains accrued from keeping goods in it. ☐
   k) Not getting basic amenities properly like rest room, clean toilets, urinals etc. ☐
   l) Hospitality shown by warehouseman as a customer was not up to satisfaction. ☐
QUESTIONNAIRE

(Questionnaire for Organizations Having Godowns under Rural Godown Scheme and APMC officials)

(Please put a tick mark (✓) against the answers if choice is given)

1. What is the purpose of establishing/operating your godown?
   a. To earn profit
   b. To serve the members of organization/society/help trading
   c. To avail government subsidy
   d. Other

2. Are you aware of the Bombay Warehouse Act which regulates the business of warehousing?
   a. Yes
   b. No

3. Are you depositing the goods in your godown on behalf of depositors?
   a. Yes
   b. No

4. If you have not taken the license of warehousing then what is the reason behind it?

5. State the nature of present utilization of your godown like-
   a. For seeds and fertilizer distribution to farmers/community.
   b. Food grains and other agricultural produce deposition.
   c. Godown is given to other party on rental basis.
   d. Not in operation (kept empty)
   e. Other
APPENDIX- II

Regression Analysis to study the difference in gross food grain production and net food grain production

Table No.1
Table for Regression Analysis of Net Food Grain Production

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Period Year</th>
<th>Period centered X</th>
<th>Net Food grain Production Z'(L.M.T.)</th>
<th>A= 2003.5 (X–A) =dx</th>
<th>dPx</th>
<th>C = 2000 (Z’– C) = dz'</th>
<th>d²z'</th>
<th>dxdz'</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1999 - 00</td>
<td>1999.5</td>
<td>2095.76</td>
<td>–4</td>
<td>16</td>
<td>95.76</td>
<td>9169.98</td>
<td>–383.04</td>
</tr>
<tr>
<td>2</td>
<td>2000 - 01</td>
<td>2000.5</td>
<td>1948.16</td>
<td>–3</td>
<td>9</td>
<td>–51.84</td>
<td>2687.39</td>
<td>+155.52</td>
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<tr>
<td>3</td>
<td>2001 - 02</td>
<td>2001.5</td>
<td>2099.46</td>
<td>–2</td>
<td>4</td>
<td>99.46</td>
<td>9892.29</td>
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</tr>
<tr>
<td>4</td>
<td>2002 - 03</td>
<td>2002.5</td>
<td>1678.92</td>
<td>–1</td>
<td>1</td>
<td>–321.08</td>
<td>103092.36</td>
<td>+321.08</td>
</tr>
<tr>
<td>5</td>
<td>2003 - 04</td>
<td>2003.5</td>
<td>2068.34</td>
<td>0</td>
<td>0</td>
<td>68.34</td>
<td>4670.36</td>
<td>0</td>
</tr>
<tr>
<td>6</td>
<td>2004 - 05</td>
<td>2004.5</td>
<td>1915.16</td>
<td>1</td>
<td>1</td>
<td>–84.84</td>
<td>7197.83</td>
<td>–84.84</td>
</tr>
<tr>
<td>7</td>
<td>2005 - 06</td>
<td>2005.5</td>
<td>2045.05</td>
<td>2</td>
<td>4</td>
<td>45.05</td>
<td>2029.50</td>
<td>90.0</td>
</tr>
<tr>
<td>8</td>
<td>2006 - 07</td>
<td>2006.5</td>
<td>2199.01</td>
<td>3</td>
<td>9</td>
<td>199.01</td>
<td>39604.98</td>
<td>597.03</td>
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<tr>
<td>9</td>
<td>2007 - 08</td>
<td>2007.5</td>
<td>2300.03</td>
<td>4</td>
<td>16</td>
<td>300.03</td>
<td>90018.00</td>
<td>1200.12</td>
</tr>
</tbody>
</table>

n=9

From the above table we have:

\[ \bar{x} = 2003.5; \quad \bar{z'} = C + \bar{d} z' = 2000 + 38.8766 = 2038.8766 \]

