CHAPTER VII
CHAPTER - VII
WORKING OF FOOD CORPORATION OF INDIA

7.1 Purchase and Procurement

7.1.1 Purchase

The Corporation's purchases consist of imported/indigenous foodgrains and other commodities. In addition, the Corporation is also purchasing imported fertilizers as principals w.e.f. 1.3.1976. The purchase transactions will be recorded in a column "Purchase Day Book" (BE.4) in form 1 to 4 (see Appendix - 2).

The purchase of foodgrains, fertilizers, gunnies and other commodities etc. will be recorded in this book on day-to-day basis, so that the Purchase Day Book will provide a complete record of all the purchases made from outside parties.

The entries in the Purchase Day Book in regard to all indigenous purchases will be made on the basis of the duplicate copy of the bill submitted by the suppliers. The original copy of the bill, duly received by the suppliers will be the Cash Voucher for entry in the Payments Cash Book (BE.2).
The purchase cost to be entered in the Purchase Day Book will be the Cost of the naked grains wherever purchase price notified prices are for naked grains. Where the prices are inclusive of gunnies/containers, the purchase cost will be total cost including the cost of gunnies/containers. Wherever the procurement charges or the cost of gunnies/ or both are payable alongwith the cost of the grains/commodities, these will be entered in Purchase Day Book in the respective columns. Wherever quality cuts are imposed and the net prices paid for the grains are lower than the notified purchase prices, the notified purchase prices will be adopted as the purchase cost and the deductions on account of quality cuts will be entered separately in the columns provided therefor. If there are any deductions by way of any adjustments against the loans/advances etc., these will be entered in the appropriate columns provided therefor in the Purchase Day Book. The net amount payable to the supplier will be entered in the column "Sundry Creditors".

Post Procurement Charges by way of interest and storage, paid/payable to the State Government and their agencies for the stocks taken over after a specified date will be booked distinctly under the relevant heads in the Purchase Day Book.
Where the procurement is made by the Corporation directly and procurement charges are incurred separately therefor, such procurement charges with appropriate break-up will be entered in the Purchase Day Book in the relevant column on the basis of the bill received.

Separate Purchase Day Book or separate folios in the same Purchase Day Book, depending upon the magnitude of the transactions will be maintained for each commodity. In respect of rice, sugar and fertilizer, separate folios will further be maintained variety-wise. For other commodities also, separate folios for each variety/grade will be maintained wherever such varieties/grade exist. In respect of wheat, paddy, rice, pulses etc., the purchase day books will also be maintained separately. For purchase made:

1. directly by the Corporation
2. from the State Government
3. from Co-operative Federations
4. from State Corporation, and
5. other agencies.

In the case of imported foodgrains, purchases are booked on the basis of quantities shown in the bill of lading.
The FOB cost of grains and the expenses on ocean freight, port clearance charges, marine insurance and bank charges will be booked separately under the relevant columns of the purchase day book for imports. In regard to foodgrains received in bulk, the F.O.B. cost will be the cost of naked grain, while in regard to foodgrains received in bagged form, the F.O.B. cost is the bagged grain. The difference between the actual quantities landed as per the drafts survey report and the quantity booked as purchases on the basis of Bill of lading will be treated as voyage gain/loss, as the case may be.

In the case of fertilizers purchases are accounted for the quantities shown in the endorsed bill of lading or the Draft Survey Report/Port out-turn statement, whichever is less. These purchases are accounted for at the pool issue prices applicable to the State Government. There being no question of voyage loss, consequent upon the accountal of purchases on the above basis, the excess quantity landed, if any, over and above the quantity accounted for as purchases, will be treated as voyage gain.

The IOG advices sent by the Head Office to the various port offices for imported foodgrains, fertilizers and gunnies will form the basis for the entry in the Purchase
Day Book. In respect of imported fertilizers, the IOG advice will be issued at the pool issue prices applicable to the State Governments. The handling charges deducted while making the payments against the letter of credit will be accounted for separately by Headquarters under sundry creditors pending adjustment (as income by the Head Office). As the letters of credit are initially encashed by the Department of Agriculture for the bill of lading quantity and the quantity as per the draft survey report/port out-turn statement, is not immediately known to Head Office, debit IOG advices are initially issued by Head Office for the bill of lading quantity only. In case the quantity as per draft survey report/port out-turn statement is less than the bill of lading quantity, only the value of quantity as per draft survey report/port out-turn statement is to be booked as purchased. Debit IOG advice for the differences between the value of bill of lading quantity for which the debit advice is received from H.O., and the value of quantity actually booked as purchases will be sent to Head Office by the Officer who got IOG advice from Head Office.

In case, however, the quantity as per draft survey report/port out-turn statement is more than the Bill of lading quantity, no credit advice is to be sent to the Head office.
In the case of imported foodgrains, the bills for the ocean freight, ship demurrages etc. for India Flag Vessels, which are paid by the Port Office/Zonal Offices will form the basis for entry in the relevant columns of the Purchase Day Book. In cases where the bills for Ocean Freight Ship Demurrage etc. both in respect of Indian Flag Vessels and Foreign Flag Vessels, in accordance with the terms of charter party agreement are paid by the Headquarters, IOG advices sent by the Import Accounts Section of the Headquarters will be the basis for the entry in the relevant columns in Purchase Day Book for imports. In regard to imported fertilizers, the question of payment of F.O.B. cost and Ocean Freight Charges by the Corporation will not arise since these are met directly by the Government of India in the Department of Agriculture and the Corporation's payments to the Government of India will be at the pool issue prices applicable to the State Government.

The various port clearance charges such as Stevedoring charges, port dues etc. will also be recorded in the respective columns in the Purchase Day Book on the basis of the bills received therefor.

If any adjustments are made in the bills received from the port authorities etc., on account of the deposits made with
them, such adjustments will be extended to the appropriate columns of the Purchase Day Book. The gross amount of the bill will be shown in the relevant column, "Port Clearance Charges".

The Credits in respect of the IOG advices received from the Head office will be given to the IOG Account (instead of "Sundry creditors") in the relevant columns of the Purchase Day Book. In regard to Ocean Freight of Indian Flag vessels and port Clearance Charges such as Stevedoring Charges, port dues etc. (wherever not adjustable against deposits) incurred by the port office themselves, the credit will be to the sundry creditors account and entered in the relevant columns of the Purchase Day Book.

IMPORTANT INSTRUCTIONS:

All stocks purchased up to the including the 31st of March of any year will be booked by the Corporation in the accounts of that year. In respect of imported foodgrains the stocks in all the vessels which sailed up to the 31st March, will be deemed to be the stocks purchased by the Corporation, the date of bill of lading being considered the date of sailing for this purpose. If there are more than one bill of lading on different dates for the same vessel,
the bill of landing dated on or before 31st March will alone be accounted for as purchases for the financial year concerned.

In the case of imports where unloading is done at more than one port, the Headquarters will prepare and send separate IOG advices in respect of the proportionate value of the stocks discharged at each port of call to the respective port operation office.

All voyage losses customs duty liabilities and ocean freight will be to the account of the Corporation in the case of foodgrains whereas these will be to the account of the Government of India, Ministry of Agriculture in regard to Fertilizers. In the case of Fertilizers the demurrage incurred at the destination ports prior to the berthing of the vessels will be to the account of the Government of India, Department of Agriculture and only demurrage/despatch money arising after the berthing of the vessels will be to the account of the Corporation.

Unlike in the case of foodgrains demurrage/despatch money at the loading port in regard to the fertilizers will not be payable by the Corporation and will be to the account of the Government of India, Department of Agriculture.
In the case of imported fertilizers, although the initial payments to the Department of Agriculture for the cost will be based on the Bill of Lading Quantity, the settlement will be on the quantities actually landed, as per survey report in the case of bulk cargo and port out-turn statement for bagged cargo.

Procurement charges as booked in the Purchase Day Book will consist of the following items:

a) Mandi charges comprising market fees, purchase commission etc.

b) Mandi labour such as handling at purchase centre, filing, sewing, marking etc.

c) Forwarding charges such as loading/unloading etc.

d) Internal movement such as the transport charges incurred from the purchase point to the godown/rail head etc.

e) Gunny cost (Payments made to the other procurement agencies only as part of procurement incidentals.)

f) Transit/temporary storage charges (payments made to the other procuring agencies only as part of procurement incidentals).
g) Service charges/establishment charges (payment made to the other procuring agencies only as part of procurement incidentals).

h) Interest charges (payments made to the other procuring agencies only as part of procurement incidentals).

i) Octroi/Toll Tax involved in the movement of grain from mandies to the storage point/rail head.

j) Purchase/Sales-tax paid specifically on procurement/purchase.

The procurement expenses incurred if any on levy sugar will not be treated as procurement charges. The total cost of levy sugar as per the bills will be treated as purchased. The purchase costs as well as excise duty applicable at notified prices and enhanced prices, if any, paid as a result of the orders of the High Court, will be shown separately in the respective columns in the Purchase Day Book.

The Port Clearance Charges normally consist of the following items:

1. Stevedoring Charges, including levies.
2. Bagging and Stitching including levies.
3. Wharfage
4. Harbour dues
5. Transit dues
6. Ground rent
7. Shed open charges
8. Gate Open Charges
9. Shed Rent
10. River and landing dues
11. Clearance from transit shed
12. Scale hire, chute hire, crane hire, OT, port OT, Custom OT.
13. Port Labour idling charges.
14. Survey Charges
15. Lighterage
16. Hire of barges
17. Other charges, if any.

As in the case of procurement charges, a separate column register in form 7 indicating commodity wise details of the port clearance charges as booked in the Purchase Day Book will be maintained, so as to indicate the various charges under the heading mentioned above.
Every effort will be made to ensure that as far as possible bills for supplies and services rendered in a month are obtained immediately from the agencies concerned and all the transactions applicable to each month are recorded in that month. In exceptional cases, however, where bills or IOG advices are not received, the purchases will be brought into the books by creating necessary liability provision through BE 10 at the end of the year.

Each of the Purchase Day Book will be totalled at the end of the month, and a posting sheet prepared. The posting sheet will indicate the debit to the purchases or procurement charges and credit to sundry Creditors, loans advances deposits, deduction for quality cuts etc., according to the prescribed heads of account, the posting sheet will clearly indicate the purchase cost, deduction for quality cuts, procurement charges (item wise) or port clearance charges (item-wise) in respect of each commodity distinctly.

For the purpose of all India accounts, purchases of foodgrains and other commodities will include port clearance charges for imported grains, procurement charges whether incurred by the Corporation or by the agencies concerned on indigenous grains.
With effect from accounting year 1982-83, unconnected wagons have actually been received but for which no invoices have been received will be accounted for as Purchases unconnected wagons in accordance with the details instructions.

7.1.2 Procurement

The Corporation alongwith the State Government and their agencies has been extending support price through purchase centres/ mandies to the farmers all over the country. In order to facilitate the farmers to bring their produce to the procuring agencies, the purchase centres have been opened even in the remote corners of the country, which have been instrumental in curbing the distress sale in the major producing areas during the peak marketing system and induce the farmers to sustain higher production to a large extent. The assured and improved income encourages reinvestment in better inputs and for better productivity.

Punjab, Haryana, Uttar Pradesh are the main States where price support operations of wheat are undertaken on a large scale for the Central pool, both by FCI and State agencies, paddy procured by
mostly within the same season. However, in the case of wheat, duty to storage and movement constraints, it has not been possible for FCI to take over wheat from the agencies immediately after procurement in Punjab and Haryana. The agencies in these States therefore hold the stocks till the FCI takes them over.

The following table shows purchase and procurement position of last ten years on all India and Uttar Pradesh basis:
Table No. 7.1

POSITION OF PURCHASE OF FCI ON ALL INDIA BASIS (FROM 1982-83 TO 1991-92)

<table>
<thead>
<tr>
<th>Year</th>
<th>Wheat % of increase or decrease</th>
<th>Rice % of increase or decrease</th>
<th>Sugar % of increase or decrease</th>
<th>Fertilizer % of increase or decrease</th>
<th>Others % of increase or decrease</th>
<th>Total</th>
<th>% of increase or decrease</th>
</tr>
</thead>
<tbody>
<tr>
<td>1982-83</td>
<td>103.61</td>
<td>64.62</td>
<td>-</td>
<td>13.68</td>
<td>-</td>
<td>0.24</td>
<td>-</td>
</tr>
<tr>
<td>1983-84</td>
<td>101.57</td>
<td>73.61</td>
<td>+ 13.91</td>
<td>12.47</td>
<td>8.85</td>
<td>-</td>
<td>0.46 + 2.22</td>
</tr>
<tr>
<td>1984-85</td>
<td>79.71</td>
<td>90.05</td>
<td>+ 39.35</td>
<td>11.83</td>
<td>13.52</td>
<td>6.66</td>
<td>+ 2675.00 + 2.22</td>
</tr>
<tr>
<td>1985-86</td>
<td>92.33</td>
<td>86.00</td>
<td>+ 33.09</td>
<td>30.15</td>
<td>120.39</td>
<td>2.26</td>
<td>+ 841.67 + 6.67</td>
</tr>
<tr>
<td>1986-87</td>
<td>116.26</td>
<td>86.79</td>
<td>+ 34.31</td>
<td>21.01</td>
<td>53.58</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1987-88</td>
<td>105.67</td>
<td>66.69</td>
<td>+ 3.20</td>
<td>18.21</td>
<td>33.11</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1988-89</td>
<td>87.25</td>
<td>76.36</td>
<td>+ 18.17</td>
<td>11.98</td>
<td>12.43</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1989-90</td>
<td>85.86</td>
<td>110.49</td>
<td>+ 70.98</td>
<td>14.37</td>
<td>5.04</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1990-91</td>
<td>103.40</td>
<td>120.00</td>
<td>+ 85.70</td>
<td>11.80</td>
<td>1.02</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1991-92</td>
<td>86.01</td>
<td>95.60</td>
<td>+ 47.94</td>
<td>12.30</td>
<td>10.09</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

* Compiled from the Annual Reports of FCI: 1982-83 to 1991-92
The table No. 7.1 shows purchase of FCI of wheat, rice, sugar, fertilizer and others, since 1982-83 to 1991-92. If we look to percentages of increase and decrease of purchase of wheat, it has gone down till 1985-86 than 1982-83, but in 1986-87 and 1988-89, it has gone up than 1982-83 because percentage of increase in 1986-87 was 12.21% and in 1987-88, it was 1.99%. The purchase of 1987-88 was lower than 1986-87. Although purchase of wheat of 1988-89 and onwards were lower than 1982-83, but in 1991-92, it was better than 1989-90. Purchase of rice in 1983-84 and onwards was better than 1982-83 but it was very poor in 1987-88 than 1986-87 because percentage of increase in purchase of rice in 1986-87 was 34.31% and in 1987-88, it was 3.20%. The position has again improved in 1990-91 because percentage of increase was 85.7% in this year, which was very good record for FCI for the last ten years. Purchase of sugar has gone down till 1984-85 than 1982-83 but in 1985-86, 1986-87 and 1987-88, it has gone up than the base year level. Purchase of sugar was better in 1985-86 than 1986-87 and 1987-88 because there was increase of 120.39%. Total purchases of FCI in 1983-84, 1984-85, 1985-86, 1986-87, 1990-91 have shown an increasing trend, while overall position of 1988-89 was very poor than other years, because there was 3.84% decrease than 1982-83.
## Table No. 7.2
Position of Purchase of FCI at U.P. Level (1982-83 to 1991-92)

(Qnt. lakh tonnes)

<table>
<thead>
<tr>
<th>Years</th>
<th>Wheat</th>
<th>% Increase or decrease</th>
<th>Rice</th>
<th>% Increase or decrease</th>
<th>Sugar, Fertilizer &amp; others</th>
<th>% Increase or decrease</th>
<th>Total</th>
<th>% Increase or decrease</th>
</tr>
</thead>
<tbody>
<tr>
<td>1982-83</td>
<td>12.77</td>
<td>-</td>
<td>6.69</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>19.52</td>
<td>-</td>
</tr>
<tr>
<td>1983-84</td>
<td>18.34</td>
<td>+ 43.62</td>
<td>9.74</td>
<td>+ 45.59</td>
<td>-</td>
<td>-</td>
<td>28.08</td>
<td>43.85</td>
</tr>
<tr>
<td>1984-85</td>
<td>21.48</td>
<td>+ 68.21</td>
<td>10.67</td>
<td>+ 59.49</td>
<td>2.44</td>
<td>-</td>
<td>34.55</td>
<td>76.99 (77 %)</td>
</tr>
<tr>
<td>1985-86</td>
<td>21.84</td>
<td>+ 71.03</td>
<td>9.04</td>
<td>+ 35.13</td>
<td>1.29</td>
<td>-</td>
<td>32.17</td>
<td>64.81</td>
</tr>
<tr>
<td>1986-87</td>
<td>15.98</td>
<td>+ 25.14</td>
<td>11.06</td>
<td>+ 65.32</td>
<td>1.82</td>
<td>- 25.41</td>
<td>28.86</td>
<td>47.85</td>
</tr>
<tr>
<td>1987-88</td>
<td>11.31</td>
<td>- 11.43</td>
<td>6.56</td>
<td>- 1.94</td>
<td>3.92</td>
<td>+ 60.61</td>
<td>21.79</td>
<td>11.63</td>
</tr>
<tr>
<td>1988-89</td>
<td>5.18</td>
<td>- 59.44</td>
<td>11.83</td>
<td>+ 76.83</td>
<td>4.02</td>
<td>+ 64.75</td>
<td>21.03</td>
<td>07.74</td>
</tr>
<tr>
<td>1989-90</td>
<td>13.17</td>
<td>+ 3.13</td>
<td>14.58</td>
<td>+ 117.94</td>
<td>3.17</td>
<td>+ 29.51</td>
<td>30.91</td>
<td>58.35</td>
</tr>
<tr>
<td>1990-91</td>
<td>15.76</td>
<td>+ 23.41</td>
<td>13.23</td>
<td>+ 97.76</td>
<td>3.36</td>
<td>+ 37.70</td>
<td>32.35</td>
<td>65.73</td>
</tr>
<tr>
<td>1991-92</td>
<td>3.63</td>
<td>- 71.57</td>
<td>8.84</td>
<td>+ 32.14</td>
<td>2.57</td>
<td>+ 5.33</td>
<td>15.04</td>
<td>22.95</td>
</tr>
</tbody>
</table>

* Compiled from Purchase Plan (1982-1992)
The Table No. 7.2 shows purchases of FCI at U.P. level, of wheat, rice, sugar, fertilizer and others since 1982-83 to 1991-92. If we see to percentages of increase and decrease of purchases of wheat, it has gone up till 1986-87 than 1982-83, but in 1987-88, 1988-89 and 1991-92, it has gone down than 1982-83 because percentage of decrease in 1987-88, 1988-89 and 1991-92 were 11.43%, 59.44% and 71.57% respectively. Purchase of 1991-92 was 4.34 times lower than purchase of 1990-91. Purchase of rice in 1983-84 and onwards (excluding 1987-88) were better than 1982-83 but the position of purchase in 1991-92 was poor than 1990-91 because it has gone down 33.18% than the previous year level. Purchases of sugar and other items in 1987-88 and onwards were better than 1984-85 but the purchase of 1985-86 and 1986-87 were poor than 1984-85. Overall position of purchase of FCI at U.P. level in 1983-84 and onwards were better than 1982-83.

7.2 Stock & Storage of Food Grains:

7.2.1 Stocks:

The stocks of foodgrains for the Central Pool are held by the Corporation and also by the State Government and other agencies till such times the stocks are handed over by them to the Corporation.
The biggest challenge of the day is thus the management of surplus food stocks and the Corporation has suggested several measures including:

(i) Increased issues to NREP/RLEGP at reduced prices.

(ii) Expansion of Tribal Distribution Programme, by enlarging Public Distribution system with adequate margins and issues at concessional prices in all the fully covered blocks.

(iii) Reduced issue prices for low income groups.

(iv) Unrestricted issues of wheat of roller flour mills/concessional prices for advance lifting and delicensing of wheat based industries.

(iv) Export of wheat to neighbouring countries.

(v) Participation in South Asian/South East Asian Food Rescue system.

