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Abstract

Nandurbar is a tribal district of Maharashtra state (India), comprises six tehsils. Taloda tehsil is one of them located in the west, near to the foot of Satpuda Mountain ranges. The main income source of people of this tehsil is agriculture. Agriculture is a gamble game depends upon uncertain rainfall of the monsoon and market prices. Tribal farmers do not get proper prices of their commodities in APMC. On other hand due to the State Government policy to protect reserve forest tribal farmers could not get additional income sources from the forest. Farmers are facing many problems regarding the uncertain rainfall, fluctuation of prices in APMC, lack of facilities in the market, money problem etc. The researcher has serving in this area; therefore, he has experience with the problems of farmers. In this research paper the researcher has attempted to explore and display the reality of farmers exploiting by the merchants in Taloda APMC. To display exploitation of tribal farmers various statistical techniques are used such as Monthly Price fluctuation (Graphical), Range of Fluctuation, Coefficient of Variation, Change in Prices, Three monthly Moving Average Price and Deviation of Actual price from Moving Average. After the analysis of price trend, concluding remarks are given.

Key word: APMC, Price, Variation, Arrival, Exploitation, Agro-economic, Trends, Fluctuation, Change, Deviation, Range, Coefficient, Variation, Wheat.

INTRODUCTION:

The study region produces number of Food Grains crops such as Jawar, Wheat, Winter jawar, Rice, Pennmillet and Corn etc. Though well fertile land, suitable climate, groundwater sources, etc are favorable, however the economic background of the farmers is weakened there.

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There are number of adverse factors creating hurdles on the way of tribal farmers. Out of these factors, agro-market system is one of them. Generally in the market, farmers do not get justice; the commercial agents exploit them. When they produce Wheat commodity they get lowest prices and when prices are hiked up they have already sold their products. On other hand most of tribal farmers are illiterate. They are located in remote areas, where inaccessibility is hindering the economy of the farmers. Considering all these issues, researcher is attracted towards the detail study of selling and purchasing system in the market federation board at Taloda.

STUDY REGION:

Study region comprises 93 villages with 133291 populations (2011). Out of them about 86.56% populations belongs to schedule tribes. This region has covered an area of 347.0266 sq km, stretching between 21^0 32'North to 21^0 42' North latitudes and 74^0 01'East to 74^0 22'East longitudes. Satpura mountain ranges have occupied the northern 30% area of the tehsil, clothed with reserved forest (7776.84 ha) and dotted by tribal settlements. Geographically the study region is unique in respect of morphology, hills, steep slope; v shaped valleys and exposed rocks. Piedmont plain has covered about 70% of the tehsil, favorable for irrigated and unirrigated Food Grains crops. Wheat, jawar, Winter Jawar, Rice, Pennmillet and Corn etc are significant crops successfully grown by the tribal farmers. To protect and to provide better facilities to farmers, Government has established APMC on November 1961 at Taloda in Nandurbar district.

Tribal farmers are far away from the urban culture. Their basic needs are limited, however they are economically poor. To understand the causes of poorness, researcher has selected to study the agro-economic system in Taloda APMC.

RESEARCH METHODOLOGY:

A) Data base: Secondary data of daily arrival and prices of Wheat commodity has been collected personally from APMC Taloda as below.

Secondary source of data:

1. Daily arrival of Wheat commodity in the market during the year 2010-11.
2. Quantity and price of Wheat purchased by the merchants in APMC Taloda. 3. Village wise number of farmers those have sent their produce in APMC.

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In the present work researcher has attempted to display concluding remarks after the analysis of price fluctuations on the basis of trend analysis of monthly price data. With the help of following statistical and graphical techniques researcher has displayed month to month acute variation in the price which is inversely related to quantity arrived in the APMC.

1. Graphical Presentation of Price Fluctuation:

Line and bar graphs are one of the best techniques showing price trend fluctuations in the APMC Taloda.

