CHAPTER ONE

INTRODUCTION
The importance of agricultural marketing in the economic development of a country like India cannot be over-emphasized. Agricultural marketing has become one of the stimulants for increasing the agricultural production. It is vitally important in any campaign to free the world from hunger. Most of those who go hungry do so because the food they need costs more than they can afford. This aspect is all the more important in the proportion of the population living away from farms and dependent on the marketing system for their food. This is true even in the low-income areas of the world. It is in the large cities of Asia and in the shanty towns around African and Latin American capitals that some of the hungriest people live.

In our country, the persistently growing population and slowly growing or stagnant agricultural production has widened the gap between the production and demand. Similarly, the need to provide adequate incentive for increased production is also more pressing to encourage the production. It would be futile to make efforts for increasing agricultural production unless the agricultural marketing system assures the producer adequate returns from his produce. This can be done only through the presence of efficient agricultural marketing system.

1. Study No. 4 "Freedom from Hunger Campaign" Page 1 World Food and Agriculture Organisation ROME 1962.
With a view to establish an efficient agricultural marketing system the regulated agricultural produce markets were established in the country under the states legislation. The regulatory measures are designed to establish proper practices in the market so that through informed and free competitive conditions the producer-sellers can have the best possible deals. Such regulation was felt necessary because the unorganised sellers due to weak bargaining capacity were not able to safeguard their interests as a result of which they faced many odds in disposing of their produce.

Regulation of agricultural markets was suggested as early as in 1928 by the Royal Commission on Agriculture in India. The legislations for the establishment of the regulated markets were initiated by Madras and C.P. and Barar (now M.P.) in 1933. Before the era of planning only 286 regulated markets were functioning in India. However, by March 1981 there were 2290 regulated markets functioning in India, against 252 in Madhya Pradesh. Their number were 15 in Raipur district during the same period.

The object of this study is to evaluate the economic efficiency of the regulated agricultural produce markets.

1. Marketing Series No. 91 Govt. of India Ministry of Food and Agriculture.

2. For statewise position of the regulated markets
   See Appendix.-XXXIV
in the district. It is hoped that such an analysis would
be helpful to identify the problems impeding the successful
working of the regulated markets and the future requirements
to ensure the desired efficiency. Several previous researchers
have also attempted to evaluate the agricultural marketing system
in India and abroad.

1 (i) Lele, Uma J. - "Foodgrain Marketing in India-
Private Performance and Public Policy" Cornell
University Press, 124 Robert Place, Ithaca,
New York - 14850.

1 (ii) Mohammed Farrukh Osman - The structure and performan
c of Rice Marketing System in East Pakistan a
published Ph.D. - Cornell University Ithaca New

1 (iii) Gupta, R.P. - Agricultural Prices in a Backward
Economy a published thesis submitted to the Vikram
University Indore, National Publishing House
Delhi 110006.

1 (iv) Subba Rao, K. - "Rice Marketing System and Compulsory
Levies in Andhra Pradesh" a published Ph.D.
submitted to the University of Delhi, 1973.

1 (v) Kahlon, A.S. - Study of impact of changing condition
of Grain Marketing Institutions and the Structure of
Grain Markets in Punjab - Punjab Agri.University
1967.

1 (vi) Kainth, G.S. - Foodgrain Marketing in India,
Associated a published Ph.D. - Publishing House
New Delhi 110005.

1 (vii) Zasamanwala, Z, - Marketing Efficiency in Indian
Agriculture, Ph.D. thesis - submitted to the

1 (viii) Cummings, R.W., Jr. - Pricing Efficiency in the Indian
Wheat Market - Impex India, D.B. Gupta Road, New Delhi.

1 (ix) Khusro, A.M. - Indian Foodgrain Marketing, Prentice
Hall M-97 Pvt.Ltd., Gannaught Circus New Delhi 1

1 (x) Satyapriya, V.S. - Marketing of Arecanut in some
Regulated Markets of Maharashtra and Mysore - An
unpublished thesis submitted to the University of
Poona.