The stock position in Central pool on 31st March of the last ten years is shown in following Table No. 7.3:
Table No. 7.3
Position of Stocks of FCI on All India Basis (from 1982-83 to 1991-92)

<table>
<thead>
<tr>
<th>Years</th>
<th>Wheat</th>
<th>Rice/paddy in terms of rice</th>
<th>Sugar</th>
<th>Fertilizer</th>
<th>Others</th>
<th>Total</th>
<th>% of Increase or decrease</th>
</tr>
</thead>
<tbody>
<tr>
<td>1982-83</td>
<td>60.10</td>
<td>49.94</td>
<td>3.61</td>
<td>14.67</td>
<td>0.48</td>
<td>128.80</td>
<td>-</td>
</tr>
<tr>
<td>1983-84</td>
<td>85.77</td>
<td>49.89</td>
<td>3.47</td>
<td>2.67</td>
<td>0.36</td>
<td>142.16</td>
<td>+ 10.37</td>
</tr>
<tr>
<td>1984-85</td>
<td>124.90</td>
<td>78.30</td>
<td>2.25</td>
<td>2.46</td>
<td>0.70</td>
<td>208.61</td>
<td>+ 61.96</td>
</tr>
<tr>
<td>1985-86</td>
<td>101.80</td>
<td>94.75</td>
<td>4.02</td>
<td>2.81</td>
<td>0.43</td>
<td>202.81</td>
<td>+ 57.46</td>
</tr>
<tr>
<td>1986-87</td>
<td>94.20</td>
<td>89.73</td>
<td>3.57</td>
<td>2.33</td>
<td>0.80</td>
<td>189.91</td>
<td>+ 47.45</td>
</tr>
<tr>
<td>1987-88</td>
<td>28.60</td>
<td>53.00</td>
<td>3.41</td>
<td>2.13</td>
<td>0.07</td>
<td>87.21</td>
<td>- 32.29</td>
</tr>
<tr>
<td>1988-89</td>
<td>21.25</td>
<td>40.19</td>
<td>2.25</td>
<td>1.74</td>
<td>0.10</td>
<td>65.53</td>
<td>- 49.12</td>
</tr>
<tr>
<td>1989-90</td>
<td>33.24</td>
<td>72.20</td>
<td>3.41</td>
<td>0.89</td>
<td>0.11</td>
<td>109.83</td>
<td>- 14.73</td>
</tr>
<tr>
<td>1990-91</td>
<td>53.80</td>
<td>107.60</td>
<td>2.70</td>
<td>0.60</td>
<td>0.10</td>
<td>164.80</td>
<td>+ 27.95</td>
</tr>
<tr>
<td>1991-92</td>
<td>21.00</td>
<td>90.80</td>
<td>2.20</td>
<td>0.30</td>
<td>0.10</td>
<td>114.40</td>
<td>- 11.18</td>
</tr>
</tbody>
</table>

The Table No. 7.3 shows position of stock of FCI on all India basis of wheat, rice, sugar, fertilizers and others since 1982-83 to 1991-92. If we compare total stock position of 1983-84 and onwards with 1982-83, the position between 1983-84 to 1986-87 was better than 1982-83 but the position of 1991-92 was 11.10% lower than 1982-83. This position is arisen due to export of wheat to neighbouring countries and participation in South Asian/South East Asian Food Rescue System.

7.2.2 Storage

Maintenance of foodgrains while in storage in good condition needs efficient and effective management. It calls for co-ordinated action both by godown and Quality Control Staff and a constant vigil over a number of points that are mentioned in the following paras. Failure on the part of the employees to translate the same into action shall result in deterioration to grains causing financial loss and bad reputation to the organisation, apart from running the risk of contravening the provisions of amended PFA Act, resulting in prosecution and punishment.

1. Principle of Storage

The grain is a seed and each seed is a living organism that breaths, requires nourishment, grows and dies, seeds
must have essentially the same care that is required by other living organisms, if they are to remain alive and in good conditions. The seed embryo is particularly sensitive to temperature and humidity. If temperature and humidity could be kept low (15 Deg. C. and 15 percent m.c. of grains). The embryo remains viable but inactive and the grain can be stored for long periods. However, when the temperature and humidity increases, the viable embryos become active, draw nourishment from the concentrated nutrients, particularly starches and proteins stored in the endosperm and exhaust themselves. Heat and moisture accelerate the process and soon the grain mass runs the chain reaction.

Moulds and micro-organisms invariably present on the grain kernals, and also insects, if present are stimulated to become active thereby generating more heat and moisture. Eventually a part or all of the grain mass may develop a temperature ranging upto 57 Deg. C. at which stage visible deterioration and rotting begins. It is with this background that grain is recommended in simple language to be kept cool and dry. The following can be listed as the main factors causing changes in grain:

* Source : Storage Manual of FCI.
1. Physical
   Temperature humidity
2. Chemical
   Moisture, Oxygen
3. Physiological
   Respiration Heating
4. Biology
   Insects, rodents, Micro-organisms.

2. Godown Requirements:

   The foodgrains are stored normally in the godowns of the FCI. The ideal requirements for good storage worthy godowns are:

   (i) Provision for ample aeration and ventilation for free passage of air and damp proofness. This facilitates keeping cook dry atmosphere in the godown, which is a prerequisite for healthy storage.

   (ii) Provision for ample light, the godown should not be dingy. This retards pest activity and its hibernation.

   (iii) High plinth and pucca cement flooring with smooth walls to serve as rodent proofing and floor being damp proof. The smooth wall has a deterrent effect on crawling in infestation.

   (iv) It should be free from crevices, cracks and holes to prevent insects hiding, especially during unfavourable weather conditions.
(v) Surrounding premises should be devoid of rat holes/burrows of bushy vegetation and should be clean.

(vi) The roofing should be preferably terraced or of asbestos sheets forming a triangular shape should be free from leakage spots walls free from seepage. Steel trusses should be used for strength. In case of asbestos roofing proper valley gutter arrangements for collecting rain water and draining out should be provided.

(vii) The godowns should be slightly away from residential areas and at the same time safely located preferably near railway sidings.

(viii) Provision for exhaust fans for removal of warm air, where necessary.

(ix) In the alternative, the store should be absolutely air tight.

3. Receipts of Grain at Depots

Before grain is received in the godown, the depot in charge should attend to the following points:

(i) Check the godown and its environments.

(ii) Clean the godown and its environment.
(iii) Assess Capacity.
(iv) Pre-storage insecticidal treatment.
(v) Draw the stack plan.
(vi) Get dunnage duly cleaned and disinfested.
(vii) Stack Card.
(viii) Security and fire fighting arrangements.

(i) CHECK-UP OF THE GODOWNS:

In order to avoid the possibility of damage to the grain to be stored, the depot-in-charge should check that there will be no leakage of water from the roof or valley gutter or walls during monsoon since leakage can cause considerable damage and loss. Inspection for detection of leakage shall be made frequently, much before commencement of monsoon, to ensure damage free storage of grain all the time of the year.

In respect of constructions belonging to FCI of Government of India, Engineering Wing of the Corporation shall be approached well in advance for effecting repairs whenever these become necessary. It shall be further ensured that these are carried out in time. Private godowns are taken by FCI as in adhoc measure on hire. The owners of such godowns shall be informed of repairs, if any which should be got done at their cost before storing foodgrains.
(ii) CLEANLINESS AND DISINFESSION:

The godown shall be thoroughly swept and cleaned. It is also essential that the surrounding of the godown are cleared of shrubs/bushes and drainages are maintained clean. As a safeguard against infestation, the godown shall be disinfested with either DDVP Malathion or with one of the fumigants depending upon the type of infestation.

(iii) ESTIMATION OF CAPACITY:

Storage capacity of the godown shall be carefully estimated on the following basis:

A standard size bag (44" x 26 1/2") will occupy about 6 sq.ft. of space and will contain 95 to 100 kgs. i.e. 10 to 11 bags to a tonne. Assuming a normal stack to be 16 layers high, a tonne will require 5 to 5 1/2 sq. ft. space. Providing 30 percent of space for alleyways for inspection and disinfestation of stacks, the area required for a tonne of grain will be 6.5 to 7.20 sq.ft. This will, however, vary according to weight per bag and the height of a stack. The following table gives the maximum permissible height of stack for different commodities.
( 220 )

Table No. 7.4

<table>
<thead>
<tr>
<th>Commodity</th>
<th>Normal Height of bags</th>
<th>Maximum possible layers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat, Barley, Oats Gram, Pulses, Jowar and other millets</td>
<td>20 layers</td>
<td>20 layers</td>
</tr>
<tr>
<td>Rice &amp; milled pulses</td>
<td>16 layers</td>
<td>18 layers</td>
</tr>
<tr>
<td>Wheat Products, viz., suji, maida and gram flour</td>
<td>12 layers</td>
<td>-</td>
</tr>
<tr>
<td>Atta</td>
<td>10 layers</td>
<td>-</td>
</tr>
<tr>
<td>Wheat Bran</td>
<td>16 layers</td>
<td>-</td>
</tr>
<tr>
<td>Paddy</td>
<td>18 layers</td>
<td>20 layers</td>
</tr>
</tbody>
</table>

The other formula for calculating the storage capacity is as under:

STORAGE CAPACITY:

\[ L \times b \times \text{No. of bags or height of stock in bags} \]

\[ 6 \times 11 \]

* Source: Food Corps (Monthly Journal)
(iv) DISINFESTATION OF GODOWNS:

Irrespective of whether infestation is apparent or not the godown shall be thoroughly cleaned and the floor walls pillars etc., swept/brushed and disinfested with any of the chemicals mentioned here as under:-

(a) Malathion 50 percent E.C. (premium grade) by preparing a solution with water in the ratio of 1:150 and spraying @ 3 litres per 100 sq. meters.

(b) DDVP - 100 E.C. diluted with water in the ratio 1:300 and sprayed only on the flour @ 3 litres per 100 square meters.

(c) EDB - 0.75 kg per 1000 C.F.T.

(d) Aluminium phosphide - 20 tablets per 1000 cu.ft.

(v) STACK PLAN:

The floor space should be divided as far as possible into uniformly sized rectangles to build up a stack on each. The standard size for a stack is 30' x 20'. In no case,
this size should be changed without approval of the Head Office. Between stacks and walls there should be a 2.5 ft. wide space to serve as an alleyway for moving about for inspection and disinfestation and also for facilitating movement of bags while constructing stacks gangways be left in such a way that maximum draft and consequent ventilations ensured.

(vi) SPREADING OF DUNNAGE DULY TREATED:

The dunnage for stacking of bags should be wooden crates or polythene sheet block 600 guage on 2 layers of mats in case of conventional bag storage.

(a) WOODEN CRATES:

The wooden crates specification which are given in appendix are ideal when used with a layer of bamboo mats over them to facilitate collection of spillings. In the wake of heavy CAP storage, wooden crates to be reserved for open storage and for use in substandard hired godown as far as possible.

(b) POLYTHENE SHEET WITH MATS:

In the event of crates being in short supply, black polythene sheet of 300 gauge sandwiched between two layers
of mats (bamboo or patera) shall be used as effective dunnage

(c) In the event of either wooden crates or polythene sheets not being available, bamboo or patera mats in two layers will be used.

(d) Ballis and casuarind poles can be used.

Food grains shall not be stored in the godowns without proper dunnage. The dunnage material shall be cleaned and disinfested with malathion/DDVP and, if necessary, fumigated after every use to ensure that it is free from infestation. Dunnage once used for storing fertilizer should be as far as possible be not used for storage of foodgrains. In exceptional circumstances, if the same grain has to be used in storage, the godown should be thoroughly washed before use.

(vii) TYPE OF STACKS:

(a) Simple of "Thappi" type stacking:

Bags are stacked one on top of the other. This type is not commonly employed in large scale storage.
(b) BLOCK STACKING:

In block stacking, each layer has lengthwise and breadthwise bags alternating to form the block.

(c) CROSS STACKING:

In cross stacking, bags are laid systematically in alternate lengthwise and breadthwise, tiers both (2) and (3) of stacking are useful for long-term storage because of stability and countability of bags.

(viii) STACKS CARDS:

Each stack shall have a separate stack card. It shall indicate complete record of the receipts and issues. Account of receipts and issues is given on one side of the card and on the other side, are recorded the condition of grain and the treatment given to the grain from time to time. The convenient size of a stack card is 14" x 18". The number of dunnage pieces utilised for each stack may also be mentioned on each card. The Card shall be tagged on front side of the stack of a height convenient for inspection of the stack and recording remarks.

The cards are preferably placed in a transparent polythene covering. The stack card should give all relevant information such as the condition of the stocks at the time
of receipt, the details of findings of fortnightly inspection, indicating infestation, the category, classification, disinfestation treatment given, treatment recommended etc.

During the fortnightly inspection, the moisture content of the stacks also should be recorded. In addition to the stack cards, all the above information should be reflected upto date in the stackwise register till every stack is killed, so that a complete history of the stocks in every stack from the time of its receipt to its issue is available. This shall be the responsibility of the Technical Assistances, attached to every storage point and a record of this type shall clearly establish whether all care has been taken or not and whether there has been any negligence on the part of either the godown of technical staff.

Further, in the light of amended PFA Act, the maintenance of such clear history of stocks for each stack will come to the elp of the nominated unit officer, in case of any prosecution proceedings for establishing that all necessary precautions have been taken.
4. Inspection of Grain During Receipt

At the time of receipt in the godown, the grain heaps shall be carefully inspected. If some bags are found slack, torn, wet damp or containing, heavily infested grain or deleterious matter they shall be segregated for taking suitable action immediately. Slack bags shall be filled to standard weight, torn bags stitched or replaced and damp or wet bags opened out and the grain dried and earmarked for early disposal.

In no case, any damp or wet grain shall be allowed to go into a stack. Heavily infested grain shall be cleaned and where necessary, fumigated. In case the grain is dried in the sun, it shall be allowed to cool down before it is rebagged. Rice will crack if dried in the sun and hence this shall be avoided. If any deleterious matter is noticed in the grain, it shall immediately be reported to the Regional Manager with samples.

Representative sample of not less than 500 grams shall be drawn from each wagon/lorry load at the time of receipt into the godown. It shall be examined for general condition of the stocks infestation etc. classified and
categorised on the basis of existing instructions. These observations require to be recorded on the reverse of the stack Card. In case live infestation is noticed, the lot shall be fumigated immediately. As a routine measure, grains on receipt shall be given propylactic treatment on the same day or within 24 hours of receipt at the latest. Moisture content of the grain shall also be determined. As far as possible only one kind of grain shall be stored in a godown. Milled products of wheat and millets shall not be stored in a godown, where rice is stored.

5. Care of Grain in Storage:

All attempts shall be made to maintain stocks in the same condition as at the time of receipt, deteriorated and damaged bags found in any consignment received shall be treated as or reconditioned, as per standing instructions.

Under no circumstances shall fertilizers and pesticides be stored along with foodgrains in the same godown.

The reconditioning and salvaging operations consist of cutting the bags open, separating out the sound grains from the damaged kernels, spreading the damaged grain in a thin layer, layer for aeration where necessary and cleaning or blending, where grain has excess foreign matter. The sound grains after sufficient aeration shall be rebagged for issue.
in the normal channel on priority. The damaged kernels shall be moved over to the isolation shed after necessary weighment etc. for disposal as per the standing instructions laid down in this regard. In case the foodgrain bags particularly of wheat are affected by rain or flood water in a godown, they shall be segregated, salvaged or reconditioned and issued to flour mills expeditiously so as to avoid decomposition of grain in wet bags. Damaged grain shall be clearly labelled as "Damaged Grain", otherwise, it will amount to contravention of PFA act.

6. Various Types of Storage:

A. Bag Storage:

(1) Conventional Godowns:

Conventional godown is rectangular structure, known as "flat warehouse" according to western terminology and, as a godown in India. It consists of godowns with brick masonry walls and asbestos corrugated cement sheet roofing on tubular trusses. The flooring consists of cement concrete. This type of godowns are considered more suitable from the point of view of scientific storage, operational convenience and economy in cost.

Initially, these were constructed in three spans of 30' each with valley gutters. Valley gutters were found to be a
nuisance, particularly when they get checked and rain water floods into the godown.

Subsequently, it was decided to have 45' span godowns in which two stacks of 20' x 30' could be accommodated. This was found to be more suitable.

In godown construction, the variable costs are the roofing costs and the walling costs. By having large span godowns, the cost of walling per tonne of grain stores is reduced while the cost of roofing goes on increasing with increases in span. A study was conducted and it was found that the most economical godown was one of 21.8 meter span in which 3 stacks of 20' x 30' could be accommodated side by side.

A typical 5000 tonne godown has compartments each of 41.85 meters length. In each compartment, 4 rolling shutters are provided. The rail side platform above ground level should not be less than 75 cms. On the railway side, the eight should not exceed 90 cms. Ventilations are provided to keep the grain properly aerated and plug points are provided for operating fumigating machines.
In places where sufficient land is not available, 14.5 meters wide or 45' wide godown are still being used.

TYPICAL LAYOUTS:

The width of roofs required is 50' and clear distance between copings for the railway track is 42 to allow for three railway lines.

LOCATION:

Godown should be located at a well-drained site, not liable to flooding or to be affected by seepage water. It should be away from fire hazards such as workshops, timber stores and petrol pumps. It should be located near the main road the preferably with a railway siding. It should be ensured that the godowns are entirely weather proof, gas tight to enable fumigation of entire contents, proofed against entry of rodents birds and sub-soil moisture and provide for natural aeration.

ANCILLARY STRUCTURES:

(i) Office block
(ii) Isolation shed

* Source: Storage Management : p.17
(iii) Lavatory Block
(iv) Canteen
(v) Chowkidars quarters
(vi) Weighbridges
(vii) Proper drinking water facility.

2. MINI GODOWNS:

In order to make use of small pockets of land in existing complexes, the mini godown design was evolved which is 41.8 meters long and 7.85 meters wide, the width can accommodate one single stack and only two platforms 4.15 meters x 0.9 meters are provided at the entrance doors, rolling shutters in normal godowns are 1.83 meters wide and in mini godowns, they are reduced to 1.53 meters width.

3. SHELL TYPE GODOWNS:

These are 420' long and 90' wide and have been constructed at Naraina, Jinjarapole and Borivilli. Although they are quite economical, considerable time is taken in designing and construction and the work can be done only by specialists. Hence, this is not suitable for large scale construction in out of way places.
4. REISER TYPE DESIGN:
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The roof truss consists of open web 2 hinged arches with a tie rod. These are very economical as far as material is concerned but involves considerable welding.

5. R.C.C. FLAT ROOF GODOWNS:
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These sheds are with flat concrete roofs relatively costlier and need aeration to move out the warm accumulated air near the ceiling. A much longer free space is also needed at the top while arranging stacks in the sheds.

B. BULK STORAGE:
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1. LARGE DIAMETER BINS:
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These have been constructed at Kanpur, Gayan, Borivilli and Manmad. They have RCC walls covered by an RCC dome, feeding as well as reclamation of grain is done by pneumatic machines, which is expensive.

2. SILOS:
-------

These have been constructed at Naraina and Faridabad and also a number of centres in U.P. and Punjab. They consist of intake pits conveying arrangements bucket elevators in
the headquarters and distribution conveyors at the top. At the bottom reclamation conveyors are provided, cleaning and automatic weighing and bagging facilities can be provided. This is the best form of storage but very costly and time-consuming for construction.

3. **FLAT STORAGE:**

Flat storage with two hinged open-web steel frames have been constructed at Hapur. These are found more economical and quicker to construct than tall silos.

4. **WORLD BANK PROGRAMME:**

Under the World bank Programme, 4 types of storage will be constructed:

(i) Conventional godowns
(ii) Bag-cum-bulk warehouses.
(iii) Circular bin complex with mechanical handling arrangements.
(iv) Flat storage with flat/happer bottom.

Considerable experience has been gained in maintaining various agricultural commodities in storage during the last few years. The co-operatives have handled large quantities of agricultural inputs, the warehousing
corporation almost all types of agricultural commodities and the Food Department and the FCI, the foodgrains steps to be taken at the time of receipt of various commodities operations to be carried out during storage of these difficult situation likely to be encountered and action to be taken at the time of issue are more or less well known.

7 Care of Grain in Stores

All attempts shall be made to maintain stocks in the same condition as at the time of receipt. Deteriorated and damaged bags found in any consignment received shall be treated or reconditioned as per standing instruction. Under no circumstances shall fertilizers and pesticides be stored along with foodgrains in the same godown.

(8) Fortnightly Examination and Maintenance of Progressive Records of Condition of Grain:

Stocks shall be examined at least once in a fortnight. A record shall be maintained to show the progressive condition of the grain degree of deterioration and infestation, if any, with names of insects present and the treatment given. This record shall also be indicated on the stack card.
(235)

(9) Heating:

On suspicion of heating in any stack, proper aeration shall be arranged and the stack may be broken if normal aeration does not bring down the temperature. If the heating is due to excessive moisture in the grain, the grain shall be released for consumption immediately. If it is due to infestation, the grain shall be fumigated. Such heated lots shall be under close watch till issued out.

