

Trend and Relationship of Market Arrivals and Prices of Major Oilseeds in *Krishi Upaj Mandies* in Chhattisgarh

ABSTRACT

Aim: To analysis the trend pattern and correlation of market arrivals and prices of major oilseeds in *Krishi Upaj Mandies* of Chhattisgarh.

Study design: The study was based on secondary data. The linear model for trend analysis and Karl Pearson's correlation coefficient for relationship between arrivals and prices were used in the study.

Place and duration of study: The study was conducted in four *Krishi Upaj Mandies* of Chhattisgarh. The monthly wise time series data from period of 2006-07 to 2020-21 were considered for study.

Methodology: Four *Krishi Upaj Mandies viz.*, Rajnandgaon, Bemetara, Pathalgaon and Ramanujganj were selected according to collectively maximum arrivals of major oilseeds in Chhattisgarh.

Results: The trend of arrivals of soybean in Rajnandgaon mandi was observed increasing trend over the year. Whereas, Bemetara mandi was shows negative decreasing trend. In case of groundnut positive but least trend were observed in arrivals of all selected mandies. In case of mustard least trend of arrivals was observed in Bemetara and Pathalgaon mandies. While significant increasing trend were noticed in Rajnandgaon and Ramanujganj mandies. The trends of prices of major oilseeds were found to be positively increasing in all selected mandies. The correlation coefficient of arrivals and prices of major oilseeds were positive and significant in all selected mandies except Bemetara and Rajnandgaon mandies. In Bemetara mandi approx no-correlation was found between arrivals and prices of soybean. Whereas Rajnandgaon mandi of mustard crop was seen positive but not significant of any level.

Conclusion: The study concludes that the trends of arrivals of major oilseeds in various Mandies were estimated least over the years. The Majorities of *Krishi Upaj Mandies* were found to be positive and significant correlation between arrivals and prices. It was indicates that the variables of arrivals and prices were significantly associated with each other over the time.

Keywords: Correlation coefficient, groundnut, linear model, mustard, soybean, time series data.

1. INTRODUCTION

Oilseeds sector of India are providing a dynamic role in the world agriculture economy. Due to favorable weather conditions and support provided by the Government of India to the Oilseeds production/developmental programmes and policies, the country produced 324.79 lakh tonnes oilseeds in 2010-11, with a record productivity level of 1193 kg/ha. From the first Five Year Plan (1951-56) to the Eleventh Five Year Plan (2007-2012), the area, production, and yield scenario showed a mixed trend, but the highest average area, production, and yield were recorded as 267.48 lakh ha, 286.27 lakh tonnes, and 1082 kg/ha respectively in the Eleventh Five Year Plan [1].

India contributes for around 15-20% of world oilseeds area, 6-7% of vegetable oil output and 9-10% of overall edible oil consumption. Oilseeds are second only to food grains in terms of acreage, production, and economic worth [2].

Chhattisgarh is the emerging state of oilseeds production in India. More than six oilseeds are grown consumption and marketing purposes in the state viz., soybean, groundnut, sesame, rapeseed-mustard, Niger seed, linseed and sunflower etc. out of this three major oilseeds i.e., soybean, groundnut and rapeseed-mustard contributed more than eighty per cent in the state. The state contributes 2.33 lakh hectares of area and 1.22 lakh tonnes of production of oilseeds in India [3]. For the marketing of all oilseeds the Chhattisgarh government established C.G. State Agricultural Marketing (Mandi) Board to provide better marketing facilities and prices support to oilseeds growers. In present status 69 *Krishi Upaj Mandies* and 118 sub-mandies (*up-mandies*) are working in the state to providing better marketing facilities and maintained stock of farm produce. Even then, sometimes many problems faced by oilseeds growers such as price fluctuation, transportation and transparency in pricing systems and exploitation by traders etc in the marketing of oilseeds produce.

2. REVIEWS OF PAST STUDY

Dudhat et al. [4] carried out by using time series data of price of groundnut from 1996 to 2016. Estimates of fitted quadratic trend model for Krnool and Villupuram market and estimates of fitted linear trend model for Rajkot market were significant. Highest instability was observed for Rajkot market.

Kachroo and Nazir [5] conducted the study to find the fluctuation in the prices and arrival of the selected high value agricultural commodities. The results of the study showed that there is a positive and significant relationship between trend in growth and the prices of selected commodities with cumin showing the highest growth rate of (9.87%) in arrival followed by turmeric (9.05%) and the lowest in coriander (5.06%) as against the prices where it showed all together with a different scenario with highest in case of coriander (7.55%) followed by soybean (7.24%) and lowest in cumin with (5.69%) respectively.