2. Statistical Analysis:

For Price Trend Analysis following techniques are used:

1. Range of Fluctuations:

A price change in a given month relative to price of previous month represents a measure of range of fluctuations, calculated using following equation.

$$= Per\ Quantal\ maximum\ price - Per\ Quantal\ actual\ price$$

2. Co-Efficient of Variations:

Co-efficient of variation denotes Cv, eliminates the unit of measurement from the standard deviation of a series of number by dividing it by the mean of this series of numbers. Cv is expressed in percentage which corresponds to following formula.

$$Cv = \frac{S}{M} * 100$$

S = *Standard deviation of series.*

M = *Mean of series.*

3. Change in the Prices:

Proportion of change in current month price and previous month price is calculated as below:

$$\%\ \text{change in the prices} = \frac{Curent\ month\ price}{Previous\ month\ price} * 100 - 100$$

4. Three monthly Moving Average of Price:

Moving averages are used to identify current trends and trend reversals as well as to set up support and resistance levels. Graphical chart pattern shows a lot of variation in price

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movement. This can make it difficult for traders to get an idea of a security over all trends. Moving Average is one of the simple methods. A moving average is the average price a security over a set amount of time. By plotting a securities average price, the price movement is smoothed out. Traders are better able to identify the true trend and increase the probability that it will work in their favor.

5. Deviation of Actual Price from Moving Average:

After calculating the moving average, deviation of actual price from moving average is calculated using following equation.

$$= \frac{Monthly\ average\ price}{Three\ months\ moving\ average\ price} * 100 - 100$$

OBJECTIVES OF THE STUDY REGION:

1) To study monthly arrival of Wheat commodity in APMC Taloda.
2) To find out the increasing /decreasing trends in prices due to excess supply of Wheat in the APMC Taloda.
3) To identify the merchants those have exploited the farmers.
4) To suggest the planning to protect the tribal farmers and APMCs.

EXPLAINATION:

Wheat is staple food grain of tribal and poor people. Out of total net sown area about 6.69 % (1846.4 ha) area is cultivated under Wheat crop. Market price of this commodity is least as compare to other grains. Hence most of the people prefer this grain in the diet. When farmers produce this commodity and send it to market they get lowest prices. To find out variations in the prices of Wheat, following statistical techniques are used and results are given.

FLUCTUATIONS IN THE PRICES OF WHEAT:

During the crop year 2010-11about 26906.32 quintals of wheat is arrived in the APMC Taloda out of which about 83.08% is arrived during the harvesting period in the months of March and April. Remaining quintals of wheat is arrived in the period of June and October to March. Table No.1.1 clears the fact that maximum farmers have sent their maximum quantity of wheat in the market immediately after the harvesting hence, they got lowest prices to their

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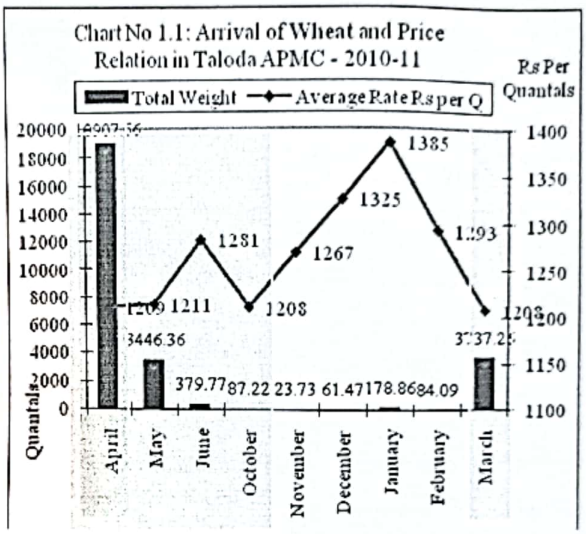
produce and those farmers have sent lowest quantity of wheat in the market they are benefited with high prices.

Table No, 1.1: Arrival of Wheat and Price Relation in Taloda APMC- 2010-11

Month	Total Weight	% of Weight	Average Rate Rs per Q
April	18907.56	70.27	1209
May	3446.36	12.81	1211
June	379.77	1.41	1281
October	87.22	0.32	1208
November	23.73	0.09	1267
December	61.47	0.23	1325
January	178.86	0.66	1385
February	84.09	0.31	1293
March	3737.26	13.89	1208
Total	26906.32	100.00	1265



- % of weight is calculated considering total arrival of wheat during the year
- Average rate of wheat is calculated considering daily arrival in the market

Chart No. 1.1 is showing arrival of wheat and price variation. In the month of April about 70.27% quintals of wheat is arrived in the market. There for merchants have declared Rs 1209 per quintal, while in the month of January only 0.66% quintals of wheat is arrived in the market, merchants have purchased their wheat by paying Rs 1385 per quintal. It is clear that those farmers have sent wheat in the market in the month of April and May they are in the loss of 176 Rs per quintal. Graphically quantity and price relation of wheat is shown in the above chart.