Following table shows converted and open storage capacity of FCI of last ten years on all India level:
Table 7.5

Position of storage capacity of FCI on all India basis (from 1982-83 to 1991-92)

(in lakh tonnes)

<table>
<thead>
<tr>
<th>Years</th>
<th>Owned Covered (Cvrd. &amp; Plinth)</th>
<th>Capacity Total</th>
<th>HIRED FROM STATE GOVT. AGENCIES</th>
<th>Covered (Cvrd. &amp; Plinth)</th>
<th>Capacity Total</th>
<th>CWC/CWC/ARDC AND OTHERS</th>
<th>Grand Total</th>
<th>% of increase or decrease</th>
</tr>
</thead>
<tbody>
<tr>
<td>1982-83</td>
<td>86.06</td>
<td>11.12</td>
<td>93.18</td>
<td>78.67</td>
<td>9.58</td>
<td>88.25</td>
<td>181.43</td>
<td>-</td>
</tr>
<tr>
<td>1983-84</td>
<td>85.45</td>
<td>10.57</td>
<td>96.02</td>
<td>85.51</td>
<td>4.72</td>
<td>90.23</td>
<td>186.25</td>
<td>2.66</td>
</tr>
<tr>
<td>1984-85</td>
<td>91.75</td>
<td>7.98</td>
<td>99.73</td>
<td>105.17</td>
<td>17.79</td>
<td>122.96</td>
<td>222.69</td>
<td>22.74</td>
</tr>
<tr>
<td>1985-86</td>
<td>103.66</td>
<td>13.32</td>
<td>116.98</td>
<td>104.28</td>
<td>23.42</td>
<td>127.70</td>
<td>244.68</td>
<td>34.86</td>
</tr>
<tr>
<td>1986-87</td>
<td>112.52</td>
<td>13.67</td>
<td>126.19</td>
<td>99.44</td>
<td>35.67</td>
<td>135.11</td>
<td>261.30</td>
<td>44.02</td>
</tr>
<tr>
<td>1987-88</td>
<td>116.20</td>
<td>12.16</td>
<td>128.36</td>
<td>79.21</td>
<td>34.06</td>
<td>113.27</td>
<td>231.63</td>
<td>27.67</td>
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<tr>
<td>1988-89</td>
<td>118.60</td>
<td>12.48</td>
<td>131.08</td>
<td>62.38</td>
<td>25.80</td>
<td>88.18</td>
<td>219.26</td>
<td>20.85</td>
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<tr>
<td>1989-90</td>
<td>119.35</td>
<td>10.73</td>
<td>130.08</td>
<td>56.52</td>
<td>10.14</td>
<td>66.66</td>
<td>196.74</td>
<td>8.44</td>
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<tr>
<td>1990-91</td>
<td>120.00</td>
<td>10.40</td>
<td>130.40</td>
<td>76.00</td>
<td>14.70</td>
<td>90.70</td>
<td>221.10</td>
<td>21.87</td>
</tr>
<tr>
<td>1991-92</td>
<td>119.40</td>
<td>11.30</td>
<td>130.70</td>
<td>63.30</td>
<td>5.20</td>
<td>68.50</td>
<td>199.20</td>
<td>9.79</td>
</tr>
</tbody>
</table>

Table No. 7.5 shows position of storage capacity of FCI on all India level from 1982-83 to 1991-92. On the basis of these figures, we can say that on 31st March of 1992, the Corporation had a storage capacity of 197.20 lakh tonnes (FCI's owned capacity being 130.70 lakh tonnes and hired capacity being 68.50 lakh tonnes) which was 9.79% greater than 1982-83 but 9.90% lower than 1990-91 due to lower volume of procurement during rabi and kharif season.
POSITION STORAGE CAPACITY OF FGI ON ALL INDIA BASIS

Covered (Owned)  
Covered (Hired)  
Owned Cap (Cover & Plinth)  
Hired Cap (Cover & Plinth)

<table>
<thead>
<tr>
<th></th>
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<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>92.06</td>
<td>85.45</td>
<td>91.75</td>
<td>103.66</td>
<td>112.52</td>
<td>116.20</td>
<td>118.60</td>
<td>119.35</td>
<td>120.00</td>
<td>119.40</td>
</tr>
</tbody>
</table>

Lakh Tonnes
Table No. 7.6

Position of storage capacity of FCI at U.P. Level (from 1982-83 to 1991-92)

(in lakh tonnes)

<table>
<thead>
<tr>
<th>Years</th>
<th>Owned Covered Capacity (Cvrd. &amp; Plinth)</th>
<th>Total</th>
<th>HIRED FROM STATE GOVT. AGENCIES CWC/CWC/ARDC AND OTHERS Covered Capacity (Cvrd. &amp; Plinth)</th>
<th>Total</th>
<th>Grand Total</th>
<th>% of Increase or Decrease</th>
</tr>
</thead>
<tbody>
<tr>
<td>1982-83</td>
<td>1004.08</td>
<td>159.41</td>
<td>1163.49</td>
<td>1151.58</td>
<td>1203.18</td>
<td>2366.67</td>
</tr>
<tr>
<td>1983-84</td>
<td>1065.08</td>
<td>155.35</td>
<td>1220.43</td>
<td>1561.67</td>
<td>1908.35</td>
<td>3128.75</td>
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<tr>
<td>1984-85</td>
<td>1095.08</td>
<td>154.19</td>
<td>1249.27</td>
<td>1810.89</td>
<td>2241.59</td>
<td>3490.86</td>
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<td>1985-86</td>
<td>1108.71</td>
<td>360.60</td>
<td>1469.31</td>
<td>1769.50</td>
<td>2240.60</td>
<td>3709.91</td>
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<td>1986-87</td>
<td>1250.99</td>
<td>336.68</td>
<td>1587.67</td>
<td>1591.29</td>
<td>1869.47</td>
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<td>1987-88</td>
<td>1329.60</td>
<td>396.68</td>
<td>1726.28</td>
<td>1494.83</td>
<td>1739.65</td>
<td>3465.93</td>
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<tr>
<td>1988-89</td>
<td>1399.60</td>
<td>414.16</td>
<td>1813.76</td>
<td>1272.85</td>
<td>1282.09</td>
<td>3095.85</td>
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<td>1989-90</td>
<td>1419.60</td>
<td>217.80</td>
<td>1637.40</td>
<td>861.60</td>
<td>953.90</td>
<td>2591.30</td>
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<tr>
<td>1990-91</td>
<td>1422.10</td>
<td>173.38</td>
<td>1595.48</td>
<td>953.75</td>
<td>1103.79</td>
<td>2699.27</td>
</tr>
<tr>
<td>1991-92</td>
<td>1422.10</td>
<td>173.38</td>
<td>1595.48</td>
<td>794.11</td>
<td>909.95</td>
<td>2505.43</td>
</tr>
</tbody>
</table>

* Source: Compiled from Annual Reports of FCI (1982-1992)
The Table No. 7.6 shows the position of storage capacity of FCI at U.P. level from 1982-83 to 1991-92. On the basis of these information we can conclude that U.P. Food Corporation had a storage capacity of 2505.43 thousand tonnes during the year 1991-92 which was 5.86% greater than 1982-83 but 7.18% lower than 1990-91 due to lower value of procurement during rabi and kharif season.
7.3 Sale of Foodgrains and other Commodities

The sale of the Corporation consists of foodgrains, fertilizers, sugar and other commodities. The sale transactions will be recorded in the following columnar books.

(i) Sale Day Book for Credit Sales BE 5-A
(ii) Sales Day Book for Cash Sales BE 5-B

7.3.1 Sale Day Book for Credit Sales

The sale of foodgrains effected by the Corporation as at present are mostly on cash basis. In respect of such cash sales, sales bills are not required to be prepared and the release orders containing all the particulars including value of sales would themselves serve the purpose of the sale bill. Where in exceptional cases, sales are made on Credit basis, sale bills are to be prepared immediately after the sales are effected.

The voucher for recording credit sales will be the sales bill. In the case of fertilizers, sales are effected to the State Governments and other agencies on the basis of irrevocable Letters of Credit, opened by them with the Zonal/Regional Managers. Billing will be completed immediately after the supplies are made and sent to the
office with whom the Letter of Credit has been established for obtaining the payment. The supplying office will record the entries in the Sales Day Book on the basis of the bills raised.

7.3.2 Sales Day Book for Cash Sales:

The voucher for entry in this book will be individual release order or a consolidated statement of Release Order as the case may be, where posting is done from the consolidated statement. The Individual Release Order will constitute the sub. voucher along with the main voucher.

Cash Sales will be recorded by debit to a control account, styled Cash Sales Control Account, with Contra-Credit to the Sales account.

The figures relating to cash sales control account being in nature need not be posted in General Ledger account though these items will be entered on the posting sheet of the Sale Day Book. The figure appearing under Cash Sales Control in the monthly posting sheets will be compared with the corresponding figures appearing in the Receipt Cash Book (BE 1).

1- Account Manual of FCI, Page No. 31
2- Account Manual of FCI, Page No. 32
Complete reconciliation of cash sales will be ensured between the Receipt Cash Book and Sales Day Book on a day-to-day basis, so that at the time of finalisation of accounts, no debit or credit balance remain unadjusted under the "Cash Sales Control Account".

All State Government and other allottees who make cash payment of the Cost of the Fertilizer before actual despatches are made are allowed a cash discount of 2% as at present. Sales will be credited at the pool issue prices and the corresponding debit for rebate and the net amount receivable will be entered in the columns provided therefor.

1- The sale of foodgrains, sugar, fertilizers, gunnies and other commodities will be recorded in these books on a day-to-day basis, so that they provide a complete record of all the sales made to outside parties. These books of original entries will be in form No. 11 & 12.

Separate Sales Day Books (Separate folios in the same Sales Day Book depending upon the magnitude of the transactions) will be maintained for each of the foodgrains like indigenous wheat, imported wheat, indigenous rice, imported rice, etc. and also each of the other commodities such as sugar, fertilizers, gunnies etc.

Separate folios will also be maintained variety-wise for wheat, rice, sugar and fertilizers.
7.3.3 Important Instructions:

The value of sales will be worked out as per the issue rates applicable for the different transactions e.g.:

a) Issue of foodgrains from the Central Pool to the State Governments, Central Government or Departments of central Government/Union Territories, Roller Flour Mills etc. at the Central Issue prices.

b) Where the Corporation acts as wholesalers in certain States for distribution of Foodgrains allotted from the Central Pool at the rates fixed in consultation with the State Government (Central issue prices plus agreed margins/incidentals).

c) In the case of procurement and distribution made by the Corporation in the states on behalf of the states as the prices mutually agreed upon.

d) For supplies of pulses, barley etc. to army purchase organisations at the specified sanctioned rates.

e) In the case of sugar at the uniform retail price fixed by the Government of India.

f) In the case of fertilizers at the pool issue prices to the State Government and at the rates fixed for issues to plantations/private parties/licensed dealers.
In the case of foodgrains wherever the sales are effected at rates other than the Central Issue rates, the Sales realisation will be broken into (i) cost of grain (ii) State Government administrative/equilisation etc. charges and (iii) Margins/incidentals allowed to the Corporation at the end of the month and recorded in a posting sheet in form no.13.

In the case of Sugar, the sales will be booked at the gross rate inclusive of retailers margin and the transportation charges which will, however, be shown separately in the relevant columns. In the case of fertilizers, cash discount will be shown separately in the relevant columns.

Sales turnover for the purpose of Sales Tax will, in all cases, be the net sales realisation only (gross sales minus discount, retailers' margin, retailers' transportation charges etc.)

Complete reconciliation of sales with the depot statements will be effected, so as to ensure agreement of the sales quantities, as per depot stock records with the district accounting records. The reconciliation must be completed before the preparation of the final accounts.
All stocks for which release orders have been issued upto 31st March and which was lifted upto 30th April are accounted as sold.

The stocks lifted between 1st April to 30th April against release orders issued till 31st March, preceding are however shown separately as unlifted stocks, as on 31st March in the SLS. These unlifted stocks thus do not form part of the closing stocks of the Corporation as on 31st March and are, therefore, to be deducted from the physical stocks available as on 31st March.

Sale of foodgrains and fertilizers against Letters of Credit and on credit are accounted for on the basis of actual delivery of stocks.

Sale of pulses to army purchase organisation (ministry of Defence) are accounted for on the basis of acceptance notes/sample slips in respect of stocks despatched upto 31st March.

A subsidiary register will be maintained in Form No. 14 provided for item-wise details of margins/incidentals such as storage charges interest, establishment etc. allowed to the Corporation wherever the Corporation functions as an agent of the State Government.
At all India level, while preparing the profit and loss account, sales are reflected as under:

a) Sales of sugar are reflected at the net value after deducting retailers' margin and transportation charges.

b) Sales of fertilizer are reflected at the pool issue prices after deducting the differential due to higher prices applicable for private parties/plantations and also cash rebate.

c) Sales effected as an agent of the State Governments are reflected at the issue prices fixed by the State Governments, including the handling margins allowed to the Corporation reduced by the equalisation charges/administrative charges paid to the State Governments.

d) Sales effected on behalf of the Central Government are reflected at the issue prices fixed by the Central Government. The differences between the economic costs and the sales realisation are claimed as subsidy.

The following Table No. 7.7 shows sales of foodgrains and other items position of last 10 years, on all India basis.
Table No. 7.7*

Position of sale of FCI on all India Basis (from 1982-83 to 1991-92)

<table>
<thead>
<tr>
<th>Years</th>
<th>Wheat</th>
<th>% Incr. or decr.</th>
<th>Rice</th>
<th>% Incr. or decr.</th>
<th>Sugar</th>
<th>% Incr. or decr.</th>
<th>Fertiliser</th>
<th>% Incr. or decr.</th>
<th>Others</th>
<th>% Incr. or decr.</th>
<th>Total (in lakh tonnes)</th>
<th>% Incr. or decr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1982-83</td>
<td>78.18</td>
<td>-</td>
<td>64.89</td>
<td>-</td>
<td>11.70</td>
<td>-</td>
<td>3.32</td>
<td>-</td>
<td>1.05</td>
<td>-</td>
<td>159.14</td>
<td>-</td>
</tr>
<tr>
<td>1983-84</td>
<td>72.76</td>
<td>-</td>
<td>69.95</td>
<td>+ 6.93</td>
<td>12.48</td>
<td>+ 6.67</td>
<td>11.48</td>
<td>+ 245.78</td>
<td>0.64</td>
<td>- 39.05</td>
<td>167.31</td>
<td>+ 5.13</td>
</tr>
<tr>
<td>1984-85</td>
<td>66.53</td>
<td>-</td>
<td>57.76</td>
<td>- 14.90</td>
<td>12.90</td>
<td>+ 10.26</td>
<td>6.77</td>
<td>+ 103.92</td>
<td>0.61</td>
<td>- 41.90</td>
<td>144.57</td>
<td>- 9.15</td>
</tr>
<tr>
<td>1985-86</td>
<td>124.34</td>
<td>+ 59.04</td>
<td>65.73</td>
<td>+ 1.29</td>
<td>28.11</td>
<td>+ 140.26</td>
<td>1.83</td>
<td>- 44.88</td>
<td>0.39</td>
<td>- 62.86</td>
<td>220.40</td>
<td>- 38.50</td>
</tr>
<tr>
<td>1986-87</td>
<td>110.20</td>
<td>+ 40.98</td>
<td>85.30</td>
<td>+ 31.45</td>
<td>21.11</td>
<td>+ 80.43</td>
<td>0.45</td>
<td>- 86.45</td>
<td>0.38</td>
<td>- 63.81</td>
<td>217.46</td>
<td>+ 36.65</td>
</tr>
<tr>
<td>1987-88</td>
<td>137.70</td>
<td>+ 75.71</td>
<td>96.86</td>
<td>+ 49.27</td>
<td>17.93</td>
<td>+ 53.25</td>
<td>0.18</td>
<td>- 94.58</td>
<td>0.05</td>
<td>- 95.24</td>
<td>252.39</td>
<td>+ 58.60</td>
</tr>
<tr>
<td>1988-89</td>
<td>89.52</td>
<td>+ 14.50</td>
<td>85.07</td>
<td>+ 31.10</td>
<td>12.94</td>
<td>+ 10.60</td>
<td>0.35</td>
<td>- 89.46</td>
<td>0.05</td>
<td>- 95.24</td>
<td>187.93</td>
<td>+ 18.09</td>
</tr>
<tr>
<td>1989-90</td>
<td>77.27</td>
<td>- 1.16</td>
<td>76.38</td>
<td>+ 17.71</td>
<td>12.97</td>
<td>+ 10.85</td>
<td>0.87</td>
<td>- 88.86</td>
<td>0.05</td>
<td>- 95.24</td>
<td>167.54</td>
<td>+ 5.28</td>
</tr>
<tr>
<td>1990-91</td>
<td>88.90</td>
<td>+ 13.71</td>
<td>81.20</td>
<td>+ 25.13</td>
<td>12.30</td>
<td>+ 5.13</td>
<td>0.30</td>
<td>- 90.96</td>
<td>0.10</td>
<td>- 90.48</td>
<td>182.80</td>
<td>+ 14.86</td>
</tr>
<tr>
<td>1991-92</td>
<td>107.90</td>
<td>+ 38.00</td>
<td>105.80</td>
<td>+ 63.04</td>
<td>12.50</td>
<td>+ 6.84</td>
<td>0.20</td>
<td>- 93.98</td>
<td>0.10</td>
<td>- 90.48</td>
<td>226.50</td>
<td>+ 42.32</td>
</tr>
</tbody>
</table>

The Table No. 7.7 shows sales of FCI of wheat, rice, sugar, fertiliser and others since 1982-83 to 1991-92. If we look at the percentages of increase and decrease of sale of wheat of last 10 years, we feel that the sale of wheat of 1985-86, 1986-87, 1987-88, 1988-89, 1990-91 and 1991-92 were better than 1982-83 but the sale of 1983-84, 1984-85 and 1989-90 were poor than 1982-83. Sale of 1987-88 was 75.71% greater than that of 1982-83. It is also 24.63% greater than its previous year level. Sale of 1989-90 was poor than 1988-89 because of less stock for sale during the year. Sale of 1990-91 and 1991-92 has gone up than 1989-90. The sale position of rice was better in 1991-92 than all previous years, because it was 63.04% more than 1982-83 and 30.3% greater than 1990-91. The sale position of sugar till 1991-92 were better than 1982-83. Sale of fertilizers were better in 1983-84 and 1984-85 than 1982-83 because sale of 1983-84 and 1984-85 were 245.78% and 103.92% greater than 1982-83. Sale of fertilizer after this has gone down in every year. Sale of others were also very poor than 1982-83 because it is also in decreasing trend. Although overall position of sale of last 10 years leaving the year 1984-85 were better than 1982-83 but the position of 1991-92 was better than 1990-91 because the percentage of increase of 1991-92 was 42.32 and the percentage of increase of 1990-91 was 14.86%. 
### Table No. 7.8*

Position of Sale of FCI at U.P. Level (1982-83 to 1991-92)

(In lakh tonnes)

<table>
<thead>
<tr>
<th>Years</th>
<th>Wheat</th>
<th>% of Incr. or decrease</th>
<th>Rice</th>
<th>% of Increase or decrease</th>
<th>Sugar, Fertilizer</th>
<th>% of Increase or decrease</th>
<th>Total</th>
<th>% of Increase or decrease</th>
</tr>
</thead>
<tbody>
<tr>
<td>1982-83</td>
<td>9.59</td>
<td>-</td>
<td>4.04</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>13.63</td>
<td>-</td>
</tr>
<tr>
<td>1983-84</td>
<td>8.61</td>
<td>- 10.22</td>
<td>3.78</td>
<td>- 6.44</td>
<td>-</td>
<td>-</td>
<td>12.39</td>
<td>- 9.10</td>
</tr>
<tr>
<td>1984-85</td>
<td>5.13</td>
<td>- 45.51</td>
<td>2.11</td>
<td>- 47.77</td>
<td>2.48</td>
<td>-</td>
<td>9.72</td>
<td>- 28.69</td>
</tr>
<tr>
<td>1985-86</td>
<td>15.62</td>
<td>+ 62.88</td>
<td>1.91</td>
<td>- 52.72</td>
<td>3.07</td>
<td>+ 23.79</td>
<td>20.60</td>
<td>+ 51.14</td>
</tr>
<tr>
<td>1986-87</td>
<td>19.87</td>
<td>+ 107.19</td>
<td>2.07</td>
<td>- 48.76</td>
<td>1.15</td>
<td>- 53.63</td>
<td>23.09</td>
<td>+ 69.41</td>
</tr>
<tr>
<td>1987-88</td>
<td>12.97</td>
<td>+ 35.25</td>
<td>4.58</td>
<td>+ 13.37</td>
<td>0.67</td>
<td>- 72.98</td>
<td>18.223</td>
<td>+ 33.70</td>
</tr>
<tr>
<td>1988-89</td>
<td>6.25</td>
<td>- 34.83</td>
<td>4.11</td>
<td>+ 1.73</td>
<td>0.14</td>
<td>- 94.35</td>
<td>10.495</td>
<td>- 23.00</td>
</tr>
<tr>
<td>1989-90</td>
<td>4.60</td>
<td>- 52.03</td>
<td>3.44</td>
<td>- 14.85</td>
<td>0.22</td>
<td>- 91.13</td>
<td>8.263</td>
<td>- 39.38</td>
</tr>
<tr>
<td>1990-91</td>
<td>6.36</td>
<td>- 33.68</td>
<td>2.67</td>
<td>- 33.91</td>
<td>0.07</td>
<td>- 97.18</td>
<td>9.10</td>
<td>- 33.24</td>
</tr>
<tr>
<td>1991-92</td>
<td>8.45</td>
<td>- 11.89</td>
<td>4.15</td>
<td>+ 2.72</td>
<td>0.55</td>
<td>- 77.82</td>
<td>12.745</td>
<td>- 6.49</td>
</tr>
</tbody>
</table>

7.3 Sale of Foodgrains and other Commodities

The sale of the Corporation consist of foodgrains, fertilizers, sugar and other commodities. The sale transactions will be recorded in the following columnar books.