1 (xi) Kulkarni, A.P. - Marketing of Ground Nut in some
Regulated Markets of Maharashtra. An unpublished
thesis submitted to the University of Poona.
The main objectives of the study are as under:

1. To study the time pattern of arrivals of paddy in the selected markets and to judge the change (if any) in the pattern of arrivals.

2. To study the interdependence of the sample markets in their price-formation in order to determine the spatial efficiency of these markets.

3. To examine the price differences between the selected markets in order to determine whether they are greater than the cost of transfer. This analysis is also aimed at judging the spatial efficiency of the sample markets.

4. To study the temporal efficiency of the selected markets.

5. To measure the influence of arrivals in the local market and the prices in the terminal market on the price formation of local markets.

The following hypotheses have been formed:

1. That all the selected markets were reasonably integrated with one another in their price formation.

2. That the inter-market price differences do not tend to be greater than the cost of transfer of produce from one market to another.
3. That the intra-market fluctuations in the off-season prices were consistent with the storage costs.

4. That the formation of prices, at the local market's level is less influenced by local arrivals whereas it is inordinately influenced by the terminal price.

Methodology of Study :

The study is based primarily on secondary data. However, in order to make case study some primary data were also collected. Secondary data were collected with reference to weekly, monthly and annual arrivals of paddy and prices prevalent in the selected markets at different periods. The informations were also sought about the number of functionaries in the market, number of processing units in the area and various charges levied on the produce and the transportation cost.

I - Selection of Markets :

Fifteen major regulated markets functioned in the district during the period. The markets were divided in to three size groups on the basis of their annual average arrival. The two drought years of 1974-75 and 1979-80 were, however, excluded from the computation of average arrivals.
### Classification of Markets

<table>
<thead>
<tr>
<th>Group</th>
<th>Size of arrivals (in '000 M. Tons)</th>
<th>Name of markets in the size groups</th>
<th>No. of markets</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Upto 10.10</td>
<td>Nagri, Basna, Kurud, Bhatagaon, B.Bazar, Pithora and Arang.</td>
<td>07</td>
</tr>
<tr>
<td>2.</td>
<td>10.11 - 30.10</td>
<td>Mahasamund, Neora, Saraipali, Bagbahara.</td>
<td>04</td>
</tr>
<tr>
<td>3.</td>
<td>30.11 and above</td>
<td>Raipur, Dhamtari, Nawapara and Bhatapara</td>
<td>04</td>
</tr>
</tbody>
</table>

Three markets from the first and two markets from each of the remaining group were randomly selected. Ultimately seven markets were selected for the study. Basna, Kurud and Nagri markets represented the first group. Mahasamund and Neora were selected from the second group while Raipur and Dhamtari markets were chosen from the last group for the present study.

### II. Choice of commodities

Though paddy has thousands of varieties, only restricted varieties come to the markets for disposal. These varieties can broadly be put in three grades viz. (1) Scented fine (2) Fine and (3) Coarse. We have selected a particular variety in each grade on the basis of its importance in the total arrivals. Thus, the three varieties representing each grade were as follows :-
S.No.  | Grades of Paddy     | Selected varieties |
-------|---------------------|--------------------|
1.     | Scented fine paddy  | Dubraj             |
2.     | Fine paddy          | Safri-17           |
3.     | Coarse paddy        | Gurmatiya          |

It would be worthwhile to mention a few things regarding the relative importance of the three selected varieties:

A. **Dubraj**: Out of various scented varieties of paddy, Dubraj variety is most popular among those cultivators who grow scented paddy, as it yields them the highest prices compared to other varieties in the same grade. Due to small coverage of scented paddy, the average contribution of Dubraj paddy in the total arrivals was hardly 4.37 per cent. This variety is generally consumed by the higher income group. Compared to fine and coarse paddy, the price of Dubraj variety always remains much higher.