Meena et al. [6] observed that the results of linear trend analysis carried out to study the trends in arrivals and prices for rapeseed-mustard in the selected markets revealed an identical pattern. In Khairthal, Sri Ganganagar and Raisinghnagar markets, the trends of arrivals of rapeseed-mustard showed significant increase over a period of time. The positive correlation coefficients of prices

between selected markets were found to be between 0.946 and 0.997, indicating the high integration among the selected markets.

Naidu and Meena [7] studied in Adoni market, of Kurnool district, a positive relationship was found between arrivals and prices over the years and across months in both the markets.

Punitha [8] conducted the study to assess the performance of groundnut and maize marketing system in Davangere and Hubli markets. In case of maize, Davangere market showed increasing trend in arrivals but Hubli market showed stagnant trend and both the markets showed an increasing trend in prices. Davangere groundnut market showed decreasing trend in arrivals and an increasing trend in prices. Hubli market showed an increasing trend both in arrivals and prices. No cyclical trend was observed in both arrivals and prices of maize and groundnut in selected markets. In Davangere market groundnut showed significant and negative relationship. Whereas, Hubli market showed a non-significant and positive relationship. In Davangere groundnut market R^2 was found to be significant at 1 percent and it was non-significant in Hubli market. As far as groundnut was considered, both the markets showed higher degree of competitiveness in trade. Forecasted values of groundnut arrivals and prices showed an increasing trend in Davangere market, but in Hubli market prices showed decreasing.

Tambe [9] revealed that the negative and significant relationship among arrivals and prices of soybean in Sangali (0.62), Kopargaon (0.56) markets from Western Maharashtra and Hingghat (0.61) and Washim (0.69) markets from Vidharbha. On the other hand the relationship between monthly arrivals and prices were negative but non-significant in Shrirampur (0.28) market from western Maharashtra, Hingoli (0.13) market from Marathwada, Amravati (0.05) market from Vidarbha region, respectively. The negative coefficient or inverse relationship implies that with increase in the quantity of arrivals of soybean in the markets, the prices were declining and vice-versa.

Verma et al. [10] revealed that the correlation coefficient between monthly arrivals and prices of soybean were negative in all the markets. This reveals that prices of soybean are governed by factors such as presence of processing units and competition prevailing between purchasers etc. in addition to the arrival of the crop. Correlation coefficient for all the markets in the corresponding months was significant at 1 or 5 percent level of significance.

3. MATERIAL AND METHODS

3.1 Sampling procedure:

The four *Krishi Upaj Mandies viz.*, Rajnandgaon, Bemetara, Pathalgaon and Ramanujganj were selected from four districts *i.e.*, Rajnandgaon, Bemetara, Jashpur and Balrampur according to collectively maximum arrivals of major oilseeds. The districts were also selected purposively to contribute maximum cultivated area of total oilseeds in the state.

3.2 Data sources:

The study was based on secondary data sources. The monthly wise time series data of 15 years (2006-07 to 2020-21) were considered for the present study. The secondary data was collected

from published and unpublished sources from selected *Krishi Upaj Mandies*, Agricultural and Land Revenue department Govt. of Chhattisgarh, District Statistical Booklets and website (*agrimandi*) of Chhattisgarh State Marketing (Mandi) Board.

3.3 Analytical tools:

3.3.1 Analysis of trends of arrivals and prices

The following linear form of equation was used to estimate and examine the trends in market arrivals and prices of major oilseeds.

$$Y = \alpha + \beta t$$

$$Z = \gamma + \mu t$$

Where,

Y = A monthly market arrivals of oilseeds in quintals

Z = Price of oilseeds in rupees per quintal

α and γ = Intercepts

β and μ = Regression coefficient

t = Time period of the variable

3.3.2 Relationship between market arrivals and prices

Correlation is a measure of the intensity or degree of a linear relationship between two variables (market arrivals and prices) for “n” pair of observations. A numerical measure of the correlation coefficient is given by,

$$r = \frac{\sum xy - \frac{\sum x \sum y}{n}}{\sqrt{\left[\sum x^2 - \frac{(\sum x)^2}{n}\right] \left[\sum y^2 - \frac{(\sum y)^2}{n}\right]}}$$

Where,

r = correlation coefficient

x and y are two related variables (market arrivals and prices)

n = Sample size.