(i) Sale Day Book for Credit Sales BE 5-A
(ii) Sales Day Book for Cash Sales BE 5-B

7.3.1 Sale Day Book for Credit Sales

The sale of foodgrains effected by the Corporation as at present are mostly on cash basis. In respect of such cash sales, sales bills are not required to be prepared and the release orders containing all the particulars including value of sales would themselves serve the purpose of the sale bill. Where in exceptional cases, sales are made on Credit basis, sale bills are to be prepared immediately after the sales are effected.

The voucher for recording credit sales will be the sales bill. In the case of fertilizers, sales are effected to the State Governments and other agencies on the basis of irrevocable Letters of Credit, opened by them with the Zonal/Regional Managers. Billing will be completed immediately after the supplies are made and sent to the
price to be paid is assessed and the objective to safeguard the interest of the producer as well as the consumer is achieved. The scientific methods and procedures based on national and international practices are adopted by FCI for effecting a sound quality control in respect of indigenous foodgrains procured/purchased locally, the imported food grains received at ports and the foodgrains that are being stored in godowns as buffer reserve.

Quality may have different meaning for every consumer and producer of food. By adopting standard practices and definitions, FCI has rendered interpretation of quality sample and practical.

7.4.1 Quality Control Organisation

The Quality Control Division is under the charge of Manager (Quality Control) at the Head office, where the all policy matters relating to quality control organisation as well as general control of field and laboratory operations are dealt with. The function of Quality Control Division at the Head Office is to render technical advice to the Corporation on policy matters, guidance to the Zonal/Regional Managers as well as field officers and to maintain liaison with various institutions like the Indian
Standard Institution, the Agricultural Marketing Advisor to the Government of India, the Central Food Technological Research Institute, the Indian Agriculture Research Institute, the Paddy Processing Research Centre, Tiruvarur, the Ministries of Government of India etc. on matters relating to Quality Control. The Division also deals with the policy matters relating to representation and participation in discussions, conferences, seminars and various Committees constituted by Ministries, Institutes and other National and International agencies from time to time.

The genesis of Quality Control is the consumer protection and producer welfare. An efficient marketing system ensures provision of right quality of good food commodities for the price paid by the consumer and price commensurate to the quality of foodgrains, offered for sale by the producer. Due weightage to the quality of commodity in the overall marketing process consequently meets the consumer and seller satisfaction. Quality Control measures as a result is an important deterrent of the efficient marketing system.

India is predominantly an agriculture economy. Effective quality control in agricultural production and marketing is, therefore, imperative to translate increased
productivity into increased real income of the producers to sustain the tempo of higher production on one hand and consumer satisfaction for basic needs on the other hand.

The FCI is the key agency to implement the national Food Policy, aims at protecting the interests of producers by providing remunerative prices to producers. Corresponding to the quality specifications and of consumers by providing foodgrains of quality at reasonable price. Effective Quality Control measures are only the integral part of the entire operations of the Corporation but also an index of the organisational efficiency.

Among foodgrains, cereals and millets constitute one of the major sources of the basic energy needs of human beings. Rich in carbohydrates, these are energy yielding foods. Pulses are major sources of protein required for human body building. Other ingredients like fats, minerals and vitamins are to be supplemented from other sources of foods like oil seeds, vegetables, fruits and animal food.

Cereals, e.g. wheat, rice, barley etc. provide stable energy requirements, millets comprising Jowar, Bajra, Rag, Maize etc. contribute energy part of minerals and fibre content for maintaining normal functions of human system
like easy digestion, blood circulation etc. and pulses like gram, green red and black grams, lentil etc. add to the requirement of protein for body building and to conserve and utilisation of energy at the time of need.

Wheat grain contains the germ (rich in all nutrients), pericarp (rich in fibre content) bran layers (rich in oil and protein) and endosperm (rich in carbohydrates). Barely is covered with a thick seed coat fibre bran layers and starchy endosperm. Paddy has got highly abrasive surface and seed coat called husk germ (rich in oil and protein), bran layers (rich in fat content) and endosperm (rich in Carbohydrates). Millets have a strong seed coat fibre and starchy endosperm. All pulses possess a hard and protective seed coat called skin/shell and endosperm which is rich in protein content.

The basic ingredients present in each food commodity differ in their quantity and quality from digestive and biological points of view. Food commodities which do not deviate and loose any of their basic character and ingredients are termed to have retained their wholesomeness and nutritive value.
These character-wise ingredients are measured in terms of standards/grades and covered under specifications to market and to fix a reasonable price base on the quality and quantity retention of natural and acquire characteristics. Here the quality control has to play an important and unique role to maintain the standards of foodgrains with the ultimate requirements of human beings.

7.4.2 Laboratories:

A network of laboratories has been set up for quality control and analysis of foodgrains handled by the Corporation at various levels. At the Head Office, the Central laboratories are responsible for evolving new procedures, collection of necessary data required for laying down policy in respect of procurement, purchase, processing and preservation of commodities handled and to give guidance to the Regional and District Laboratories, as there is a quality control laboratory attached to every important district of FCI. This is the primary laboratory where analysis of the sample is carried out for quality assessment for foodgrains to be procured/purchased. Each Regional office is also provided with a Regional Laboratory where analysis in respect of imported foodgrains and indigenous foodgrains procured and stores in the Corporation godowns as buffer stocks is conducted.
At a Regional Laboratory, chemical analysis of wheat products is also carried out where necessary guidance required is given to the District laboratories in respect of samples sent for opinion from the Regional Laboratory. In such of the regions as are handling imports, consignment, samples are analysed in the Regional Laboratory. The work of looking into destination compliants pertaining to procured stocks is also dealt with in the Regional Laboratory.

Very soon, the Regional Laboratories will be fully equipped with the apparatus and the staff for carrying out chemical analysis for pesticide residues in foodgrains uric acid estimations, analysis of fertilizers and testing of jute bags.

Apart from the district, Regional and Central laboratories, a laboratory also functions in each of the production units of FCI. These laboratories are equipped for carrying out facilitate phusical and chemical analysis, as required, to keep control over the quality of the processed food and by-products.

7.4.3 Inspection Laboratories of the Corporation

Besides the Central laboratory at Head Office, attached to the Quality Control Division, there are 18 Regional
Laboratories and 119 District Laboratories (Appendix-3)

List of equipments for Regional and District Laboratories can be seen in Appendix - 4, 5 & 6.

7.4.4 Quality Specifications

Foodgrains (wheat, rice, paddy, barley, gram jowar, bajra, maize etc.) may be purchased internally by the Corporation at fixed prices as a measure of price support on the basis of prescribed specifications.

The Government of India after due consideration of the condition of the crop and other quality requirement, issue the uniform specifications for foodgrains that are to be procured/purchased for the Central pool in the country ahead of the marketing season. The State Governments and the Union Territories are advised to adopt these uniform specifications for purchase operations, particularly when purchase is to be handed over to the Central Pool. The State Governments also notify the specifications in their levy orders or through special gazette notification. The whole process aims at maintenance of quality standards and to assure fair price to the producer and to safeguard the interest of the consumer. Adoption of uniform specifications makes the task easier. However, some States
adopt quality standards which differ from uniform specifications to suit special conditions obtaining in the States. In such States where the FCI is called upon to procure grains as an agent of the State for the State Pool specifications adopted by the State Governments are followed, but, when these stocks are offered to the Central pool, the stocks are examined with reference to uniform specifications and only those conforming to them are accepted.

7.4.5 Function of Quality Control

a) Marketing Functions:

Quality control as an instrument or assistance to all users of foodgrains like producers, dealers/traders, processors, storage personnel, consumer etc. is an activity/procedure, method of programme, that ensures the maintenance and continuity of quality standards of foodgrains within the prescribed tolerance during the process of marketing. Quality control, consequently, is one of the major marketing function in the case of agricultural commodities like foodgrains.

b) Quality Differences:

Quality of foodgrains differ from lot to lot. It is difficult to achieve uniformity in all lots due to
change in genetic factors, attack by plant diseases variations in soil structure and atmospheric conditions. Added to this is the farming traditions, cultural practices, socio economic conditions etc. also play an important role in notice of differences in quality. With all these things, most markets prefer standardised products and buying and selling take place on the basis of price per unit of weight or volume and quality standards. Quality Control in foodgrains therefore assist in the identification of quality differences and creation of norms for pricing of commodities.

c) Quality Requirements:

Quality in literal terms explains the nature, character, kind, property, status, grade of goodness, excellence etc. of a commodity in question. The common requirements of quality are good appearance, absence of impurities, insects and deleterious materials and in scientific terms, it is the wholesomeness of the marketable commodity besides other requirements like nutritive value, cooking behaviour, appearance and purity.
d) Quality Control:

The quality concept and requirements are different for different persons/agencies. Producers view quality in the context of maximisation of their returns. Traders identify quality with price differentiation and market goodwill. Processors want quality raw material for higher plant utilisation and better finished product and by-products for ready market.

Consumers are primarily interested in getting their daily energy and nutritional requirements by purchasing and consuming quality food commodities. Foodgrains and pulses, satisfy the major energy and part of nutritional requirements in terms of carbohydrates, proteins, minerals and vitamins. It is easy to get and digest the requirements from foodgrains and pulses as they are much cheaper than that of animal foods. Hence the consumers always prefer vegetable food resources (compared to others) both from their basic requirements (energy and nutritional) and price point of view also of they prefer variety of quality products in the market at reasonable price and evaluate them from sensory and organoliptic methods. Storage personnel like quality materials for adopting better and appropriate methods of
scientific storage. Quality concepts also change from time to time and depend upon the intended utility of the commodity.

e) Quality Standards:

Quality of a product is as important as the weight of volume, bought or sold. Quality standards measure the quality differences, depending upon the consumer preferences and the market demand. Quality Control programmes involve and the establishment of quality standards from time to time and also the maintenance of them during the process of marketing involving handling, packing, transport and storage. These standards also undergo change, depending upon changing circumstances and consumer preferences.

f) Quality Demands:

The ultimate aim of establishing the quality standards is to assure all users from their expected benefits and to achieve efficiency in marketing in order to meet the diverse consumer demands from the diversified qualities of each commodity received and noticed due to natural and acquired factors. These standards should also take
care of some marketing problems like adulteration, malpractices etc. and satisfy the needs of many within and outside the country.

g) Quality Grades:

Quality standards for foodgrains and pulses are explained in the form of grades and specification for their marketing and processing. Modern scientific techniques are adopted for evaluating the quality. Grade is an established measure of quality of a commodity being marketed. It establishes an understandable language among buyers and sellers by forming a base to judge the quality of a commodity in relation to its price. It helps sorting out the class and condition of the lots for which standards of specifications have been established with the objectives that they are marketed and handled in an orderly manner.

h) Quality Characteristics:

The main basis for laying down the grain specifications is the intrinsic or inherent and acquired characteristics of the grain size, shape, texture etc. are some of the inherent characters of the grains. Grains acquire some characters like presence/adherence of foreign matter, moisture content, broken etc. during
handling and processing. Both these characters are defined in the form of grain specifications for the measurement of quality. The essential general characters along with main impurities admixtures and refractions of grain specifications have been shown in the following chart:

1) Quality Specifications:

Quality specifications are laid down from time to time to provide standardised uniform quality assessment of food commodities marketed in the country. For principle cereals, millets and pulses, Government of India in consultation with State Government and some of the large procurement storage and handling agencies formulate the uniform specifications before start of harvest in each season. This helps in easy understanding of the uniform system of classification and grading of foodgrains not only in respect of purchase but also for safe handling preservation and storage quality in terms of various characters of the grain is expressed as Fair Average quality (F.A.Q.), Superior Average Quality (S.Q.A.), grade etc. In general, there are four types of specifications for purchase of food commodities in the country, as discussed below:
CHART-7.1

CHART OF ESSENTIAL GENERAL CHARACTERS ALONG WITH MAIN IMPURITIES, REFRACTIONS AND ADMIXTURES OF GRAIN SPECIFICATIONS

<table>
<thead>
<tr>
<th>Essential General Characters</th>
<th>Impurities</th>
<th>Refractions</th>
<th>Admixtures</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Each grain shall be in merchantable condition sweet, dry, clean wholesome of good food value, uniform, natural in colour, shape and size of grain and free from moulds, weevils, discoloration, admixture of deleterious substances or colouring agents and all impurities except to the extent indicated against each item.</td>
<td>Foreign Matters:</td>
<td>1. Moisture Content</td>
<td>1. Other Commodities</td>
</tr>
<tr>
<td>2. Shall not have any admixture of pesticide fumigicide and any adnoxious deleterious and toxic material.</td>
<td>Inorganic-mineral metallic.</td>
<td>2. Damaged grains</td>
<td>2. Other varieties</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Shrunker grains</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. Broken grains.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>6. Sprouted grains</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>7. Discoloured grains</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>8. Red grains</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>9. Weevilled grains</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>10 Immature or unripe grains</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>11 Dehusked grains</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>12 Chalky grain (in raw rice only)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>13 Touched grains</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>14 Unsound grains</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>15 Split kernels</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>16 Degree of polish</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>17 Unhusked grains</td>
<td></td>
</tr>
</tbody>
</table>
(i) Uniform Specification:

These cover all cereals, millets and some of the pulses also. In respect of wheat, barley and paddy, there are only two grades and for maize, jowar, ragi, black gram, green gram, lentil, red gram, Bengal gram etc., specifications have been given in three grades.

Specifications for rice are expressed in S.A.Q. and F.A.Q. covering three groups, viz., common fine and super fine separately for raw and preboiled. All individual characters of grain are expressed in percentage limits (tolerance and rejection) with appropriate value out for each of them exceeding tolerance upto rejection limits.

(ii) Commercial Specification:

For purchase of foodgrains, pulses (whole and split) other various food commodities on commercial basis, FCI has laid down these specifications. These carry grade as well as FAQ/SAQ limits for each item of character of food commodities and mostly adopted for supply to defence service or for other limited and specific purposes.
(iii) A.S.C. Alleged with Grade-II of Uniform Specification

For defence supplies, these specifications are followed in respect of barley and pulses. Barley and pulses (whole) are purchased and supplied as such or after upgradation, conforming to these specification. Split pulses are supplied to defence service, conforming to ASC specification after getting the commercial specification are followed as these are more rigid than ASC specifications.

(iv) Export Specifications:

These are laid down to various commodities in mutual agreement between the importing and exporting countries. All the characters of grains are specified either individually or in combination, depending upon the requirements of importing country.

j) Food Laws

Food laws are essential to prevent outbreak of foodborne illness, health hazards, presence of excessive pesticide, residues (beyond permissible limits), adulteration, fraud in foodgrains traded and for successful implementation of fair trade practices in
food articles. To implement and enforce these objectives, there are authorities functionaries working in each state for drawing of samples from all food commodities marketed in the country. The samples drawn by the food inspectors are analysed in a public analyst laboratory to conform to the laid down standards. The report of the public analyst taken as the basis for indicating further legal action against persons/firms whose samples do not conform to the standards.

(a) Standards:

Foodgrains meant for human consumption should not exceed the tolerance limit laid down in PFA Act. Primary food is defined as any article of food being a produce of agriculture or horticulture in its natural form, while foodgrains, millets, cereals and pulses come under primary food. Paddy is a primary food and milled foodgrains like rice and foodgrain produces come under processed food.

(b) Adulteration

Adulteration is defined as materials which are or could be employed for the purpose of adulteration and the article of food shall deem to have adulterated if the article sold is not of the nature, substance or quality demanded by:
i) the purchase or it represented to be from these qualities.

ii) Contains any other substance which injuriously affects the food during processing.

iii) Cheaper substance has been submitted.

iv) Any constituent of the article has been wholly or in part abstracted.

v) Article prepared, packed or kept under unsanitary conditions and get contaminated and become injurious to health.

vi) Article consists wholly or in part of any filthy, putrid, rotten, decomposed or diseased animal or vegetable substance or is insect infested or is otherwise unfit for human consumption.

vii) Obtained from a diseased animal.

viii) Contains any poisonous or other ingredients injurious to health.

ix) Container of the article is composed wholly or in part any poisonous or deleterious substance.

x) Colouring matter other than prescribed and within prescribed limits of variability.
xi) Contains any prohibitive preservative or permitted perservative in excess of the prescribed.

xii) Quality and purity of the article or its constituents falls below the prescribed standards or not within prescribed limits or variability rendering the article injurious to health etc.

NOMINATION:

The presence of injurious admixture in food beyond the prescribed limits is considered as adulterated food and attracts the provisions of PFA Act. The depot is considered as a unit and depot incharge is nominated as unit officer for implementation of the provision of this Act. The unit officers exercises the care in ensuring proper quality standard and maintaining the prescribed hygenic conditions where foodgrains are handled or are labelled for sale.

For any deviation or contravention of the provisions the unit officers have to exercise their full administrative charge and ability to ensure that only stocks conforming to the standards of PFA Act are issued. In case of processed food, if the container has not been tempered in the course of handling and storage, responsibility for defaults, if any, will be with the agency who has processed the food.
For this reason, processed food articles like sugar, rice etc. should possess the clean stenciling on the bags and handled carefully without being tampered.

7.5 Maintenance of Buffer Stock:

Buffer stocks are those stocks which serve something like a dam which provides flood control in wet years and irrigation water in dry years. Buffer stocks of foodgrains are maintained by FCI. The Chairman who drew this analogy to explain the need of buffer stocks at the godown, said that in the years of shortfall in production, the buffer stocks provide a reserve to draw until next year's crop is available, while in the years of ample production, it absorbs and stores the surplus output, preventing a collapse in farm prices.

7.5.1 Objective of Buffer Stocks:

The major task of buffer stocks obviously is to attempt to even out fluctuations in year to year domestic production of foodgrains and market availability.

* The basic idea of a buffer stock appears to be simple to maintain a quantity of foodgrains to offset (buffers) the production irregularities, by adding to private consumption availability (i.e. drawing down public stocks) during shortages and withdrawing from consumption availability (i.e. by building up stocks) during relative abundance.

- Storage Management in India by N.K. Basu.
During scarcity periods, the consumer needs an assurance of availability as well as reasonable price. It is argued that price level depended on besides supply, several other factors like fiscal and monetary policies. In advanced countries, buffer stock operations do not have to content with this type of complexity. If the same with the available supply and prices maintained at even level would meet its objectives.

The objectives are summarised as follows:

1. Protection of consumers interest by-
   a) assuring a reasonable level of food supply to the population, specially to vulnerable section of the society, at reasonable price.
   b) Evening out of intra seasonal fluctuations in prices.

2. Protection of producers' interest by:
   a) assuring a minimum price level with a view to stabilise farm incomes and provide incentive for adoption of improved farm practices and new technology.
   b) evening out of intra-seasonal fluctuations in prices.
7.5.2 Magnitude of Buffer Stock

The size of the buffer stock has the constraints of storage, finance and turnover involved in the building up of a large scale buffer stock would impose a limit of its size. It depends upon task which the stocks are supposed to be accomplished. Their efficiency lies in their ability to restrain excessive price fluctuations but, in effect, what actually they do is to even out year to year availability of foodgrains, affected by fluctuations in domestic production. Buffer is estimated on the basis of post experience in respect of variability in domestic production. Analysis of production and per capital availability of foodgrains provide a pointer for buffer maintenance.

7.5.3 Conditions for Successful Buffer Operations

If the trend in demand of food continuously exceeds the trend in home supply of food, then no buffer stock operation could stabilise food prices. Government may try to build up stocks but due to excess demand in supply, stocks would again and again get exhausted. Hence it becomes necessary to adopt certain measures, like:

1. Theoretically speaking, the mean or average levels of the price of the commodity should be kept at slightly higher level since a high price generally counteract
the demand and augments the supply. From the point of view of an economic expert, this may be a solution but you would agree that this aspect will basically clash with the objective of supplying foodgrains at a lower cost and need for maintaining the price level at a moderately lower point. Though in a shortage situation, to equilibrate demand and supply will amount to paying a dear price of the shortage of commodity.

2. In average situation, if supplies rise faster than demand (which may be possible with the total agricultural revolution), then the excess supply would keep on putting downward pressure in prices until a point will reach when Government would fail to provide support price to the producers for the produce besides exhausting the available storage capacity. At this stage, the programme of price support and buffer stock would face a collapse. Hence, it would become imperative to adopt certain measures which would not only bring price stabilisation within the price mechanism. An approach for augmenting demand and checking excessive supplies may bring an equilibrium in a limited years. Alternatively, the measures for increasing production and also encourage consumption of
foodgrains are adopted besides export promotion and even considering diverting acreage to other commodities.