B. **Safri-17**: This variety is widely cultivated in the district, belongs to fine-grade paddy. Due to its drought resistant nature, size of grain and better yield, the producer prefers its cultivation. Hence, the coverage of Safri-17 in the district is highest. This variety is mostly consumed by the middle income group as it is relatively cheaper than the scented paddy. The contribution of fine paddy in the total arrivals was 51.54 per cent in the selected markets.
C. **Gurmatiya**: This variety is most popular among the different varieties of coarse paddy. It is just next to Safri-17 in coverage and due to its cheapness is generally consumed by the lower income group especially in the rural areas. This variety is also preferred by POHA millers for making POHA as it is most economical for them for the purpose. It is due to this reason that Gurmatiya paddy yields the highest price as compared to other coarse varieties. The share of coarse paddy in the total arrivals was 44.30 per cent during the period under study.

It is a well known fact that the above three varieties overwhelmingly dominate the total arrivals among the three grades of paddy.

III - **Selection of Farmers** :

In order to study the disposal pattern of the producer-sellers the data were collected from four villages in the neighbourhood of four sample markets. Ten per cent of the farm-households were randomly selected from each village. In all 96 farm-households were selected from 4 villages for interview. The detail informations regarding the selection of the households have been given in Appendix

1. See Appendix XXVI
IV. Pattern of Arrivals:

A. Monthly pattern: The monthly arrival data of 120 months was taken up to ascertain monthly pattern of arrivals. However, two abnormal years (1974-75 and 1979-80) were excluded from our study.

On the basis of the intensity of arrivals the marketing year (October to September) was sub-divided into four periods of marketing. These four periods were termed as Early Marketing Period (October and November months), Peak Marketing Period (December to February months), Pre-Lean Marketing period (March to May) and Lean Marketing period (June to September). The abbreviations of these four periods are E.M.P., P.M.P., Pre-L.M.P., and L.M.P.

It would be worthwhile to mention the criterion adopted for the division of the marketing year into above stated four periods. The first two months of the marketing year have been termed as E.M.P. because the fresh arrivals are received each year from October which comes in the market up to November at a slower rate. December to February period is termed as P.M.P., as in these three months the arrivals of paddy are heavier each year. On an average more than 60 per cent of the annual total arrivals is received in the three months. After the peak period, the rate of arrivals of paddy decreases from March onwards till June but it maintains continuity. This period has been termed as the Pre-L.M.P. One remarkable feature of this period is
that the arrivals of paddy is recorded more or less daily in all the markets. The last part of the marketing year is from July to September and is termed as L.M.P. During this period even in big markets, arrivals become irregular, so much so, that at times there is no arrivals for weeks together.

E. Weekly Pattern: To ascertain the weekly pattern of arrivals the marketing year was again divided into four periods discussed earlier. These four were located on the basis of the intensity of per week rate of arrivals. Accordingly, the E.M.P. was assumed to have started from the date of fresh arrivals. This period was supposed to continue till the start of P.M.P. It was observed that during E.M.P. the weekly rate of arrivals was 2 per cent or less.

The P.M.P. was assumed to have started when per week rate of arrivals equalled or exceeded 3 per cent or more of the annual total. The period next to P.M.P. already referre as Pre-L.M.P. was supposed to have started when the per week rate of arrivals become less than 3 per cent but not less than 1 per cent of the annual total. The last period of the marketing year was supposed to have started when the arrivals were received at less than 1 per cent per week rate. This period generally extended up to September, the last month of the marketing year.
Yearwise dates of the starting and ending points were located for the four periods on the above lines. Later on, periodwise duration (in weeks) along with the total arrivals in each year was divided by its respective duration (in weeks). Per week rate of arrivals, thus, obtained were then expressed in percentages to the respective years total arrivals. Further, per week rate of arrivals of the individual year was averaged to get the average rate for a particular marketing period and a particular market. It was further re-averaged to obtain periodwise overall per week rate of arrivals for all the selected markets.

C. Shift in the Pattern of Arrivals: The study period has been divided into two parts to find out the shift in the arrival pattern of paddy. The first part comprised of 1971-72 to 1975-76 whereas the second part consisted of 1976-77 to 1980-81. With the help of monthly arrival data periodwise percentages (i.e., in E.M.P., P.M.P., Pre-L.M.P. and L.M.P.) of the two parts were computed separately. However, while doing so the two abnormal years were excluded. Further, periodwise percentages of first and second part were termed as 'Average No. -1' and 'Average No. -2' respectively. To ascertain shift in the pattern of arrivals Average No. 2 was subtracted from average No. 1 of that period. The positive differences were termed as positive shift and the negative differences were termed as negative shift. In our case, the
positive shift in a particular period indicated increase in arrivals and the negative shift indicated decrease in arrivals.