To support this graphical presentation of price fluctuations, researcher has used number of statistical techniques and results are given.

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Table No: 1.2: Fluctuations of Monthly Average Price of Wheat in the APMC Taloda-2010-11					
Month	% Weight of wheat Arrived in the Market	Monthly Average Price of wheat (Per Q)	Change in Price from Previous Month (%)	Three Months Moving Average Price (Rs)	Deviation of Actual Price from Moving Average (%)
1	2	3	4	5	6
April	70.27	1209.07			
May	12.81	1211.30	0.18	1233.73	-1.82
June	1.41	1280.83	5.74	1233.32	3.85
October	0.32	1207.82	-5.70	1251.82	-3.51
November	0.09	1266.80	4.88	1266.43	0.03
December	0.23	1324.68	4.57	1325.52	-0.06
January	0.66	1385.06	4.56	1334.10	3.82
February	0.31	1292.54	-6.68	1295.17	-0.20
March	13.89	1207.92	-6.55		

Source: Researcher has calculated with the help of dataset obtained from APMC Taloda.

Table No 1.2 is showing six columns. Column 1 shows months while column No 2 is showing % average quantity of wheat arrived in the APMC. This column is clearly showing acute variation in the arrival of wheat. During the harvesting period farmers have sent 83.08% of wheat during two months. Column 3 shows monthly average price, clearly reveals that there is acute variation in the prices.

- Change in Price of Wheat from Previous Month (%):

Column No 4 shows Change in Price of wheat. During the harvesting period 0.18% Change in prices is observed clears that, month to month there is high fluctuation in the prices of wheat which is related to fluctuations in the arrival of wheat quantity.

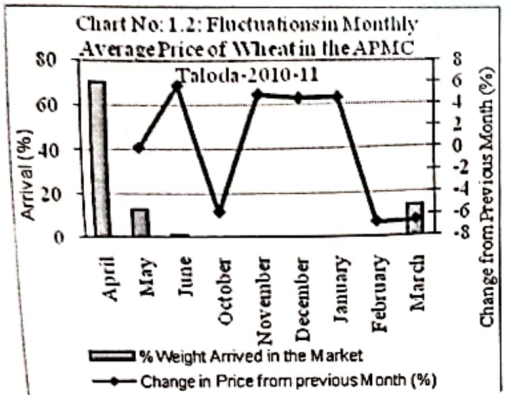
- Three Months Moving Average of Wheat Prices:

Column No 5 is showing acute variations in the moving average price of wheat. Data series of column 5 reveals that lowest price declared by merchants is Rs 1233.32 per quintal while highest price is Rs 1334.10 per quintal.

- Deviation of Actual Price from Moving Average (%):

Column No 6 is showing high fluctuation. Deviation is ranging between -3.51 % to +3.85%. These figures reveal that during the period of nine months there is **7.36% difference** in the prices of wheat. This is high difference, indicating unexpected exploitation of tribal farmers in

the APMC Taloda. To display the results of fluctuations in the prices of wheat, following graphical method is used.



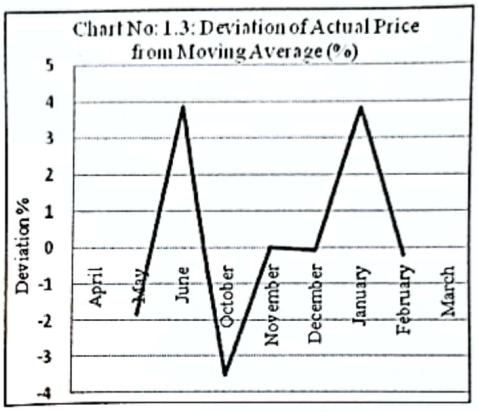


Chart No. 1.2 and 1.3 showing fluctuations in the arrival of wheat, its prices and deviation of actual prices from moving average. Both charts are self explanatory displaying negative relationship between arrival of wheat and prices declared in market.