3. It is only in the long-term situation where there is neither excess demand nor excess supply the buffer stocks can be thought of as a useful mechanism for relative price stabilization. Only in this long run equilibrium, buffer stocks would appear to be a very useful instrument of policy. Indian set-up at present still reflects the dreaded shortages in foodgrains and surpluses are not yet a right.

This in fact necessitates the operation of buffer stock in the country. We have observed in the past that excepting at one or two places, a bumper crop is generally followed by 2 or 3 successive spells of drought. Still we depend most on rainfall and scanty rains often cause hardships. This all leads to a shortage situation, which in turn points out the necessity for buffer storage.

4. Hence buffer stocks play a vital role in evening out the price fluctuations. Also they exercise a great influence on the mean level of the price of the
commodity. This indirectly induces the farmers in a shortage situation to increase the acreage for getting an increase in the supply, which in turn will curb the demand.

As a result, a balance situation will emerge in a course of time, subject to the other policies of the Government (like taxation etc.) and automatically the shortage will disappear. In the opposite situation, unless the supplies are in excess, the buffer stock operations will fix the price at a lower level. This will augment the consumer demand on the one hand and on the other, create a disincentive in the production of surplus commodity. At this juncture, perhaps the subsidies can be withdrawn and acreage is directed for other commodities to achieve a long-term balance.

7.5.4 Food Security:

The Need for Buffer Stocking:

One of the most important food policy objectives of any independent developing country would be to ensure national food security. If that security is lacking, political and economic subservience to some food surplus exporting country
would be inevitable, especially when adequate foreign exchange is not available to pay for the imported food in a competitive market. The concept of national food security would require for its fulfilment of adequate level of food stocks to act as a buffer in a country where agriculture depended on the vagaries of the monsoons, leading to wide fluctuations in food production. No wonder, the building up of an adequate buffer stock was an important constituent of our food policy, in its wider sense. It is to cater to the food needs in the lean production year that the build-up of such a stock becomes necessary over a few years, during which it incidently provides a much needed price support to the producer in the bumper crop year also. Such a buffer stock policy would thus help the producer in excess production year and the consumer help the producer in excess production year and the consumer in the lean years of availability, without further elaboration, "let us briefly say that".

The need for such reserves had been stressed by the various food policy and/or enquiry committees set up by the Government of India from time to time to review the obtaining food situation. Right from the Foodgrain Policy Committee (1943) and the Bengal Famine Enquiry Commission in 1945, to the last such Committee, viz., the Foodgrains
Policy Committee of 1966, the building up of reserve stocks of varying dimensions had been recommended, by import of grain from abroad till it got linked with indigenous surplus production under the Green Revolution from the late sixties onwards. The pattern of food policy which was slowly formulating over the years consisted of:

1. Assurance of a guarantee of minimum support price to the producer for all major grains.

2. The maintenance of a public distribution system through statutory/informal rationing and fair price shops,

3. A somewhat flexible system of food procurement, suiting to the conditions of each crop and State.

4. Restrictions on the inter-state movement of foodgrains by private traders, viz., a sort of a zonal system to help procurement.

5. Institution of the FCI as an official agency for implementation of food policy.

6. Substantial imports of foodgrains in anticipation over the years after careful calculation of needs and prices in the international market and,

7. Last but not least, the building of a sizeable buffer stock of grain.
The determination of size of buffer stocks for the country's food security needs has been of crucial importance though it actual build up was to face many physical as well as financial constraints. Not only the build-up costs, but also the cost of maintaining such stocks by no means inconsiderable had also to be borne in mind. The alternatives available or a combination thereof for the determination of the size of these stocks could be:

a) Estimation based on the variation in the level of stocks of foodgrains held by the Government/public agencies, estimation based on the gap in the level of public distribution and procurement of foodgrains.

b) Estimation based on the extent of the variation between net production and demand for foodgrains.

c) Estimation based on the trend and size of imports from outside the country over a period of last 10-15 years and FAO's criterion viz., 17 to 18% of the total consumption requirements in one year.

It was a complicated exercise for which special committees had to be appointed for arriving at a suitable figure. needless to say that the size of buffer stock is distinct from the normal operational stocks required for the public distribution system in the normal course.
Table 7.9*

Position of Maintenance of Buffer Stock on All India Basis (1992-83 to 1991-92) (Rs. in crores)

<table>
<thead>
<tr>
<th>Years</th>
<th>Handling</th>
<th>Storage Charges</th>
<th>Interest</th>
<th>Storage and transit shortages &amp; freight</th>
<th>Administrative</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1982-83</td>
<td>11.88</td>
<td>40.46</td>
<td>102.12</td>
<td>20.53</td>
<td>9.48</td>
<td>184.43</td>
</tr>
<tr>
<td>1983-84</td>
<td>18.39</td>
<td>60.69</td>
<td>151.42</td>
<td>24.62</td>
<td>13.87</td>
<td>268.99</td>
</tr>
<tr>
<td>1984-85</td>
<td>30.61</td>
<td>103.77</td>
<td>290.71</td>
<td>36.28</td>
<td>27.57</td>
<td>497.94</td>
</tr>
<tr>
<td>1985-86</td>
<td>32.45</td>
<td>113.64</td>
<td>317.39</td>
<td>30.24</td>
<td>23.85</td>
<td>517.57</td>
</tr>
<tr>
<td>1986-87</td>
<td>39.16</td>
<td>118.82</td>
<td>294.83</td>
<td>32.27</td>
<td>24.97</td>
<td>510.05</td>
</tr>
<tr>
<td>1987-88</td>
<td>23.27</td>
<td>94.28</td>
<td>49.14</td>
<td>20.85</td>
<td>16.28</td>
<td>203.82</td>
</tr>
<tr>
<td>1988-89</td>
<td>9.40</td>
<td>75.33</td>
<td>8.35</td>
<td>7.81</td>
<td>13.20</td>
<td>114.09</td>
</tr>
<tr>
<td>1989-90</td>
<td>18.53</td>
<td>94.85</td>
<td>27.40</td>
<td>7.22</td>
<td>19.22</td>
<td>167.22</td>
</tr>
<tr>
<td>1990-91</td>
<td>47.25</td>
<td>157.34</td>
<td>200.78</td>
<td>25.33</td>
<td>45.47</td>
<td>476.17</td>
</tr>
<tr>
<td>1991-92</td>
<td>40.35</td>
<td>135.43</td>
<td>191.30</td>
<td>34.42</td>
<td>31.23</td>
<td>432.73</td>
</tr>
</tbody>
</table>

The above table shows that position of maintenance of buffer stocks were satisfactory from 1982-83 to 1985-86, because position of 1985-86 was about three times higher than the position of 1982-83. The position of 1986-87 was less satisfactory because the maintenance cost of buffer stock was little less than the cost of 1985-86. The position of 1987-88, 1988-89 and 1989-90 was very poor because cost of maintenance of buffer stocks in these years were in zig-zag trend. Again the cost of 1990-91 has increased by about 3 times than the previous year level, but the cost of 1991-92 has gone down by about 9% than 1990-91.

7.6 Distribution of Foodgrains

Foodgrains are distributed to State Government and their nominees on receipt of allotment from Government of India, under various scheme. State Government nominate their undertakings, co-operative agencies or fair price shops (F.P.S.) to lift the allotted foodgrains stocks from the godowns of FCI for price distribution issue of foodgrains under Public Distribution System, to fair price shops and Roller Flour Mills in a routine exercise in our depots on receipt of allotments.
Based on fortnightly inspection details, stock-wise priority list is prepared by the Q.C. staff for issue of foodgrains from the depots. While preparing the priority list, various factors such as type and place of storage, number of curative treatments given, class and category of foodgrains, present quality etc. are considered. For Public Distribution System and various other schemes, A and B (higher) category stocks are issued, C & D (lower) category wheat stocks are issued to roller flour mills (RFM) on priority according to the prescribed proportion. Sometimes, cleaning of lower category stock is undertaken to upgrade the category and to bring the stocks within the purview of limits prescribed under PFA Act. 66% of the allotment of wheat to roller flour mills is met from lower category and the balance from higher category. Joint sampling and sealing of samples is being undertaken for display by the nominees in their place of sale, which indicates the quality of stocks issued from FCI depots.

7.6.1 Public Distribution System - Need for Procurement

It is the basic duty of the democratically elected popular Government to make available a minimum daily supply of food at reasonable prices to consumers in industrial urban areas and to scarcity affected parts of the population in the country under a public distribution system (PDS)
consisting of statutory/non-statutory rationing or controlled distribution through fair price shops. Stocks for distribution called operational stocks could be acquired either by procurement in the surplus areas by imports or by imports of a combination of both. Indigenous procurement could be by open market purchases or by market purchases with the Government exercising the right of presumption or by requisitioning stocks from the traders or by a levy on the producers traders and millers or buying under a system of monopoly or even by making purchases under price support in surplus areas. It is not necessary here to collaborate the necessities of these systems, except mention that many permutations and combinations thereof have been tried in this country over the last four decades and now happily we have arrived to buying only under price support operations in the heavily surplus areas of the Northern States. Andhra Pradesh and Tamil Nadu, without resorting to any direct levies on the producers anywhere, though imposing a levy on the rice millers in the non-rice eating surplus States of the North. The history of the country's food policy is full of all sorts of experiments of monopoly procurement the whole sale wheat trade takeover (1973), traders levy on wheat (1974) with varying lessons, the details of which
would make a fascinating reading full of conceptual pit falls heartening experiences with success and failure etc.

No food security system can work without a public distribution system (PDS). In fact, public distribution system has all these years been an integral part of India's overall food policy. Even the colonial rulers had introduced some such system during the 2nd world war by starting statutory rationing in urban complexes like Bombay and Calcutta, further accentuated by the situation of famine in Bengal (1943). Since independence, it has been foremost in the minds of the food policy makers of the country to safeguard the interests of vulnerable section of society in regard to food supplies through regulated consumption.

All five year plans stressed the need of it, so did the various food enquiry committees from time to time, logically also, if in the interest of a food security system, foodgrains have to be procured and/or imported, it is necessary that these should be distributed equitably to cater at least to the needs of vulnerable sections of the

soceity. In a situation of shortages of food, distribution thereof, cannot be left merely to the market channels of distribution. It does not necessarily imply a cent percent procurement and a similar distribution of available supplier even a discrete but well worked out control over supplies on the margin would yield desirable results. Moreover, the actual quantum of controls and distribution can be varied in good crop years when more supplies become available in the open market and reasonable prices and areas of operation thereof reduced. Procurement and public distribution thus go well together. You procure because you need for stocks and having procured you must distribute them equitably in the interest of food security.

Foodgrains for public distribution system are issued through the State Government and their agencies against monthly allocations made by the Government of India. The issues are made from the Corporation's storage points throughout the country. The distribution to fair price shops is arranged by the State Government except in some districts of West Bengal and Kerala, where the Corporation undertakes the distribution operation as the agent of the State Government. The Corporation with its wide ranging network spread throughout the country strives to build up
and ensure availability of adequate stocks in every State, despite several constraints and problems faced like, movement, handling and storage operation. Adequate stocks and interior stocks are made available even to remote areas and interior places of hill States, including areas in the North Eastern Region.

Position of PDS of last 10 years is shown in Table No. 7.10 below:

Table No. 7.10
Position of Public Distribution System of FCI on All India Basis (1982-83 to 1991-92)
(Qnty in lakh M.T.)

<table>
<thead>
<tr>
<th>Years</th>
<th>Public Distribution System</th>
</tr>
</thead>
<tbody>
<tr>
<td>1982-83</td>
<td>116.35</td>
</tr>
<tr>
<td>1983-84</td>
<td>124.21</td>
</tr>
<tr>
<td>1984-85</td>
<td>98.15</td>
</tr>
<tr>
<td>1985-86</td>
<td>94.30</td>
</tr>
<tr>
<td>1986-87</td>
<td>100.90</td>
</tr>
<tr>
<td>1987-88</td>
<td>136.97</td>
</tr>
<tr>
<td>1988-89</td>
<td>131.97</td>
</tr>
<tr>
<td>1990-91</td>
<td>129.30</td>
</tr>
<tr>
<td>1991-92</td>
<td>126.47</td>
</tr>
</tbody>
</table>

The position of PDS of FCI has been shown in the above table. It was 124.21 lakh M tonnes in 1983-84 which was 6.76% higher than the previous year level. But, due to

* Source: Annual Reports of FCI (1982-1992)
encouragement of sale in open market, this system was badly affected in the year 1984-85 and 1985-86. The Corporation has again paid special attention for the improvement of this system. Due to this, the position of the system has again improved in the year 1986-87 and 1987-88. Thereafter, it was again in zig-zag trend.

7.6.2 Distribution under ITDP/Nutrition Programme/Jawahar Rojgar Yogna/NREP/RLEGp:

Distribution and sale of food grains under Integrated Tribal Development Project (ITDP), Nutrition Programme, National Rural Employment Programme (NREP) and Rural Landless Employment Guarantee Programme (RLEGp) continued this year also. Under the ITDP scheme, which form part of public distribution system, issued at specially subsidised rates are made to people in areas covered under the integrated tribal development project. The extra expenditure on account of this specially subsidised scheme covering 57 million people was about Rs. 148 crores during this report. The nutrition programme sponsored by the Department of women and Child Development Ministry of Human Resource Development caters to the needs of wheat based nutrition programme for the welfare of women and children. Consequent upon the decision of the Government of India, a merger of the earlier National Rural Employment Programme (NREP) and Rural Landless Employment Guarantee Programme
(RLEGP) for generating additional gainful employment for the unemployed and underemployed men and woman in the rural areas and for bringing about improvement in the living style of the rural population.

Table No. 7.11*

Position of Distribution under ITDP, Nutrition Programme, JRY, NREP, RLEGP of FCI on All India Basis (1982-83 to 1991-92)
(Qnty. in lakh M.T.)

<table>
<thead>
<tr>
<th>Year</th>
<th>ITDP</th>
<th>Nutrition</th>
<th>JRY</th>
<th>NREP</th>
<th>RLEGP</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1982-83</td>
<td>-</td>
<td>-</td>
<td>2.42</td>
<td>-</td>
<td>-</td>
<td>2.42</td>
</tr>
<tr>
<td>1983-84</td>
<td>-</td>
<td>-</td>
<td>1.39</td>
<td>-</td>
<td>-</td>
<td>1.39</td>
</tr>
<tr>
<td>1984-85</td>
<td>-</td>
<td>0.17</td>
<td>-</td>
<td>2.64</td>
<td>-</td>
<td>2.64</td>
</tr>
<tr>
<td>1985-86</td>
<td>4.20</td>
<td>-</td>
<td>14.66</td>
<td>9.13</td>
<td>-</td>
<td>44.95</td>
</tr>
<tr>
<td>1986-87</td>
<td>20.50</td>
<td>0.66</td>
<td>-</td>
<td>-</td>
<td>9.89</td>
<td>48.10</td>
</tr>
<tr>
<td>1987-88</td>
<td>23.99</td>
<td>1.72</td>
<td>-</td>
<td>12.50</td>
<td>-</td>
<td>27.94</td>
</tr>
<tr>
<td>1988-89</td>
<td>20.86</td>
<td>0.80</td>
<td>-</td>
<td>3.46</td>
<td>-</td>
<td>24.68</td>
</tr>
<tr>
<td>1989-90</td>
<td>19.56</td>
<td>0.64</td>
<td>4.48</td>
<td>-</td>
<td>-</td>
<td>21.20</td>
</tr>
<tr>
<td>1990-91</td>
<td>20.50</td>
<td>0.40</td>
<td>0.30</td>
<td>-</td>
<td>-</td>
<td>22.70</td>
</tr>
<tr>
<td>1991-92</td>
<td>21.90</td>
<td>0.60</td>
<td>0.20</td>
<td>-</td>
<td>-</td>
<td>22.70</td>
</tr>
</tbody>
</table>

The total distribution under ITDP, Nutrition programme, JRY, NREP and RLEGP are shown in the above table. It has gone up from the year 1983-84 to 1987-88 but from 1988-89, it has come down till 1990-91. Again during the year 1991-92, total distribution was 7% higher than the previous year level and about 9.38 times more than 1982-83.

7.6.3 Roller Flour Mills

A substantial increase was recorded in the sale of wheat to roller flour mills (RFM) in the year under report. The delivery aggregated to 55 lakh tonnes as against 33 lakh tonnes in the previous year.

7.6.4 Sale in Open Market:

As a measure to contain the open market price of wheat and also clearing a part of the huge wheat stocks, the Government of India permitted the Corporation to also sell wheat in the open market. The sales were initially made through open tenders but later converted into delivery at selected places at prices fixed by the Government. The sales thus effected amounted to 17 lakh tonnes.

7.6.5 Tender/Open Sale of Wheat

In view of the comfortable stock position and availability of adequate stocks of wheat, tender sales were undertaken during the last quarter of 1992 with a view to arrest inflationary trend in prices. Wheat was sold to roller flour mills, bread manufacturers, traders, super bazar etc.
Table No. 7.12 *

Distribution Under Roller Flour Mills and Sale in Open Market of FCI on all India Basis (1982-83 to 1991-92) (Qnty. in lakh M.T.)

<table>
<thead>
<tr>
<th>Years</th>
<th>Roller Flour Mills and Sale in Open Market</th>
</tr>
</thead>
<tbody>
<tr>
<td>1982-83</td>
<td>30.33</td>
</tr>
<tr>
<td>1983-84</td>
<td>27.35</td>
</tr>
<tr>
<td>1984-85</td>
<td>33.25</td>
</tr>
<tr>
<td>1985-86</td>
<td>72.00</td>
</tr>
<tr>
<td>1987-88</td>
<td>-</td>
</tr>
<tr>
<td>1988-89</td>
<td>-</td>
</tr>
<tr>
<td>1989-90</td>
<td>-</td>
</tr>
<tr>
<td>1990-91</td>
<td>-</td>
</tr>
<tr>
<td>1991-92</td>
<td>9.00</td>
</tr>
</tbody>
</table>

The total distribution under Roller Flour Mills and sale in open market has been shown in the above table. It was 30.33 lakh tonnes in 1982-83; 27.35 lakh tonnes in 1983-84; 33.25 lakh tonnes in 1984-85 and 72.00 lakh tonnes in 1985-86. It shows tremendous increase in the year 1985-86 than the previous year 1982-83; 1983-84 and 1984-85. After the year 1985-86, FCI has not done any business through these channels till 1990-91. From the year 1991-92, Corporation has again started business through these channels.

* Source: Annual Reports of FCI (1982-83 to 1991-92)
7.7 Efficient Handling of Sugar and Fertilizer

7.7.1 Efficient Handling of Sugar:

Food Corporation of India had been advised by the Government of India to procure levy sugar from the sugar mills with effect from 1.1.1973. Sugar being a costly commodity and liable to deteriorate easily, requires meticulous handling during storage. It gets easily affected under adverse conditions of temperature and humidity. Hence, it is desirable to store sugar under ideal godown conditions. The godown is considered fit and ideal for sugar storage when it has high plinth, rodent, damp and bird proof and the shutter doors and ventilators should be such as to make the unit reasonably air tight at short notice. Godowns with low plinth kutcha or brick floor and walls should be avoided even for short-term storage of sugar. If the flooring is of cement lined with bitumen duly covered with black tar felt cloth, it would be ideal for sugar storage. Use of suitable dunnage is equally important in storage of sugar. Wooden crates covered with pateramats or double layer of pateramats with polythene sheet sandwiched in between is the most suitable dunnage for sugar storage.

In the case of movement of sugar stocks by rail, care should be taken to see that at the time of loading the
wagons, gunny wrappers may be spread and cleaned. Wagon floor and pateramats on the sides to avoid possible damage due to condensation and specially in case of long duration transit.

Sugar shall be packed in new A-Twill sound gunnies duly stencilled with relevant details such as name of mill, grade of sugar, date of production etc. No bleeding bags shall enter the stack, stitches to mends the bags should invariably be made before stacking. As far as possible, sugar should not be stored with other foodgrains. No hooks should be used while handling sugar bags. For sampling parkhies to be avoided and samples should be drawn by cutting open the mouths. Samples should be kept in air-tight containers. The stack height may go upto 20 bags in coastal areas and 22 to 24 bags in other areas. In case of khandasari sugar should be 10 bags to the maximum.

Sugar should be stacked grade-wise. No disinfection treatment should be given to sugar stocks. In case sugar is kept along with other stocks due to unavoidable circumstances and if fumigation becomes necessary for other stocks, then the sugar stacks should be properly covered with polythene covers until the duration of fumigation of neighbouring foodgrains stocks.
Aeration has to be selective and controlled. During humid weather, sugar stacks can be covered with polythene and tarpaulins. Only temporarily continuous covering should be avoided, otherwise heating and moisture translocation may occur. It is advisable to have a hygrometer in sugar godowns to record daily humidity and plan selective aeration.