The significance of the correlation coefficient (r) is tested by using “t” test and is given by,

$$t = \frac{r\sqrt{(n-2)}}{\sqrt{(1-r^2)}}$$

Where,

r = Correlation coefficient

The calculated “t” value is compared with table “t” value at (n-2) degree of freedom at a given level of significance.

4. RESULTS AND DISCUSSION

4.1 Trend of arrivals and prices of major oilseeds

Trend or secular trend is the major component for analysis of growth of arrivals and prices of any commodities. It shows increases or decreases pattern of arrivals and prices with respect to time. The increases or decreases rate is mainly depend of imbalance of demand and supply of those commodities.

4.1.1 Trend in monthly arrivals and prices of soybean

The trend in arrivals and prices of soybean is presented in fig 1 to 4. The arrivals in Rajnandgaon mandi was observed positively increasing trend over the year. Whereas arrivals in Bemetara mandi was observed negatively decreasing trend.

The trends in prices of all selected mandies of soybean were noticed increasing rate over the year. Both mandies was positive and statistically significant with 1 per cent. The trend in monthly arrivals and prices of soybean are shows in table 1.

Table 1. Trend in monthly arrivals and prices of soybean

S. No.	APMC's	Arrivals and prices	Intercept	Regression coefficient	R ²
1	KUM Rajnandgaon	Arrivals	2415.00	20.25	0.013
		Price	1439.00	13.51***	0.571
2	KUM Bemetara	Arrivals	13058.00	-38.79	0.020
		Price	1344.00	13.28***	0.479