Extent of Fluctuation in the Prices of Wheat:

Range of fluctuation and Cv are the appropriate techniques to calculate the price fluctuations of any commodities. Range of fluctuation indicates difference between maximum price and actual price of commodity, while Cv denotes proportion of fluctuation in the prices. With the help these equations price fluctuations in the prices of wheat is calculated and displayed in the following table.

Table No. 1.3: Extent of Fluctuation in the Prices of Wheat in APMC Taloda -2010-11

Month	Total Weight (Q)	Average Price Per (Q)	Range of Fluctuation	CV (%)
1	2	3	4	5
April	18907.56	1209.07	175.99	11.56
May	3446.36	1211.30	173.76	4.73
June	379.77	1280.83	104.23	2.19
October	87.22	1207.82	177.24	4.11
November	23.73	1266.80	118.26	1.01
December	61.47	1324.68	60.38	7.43
January	178.86	1385.06	0.00	10.89
February	84.09	1292.54	92.52	8.76
March	3737.26	1207.92	177.14	6.59

Range of fluctuation:

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Table No. 1.3 is showing extent of fluctuation in the prices of wheat during the study period. Column No 4 is showing range of fluctuation. Maximum Average Price of wheat is found 1385.06 Rs per quintal in the month of January and lowest price of is observed in the months of March, April and May. Range of Fluctuation is ranging between 0 to 177.24 Rs per quintal. It is clear that fluctuation of wheat prices are up to 177.24 Rs per quintal. This is extreme variation in the wheat prices. Government authorities should protect the tribal farmers by implementing rules immediately.

Coefficient of Variation (Cv):

Table No 1.3, Column No 5 is showing index of Cv. Coefficient of variation is ranging between 1.01% and 11.56%. June to December is the off period of wheat production. In this period lowest index of Cv is observed. December to April highest Cv is observed. Harvesting period is March to May hence in these months highest variation is found due to excess supply of wheat in the APMC. December and January is the period of cultivation. Most of the farmers demand wheat as a seed to cultivate. Hence, fluctuation in the prices is high. It is also found that when insignificant quantity is arrived in the APMC, merchants have purchased wheat by paying high prices; hence Cv is low in the off period. Month wise variations in the prices calculated by range of fluctuation and Cv are displayed in the following graphs.

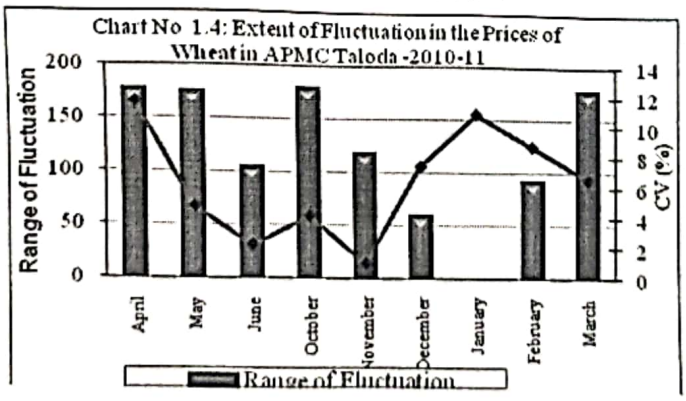

Chart No 1.4 is displaying extent of fluctuation in the prices of wheat, this graph is clearly showing relationship between range of fluctuation and Cv.

CONCLUSION:

The study of supply and price trends clears that when the farmers produce the commodities and send it in the market they get low prices. When large number of farmers sold out of their produce in the market, prices hiked up.

Wheat is first ranking commodity regarding the arrival in Taloda APMC. During the study period about 26906.32 quintals of Wheat is arrived. Out of them 74.49% wheat is supplied by only 10 villages. It is clear that few villages are producing wheat.

In the study region total estimated production of **Wheat** is 31388.8 quintals while farmers have sent 26906.32 (85.72%) quintals of wheat in the Taloda APMC. Total difference between actual production and arrival of wheat is calculated as quintals. It is clear that 14.28% produce is used as staple food by the farmers.