Crystaline sugar falls under 5 grain size groups A, B, C, D, and E. Each grain size group falls into two colours grouping namely 30 and 29. There are thus 10 grades indicated as under:

The appellation for grain size always precedes that for sugar is "Crystal Sugar I.S.S. grade C-29" and in abbreviation crystal sugar I.S.S. may not be used and C-29 will do -

<table>
<thead>
<tr>
<th>I.S.S Grade</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A-30</td>
<td></td>
</tr>
<tr>
<td>A-29</td>
<td></td>
</tr>
<tr>
<td>B-30</td>
<td></td>
</tr>
<tr>
<td>B-29</td>
<td></td>
</tr>
<tr>
<td>C-30</td>
<td></td>
</tr>
<tr>
<td>C-29</td>
<td></td>
</tr>
<tr>
<td>D-30</td>
<td></td>
</tr>
<tr>
<td>D-29</td>
<td></td>
</tr>
<tr>
<td>E-30</td>
<td></td>
</tr>
<tr>
<td>E-29</td>
<td></td>
</tr>
</tbody>
</table>
For inspection and determination of grade, the specification method of circulation, grade determination, sieve test etc. as laid down under I.S.I. specification should be used.

Sugar

(i) Levy Sugar:

FCI continued to handle levy sugar which is distributed in 12 States and 3 Union territories, the areas allotted namely, Assam, Arunachal Pradesh, Andaman Nicobar Islands, Bihar, Delhi, J & K, Lakshadeep, M.P., Meghalaya, Mizoram, Orissa and West Bengal. The levy sugar stocks were lifted by the Corporation at notified prices from the sugar mills mostly in Maharashtra, U.P. moved to the respective States and distributed.

(ii) Imported Sugar:

The imported sugar was released through three channels viz.,

(a) by sale in the open market through tenders at selected centres.

(b) by supply to State Government through PDS at concessional rates.
(c) By sales made to State Government, meant for free sale and to other agencies.

The following table shows the position of distribution of levy sugar and imported sugar of FCI of last 10 years at all India level:

Table 7.13*

Position of Distribution of Levy and Imported Sugar of FCI on all India levels (1982-83 to 1991-92)

(Qnty. in lakh tonnes)

<table>
<thead>
<tr>
<th>Years</th>
<th>Levy Sugar</th>
<th>Imported Sugar</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1982-83</td>
<td>11.70</td>
<td>-</td>
<td>11.70</td>
</tr>
<tr>
<td>1983-84</td>
<td>12.48</td>
<td>-</td>
<td>12.48</td>
</tr>
<tr>
<td>1984-85</td>
<td>12.90</td>
<td>6.76</td>
<td>19.66</td>
</tr>
<tr>
<td>1985-86</td>
<td>12.60</td>
<td>15.50</td>
<td>28.10</td>
</tr>
<tr>
<td>1986-87</td>
<td>12.09</td>
<td>9.02</td>
<td>21.11</td>
</tr>
<tr>
<td>1987-88</td>
<td>11.08</td>
<td>6.85</td>
<td>17.93</td>
</tr>
<tr>
<td>1988-89</td>
<td>11.51</td>
<td>1.43</td>
<td>12.94</td>
</tr>
<tr>
<td>1989-9</td>
<td>11.43</td>
<td>1.53</td>
<td>12.97</td>
</tr>
<tr>
<td>1990-91</td>
<td>11.80</td>
<td>0.60</td>
<td>12.40</td>
</tr>
<tr>
<td>1991-92</td>
<td>12.10</td>
<td>0.40</td>
<td>12.50</td>
</tr>
</tbody>
</table>

The Table No. 7.13 shows position of distribution of levy and imported sugar of FCI at all India level since 1982-83 to 1991-92. On the basis of this table, we can interpret that the distribution of levy sugar through FCI of 1983-84, 1984-85, 1985-86 & 1986-87 were in better position than 1982-83 but from the year 1987-88 to 1990-91, it was in

* Source - Annual Reports of FCI (1982-83 to 1991-92)
decreasing trend, due to encouragement of distribution of sugar in open markets on standard prices. The position of 1991-92 was again in increasing trend. Due to export of National Product of sugar to the foreign lands in 1985-86, there was huge shortage of sugar in our country. So, our Government has imported large quantity of sugar from foreign land to meet out internal requirements.

7.7.2 Efficient Handling of Fertilizer:

The FCI took over the fertilizer handling as principal from 1.3.1976. Earlier, it was done by the Ministry of Food and Agriculture, Department of Food. As principal, the stocks till now held by the Ministry were taken over by the FCI. Fertilizer stocks being received at the ports from other countries are moved and stored in FCI godowns.

Fertilizer stocks need handling with extreme care and caution. Any slackness on the part of the staff who handles the commodity results in hazards or damages. The following precautions should be taken for storage of fertilizer:

1. It is desirable to maintain the original factory packing condition.
2. Lot of damage is caused to the stocks by floor seepage and moisture migration due to condensation. Hence, it is extremely necessary to store fertilizer on suitable dunnage.

3. It is equally important to collect the spillage every day and store separately. The workmen and labour should be given hand gloves and gunhoots at the time of collection and standardisation.

4. It is also desirable to store fertilizers of varying degrees of hygroscopicity and combustibility separately to avoid quality deterioration and other hazards.

5. Improper stacking leads to accidents and loss of life. Hence it is important to resort to orderly stacking. This maximises space utilisation also.

6. Care should be taken to see that nitrate bearing fertilizer stocks are stored separately from Carbonaceous materials to avoid possible fire hazards specially in the high temperature areas.

7. As a matter of precaution, it is essential to provide first aid box and other safety equipment in fertilizer godowns.
8. It is necessary to avoid exposure of fertilizer stocks to vagaries of weather, otherwise, the granulation is affected. Hence, it is advisable to create airtight condition during storage since humid weather affects the storability.

9. Maximum care should be taken to avoid deterioration of fertilizer as it would become difficult to disperse the same in the fields.

10. Strict watch is necessary to see that hooks are not used by the labourers while handling fertilizer bags to avoid quality deterioration.

11. Fertilizer stocks are stored only in covered accommodation for a scientific storage. Storage of fertilizer under CAP conditions should be avoided since it affects the quality and storability.

12. It is also desirable to alter staff and workmen to avoid contaminated chemical atmosphere and other fumes while working in a fertilizer godown.

13. For obvious reasons, bringing of naked fire in the fertilizer godown and smoking are strictly prohibited.
14. Long exposure of staff and workmen to chemical atmosphere in a Fertilizer godown should be avoided as it may lead to nansea and giddiness.

15. It is also advisable to subject the staff and the workmen to periodical medical check-up to prevent any possible health hazards.

16. Life span of fertilizer godown is generally reduced if the metallic parts of the godowns are not painted periodically to prevent rusting and damage to other structures.

In addition to the aforesaid precautions, safe storage of fertilizers depends on the following factors:

(a) Nature of Fertilizer:

The chemical composition and the physical condition of a fertilizer and its hygroscopicity determine its keeping quality. Bigger the size of granule the lesser the tendency for cake formation. Some of the common fertilizers are classified as under:
Hygroscopic Acid Treatment | Non Hygroscopic | Fertilizers
---------------------------|----------------|------------------
Calcium Ammonium Nitrate  | Potassium (Neutral) | Sulphate
(Acidic)                  |                |                  
Ammonium Sulphate Nitrate | Potassium (Neutral) | Chloride
(Liable to cause damage to gunnies)
Nitro Phosphate (Liable to cause damage to gunnies)
Urea (Acidic) Super Phosphate (Liable to cause damage to gunnies)
Rock Phosphate (liable to cause damage to gunnies)
Tripple Phosphate (Liable to cause damage to gunnies)
Di-Ammonium phosphate (liable to cause damage to gunnies)
Potassium Nitrate

b) Climate Factors:

The effect of temperature and relative humidity is markedly pronounced in hygroscopic fertilizer. Generally, an increase in the mean temperature of atmosphere improve the keeping quality of the fertilizer by lowering the moisture content whereas the increase in the relative humidity of the atmosphere gives rise to rapid deterioration of its keeping quality. Relative humidity level of over 60% is harmful. Such atmospheric changes induce lump or cake
formation. In areas of high humidity, the whole bag may become a pastry mass though in semi-dry area, the fertilizer retains its solid condition.

c) KIND OF PACKING MATERIAL:

The type of packing material exerts considerable influence on the absorption of moisture by the fertilizers. Polythene lined bitumenised jute bags more suitable than any other packing material.

In the case of ammonium phosphate and ammonium sulphate and other non hygroscopic fertilizers, ordinary jute bags can be used as a packing material. Fertilizer packed in crape paper bags and jute bags absorbs considerable moisture. The use of five-ply paper bags with two moisture proofplies bag is quite a satisfactory packing material, provided the fertilizer is dry at the time of packing. However, polythene lined bitumenised jute bags are ideal. The mouth of the bag may be hand or machine stitched. In the case of hand stitching, the mouth of the bags is rolled over and then stitching in two rows with at least 14 stitches in each row should be done.
d) Type of Storage Structure:

Fertilizer stocks should be stored preferably in covered godowns only which are structurally suited for this purpose. Ordinary godowns with low plinths mud walls or galvanised iron sheet roofing are not ideally suited for storage of fertilizer. The godowns for fertilizer storage should be such that it should guard the stock from atmospheric high humidity and high temperature. An ideal storage godowns for fertilizer should be well ventilated and away from places of fire hazards. The godown floor should be good and free from ammonical smell and should be properly decolourised before arranging storage. The godowns once used for fertilizer storage should be thoroughly cleaned, washed with washing soda and fully derated before using it for storage of foodgrains.

e) Dunnage and Stacking:

As stated earlier, proper dunnage is necessary for storage of fertilizer. It prevents damage to bottom layers not only on account of seepage from floor but also due to diurnal variation in the temperature resulting in condensation of water on the floor. Wooden crates with a layer of bamboo matting are ideal as dunnage. It also helps free circulation of air under the stacks. In the absence of wooden crates, polythene sheets sandwiched between two layers of mats can also be used as dunnage.
Proper stacking of fertilizer bags is very necessary for the safe storage of fertilizers. Before the stocks are received, a stack plan in the godown should be prepared, dividing the floor area into uniformly sized and serially numbered rectangular or square stack base to build stacks.

Ordinarily, the maximum base area of a stack should not exceed 30' x 20'. Of the thee types of stacking in practice for foodgrains viz. (i) simple (ii) block and (iii) cross-wise, the block system is considered to be convenient for fertilizers. All the bags in a stack should be of uniform size and weight. The height of the stack is important for storage of fertilizers and could be divided into two broad categories. The fertilizers that are highly hygroscopic acid treated or explosive in nature could be stacks generally to a maximum height of 12 ft. while non hygroscopic fertilizers could be stored to a maximum height of 14 ft. During storage, it is observed that in bigger stacks generally the percentage of damage is less. Smaller stacks built, therefore be avoided and bigger stacks should be built. The spillings and droppings of the fertilizer should be daily collected, cleaned and kept separately in empty bags attached to the respective stacks. Stack cards indicating the name of the fertilizer, date, of receipt and
issue number of bags, weight of the stack and other relevant information should be tagged to each stack at a convenient height. The stocks of different fertilizers should not be stacked together. No other agricultural commodity should be stored in the same godown where fertilizers are stored.

f) Handling and Transportation:

Since bulk transport is not very popular outside the manufacturing plants in India, fertilizers are transported in bags by rail, road and water. In the case of transport by rail, only clean and water-tight wagons should be selected and proper dunnage spread on the wagon floor.

The bags should be stacked neatly on either side within the wagons and a small stack built in between the two stacks so that the bags are tightly kept and do not collapse during transit. The fertilizer bags should be kept at least one foot away from the doors. Damaged bags should be kept near the wagon doors. Loading and unloading of fertilizer bags should be done at a concrete platform with covered roof, especially during rains. Hooks need to be avoided at any stage of handling.

Physical Verification of Fertilizer Stocks:

In the Head Office Circular No. E/S & C/Stocks A/C 176 of
18.3.1977, it has been prescribed that the physical verification of stocks should be conducted at the end of each quarter, i.e. 30th June, 30th September, 31st December and 31st March, every year. The matter regarding physical verification of fertilizer stocks has been considered in consultation with the finance division and it has now been decided that the physical verification in regard to fertilizers will be conducted in each quarter, as follows:

(a) Stocks held with SWC/CWC:

A certificate of physical verification balance signed by the Managing Director/Regional Director of SWC/CWC indicating the number of bags, weight variety etc. should be obtained for each quarter.

(b) Stocks held in the owned/hired godowns of the F.C.I.:

In respect of the stocks of fertilizers held by the Corporation in the owned/hired godowns, most of the stocks being in standardised bags, the stocks will be verified by count for the first 3 quarters and both by count and 10% weighment as on the 31st March.

(c) As far as sub-standard fertilizers are concerned, the quarterly physical verification will be conducted on the basis of count and 100% weighment by the storing agencies for the stocks held by them. Similar procedure would be
followed by FCI Officers in respect of stocks held by us in our owned/hired godowns.

(d) As far as stocks deposited with the storing agencies are concerned, the SWCs/CWCs remain responsible as custodian for the stocks. Therefore, if any shortage is noticed from the certificates given by the SWCs/CWCs, action should be taken immediately to obtain clarification from the concerned storing agency for processing the case further.

(e) As far as result of physical verification of the stocks held in the owned/hired godowns of the Corporation are concerned, if the result of the physical verification discloses an excess as compared to the book balance, the difference should be accounted for in the stock ledgers as "receipt" as a distinct item headed "Excess found on physical verification". On the other hand, if the result of physical verification discloses loss as compared to the book balance, the ledger balance should not be corrected till such shortages are thoroughly investigated into and established as real loss to be regularised by the competent authority. The book balance should not, therefore, be corrected on the basis of physical verification weight but a certificate should be recorded in the ledger to show quantity of fertilizers found as a result of physical verification.
The following table shows the position of commercial and pool fertilizer of FCI of last ten years on all India basis:

Table No. 7.14*

<table>
<thead>
<tr>
<th>Years</th>
<th>Commercial fertilizers</th>
<th>Pool Fertilizers</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1982-83</td>
<td>3.32</td>
<td>-</td>
<td>3.32</td>
</tr>
<tr>
<td>1983-84</td>
<td>9.65</td>
<td>1.83</td>
<td>11.48</td>
</tr>
<tr>
<td>1984-85</td>
<td>5.50</td>
<td>1.27</td>
<td>6.77</td>
</tr>
<tr>
<td>1985-86</td>
<td>1.78</td>
<td>0.05</td>
<td>1.83</td>
</tr>
<tr>
<td>1986-87</td>
<td>0.32</td>
<td>0.13</td>
<td>0.45</td>
</tr>
<tr>
<td>1987-88</td>
<td>0.18</td>
<td>-</td>
<td>0.18</td>
</tr>
<tr>
<td>1988-89</td>
<td>0.28</td>
<td>0.07</td>
<td>0.35</td>
</tr>
<tr>
<td>1989-90</td>
<td>0.612</td>
<td>0.258</td>
<td>0.87</td>
</tr>
<tr>
<td>1990-91</td>
<td>0.10</td>
<td>0.20</td>
<td>0.30</td>
</tr>
<tr>
<td>1991-92</td>
<td>0.20</td>
<td>-</td>
<td>0.20</td>
</tr>
</tbody>
</table>

The above table shows distribution of commercial and pool fertilizer through FCI at all India level since 1982-83 to 1991-92. On the basis of these information, it is obvious that the FCI has not taken keen interest in the distribution of fertilizer because many other parallel organisations have been set up for completion of this task.

* Source: Annual Reports of FCI (1982-1992)
7.8 Processing Activities

Though the basic function of the Corporation is food management, it has contributed a lot to the allied field also. The Corporation established Modern Rice Mills, Rice Bran, Solvent Extraction Plant, Modern Dal Mill, Maize Plant etc. The basic idea of establishing these units was to disseminate the latest technology in the field of processing.

7.8.1 Modern Rice Mills:

The FCI of India has set up 25 Modern Rice Mills throughout India. It has 11 mills in east Zone, 8 in Tamil Nadu one in Kerala, 4 in North Zone of 4 tonnes per hour capacity and one in Imphal of two tonnes per hour capacity.

Out of these four rice mills at Imphal Nellur (A.P.) and Batala (Punjab) were not originally provided with parboiling facilities. Recently FCI decided to provide the Kernal and Batala units with pressure parboiling facility which is a latest technological advancement in the field of parboiling of paddy.

* Source: Food Corp (Monthly Journal) July 1991
PARBOILING:

Parboiling is a process of pre-treatment of the raw paddy prior to its being milled in the Mill.

In general, the process consists of soaking the raw paddy after its cleaning in hot water for a period varying from a few hours to several days, depending upon the temperature of the hot water used for soaking and the quality of the paddy.

The soaked paddy is then subjected to steaming for a short duration for about one quarter or half an hour. The paddy is then fully parboiled and ready for milling or storage as the case may be.

ADVANTAGE OVER RAW RICE:

(i) Higher percentage of recovery of rice 2-3%
(ii) More head rice, i.e. less brokens.
(iii) More nutritional
(iv) More percentage of bran
(v) More percentage of oil in bran (apprx. 4%)
(vi) Better quality.

CFTRI METHOD PARBOILING:

So far the CFTRI method of parboiling is being used in almost all the FCI Modern Rice Mills. In this process, raw paddy is soaked in hot water at a temperature of 70-80°C
for a period of about three to four hours, depending on the variety of paddy. After soaking, the water is drained out and the soaked paddy is subjected to steaming for a period of 10 to 15 minutes, when the steam pressure of 50 to 60 PSI is maintained. The parboiling process is complete with the draining of the condensate.

The parboiled paddy which contains about 35% moisture at this stage is required to be dried mechanically to 14% moisture before its being milled in the modern rice mills.

PRESSURE PARBOILING METHOD:

This is developed method of parboiling. In this pressure boiling process, the raw paddy is only wetted and not soaked. Gelatinization is achieved by steaming the wet paddy under pre-determined and controlled steam pressure.

THE PROCESS:

a) The raw paddy after cleaning through paddy cleaner is automatically fed to the pressure parboiling tanks.

b) The paddy in the pressure vessel is wetted by recirculation of cold water through a circulating water pump which not only wets the paddy but also washes the paddy. The soaking process as in the case of CFIRI
Method is completely eliminated. The circulation water is drained out after wetting and washing.

(c) The steam is applied in the closed pressure parboiling tank at 20 PSI for 20 to 25 minutes.

(d) Pressure parboiled paddy becomes ready after draining the condensate.

ADVANTAGE OF PRESSURE PARBOILING:

1. Since the paddy is only wetted and not soaked, it results in a net saving of time by 3-4 hours per batch, as compared to CFTRI method of parboiling.

2. Moisture content of the pressure parboiled paddy is only 22 to 24% as compared to 32 to 34% in case of CFTRI method.

3. Less moisture helps saving in drying time.

4. There are certain soluble ingredients in the kernel, which get dissolved in the water and are lost when the paddy is soaked in water for a long time. This is known as "leachate" loss. Since, in the pressure parboiling method, the paddy is only wetted and not soaked, the leachate loss is completely eliminated with an increase in the percentage of recovery.
4. The pressure parboiled rice is more nutrient due to elimination of leachate loss.

Table No. 7.15 *

Position of Paddy Processed in Modern Rice Mills of FCI on All India Basis (From 1982-83 to 1991-92)

(Qnty. in lakh tonnes)

<table>
<thead>
<tr>
<th>Years</th>
<th>Paddy Processed</th>
<th>% of decrease</th>
</tr>
</thead>
<tbody>
<tr>
<td>1982-83</td>
<td>2.76</td>
<td>-</td>
</tr>
<tr>
<td>1983-84</td>
<td>2.10</td>
<td>23.91</td>
</tr>
<tr>
<td>1984-85</td>
<td>1.59</td>
<td>42.39</td>
</tr>
<tr>
<td>1985-86</td>
<td>1.24</td>
<td>55.07</td>
</tr>
<tr>
<td>1986-87</td>
<td>0.67</td>
<td>75.72</td>
</tr>
<tr>
<td>1987-88</td>
<td>0.59</td>
<td>78.62</td>
</tr>
<tr>
<td>1988-89</td>
<td>0.54</td>
<td>80.43</td>
</tr>
<tr>
<td>1989-90</td>
<td>0.31</td>
<td>88.77</td>
</tr>
<tr>
<td>1990-91</td>
<td>0.60</td>
<td>78.26</td>
</tr>
<tr>
<td>1991-92</td>
<td>0.40</td>
<td>85.51</td>
</tr>
</tbody>
</table>

The above table shows position of paddy processed in modern rice mills of FCI on all India basis from 1982-83 to 1991-92. On the basis of the above information, we can say that the position of paddy processed is in decreasing trend from the year 1982-83 to 1991-92. The position of 1991-92 is very poor than 1982-83 because it has gone down by about 85.51% than 1982-83.