V. Influence of annual arrivals on P.M.P./L.M.P. arrivals

In order to ascertain the influence of annual arrivals on P.M.P. and L.M.P. the following model was adopted:

Model:

\[ Y = a + bx \]

Where,

\[ Y = \text{Arrivals in P.M.P./L.M.P. (in '000 qtls)} \]

in each of the years under the study.

\[ X = \text{Annual total arrivals (in '000 qtls.) in each of the year under the study.} \]

In the above model, the annual arrivals were taken as independent variable \((X)\) and the arrivals in P.M.P./L.M.P. were taken as dependent variable \((Y)\). For each of the selected markets, two regression equations were fitted to obtain the influence on P.M.P. or L.M.P. separately. In the present analysis, arrival data of total paddy were used, as varietywise weekly or monthly arrival data were not available. Therefore, on the basis of the monthly data of total paddy, the arrivals in P.M.P. and L.M.P. were calculated yearwise for each market. We have excluded the two abnormal years from our calculation. Thus the total number of observations were reduced to eight. Later on, along with the data of annual
arrivals the arrival data of P.M.P. or L.M.P. were feded in the
equation and results obtained.

For testing the significance of regression co-efficien
and the co-efficients of correlations value of 't' and Standard
Error were computed.

VI Seasonality in prices : To examine the
seasonality in the wholesale prices of all the three varieties
of paddy during the last ten years, the monthly seasonal
indices were computed.

For this purpose the monthly wholesale prices of
all the three sorts of paddy were obtained for each of the
selected market. Thus we got 120 monthly prices for the
period October-1971 to September-1981. To this a centred 12
months moving averages were calculated. The monthly price
series was then expressed for every month as percentage of the
corresponding moving average. The resulting percentages
were termed as price-relatives. Again these price-relatives
were arranged monthwise and averaged for each month over the
years. Thus we got the average seasonal pattern in each of
the months for all the years under the study. These monthly
average indices were corrected so that the resulting average
of all the 12 months of the year was 100. As in a series
free of seasonal components, the index for each month should
be equal to 100.
For the purposes of interpretations it could be mentioned that if the index for a particular month was say 108, it meant that the price in that month was higher by 8 per cent than the seasonal mean (i.e., normal trend).

Along with the seasonal indices of prices the mean deviations in the seasonal index of each month was also calculated. This was necessary because the seasonal indices gave us only the idea about the normal seasonal trend of prices but the mean deviations revealed the extent of variations in the seasonal indices.

Periodwise seasonal indices:

We have also calculated the seasonal indices in E.M.P., P.M.P., Pre-L.M.P. and L.M.P. for each selected market and for all the varieties. To arrive at this, the seasonal indices of the respective months in a particular period was added and divided by the number of months in that period.

Similarly, periodwise average prices for each of the selected markets were arrived at by adding the prices of respective months in a particular period divided by the number of months in that period.

Extent of seasonal fluctuations in prices:

For this purpose, the seasonal index for the peak
month was expressed as a percentage of the trough index in each of the years to arrive at the percentage rise in the price over the season. This was done yearwise for each of the selected sample markets under the study.¹

Influence of Weekly arrivals and terminal prices:

Attempt has also been made to study the impact of local arrivals and terminal prices on the formation of local prices. We have used regression technique in order to find out the impact. Due to paucity of weekly arrival data regarding scented and coarse paddy the study is confined to fine paddy only. Another reason for considering fine paddy in the present analysis is that it occupies more than 50 percent of the total arrivals of paddy in the sample markets.²

The data of weekly arrivals and prices of fine paddy were computed from the records of the sample markets for the period October-1971 to September-1981. Two abnormal years were however excluded from the study. Thus our total

1. The formula applied for the computation of the per cent rise in peak indices over the trough indices was as:

\[
\text{Per cent rise of peak index over the trough} = \frac{\text{Index of peak}}{\text{Index of trough}} \times 100 - 100
\]