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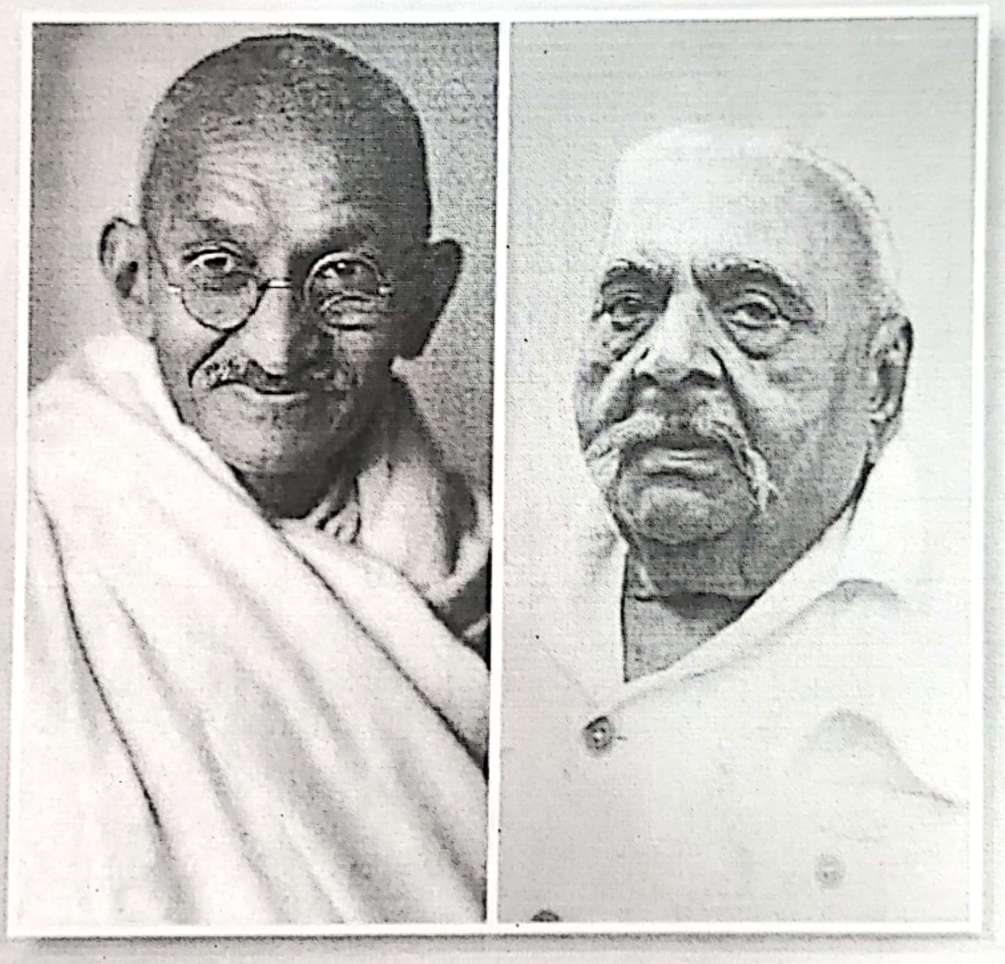

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A) Data base: Secondary data of daily arrival and prices of Wheat commodity has been collected personally from APMC Taloda as below.

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Line and bar graphs are one of the best techniques showing price trend fluctuations in the APMC Taloda.

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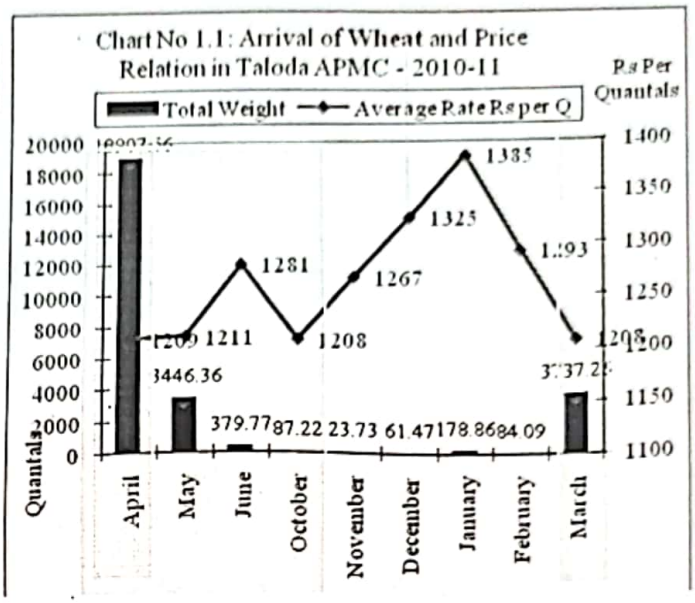

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To support this graphical presentation of price fluctuations, researcher has used number of statistical techniques and results are given.