7.8.2 Solvent Extraction Plant at Sembanarkoil

This plant was established for processing of bran and production of rice mill oil. This plant is also plagued with frequent power failure and constant power cut imposed by the State. Inspite of this, the production of this plant has been satisfactory. With the implementation of ban on the import of tallow by the Government of India, there was an unprecedented demand for rice bran oil from the shop manufactures. The market is steadily rising and we are able to get substantially higher prices for our products. The position of processed rice bran of last 10 years has been shown in the following table:

Table 7.16 *
Position of Rice Bran of FCI on all India Basis (1992-83 to 1991-92) (Qty. in lakh tonnes)

<table>
<thead>
<tr>
<th>Years</th>
<th>Processed rice bran</th>
<th>% of decrease</th>
</tr>
</thead>
<tbody>
<tr>
<td>1982-83</td>
<td>7912</td>
<td>-</td>
</tr>
<tr>
<td>1983-84</td>
<td>4721</td>
<td>40.33</td>
</tr>
<tr>
<td>1984-85</td>
<td>3192</td>
<td>59.66</td>
</tr>
<tr>
<td>1985-86</td>
<td>2157</td>
<td>72.74</td>
</tr>
<tr>
<td>1986-87</td>
<td>1560</td>
<td>80.28</td>
</tr>
<tr>
<td>1987-88</td>
<td>1291</td>
<td>83.68</td>
</tr>
<tr>
<td>1988-89</td>
<td>1743</td>
<td>77.97</td>
</tr>
<tr>
<td>1989-90</td>
<td>926</td>
<td>88.30</td>
</tr>
<tr>
<td>1990-91</td>
<td>289</td>
<td>96.35</td>
</tr>
<tr>
<td>1991-92</td>
<td>481</td>
<td>93.92</td>
</tr>
</tbody>
</table>

The above table shows position of rice bran of FCI on all India basis from 1982-83 to 1991-92. On the basis of these data, we can say that the position of rice bran is in decreasing trend from the year 1982-83 to 1991-92. The position of 1983-84, 1984-85, 1985-86; 1986-87; 1987-88; 1988-89; 1990-91 and 1991-92 were 40.33%; 59.66%; 72.74%; 80.28%; 83.68%; 77.97%; 88.30%; 96.35% and 93.92% lower than the year 1982-83.

7.8.3 Welfare Measures

In keeping with the Government of India policy of small family, incentives have been granted by the Corporation to its employees for practising the small family norms which were widely publicised among the employees. Fifty employees have undergone family planning operation and received incentives in Tamil Nadu Region. The district-wise break-up of the same is furnished below:

<table>
<thead>
<tr>
<th>R.O.</th>
<th>D.O.</th>
<th>District</th>
<th>Incentives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Madras</td>
<td>Madras</td>
<td>R.O. Madras</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>D.O. Madras</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tanjavur</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Coimbatore</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cuddalore</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tuticorn</td>
<td>3</td>
</tr>
</tbody>
</table>

50
In order to fulfil the employees' desire to own their houses at their places of choice, house building advance at concessional rate of interest were granted to the tune of Rs. 24.25 lakhs to 50 employees of this region.

Workers' participation in management has been implemented in this region since long and two plant councils and three depot concils are functioning. The plant councils are at MRM Tanjavur and SEP Sembanarkoil also in Tanjavur District and the Depot Councils are at FSD, Avadi, Egmore and Arakkonam in Madras District.

During the year, officers were sent for training to various training institutes located at Zonal and headquarters level and also to outside institutions in various faculties like administration, shipping, storage, accounts etc. It is always our endeavour to see that a number of officers are trained to increase their efficiency. As a matter of welfare measures, dependents of employees who died in harness are being appointed in various capacities. During the year, 6 dependents were appointed.

In order to encourage the use of Hindi in official correspondence, inservice training has been imparted to the employees. During year, as many as 90 employees were sent to various Hindi examinations.
Experiments were programmed during the year under review by Mini Session-II of technology mission on oil seeds in collaboration with CFTRI Mysore and CSIR New Delhi for chemical stablisation of the rice bran so as to produce edible rice bran oil grade-I. The experiments were completed successfully and a quantity of 30 MT Grade-I oil was produced through extraction of chemically stabilised rice bran.

7.9 Transportation

Food is the vital item for the survival of human beings. In a vast country like India about 60% of whose agriculture produce depends upon the mercy of the monsoon, it is the most important duty of the Government to ensure food to every individual. Prior to the current decade, this work was being looked after by the private sector who were exploiting the situation working in a speculative manner and making the maximum profit. The general mass was subjected to uncountable miseries by this class.

Realising this, the Government thought of taking over the entire function of purchase and sale itself and gradually this work was handed over to the FCI. The Government also

decided to fix the support and issue price on a flat rate basis for purchase and sale throughout the country.

Now, let us look into the production potential of the different corners of our country. The North, East, North East, South and West zones all differ significantly. The production of major items like wheat and rice is very heavy in the northern States like Punjab, Haryana and U.P., while it is in scarce in other zones. Hence, to keep up the balance between procurement and distribution, and above all, to fulfil the major function entrusted to FCI, it is imperative that well-planned movement is continued throughout the year. For this, we have to resort to viable and cheaper modes of transport.

As clear from the word itself, 'movement' means shifting of things from one place to another. Movement is a law of nature. The air and water flow from one place to another to maintain the existence of millions of man, animals and plants. Likewise, movement of raw materials and manufactured goods move from one end to another, to fulfil the needs of the millions. It is also a source of livelihood of millions of people and a major source of country's financial status. Amongst these things, movement of foodgrains and its allied inputs form a vital part. It has
saved the lives of millions of people during the famine floods earthquakes and other calamities.

Concentrating this issue to our country and the movement of foodgrains, the main item we fear, I will like to take you back to the year 1965 to 1970 when our country was facing the grim problem of feeding the rising population in view of inadequate production and failure of crops due to vagaries of nature. During this period, we imported foodgrains from a number of countries. Out of these, U.S.A. was the important country. This movement took place through sea-cum-rail/road.

**NECESSITY:**

India is a vast country. Moreover, its productive potential of different varieties of foodgrains and its consuming preference differ from one end to another. Although with the taking over of the scientific way of agriculture and construction of dams, we have increased our production significantly. Still, there is a vast gap of production and demand in the distant opposite corners of the country due to different climatic conditions and land. The northern States of Punjab, Haryana and U.P. are surplus in

wheat and rice while the state of West East and North East and South, viz., Maharashtra, West Bengal, Assam, Orissa, Kerala, Karnataka, Andhra Pradesh and Tamil Nadu are deficit, particularly in wheat.

INTER AND INTRA STATE MOVEMENT:
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Intra means inside. Intra State movement refers to the movement inside the State itself. It is done to meet the requirement of the State, mostly due to the following factors:

1. To meet the requirement of the consumers
2. To make room for the next expected crop.

As it is generally observed that some areas of a State are more fertile while the other areas deficit. We are faced the problem of accommodating the full influx of rabi and kharif. At the peak of the crop, the railway despite best efforts cannot cope up with our demands. As such, we are forced to store the foodgrains in the surplus areas temporarily. With the earliest opportunity the stocks are required to be shifted to the consuming areas to make room for next crop. Likewise, we have to move the foodgrains from one state to another. This movement is called the intra-State Movement.
There are four categories of modes of transport, such as:
(i) Rail  (ii) Road  (iii) Sea  (iv) air; out of the four, the first two are in common use. The sea media is generally used for importing foodgrains. In case need arises, it is also utilised to carry out foods from one port to another normally when the wagon supply is poor and the need is urgent. The air media is used only in cases of extreme urgency, generally to areas which are not accessible due to flood and other natural calamities. Out of the first two, the rail is more common mode for transporting foodgrains. Road movement is generally undertaken to supplement the rail movements. It is used for short distance traffics and from mandies to rail-heads and godowns.

7.9.1 Rail Transport

In the FCI operations, rail movement of foodgrains plays a very crucial part. The Railways account for the lion's share of the movement. Railway movement involves a number of operations such as indenting for wagons in time, proper loading at loading points, keeping stack of the movement of wagons, receiving the wagons at the unloading points and making arrangements for actual unloading and further movement on to the storage depots. I found that the
operation involved meticulous planning, close collaboration with railway authorities at all levels and close monitoring, supervision and control over the operation. The lack of availability of sufficient number of empty wagons, inadequate line capacity and trans-shipment at broad gauge and meter gauge break points, always posed problems.

The work of efficient and timely distribution of foodgrains, sugar and fertilizer was to a great extent dependent on the location of storage godowns at vital points and planned movement. The task of making the foodgrains available for the public distribution system in West Bengal caused concern, because West Bengal was the largest consuming State from the Central Pool and the railway movement to that area beyond a limit faced bottlenecks. The inadequacy of railway line capacity and the existence of meter gauge section proved to be serious handicap to move to North Eastern State, so much so that supply for the public distribution system became generally a case of living from hand to mouth. Innovative measures by way of alternative modes of transport head to be devised to keep the supply line going. In order to take care of complaint against quality of foodgrains distributed, joint inspection by the FCI and state Government official as well as the system of
retention of sealed samples of supplies made from the FCI godowns had to be introduced.

Railway is now almost universally that of train load movement. FCI had to adjust and gear up its machinery to see that the train load of foodgrains is handled with efficiency and promptness both at originating and destination stations. For this, a lot of headway has to be made and, in our major storage complexes, railway sidings have to be provided, so that loading of rakes does not pose a serious problem and movement of foodgrains by trucks from our depots to railway station is avoided. This will also save the FCI substantial sum of money, besides avoiding theft and pilferage.

These priorities are five, form A to E. All foodgrains consignments including Atta, Suji, Rava, Coarse foodgrains, Maize, Milo etc. pulses on defence account programmed and sponsored by Ministry of Agriculture/FCI and approved by the Railway Board move under "B" priority.

PROCEDURE FOR BOOKING OF GOODS:

Implementation of Planning:

After the planning programme is drawn and sponsored by FCI authorities, it is examined and approved by the railway
representative present in the meeting. This programme is then flashed by the regional representative attending the meeting to their respective loading points.

Forwarding Note:

It is a demand note, prescribed by the railway, containing the details of consignor, cosignee, station, from, to, number of bags, commodity and also some specific conditions which is required to be filled, signed and handed over to the Station Master for supply of wagons.

Registration Fees:

To safeguard against false indents, railway is charging some earnest money for demand of each wagon. It is called registration fee. It is charged at the rate of Rs. 150/- per BC, Rs. 100/- per MG and Rs. 60/- per NG wagons. It is refundable on completion of loading.

FOREFEITURE OF REGISTRATION FEES:

Registration fee is forefeited under the following conditions:

i) The demand is cancelled within 30 days.

ii) The demand is cancelled after the physical supplies of wagons.
iii) When the minimum weight specified for registration and supply of wagon is not offered after the wagon is supplied.

DUMPING OF GOODS:

FCI has given the benefit of dumping the goods against their pending indents in railway premises. This is aimed at facilitating the loading of wagons within the free time.

EXAMINATION OF WAGON:

As we are demanding water-tight (WT) covered wagons only, we must ensure before loading that the wagons are water tight and clean from dust and oil.

MARKING OF BAGS:

To avoid mis-despatch of consignment and to facilitate connection, 10% of bags in case of direct traffic and 100% in case of transhipment should be marked with codes of the forwarding station, number of bags loaded and destination station code.

WEIGHMENT:

It should be ensured that only standard bags are loaded.
As a test check, weighment of 10% bags should be conducted and, if variation in weight is found to be within 500 gms. per bag, the loading should be continued, otherwise loading of the stack should be stopped.

CONVOY NOTES:

Convoy on the prescribed proforma in quadruplicate giving details of station, from, to, commodity, number of bags, booking particulars should be prepared. Two copies of this convoy notes should be tied with the ears of bags stacked near the wagon door without fail and loading of the bags should be done 18" away from the flab door of the wagon.

SEALING AND REVETTING:

After the loading is completed, the sealing and revetting of the wagons should be ensured in the presence of FCI Staff before the wagons are shunted out.

RAILWAY RECEIPT:

It is a document prepared by railway staff and handed over to the consignor as a token of having received the consignment as per details filled in the forwarding note. It is a legal document and forms the base of our claim in case of non-receipt, short deficient receipt or refund in case of excess realisation of freight.
These are of three types paid, to pay and paid on to pay. When the freight is collected at the forwarding station, it is called paid R.R. When the freight is to be recovered at the destination, it is called to pay RR while to pay RR booked from Station A to B in case of being re-booked to C station without unloading a fresh RR is prepared on production of original RR at B and this RR is called paid on to pay.

RATES:

Two types of rates are presented by the railway for all commodities. These are:

(i) Railway Risk Rate
(ii) Owner Risk Rate

Railway Risk Rate is 20% higher than the owners' risk rates. FCI is booking its consignment at Railway Risk Rate only.

DESPATCH ADVICE:

As soon as the loading is completed, a telegram should be sent to the consignee, intimating him about the loading in brief. After that, complete despatch document should be prepared on prescribed proforma and despatched under registered A/D to the consignee on the same day.
DELIVERY:

The delivery of the consignment booked by rail can be taken at the destination on production of R.R. In case the R.R. is not received, delivery can be effected on production of indemnity note.

INDEMNITY NOTE:

It is a form of guarantee to compensate to the railway an amount equivalent to the quantity delivered under the said bond, in case it is claimed by some other party. It is generally filled on stamped note but FCI is exempted and we can fill the ordinary note. The powers to permit delivery on these notes are vested with Station Master and Divisional Superintendent, according to the valuation of foods.

In case of FCI's consignment of foodgrains, Station Masters are permitted to grant delivery on these notes, irrespective of the valuation of goods.

GENERAL INDEMNITY NOTE:

It is a special concession granted to consignors despatching regular heavy traffic by rail to relieve them from trouble of producing indemnity note for each and every consignment without production of RR. This note can serve the purpose of delivery of a number of consignment without
producing railway receipt at the time of delivery but railway receipt is required to be submitted within 10 days of the date of delivery. In case of failure to do so, a separate indemnity note is executed failing which further concession can be refused.

DELIVERY BOOK:

It is a book maintained by the destination Station Master to enter all inward consignments on receipt of invoice of on production of RR. It contains all column of a RR with date and time and signature of the consignee, Railway staff and remarks in regard to shortage to be passed by the consignor. It forms the base of a claim with railway. We should be very cautious while taking delivery and passing remarks of shortages with details, i.e. seal condition in case of full bags and location in case of loose/cut/torn/damaged bags.

7.9.2 Road Transport

The road movement is normally undertaken to supplement railway movement and also to make good the shortfall in wagon supply in view of the demand and allocation of a particular region. The given figures indicate that our overall movement is on the increase but the railway cannot
cope up the increased demand, it is showing an increasing trend on the road movement.

The road movement is normally undertaken from mandies and ports to depots from MG stations to BG stations and from depots to Railheads. It is also largely used in feeding Delhi from the adjacent States of Haryana and U.P.

In addition to the above movements, about 2 million tonnes of fertilizer is imported and moved from the ports to the inland destinations of FCI accounts.

Out of the total quantum of foodgrains movement, nearly half has to be moved from Punjab, Haryana and U.P., the principal grainaries of India. Since almost all the above States fall within the jurisdiction of Northern Railway, the major burden of clearance falls on this Railway as far as movement indigenous foodgrains are concerned. Andhra Pradesh and Tamil Nadu similarly have to effect the heavy despatches of rice to other needy States. Movement of foodgrains, therefore, has necessarily to take into account all limitations as are clear from the following factors., viz.:

(i) Movement is concentrated in certain areas of the country;
(ii) The bulk of it takes place in certain parts of the years.

EXAMPLES:
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Wheat is a Rabi crop, the harvest commence from the end of April and the inflow continues until the middle of July. While planning movement from the surplus States, the following factors have to be kept in view:

Factors Involving Road Movement:
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(i) Since the monsoon starts from middle of June, it is necessary that maximum stocks are moved out during May and early June, particularly to deficit States like Maharashtra, West Bengal, Assam and Kerala, where the monsoon arrives early and which require a sizeable quantity of wheat to sustain public distribution system.

(ii) The availability of wagons on the Northern Railway goes down considerably after June, particularly due to the reason that open wagons cannot be used in monsoon.

(iii) Bulk of the despatches of the Rabi crops must be completed by October, so as to make room for the arrival, storage and subsequent rail movement of Kharif crop, i.e. rice and maize etc. Movement of Kharif crop continues throughout winter season.
(iv) It is an open truth that railway alone cannot cater to our heavy and urgent requirements due to shortage of wagons. Due to the various problems like handling operation, transit losses and time, road movement within 100 kms. had been proved economical and expedient.

(v) There are places which are not connected by rail like the major portion of Jammu & Kashmir and Himachal Pradesh, where the distribution is maintained through road movement.

(vi) Road movement is also in common use for transporting foodgrains from procurement centres to our godown and suitable railway station.

(vii) Any time to ensure swift and urgent movement, we have to resort to road movement from a point on MG to point on BG.

(viii) Sometimes, we ave to move stocks by road between two points of the same gauge to make use of the better wagon supply due to heavy inward traffic.

(ix) Apart from the above reason, we had to use road media to meet the emergent situation irrespective of the economic consideration.
Irrespective of the factors explained above, which justify the road movement, it is essential that the road movement should be discouraged as far as possible due to the following reasons:

a) Road movement is in the hand of private sector and the Government revenue goes to it instead of railway - a Government organisation.

b) It also encourages a tendency of corruption.

c) It is time consuming and uneconomical for distances beyond 100 kms.

To discourage road movement over rail, hard lines have been drawn by the Corporation by delegating powers in the hands of senior executives, as detailed below:

1. Regional Managers are competent to permit road movement upto 200 kms.

2. Beyond 200 kms. and upto 500 kms., the powers are vested with Zonal Managers.

3. Beyond 500 kms. the permission has to be sought from Head Office.
FORMALITIES OF ROAD MOVEMENT:

The road movement is undertaken through contract system. Whenever transport contractors are required to be appointed for a regular or specific work, tenders from viable and reputed transporters should be invited and lowest tenders be accepted, subject to the following conditions:

1. The firm has good and reputed standing, as known from its past record.

2. For inter State movement, it must have a valid permit.

3. Insurance of the goods which is in the custody of the transporter should be fully ensured.

4. He must give an undertaking to compensate all transit losses.

5. He must deposit the required security deposit.

DELEGATION OF POWERS FOR AWARDING CONTRACTS:

The Board of Directors in their meeting held at New Delhi have approved the delegation of the following powers for deciding the road transport contract:
<table>
<thead>
<tr>
<th>Authority</th>
<th>Extent of which powers delegated</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. District Managers</td>
<td>By ad-hoc sanction in an emergency, subject to justification.</td>
</tr>
<tr>
<td>2. Regional Manager/</td>
<td>Upto Rs. 5,00,000 (Rupees five lakhs by limited and open tender.</td>
</tr>
<tr>
<td>Sr. Reg. Managers/</td>
<td></td>
</tr>
<tr>
<td>Joint Managers (P.O.)</td>
<td></td>
</tr>
<tr>
<td>3. Zonal Managers</td>
<td>Upto Rs. Ten Lakhs by limited tender and full powers by open tenders in consultation with Manager (Finance). This is limited upto 50% difference in rail and road freight; after that approval of Head Office is required.</td>
</tr>
<tr>
<td>Managing Director</td>
<td>Full powers in consultation with the Financial Advisor at the Head Office.</td>
</tr>
</tbody>
</table>

SECURITY AND PRECAUTIONS AND PROCEDURE FOR BOOKING:

The security deposited by the contractors should be either in cash or in the shape of Bank Guarantee from any schedule bank of India.
Although the transport contractors are liable to hand over the number of bags and quality of foodgrains loaded at destination and bound to pay for any deficiency or slackness from the conditions laid down in the contract direct from the bills tendered precautions should be taken to fill, stitch and load the consignment correctly.

A gate pass in quadruplicate is to be prepared by the despatching end, giving all details of the consignment loaded, station from and to, name of consignee, three copies of which are to be handed over to the truck driver who will hand over the same at the destination. At destination of the consignment, checking should be made properly in terms of number, quality and weight and any discrepancies found should be recorded on the copies of gate pass. This gate pass along with the bill will form the base of payment at the forwarding end.

In transport by road, there is hardly any scope for loss left for regularisation as the losses are generally recovered from the contractor from the bills.

To keep up the public distribution system run smoothly and also to maintain a balance between procurement and storage/distribution. FCI has to move about 10 millions mts
of grain per annum by rail from the surplus States of Punjab, Haryana and U.P., to the deficit States of West, East, North East and South to have a control over the movement. Fortnightly movement planning meeting is conducted at Head Office. In this meeting, date-wise loading programme is drawn from different stations, based on the decision taken in the basic plan meeting, the decision to the basic plan further depends upon the urgency of requirement in particular State and the stock position and procurement probabilities in the procuring States.