Note: ***, ** and * Indicates at 1%, 5% and 10% level of significance

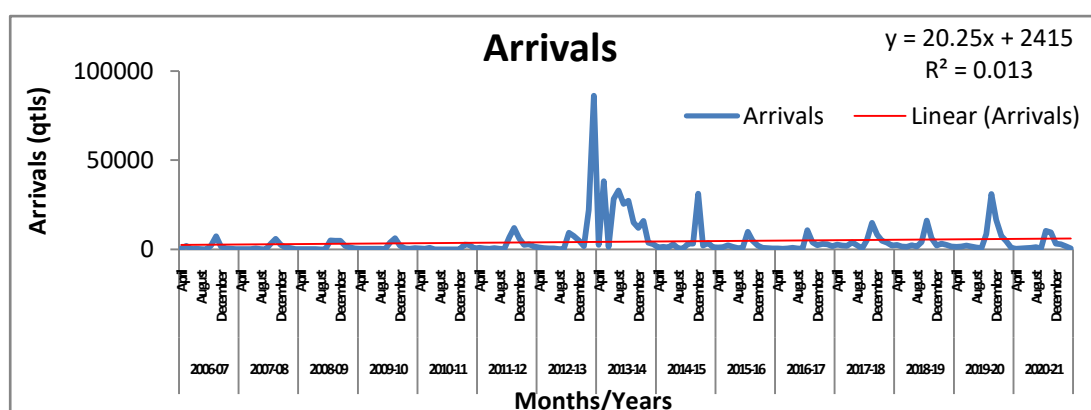


Fig 1: Trend in arrivals of soybean in KUM Rajnandgaon

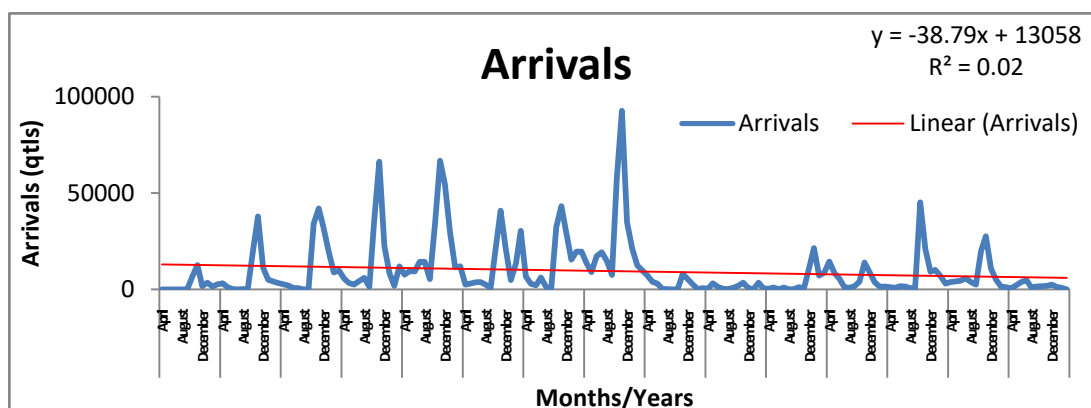


Fig 2: Trend in arrivals of soybean in KUM Bemetara

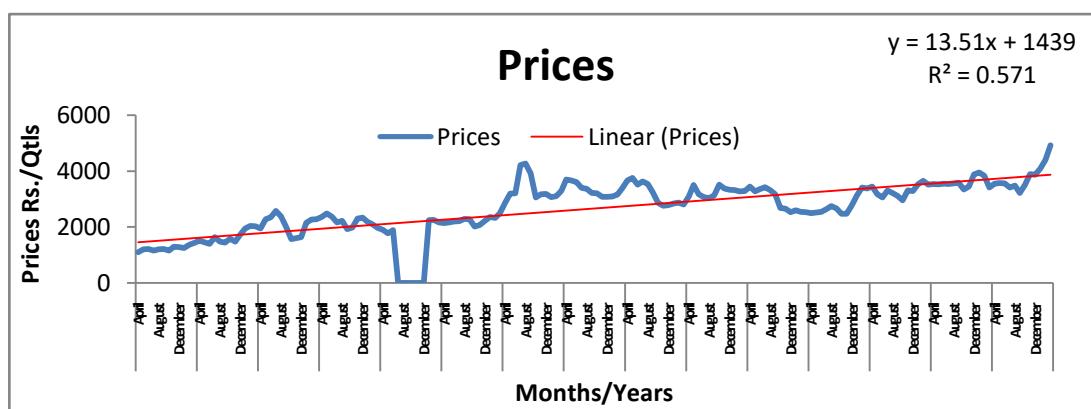


Fig 3: Trend in prices of soybean in KUM Rajnandgaon

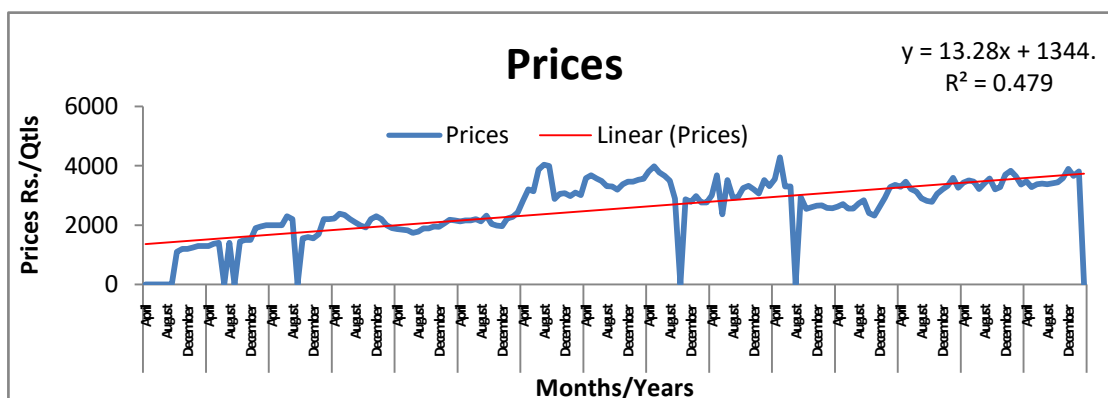


Fig 4: Trend in prices of soybean in KUM Bemetara

4.1.2 Trend in monthly arrivals and prices of groundnut

Table 2 shows the trend in arrivals and prices of groundnut of selected mandies in study area. The trend in arrivals of groundnut in Pathalgaon mandi was observed positively increasing over the year. Whereas least trend were showing in Bemetara and Ramanujganj mandies with the time. The figures clearly show the long term variations in monthly arrivals were not seen very much over the period.

The trend in prices in Bemetara, Pathalgaon and Ramanujganj mandies were found to be significantly increasing rate. The highest trend was noticed in Ramanujganj mandi in the study period.

Table 2. Trend in monthly arrivals and prices of groundnut

S. N.	APMC's	Arrivals and prices	Intercept	Regression coefficient	R ²
1	KUM Bemetara	Arrivals	-0.08	0.02*	0.021
		Price	63.64	2.73*	0.018
2	KUM Pathalgaon	Arrivals	170.30	0.15	0.001
		Price	715.60	14.89***	0.199
3	KUM Ramanujganj	Arrivals	12.32	0.06	0.013
		Price	345.10	16.46***	0.201

Note: ***, ** and * Indicates at 1%, 5% and 10% level of significance

4.1.3 Trend in monthly arrivals and prices of mustard

The trend in arrivals and prices of mustard is presented in Table 3. The arrivals of mustard in all selected mandies were found to be positive trend. The Rajnandgaon and Ramanujganj mandies observed to be significantly increasing trend in arrivals over the year. Whereas Bemetara and Pathalgaon mandies observed to be positive but least trend over the time. The least trend shows that the long term changes in arrivals was very low with the time.