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Table No: 1.2: Fluctuations of Monthly Average Price of Wheat in the APMC Taloda-2010-11					
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1	2	3	4	5	6
April	70.27	1209.07			
May	12.81	1211.30	0.18	1233.73	-1.82
June	1.41	1280.83	5.74	1233.32	3.85
October	0.32	1207.82	-5.70	1251.82	-3.51
November	0.09	1266.80	4.88	1266.43	0.03
December	0.23	1324.68	4.57	1325.52	-0.06
January	0.66	1385.06	4.56	1334.10	3.82
February	0.31	1292.54	-6.68	1295.17	-0.20
March	13.89	1207.92	-6.55		

Source: Researcher has calculated with the help of dataset obtained from APMC Taloda.

Table No 1.2 is showing six columns. Column 1 shows months while column No 2 is showing % average quantity of wheat arrived in the APMC. This column is clearly showing acute variation in the arrival of wheat. During the harvesting period farmers have sent 83.08% of wheat during two months. Column 3 shows monthly average price, clearly reveals that there is acute variation in the prices.

- Change in Price of Wheat from Previous Month (%):

Column No 4 shows Change in Price of wheat. During the harvesting period 0.18% Change in prices is observed clears that, month to month there is high fluctuation in the prices of wheat which is related to fluctuations in the arrival of wheat quantity.

- Three Months Moving Average of Wheat Prices:

Column No 5 is showing acute variations in the moving average price of wheat. Data series of column 5 reveals that lowest price declared by merchants is Rs 1233.32 per quintal while highest price is Rs 1334.10 per quintal.

- Deviation of Actual Price from Moving Average (%):

Column No 6 is showing high fluctuation. Deviation is ranging between -3.51 % to +3.85%. These figures reveal that during the period of nine months there is **7.36% difference** in the prices of wheat. This is high difference, indicating unexpected exploitation of tribal farmers in the APMC Taloda. To display the results of fluctuations in the prices of wheat, following graphical method is used.

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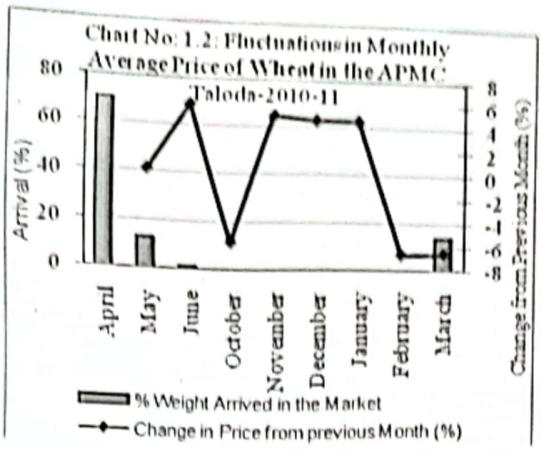

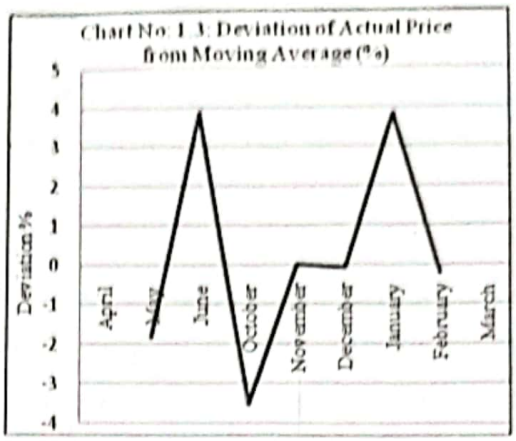

Chart No. 1.2 and 1.3 showing fluctuations in the arrival of wheat, its prices and deviation of actual prices from moving average. Both charts are self explanatory displaying negative relationship between arrival of wheat and prices declared in market.