PREFERENTIAL AND TRAFFIC SCHEDULE:

In exercise of the powers conferred by section 27-A of the Indian Railway Act 1890, the railway Board issues from time to time a schedule for regulating the movement of goods traffic by rail in a descending order of priority. This applies to wagon load traffic only. It is necessitated to accommodate the essential traffic of foodgrains, cement, coal, edible oil and petrol etc. In view of limited capacity of railways under pressing demand, it is aimed at ensuring urgent traffic of general public utility move faster as compared to other traffic though registered after the later.
9.3 Transport by Canal, River and Sea

(i) Transport by canal or river:

This method of transport has to be undertaken only with the approval of the Joint Manager (Movements) in the Head Quarters. The proposals should be put up through the Regional Manager after study of relevant aspects such as charges for conveyance, liability involved, reliability of transport services, measures for assuring safety as well as prevention of damage in transit. In the Southern State, canal transport may be considered, as under:

a) By the Buckingham canal on the East Coast of Andhra Pradesh and Northern Part of Tamil Nadu State.

b) By the backwater canals in the West Coast of Kerala.

PRECAUTIONS:

Whenever canal transport is used, tarpaulin should be insisted upon and an authority should be taken for permitting an employee of the FCI to accompany the trip. Arrangements should be made with River Transport Contractors for unloading and loading at Wharfs. Arrangements must be made for insurance of the goods in transit when the value is more than Rs. 5000/-
LEGAL POSITION:

The legal position in regard to river transport is the same as in case of road transport. This is also being governed by the provisions of the Carriagers Act 1865.

ADVICE OF DESPATCH:

The despatching official should intimate by telegram to the consignee as soon as despatches commence. He should send documents by Registered post. An Advice of movements arranged should also be sent to the District Managers within whose jurisdiction the originating and destination stations fall.

(ii) Transport by sea:

Under special circumstances, arrangements may have to be made for transport of foodgrains by sea. This may arise for instance for movement of rice from the coastal district of Andhra pradesh to Kerala State, served by Cochin and other ports like Calicut, Quilon. While basic information has to be collected at the District and Regional levels, all other arrangements in connection with steamer movements will be finalised in the Head Quarters office. The approval of the Managing Director has to be obtained for arranging steamer movement. Vessels should be either on charter or on liner
terms, preferably the latter. Other factors being equal movement by vessels belonging to the Government sponsored Shipping Corporation should be preferred.

COLLECTION OF STUFF:

Clear notice of not less than 15 days should be given to the District Managers concerned in regard to the sailing of vessel from the port. It is the responsibility of the District Managers and Regional Managers concerned for making arrangements to step up procurement, collect the stocks and store them in godowns nearest to the ports, inclusive of warehouses and godowns in the ports, as may be made available. The entire quantity to be moved should be collected and got ready for despatch at least 5 days before the due sailing date of the vessel. In order to ensure this, top priority in procurement and movement should be assigned for foodgrains intended for steamer movement.

C. HANDLING:

Arrangements for handling operations in the port ex-rail heads and export godowns should be made with contractors on ad hoc basis at rate not exceeding that allowed for similar
operations by Regional Director (Food) or the Metals & Mineral Trading Corporation and State Trading Corporation. Wherever there are no such guiding factors, the approval of the Regional Manager must be obtained for the rates to be allowed.

DESPATCH AND RECEIVING ARRANGEMENTS:

The District Manager must supervise all arrangements for despatch by steamer. An advice of loading should be sent by him by a letter to the consignee as well as a District Manager and the Regional Manager, in whose jurisdiction, the destination station is situated. Similarly, another advice should be sent on completion of loading and the final advice on the departure of the vessel. This is to enable sufficient arrangements being taken on hand at the terminal end for unloading and ultimate clearance. A narrative report should be submitted to the Headquarters with a copy to Regional Manager by the District Manager in charge of despatch explaining the arrangements made and also forwarding a financial statement showing incurrence of expenditure on different accounts etc.

Similarly, at the receiving end, the District Manager concerned should personally supervise unloading and clearance arrangements. He should submit a narrative report
to the Headquarters (with copy to the Regional Manager), explaining the arrangements made and also forwarding a financial statement, showing incurrence of expenditure on different accounts.

e. INSURANCE:

Arrangements should be made for insurance of foods involving transit by sea.

f. FREIGHT CHARGES:

Payment of freight charges will be arranged at the Headquarters as also all bills of the Steamer Agents. Port dues as well as other expenditure should be arranged to be paid by the Regional Manager.

g. LEGAL POSITION (ACTION IN THE EVENT OF LOSS OR DAMAGE)

The transport arrangements by sea come within the jurisdiction of India Carriage of Goods by Sea Act 1925. The rules set out in the schedule of this Act, define the liabilities and responsibilities in connection with the carriage of foods by sea.

* Source: Indian Carriage Goods Sea Act 1925, Sec 4 & 6
The Bill of lading should contain an express endorsement indicating that the rules of this Act will apply.

In view of the implications of the section 6, it is imperative that packing and marking should be properly done in respect of consignments loaded in ships.

h. It should be noted that under para 6 of article III, notice for loss or damage should be given immediately before removal of the goods and in exceptional cases, within 3 days.

i. All shortages and damages to consignments conveyed by steamer should be immediately brought to the notice of the steamer agents and port authorities. The Regional Manager and the Joint Manager (Movements) in the Headquarters should also be advised of the same. Wherever necessary, a survey of damages will have to be arranged. The District Manager in charge of receiving arrangements should himself thoroughly be acquainted with the procedural formalities and all other instructions in force in this regard.

The quantities despatched and received by river, canal or sea should be included in the Statements referred to in forms Nos. 39.6 (xi) and 39.12 (vii) respectively.
The Table No. 7.17 shows the position of transportation of surplus foodgrains of FCI from one State to another, on all India basis.
Table No. 7.17*

Position of Transportation of Foodgrains of FCI on All India Basis (from 1985-86 to 1991-92)

<table>
<thead>
<tr>
<th>Qnty. in lakh tonnes</th>
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**Rail Movement:**

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<tbody>
<tr>
<td>Ex-Punjab</td>
<td>88.27</td>
<td>100.72</td>
<td>116.33</td>
<td>85.15</td>
<td>76.09</td>
<td>98.30</td>
</tr>
<tr>
<td>Ex-Haryana, U.P., Rajasthan</td>
<td>50.75</td>
<td>63.89</td>
<td>58.31</td>
<td>36.83</td>
<td>44.14</td>
<td>46.10</td>
</tr>
<tr>
<td>Ex-Andhra Pradesh</td>
<td>16.02</td>
<td>15.49</td>
<td>13.19</td>
<td>10.66</td>
<td>15.87</td>
<td>13.60</td>
</tr>
<tr>
<td>Ex-other States</td>
<td>8.56</td>
<td>15.06</td>
<td>18.32</td>
<td>10.94</td>
<td>10.68</td>
<td>7.70</td>
</tr>
<tr>
<td>Ex-Ports</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>14.10</td>
<td>3.24</td>
<td>0.70</td>
</tr>
<tr>
<td>Ex-Hills (Levy Sugar) &amp;</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ex-Ports (Imported Sugar)</td>
<td>23.72</td>
<td>17.82</td>
<td>15.70</td>
<td>11.81</td>
<td>14.21</td>
<td>11.70</td>
</tr>
</tbody>
</table>

**Other Movements:**

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<tbody>
<tr>
<td>Road Movements mainly from Punjab to Jammu &amp; Kashmir and Rajasthan and from Haryana to Delhi, Rajasthan and U.P.</td>
<td>7.81</td>
<td>15.10</td>
<td>12.70</td>
<td>8.89</td>
<td>7.58</td>
<td>6.40</td>
</tr>
<tr>
<td>Exports</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>12.68</td>
<td>1.93</td>
<td>-</td>
</tr>
</tbody>
</table>

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</thead>
<tbody>
<tr>
<td>River line movement from Calcutta to Karimganj and Pandu in Assam via Bangladesh</td>
<td>0.34</td>
<td>0.30</td>
<td>0.27</td>
<td>0.32</td>
<td>0.22</td>
<td>0.30</td>
</tr>
<tr>
<td>Coastal Movement from Gujarat</td>
<td>-</td>
<td>-</td>
<td>1.52</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Total**

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<tbody>
<tr>
<td>Total</td>
<td>195.48</td>
<td>228.38</td>
<td>238.34</td>
<td>121.38</td>
<td>173.96</td>
<td>184.80</td>
</tr>
</tbody>
</table>

On the basis of given details, we can say that the Corporation continued to arrange massive movement of foodgrains and sugar for meeting its obligation to the customers. These movements were mainly effecte ex-Northern State of Punjab, Haryana and Uttar Pradesh to the deficit areas all over the countries. Total transportation of surplus foodgrains during the year 1982-83 and onwards were 167, 165, 147, 195.48, 228.38, 238.34, 191.38,. 173.96, 184.80 and 198.90 lakh tonnes respectively. Total transportation of surplus foodgrains during the year 1991-92 was 7.63% more than the previous year level and 19.10% more than 1982-83.

7.10 Weigh Bridges

Stocks are received either by rail or by road or by waterways (sea). Foodgrains are received from docks from procurement/purchase centres and from other depots.

Foodgrains stocks have to be weighed at the time of receipts. 100% bags should be weighed if these have last standard weight, i.e. if variation on either side of the standard weight exceeds 500 gms. in each bag. In case of bags are of standard weight only 10% of these bags are to be weighed, multiplying the total by 10 to arrive at the weight
of the lot. If weighment of the stock to be transported to storage depot is not possible at the railhead for one reason or the other, it should be transported in convey under escort and weighed in the depot on the way of its receipts.

The record of weighment has to be maintained in the prescribed form for "weight check memo" (Form No. 22.6 (a) It is an important initial record on which depot accounts are based. Each such memo is to be signed by the Asstt. Depot Supdt. and counter-signed by the AM (D). At least 10% weight is to be personally supervised by the AM (D).

Methods of Weighments

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Weighments of foodgrains with accuracy is needed at all stages of handling, movement, storage and public distribution, to minimise loss and for consumer satisfaction. In developing countries of South East Asia generally grain is stored in bags and weighing by traditional mechanical weighing scales with all its inherent handicaps. In grain handling laboratory scales, platform scales, lorry weigh bridges and railway wagon weighing machines are used. The bagged grain weighment is generally done in technologically less advanced countries by platform scales and weigh bridges of mechanical type. In modern time electronic weighing machines are used.
Following are some kinds of weighing machines used in FCI depots:

(i) BEAM SCALE:

It is the most simple scale commonly used at the depots. It has pans with iron chains hung on to the beam with fulcrum in the centre. Certified weights are used and normally one bag at the time is weighed. This scale is supposed to be the simplest but most accurate on the weighing equipment. It is essentially used when standardisation of the bag is carried out.

(ii) PLATFORM SCALE:

It is used in almost all the godowns. This is a platform which is suspended in a system of joints which are connected with graduated beam. A weight with the pointer is easily movable to counter the weight of the bags (5 to 10) placed on the platform. The advantage of this scale is that at a time it can weigh either 5 or 10 bags (depending upon the capacity) and as such, the rate of weighment is increased. The other advantage of this scale is that it can be moved to any part of the godown since wheels are fitted at the base.
(iii) ROAD WEIGH-BRIDGE:

Godowns having capacity of over 10000 M.T. are recommended to have this facility installed, specially all long depots where the turnover is quick. Road weigh-bridge is normally installed to facilitate quick weighment of a whole truck load of consignment. The entire truck with the consignment is placed over the iron platform, which is suspended on a lever connected with a dial having the markings. The truck after unloading is again weighed and this weight when deducted from the gross weight gives the weight of the whole consignment.

(iv) Automatic Weighing Machines:

They are either fixed or portable and are normally installed in our files. They are costlier equipment but certainly helps in speedy weighment of foodgrains at the time of receipt or despatches. Following are some kinds of automatic weighing machines used in FCI depots:

(a) Mechanical Type:

The mechanical scale depends on a system of level and knife edges. This requires a lot of care in operation and is subjected to considerable wear and tear, resulting in inaccuracy over extended period of use. This inaccuracy is more in road weigh bridges which are heavily used.
(b) Electronic weighments:

Electronic weighing systems are fast replacing conventional mechanical weighing systems all over the world. The basic system consists of a platform resting on one or more load calls in case of platform scales and four or more load calls in case of lorry weigh bridges. The platform scales shall be at the ground level in case of pit type weigh bridge and above the ground level in case of pitless type weigh bridges. In this system, the strain causes by the weight is senses by highly sensitive strain gauges housed in load cells. The output voltage is amplified by an electronic circulatory digitised and displayed to give the weight information.

(c) Electronic Platform Weighing Scales:

The electronic platform weighing scales are available in different capacities. The commonly accepted capacity for grain bag weighing is the one with 200 kg. capacity. With over-load protections of at least 50% beyond rated capacity, with platform size of 500 mm x 500 mm at a height of one meter above the ground level mounted on M.S. stand. The scale is fully electronic without moving parts. It would work on power supply 230/12V D.C. Battery. It is also provided with facility for connecting the printer for automatic weight recording.
(d) **Electronic Lorry Weigh Bridge Load and Platform Capacity:**

For a lorry weigh bridge, the rated load could be 20 M.tonnes, 30 M. tonnes or 40 M.tonnes on platform sizes of 6 m x 3 m, 9 m x 3 m and 12 m x 3 m respectively. It works with 230V single phase power supply and a battery back-up is provided to enable the continuous operation of the weigh bridge in the event of power failure.

**ACCURATE AND HONEST WEIGHMENT:**

The most attractive feature of the Electronic lorry weigh bridge is its ability to remember the data reading lorry registration numbers and gross weight at the time of the entry and to printout this information at the time of exit, along with appropriate "tare weight" and "net weight".

By this feature, any book-keeping by the operator is completely avoided and weight of the material/goods brought in by the lorry is automatically calculated and printed out. This exit sequence of lorries can be independent of the entry sequence. By this weighment, honest and accurate results could be guaranteed and the change of misuse totally eliminated.
During the year under report, 93 new lorry weigh bridges were installed in godowns with capacity of 5000 M.T. and above. With this, the total number of such depots having lorry weigh bridges has gone up from 65% to 85%.

A proposal to instal four electronic wagon weigh bridges to give precise weight of wagons in motion at the time of despatch and receipt has been finalised. Two of these weigh bridges will be in the despatching centres of North and two in the receiving centres of East Zones.

7.11 Export and Import Policy

India has become a food exporting nation. Although the population of India is increasing faster than food production and hunger is widespread in this country, it has been able to build up a substantial grain reserve. Export of wheat, rice and sugar were made during the years to fulfil the commitment entered into by Government of India in early years.

The Corporation continued to handle various relief supplies and gifts for delivery to the voluntary agencies like Co-operative for American Belief Everywhere, Catholic Relief Services, World Food Programme, Catholic Auxillary Service Association and other agreements. The gift items
cover milk powder, mustard oil, salad oil, corn meal, hospital equipment and other miscellaneous items. This work was transferred to Indian Potash Ltd., from end of December 1986. However, we continued to bangle gift cargo in Bombay and Madras ports up to February, 1987.

During the year 1991-92, the Corporation delivered 0.69 million tonnes of wheat to MMTC and STC and 0.05 tonnes of rice to MMTC for export by these agencies in accordance with the directives of the Government of India. The Corporation also supplied 39070 tonnes of wheat and 2500 tonnes of rice to His Majesty's Government of Nepal as per authorization of Government of India.

The Corporation exported 0.01 million tonnes of rice as gift from Government of India to the U.S.S.R.

A quantity of 12000 tonnes of rice, maida, atta and sugar were also exported as gift/relief supplies.

A quantity of 0.05 million tonnes of rice were received from WEP during the year.

The Manager (Planning and Research) is in charge of agricultural, intelligence, price intelligence, commodity economic research and planning. He will collect, co-ordinate, analysis all relevant statistics and prepare necessary notes, memoranda and bulletins and publish the data in the form of blue books. His other functions include co-ordination of all development schemes, assessment of their progress, undertaking specialised commodity studies, watching the behaviour of market prices and factors influencing it, organising research studies and surveys and preparing briefs for conferences and annual reports of the FCI.

The Manager (Planning & Research) will compile and present regularly information on weather and crop condition, estimates of area and production under various food crops, sugarcane etc. trend of prices, market intelligence, bank advances against foodgrains and sugar and other data, as may be desired. He will also construct and publish index number of agricultural production including separate index numbers for individual cereals and pulses.

He will keep the FCI upto date about all India position of foodgrains and sugar. He will also compile and present
figures of stocks with licensing order, in different districts and will keep the Corporation informed of the progress of the regulatory measures of selective credit control and advise on the desirability or otherwise of imposing or relaxing control measures such as regulation of forward trading credit squeeze restrictions on Inter-state movement export act. He will obtain an independent appraisal of crop outlook and prospects behaviour of market prices arrivals, stock market sentiment and other related information. He will also inspect the reporting system in course of his tours of the markets and furnish periodical intelligence reports on market behaviour studies and surveys are also organised by him.

In order to give to all concerned an integrated picture of the weather and rainfall conditions, production trends, marketing day to day price position, imports, stocks, distribution and the effects of regulatory measures, a Food Intelligence Room will be set up wherein data on food economy of the country are graphically and pictorially displayed.

The studies completed during the year included a project report on the construction of godowns with the assistance of European Economic Community, mid-term
appraisals of Rabi Crop and procurement pilot scheme for procurement of rice direct from farmers etc. Papers were also presented in seminars and discussion on foodgrains storage problems of the Corporation in the 80s. Corporation's role in foodgrains marketing and on food self-sufficiency.

COLLABORATION WITH CFTRI IN RESEARCH AND TRAINING:

(a) In purchase of the decision to work in close relationship with Central Food Technological Research Institute (CFTRI) a premier institute involved in food research, the services of the institute are being used to import training to the field staff and officers of the Corporation in the subjects of storage, preservation, milling etc. of foodgrains, the Institute has already conducted free programmes for the Corporation.

(b) A training-cum-demonstration programme on food processing including infestation control, packaging, oil seed technology etc., sponsored by the Association of Food Marketing Institution in Asia and the Pacific (AFMI), under the aegis of FAO, was organised by the FCI at the Central Food Technological Research
Institute (CFTRI), Mysore, during 23rd February to 3rd March, 1987. Ten participants—9 from AFMA member-organisation/countries and one from India participated in this programme.

(c) A research proposal for developing a suitable technology for production of parboiled rice suggested by CFTRI is under consideration.

7.13 Computerisation

The Corporation proposed to computerise the accounting and information system for better and more effective management control. A feasibility study on this was conducted by the Electronic Corporation of India Ltd., (ECIL) and the report submitted by them has been approved by the management. Further action for implementation is underway.

A micro processor based computer system from ECIL was installed at Headquarters by the Corporation in November, 1986. It has processed the Provident Fund Data for the year 1986-87. Consolidation of annual accounts for the year 1987-88 has also been done on computer. Various daily and monthly Management Information System reports in respect of
movement of stocks, quality control and storage are being successfully processed on computer.

The National Informatics Centre Department of Electronics, Government of India have provided the Corporation a terminal connected to its computer for utilisation of its country-wide network (NICNET) facility, so that the Corporation may, in course of time, have up-to-date information on stocks in its godowns throughout the country.

The Memorandum of Understanding for using NICNET was entered into with the National Informatic Centre (NIC) Planning Commission on 30th October, 1989. NIC provided an additional computer with 16 programmes to query into the various data bases, which were developed and made available on these terminals.

Proposals for installation of Micro Earth Stations for communication of data and information through Satellite between FCI Headquarters and some of the Regional offices have been approved.
Monitoring of procurement information from some of the Districts in Punjab and Haryana regions directly with the assistance of NICNET was experimented during current Rabi season of 1990-91 which proved quite successful. It is proposed to monitor the procurement of rice and paddy during Kharif season also in Punjab, Haryana and U.P. and A.P. regions.

Computer training programmes were organised with the assistance of NIC for staff and officers in Punjab, Haryana, Uttar Pradesh, Maharashtra and Andhra Pradesh.

Personal Computers have been installed in the Zonal/Regional offices at Bombay, Madras, Punjab, Uttar Pradesh, Andhra Pradesh, Kerala and Delhi during the year.

Satellite linked Micro Earth Station was installed in Guwahati, Chandigarh and Headquarters with linkage facilities with National Informatic Centre. District Units computers have been installed in Zonal/Regional Offices with a view to make use of the latest technology. Computer terminals have been provided to Senior Executives at headquarters for retrieval of various data through query programmes.
New programmes have been developed in association with the National Informatic Centre and successfully tests in respect of storage capacity utilisation, pay rolls stock position etc. Several new programmes are under various stages of development.