Regression equation of regression of z’ on x is given by

\[ z' - \bar{z'} = bx' (x - \bar{x}) \]

where, \( b z' x = \frac{\sum dxz' - n \bar{d} x \bar{d} z'}{\sum d^2 x - n(\bar{d} x)^2} \)

\[ = \frac{1697.05 - 0}{254760.1798} = 0.00666 \]

The Coefficient of Correlation between x and z’ is given by

\[ r = \sqrt{bx' *bz' x} \]

\[ = \sqrt{0.00666 * 28.2842} \]

\[ = \sqrt{0.188372772} = 0.434019 \]
Regression of net food-grain production, $z'$ on $x$ is given by

$$z' - z' = b z' (x - \bar{x})$$

$$z' - 2038.8766 = 28.2842 (x - 2003.5)$$

$$z' = 28.2842 x - 56667.394 + 2038.8766$$

$$z' = 28.2842 x - 54628.5181$$

___________________(1)

The estimates of the net production of food grains, $z'$, during the study period is obtained by putting $X= 1999.5, 2000.5, 2001.5, \ldots, 2007.5$ in equation (1)

$$\hat{Z}'_1 = 28.2842 (1999.5) - 54628.5181$$

$$= 56554.2579 - 54628.5181$$

$$= 1925.7398$$

Similarly, we obtain,

$$\hat{Z}'_2 = 1954.02$$

$$\hat{Z}'_3 = 1982.3082$$

$$\hat{Z}'_4 = 2010.5924$$

$$\hat{Z}'_5 = 2038.8766$$

$$\hat{Z}'_6 = 2067.1608$$

$$\hat{Z}'_7 = 2095.445$$

$$\hat{Z}'_8 = 2123.7292$$

$$\hat{Z}'_9 = 2152.0134$$

Table No. 2

The Standard Error of Estimate and Testing of Hypothesis Regarding Significance of Regression Coefficient

<table>
<thead>
<tr>
<th>Period Centered at $x$</th>
<th>$dx$</th>
<th>$d^2x$</th>
<th>$Z'$</th>
<th>$\hat{Z}'$</th>
<th>$(Z' - \hat{Z}')$</th>
<th>$(Z' - \hat{Z}')^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999.5</td>
<td>−4</td>
<td>16</td>
<td>2095.76</td>
<td>1925.7398</td>
<td>170.0202</td>
<td>28906.868</td>
</tr>
<tr>
<td>2000.5</td>
<td>−3</td>
<td>9</td>
<td>1948.162</td>
<td>1954.02</td>
<td>−5.858</td>
<td>34.3162</td>
</tr>
<tr>
<td>2001.5</td>
<td>−2</td>
<td>4</td>
<td>2099.46</td>
<td>1982.3082</td>
<td>117.1518</td>
<td>13724.5442</td>
</tr>
<tr>
<td>2002.5</td>
<td>−1</td>
<td>1</td>
<td>1678.92</td>
<td>2010.5924</td>
<td>−331.6724</td>
<td>110006.58</td>
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<tr>
<td>2003.5</td>
<td>0</td>
<td>0</td>
<td>2068.34</td>
<td>2038.8766</td>
<td>29.4634</td>
<td>868.0919</td>
</tr>
<tr>
<td>2004.5</td>
<td>1</td>
<td>1</td>
<td>1915.16</td>
<td>2067.1608</td>
<td>−152.0008</td>
<td>23104.243</td>
</tr>
<tr>
<td>2005.5</td>
<td>2</td>
<td>4</td>
<td>2045.05</td>
<td>2095.445</td>
<td>−50.395</td>
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<td>2006.5</td>
<td>3</td>
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<td>2199.01</td>
<td>2123.7292</td>
<td>75.2808</td>
<td>5667.1988</td>
</tr>
<tr>
<td>2007.5</td>
<td>4</td>
<td>16</td>
<td>2300.03</td>
<td>2152.0134</td>
<td>148.0166</td>
<td>21908.9138</td>
</tr>
<tr>
<td>$\sum dx = 0$</td>
<td></td>
<td>$\sum d^2 x = 60$</td>
<td></td>
<td></td>
<td></td>
<td>$\sum (Z' - \hat{Z}')^2 = 206760.4119$</td>
</tr>
</tbody>
</table>
The standard error of the estimates of net Food - grain Production, $Z'$, ( $Z'$=Gross Food grain production, $Z$ – Export + Import ) which is the measure of spread of observed values, $Z'$, from estimated ones $\hat{Z}'$, is obtained by