Extent of Fluctuation in the Prices of Wheat:

Range of fluctuation and Cv are the appropriate techniques to calculate the price fluctuations of any commodities. Range of fluctuation indicates difference between maximum price and actual price of commodity, while Cv denotes proportion of fluctuation in the prices. With the help these equations price fluctuations in the prices of wheat is calculated and displayed in the following table.

Table No. 1.3: Extent of Fluctuation in the Prices of Wheat in APMC Taloda -2010-11

Month	Total Weight (Q)	Average Price Per (Q)	Range of Fluctuation	CV (%)
1	2	3	4	5
April	18907.56	1209.07	175.99	11.56
May	3446.36	1211.30	173.76	4.73
June	379.77	1280.83	104.23	2.19
October	87.22	1207.82	177.24	4.11
November	23.73	1266.80	118.26	1.01
December	61.47	1324.68	60.38	7.43
January	178.86	1385.06	0.00	10.89
February	84.09	1292.54	92.52	8.76
March	3737.26	1207.92	177.14	6.59

Range of fluctuation:

Table No. 1.3 is showing extent of fluctuation in the prices of wheat during the study period. Column No 4 is showing range of fluctuation. Maximum Average Price of wheat is found 1385.06 Rs per quintal in the month of January and lowest price of is observed in the

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months of March, April and May. Range of Fluctuation is ranging between 0 to 177.24 Rs per quintal. It is clear that fluctuation of wheat prices are up to 177.24 Rs per quintal. This is extreme variation in the wheat prices. Government authorities should protect the tribal farmers by implementing rules immediately.

Coefficient of Variation (Cv):

Table No 1.3, Column No 5 is showing index of Cv. Coefficient of variation is ranging between 1.01% and 11.56%. June to December is the off period of wheat production. In this period lowest index of Cv is observed. December to April highest Cv is observed. Harvesting period is March to May hence in these months highest variation is found due to excess supply of wheat in the APMC. December and January is the period of cultivation. Most of the farmers demand wheat as a seed to cultivate. Hence, fluctuation in the prices is high. It is also found that when insignificant quantity is arrived in the APMC, merchants have purchased wheat by paying high prices; hence Cv is low in the off period. Month wise variations in the prices calculated by range of fluctuation and Cv are displayed in the following graphs.

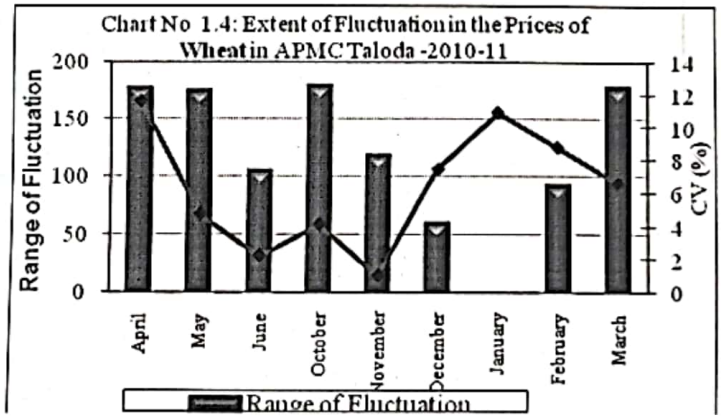

Chart No 1.4 is displaying extent of fluctuation in the prices of wheat, this graph is clearly showing relationship between range of fluctuation and Cv.

CONCLUSION:

The study of supply and price trends clears that when the farmers produce the commodities and send it in the market they get low prices. When large number of farmers sold out of their produce in the market, prices hiked up.

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Wheat is first ranking commodity regarding the arrival in Taloda APMC. During the study period about 26906.32 quintals of Wheat is arrived. Out of them 74.49% wheat is supplied by only 10 villages. It is clear that few villages are producing wheat.

In the study region total estimated production of **Wheat** is 31388.8 quintals while farmers have sent 26906.32 (85.72%) quintals of wheat in the Taloda APMC. Total difference between actual production and arrival of wheat is calculated as quintals. It is clear that 14.28% produce is used as staple food by the farmers.

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