2. See appendix XXVI
observations were reduced to 416 weeks only. Average of weekly arrivals and weekly prices for each of the month was worked out. Thus, we arrived at 96 average of prices and arrivals representing each of the month. 1

Further, two models of regression equations were constructed (to be called hereafter as model No. 1 and 2). In model 1 the influence of local arrivals \(X\) on the local prices \(Y\) was measured. In model 2 the influence of local arrivals \(X_1\) along with the terminal prices \(X_2\) on the local prices \(Y\) was measured. The above two models were as:

\[
\text{Model - 1} \\
Y = a + bx \\
\text{Where,} \\
Y = \text{Average weekly price in the local market (in Rs. per qtl.)} \\
X = \text{Average weekly arrivals in the local market (in '000 qtls.).}
\]

\[
\text{Model - 2} \\
Y = a + b_1X_1 + b_2X_2 \\
\text{Where,} \\
Y = \text{Average weekly price in the local market (in Rs. per qtl.)}
\]

1. Since the calculation work was done by the simple calculator, the author regrets that detail study could not be undertaken and had to be satisfied with 96 observations.
\[ x_1 \] = Average weekly arrivals in the local markets (in '000 qtls.).

\[ x_2 \] = Average weekly prices in the terminal market (in Rs. per qtl.)

The above regression equations were calculated for each of the sample markets. To test the significance of the regression coefficients and the correlation coefficients, the value of 't' and standard error were computed.

VII - Market Integration:

The inter-relationship between the price movements in the two geographically separated markets was examined by computing the coefficient of correlation. It indicated the degree to which the two markets of a commodity were integrated to one another. Higher the value of 'r' between the two markets greater would be the integration. On the contrary, lower value of 'r' would indicate that the two markets were not closely integrated or that two markets were independent in their price movements.

For the calculation of 'r' between the sets of the sample markets, the same 96 observations of price series of regression analysis were used. The 'r' between the price series of 15 sets of selected markets for each of the selected varieties were calculated and arranged in the matrix form. The test of significance for the obtained values of 'r' were also made.
VIII  Price Differentials :

Mere existence of higher 'r' between the two geographically separated markets is not always a perfect indication of the efficiency of the marketing system. Therefore, price-differentials among such markets were calculated between which the flow of paddy were generally found during the period of study. This was done to judge whether these differences exceeded the cost of transfer during a unit of time (month or year). The price differentials were worked out both on annual and monthly average prices. In an efficient marketing system it is expected that the price differences between the two markets should not be more than the cost of transfer of produce between them.

To examine the price-differences between the considered sets of markets the average cost of transfer for 1 qtl. of produce was calculated. The components of the transfer cost are as:

1. Average cost of transportation during the period of study between the sets of sample markets.
2. Handling charges.
3. Depreciation of gunny bags.
4. Market fee and other charges e.g. Nirashrit fee.
5. Commission.

For estimating the cost of transport yearwise truck charges were obtained and its average was worked out. The
reason for considering only the truck charges was that this mode of shipment was mostly used by the traders.

The transfer cost, thus, obtained for a particular set of market was compared with the price-differentials over the annual and monthly average prices.

XII Returns to Storage: A market can be said to be efficient if the price differentials over the time doesn't exceed the total cost of carrying marketed surplus through storage period and some normal profit. The concept of normal profit in economic theory is vague and its estimation of such profit in practice is difficult and imprecise. Therefore, we have not taken into account the normal profit while calculating storage cost. As the producer-seller will move the produce over the time if the expected rise in the prices between the harvest and the off-season equals or exceeds the storage cost:

   We, therefore, have computed the returns to storage by comparing the actual prices at the end of assumed storage period with the "Computed Prices". The computed prices were obtained by adding the storage cost in the base month's average price of paddy.