$$S_{z'} = \sqrt{\frac{\sum (Z' – \hat{Z}')(Z' – \hat{Z}')}{(n-2)}} = \text{Se}(z'),$$

$$= \sqrt{\frac{206760.4119}{9-2}}
= \sqrt{29537.2017}
= 171.8639 = \text{Se}(z'),$$

To test the significance of linear relationship between net food grain production $z'$ and time period $x$ by using $t$ test, we have, The null & alternative hypotheses are as follows -

$H_0 : \beta = 0$, i.e. there is no linear relationship, against

$H_1 : B \neq 0$ i.e. there is linear relationship.

The formula for test statistic $t$ is

$$t_c = \frac{(b \cdot x' – \beta)}{S_b}$$
where, $S_b = \frac{\text{Se}(z')}{\sqrt{\{\sum d^2x – n(\bar{d} x)^2}\}}$

$$= 171.8639/\sqrt{60}
= 171.8639/7.74597
= 22.18752$$

Under $H_0$, $\beta = 0$, so that

$$t_c = \frac{b \cdot x'}{S_b}
= \frac{28.2842}{22.18752}
= 1.27478$$

Now the table value of $t$ for $(n-2) = (9-2) = 7$ d.f. at $\alpha = .05$ level of significance is

$$t_{(\alpha /2)} = 2.365$$

Thus, here we note that the calculated value of $t = tc = 1.27478 < 2.365$, [$=t_{(\alpha /2)}$].

Hence, we accept the null hypothesis and conclude that there is no significant linear relationship between the net food grain production and time period, which is same as it is seen in the gross food grain production & time period.
To Test the significance of the difference between the regression coefficients of Gross food grain production and Net food - grain production, $bzx$ and $bz'x$:

we use the $t$ test, for that the null and alternative hypotheses are given by

$H_0 : bzx = bz'x$, the regression coefficients are equal,

Against $H_1 : bzx \neq bz'x$ i.e. the regression coefficients differ significantly.

The test statistic is given by

$$t_c = \frac{|bzx - bz'x|}{\sqrt{\frac{1}{n_1} S_1^2 + \frac{1}{n_2} S_2^2}}$$

Where, $S_1 = Szx = S(z(e)) = 148.4692$, From result no.3(B1)

And $S_2 = S z'x = S z'(e) = 171.8639$, From result no.3( B'1)

Again, \(\frac{n_1 S_1^2 + n_2 S_2^2}{n_1 + n_2 - 2}\) = \(\frac{9(22043.103 + 29537.2)}{(9 + 9 - 2)}\)

= \(\frac{9(51580.303)}{16}\)

= \(\frac{46422.727}{16}\)

= \(29013.92\)

Therefore $t_c = \frac{|26.73167 - 28.2842|}{\sqrt{29013.92}}$

= \(\frac{1.55253}{170.3347}\)

= \(0.009114\) \(\quad \text{(A)}\)

The table value of $t$ at $\alpha = 0.05$ level of significance, for $(n_1 + n_2 - 2) = 16$ df, given for two tailed test is

$$t_{(\alpha/2)} = 2.120 \quad \text{(B)}$$

Thus, from (A) & (B), the calculated value

$$t_c = 0.0091503 \ll 2.120 = t_{(\alpha/2)}$$

Hence we accept the null hypothesis that the Regression Coefficients $bzx$ & $bz'x$ may be equal i.e. the difference in Regression Coefficients in Gross Food – grain production and Net Food - grain production is very - very insignificant. Thereby, we may, for simplicity consider the Gross Food Grain production for the following Regression Analysis.