The prices of mustard in all selected mandies were observed positive trend. The Rajnandgaon, Pathalgaon and Ramanujganj mandies were observed significantly increasing trend in over the year. Whereas Bemetara mandi was found to be positive but non-significant over the time.

Table 3. Trend in monthly arrivals and prices of mustard

S. N.	APMC's	Arrivals and prices	Intercept	Regression coefficient	R ²
1	KUM Rajnandgaon	Arrivals	35.20	0.92***	0.061
		Price	1585.00	12.75***	0.540
2	KUM Bemetara	Arrivals	52.11	0.38	0.008
		Price	147.50	0.93	0.003
3	KUM Pathalgaon	Arrivals	10.85	0.08	0.009
		Price	492.90	11.09***	0.136
4	KUM Ramanujganj	Arrivals	-9.61	0.74***	0.068
		Price	353.40	15.88***	0.264

Note: ***, ** and * Indicates at 1%, 5% and 10% level of significance

4.2 Relationship between market arrivals and prices of major oilseeds

The correlation coefficient of monthly arrivals and prices of 15 years (2006-7 to 2020-21) time series data in KUM Chhattisgarh is presented in table 4.

It was observed that the correlation coefficient of arrivals and prices of soybean in Rajnandgaon mandi was found to be positive and significant at 1 per cent level. Whereas the

correlation coefficient in Bemetara mandi was seen approximately zero or no-correlation between arrivals and prices. The positive and significant correlation indicates increases in arrivals are associated with reasonable increase in prices. The zero or no-correlation indicates increases or decreases of arrivals are not associated with increases or decreases in prices and vice-versa.

The correlation coefficient of arrivals and prices of groundnut in all selected mandies were estimated as positively significant at 1 per cent level. The Bemetara mandi was estimated higher correlation (0.833) instead of other mandies.

The correlation coefficient of arrivals and prices of mustard in Bemetara, Pathalgaon and Ramanujganj mandies were observed positively significant. Whereas Rajnandgaon mandi was estimated positive but non-significant.

The conclusion found to be all selected mandies were positively correlated between arrivals and prices except the Bemetara mandi for soybean.

Table 4. Correlation coefficient of monthly arrivals and prices of major oilseeds in KUM Chhattisgarh

S. No.	APMC's	Correlation Coefficient	<i>P-value</i>
Soybean			
1	KUM, Rajnandgaon	0.200***	.007
2	KUM, Bemetara	0.00024	1.00
Groundnut			
1	KUM, Bemetara	0.833***	.000
2	KUM, Pathalgaon	0.325***	.000
3	KUM, Ramanujganj	0.573***	.000
Mustard			
1	KUM, Rajnandgaon	0.113	.13
2	KUM, Bemetara	0.170**	.02
3	KUM, Pathalgaon	0.403***	.000
4	KUM, Ramanujganj	0.397***	.000

Note: *** Indicates significance at 1% , ** Indicates significance at 5%

5. CONCLUSION

The result shows that the arrivals of major oilseeds in selected mandies were fluctuated in every month or annually. But the long term variations of trend were found to be positively low approx all selected mandies in Chhattisgarh. The Bemetara mandi was observed negative trend for soybean

crop. In case of mustard the trend movements were shows significantly increasing in Rajnandgaon and Ramanujanj mandies. The trends in prices of all selected mandies of oilseeds were shows significantly positive and it increasing over the period. Except Bemetara mandi was shows positive but not significant. The positive correlation was found in all selected mandies over the study period. Except Bemetara mandi of soybean was shows approximately zero correlation. It shows increases of arrivals are not associated with increases of prices and vice-versa.

The arrivals of major oilseeds in selected mandies were shows fluctuated and constant over the years. It was because of seasonality nature of those crops. To increases the arrivals of major oilseeds in mandies, it should need to increases the production these crops. The improved varieties, lower cost of inputs and better price mechanism can help to increases the production of major oilseeds.

COMPETING INTERESTS

The all authors have declared that no competing interests exist.

AUTHORS CONTRIBUTIONS

This work was done by cooperation with all authors and it was scrutinize and approved by authors.

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