The calculation of returns to storage requires estimation of storage period. For this purpose the storage period was assumed to have started in P.M.P. and ended upto L.M.P. This assumption was necessary since the sample markets received more than 61 per cent of arrivals during P.M.P. whereas it was only 6.40 per cent during L.M.P. Accordingly, in the P.M.P., the month of January during which largest arrivals were received (to be called hereafter as base month) was taken as the exact starting point of storage periods. In the other end, in L.M.P. the month of July and September were taken as the two ending points of storage period due to very small arrivals during these months. Thus our total assumed storage period upto July and September came to 6 months and 8 months respectively.

The items of storage cost considered were weight loss, losses due to rodents and weevils, depreciation of gunny bags, godown rent and interest on the price of a quintal of produce stored in the base month. The norms for the calculation of these cost have been given in detail in Chapter-VI.

To calculate the returns to storage the average price of 1 quintal of paddy in the month of January was taken as

1. See Chapter III table 3.03 Page. 55
2 & 3. See Chapter III table 3.02 Page. 54
base. Further, the values of the above stated items of storage cost due to the postponement of sales till the assumed off-season were calculated. Later on, by adding these cost items in the base month's price the computed price was obtained. This calculation was made for both the assumed storage periods (i.e., January to July and January to September).

Further, to work out the returns to storage the actual average prices in the last two off season months were compared with their respective computed prices. The resulting balances (if any) were termed as positive returns when the actual prices exceeded the computed price. On the contrary, the returns to storage were termed as negative, when the actual price in the off season was less than the computed price. These returns thus obtained were converted in percentages to their respective computed prices for obtaining the percentage returns from storage. This has been summarized in the following formula also:

If \( P_0 \) is the price in the base month, \( SC \) is the cost of storage, \( t_1 \) and \( t_2 \) are the period of storage upto the two off seasonal months respectively and the \( RS \) is the return from storage, then:

\[
\text{RS} = P_0 + SC + (P_0 - C) \times \frac{t_1 + t_2}{2}
\]
(1) **Returns from storage up to first off seasonal month:**

\[ \text{RSt}_1 = \text{Pt}_1 - (\text{Po} + \text{Sct}_1) \]

(2) \[ \text{RSt}_2 = \text{Pt}_2 - (\text{Po} + \text{Sct}_2) \]

Where,

\[ \text{Pt}_1 \text{ and } \text{Pt}_2 \text{ represent the actual price in the first and second off seasonal months.} \]

\[ \text{RSt}_1 \text{ and } \text{RSt}_2 \text{ indicate the returns from storage in the period } t_1 \text{ and } t_2 \text{ respectively.} \]

Thus as per the above formulae the returns from storage will be positive if \( \text{Pt}_1 > (\text{Po} + \text{Sct}_1) \) in the period \( t_1 \) and \( \text{Pt}_2 > (\text{Po} + \text{Sct}_2) \) in the period \( t_2 \) and it will be negative in the contrary situations.

**PLAN OF THE STUDY:**

The whole study has been spread over seven chapters and each chapter deals a separate issue. A brief discussion of the importance and the problem of study along with the objectives and hypotheses have been already made in this introductory chapter. Besides, a layout plan of study, research method and the nature of data have been given in this chapter.

In the second Chapter the characteristics of the sample markets along with some basic informations regarding
the district have been dealt with.

The third chapter studies the pattern of arrivals of paddy in the district during the period October-1971 to September-1981. For this purpose the yearwise, monthwise, weekwise and the periodwise arrival pattern have been worked out.

In fourth chapter the pattern and the extent of fluctuations in the wholesale prices of different grades of paddy have been dealt with. This chapter also deals the influence of the arrivals in the local market and the prices in the terminal markets for the formation of prices at the local market's level.

In the chapter fifth the price-integration among the geographically separated markets (sample markets) have been analysed with the help of correlation technique. For this purpose correlation matrix for each grade of paddy was calculated separately. In the same chapter the price-difference over the annual average prices and the average monthly prices were calculated between the pairs of selected markets.

Chapter sixth deals with the yearwise returns to storage for each of the three grades of paddy. This analysis is done to judge the temporal efficiency of the sample markets. This analysis is confined to only 5 primary-cum-secondary markets of the sample.
The concluding chapter, besides dealing with the summary of the study, includes the conclusions and suggestions on some of the policy implications which emerged from the study.

At the end appendix tables and a selected bibliography have been given.