Relationship between Prices and Market arrivals of Gram in Madhya Pradesh

Abstract

In view of this, the current study was undertaken by collecting monthly wholesale prices of gram in Madhya Pradesh. This study was centred on the secondary data on relationship between prices and market arrivalsof gram in selected A.P.M.Cs., (*Kindly write A.P.M.Cs in full since it is appearing for the first time in this manuscript afterward it can be abbreviated as it is)* of Madhya Pradesh for the period of 10 years i.e., from 2012-13 up to 2021-22. Maximum significant association between prices and arrivals was seen in Vidisha *mandi* during eight years (2012-13, 2013-14, 2014-15, 2015-16, 2016-17, 2017-18, 2020-21 and 2021-22) while it was non-significant only in two years in Vidisha *mandi* (2018-19 & 2019-20). Followed by Raisen and Bhopal mandies during six years. Only in Vidisha and Bhopal *mandies* the correlation between arrivals and price was negative (-0.2330 and -0.0327) and statistically significant while it was statistically non-significant in Raisen*mandi*. Market arrivals were highest in Vidisha *mandi* with a monthly mean of 1563.04 quintals and lowest in the Bhopal with the mean of 22.67 quintal per month. Coefficient of variation was computed to study the variations in monthly prices and arrivals gram during 2012-13 to 2021-22. The coefficient of variations in prices of gram wasoriginate to be highest(*change the highlighted phrase* to *was originally the highest)* (49.41%) in Vidisha, followed by (23.51%) Raisen and Bhopal (19.37%) from 2012-13 to 2021-22. The highest variation in arrivals was in Vidisha (49.41%) followed by Bhopal (44.73%) and Raisen(40.93%).

Key words: Prices andarrivals, mean, variations, APMCs, correlation co-efficient.

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Introduction

Gram serves as food in many ways. Gram soup has good food value and that it helps in the recovery from spleen and liver disorders. Besan, a flour made from pulses, is utilized in the preparation of sweets, snacks, and namkeen. It can also be consumed fried, boiled, or salted. India holds the title of being the largest producer and consumer of pulses globally. Pulse cultivation in India spans an average of approximately 23 million hectares. Over time, the cultivation of pulses in India has shifted towards marginal lands and rainfed areas. The primary region for pulse cultivation is concentrated in Madhya Pradesh(21%), Maharashtra (14%), Rajasthan (17%), Uttar Pradesh (10%), Karnataka (9%), Andhra Pradesh (8%), Chhattisgarh (4%), Bihar (3%) and Tamil Nadu (3%). These states add 80% of total pulse production**(Yadav et.al 2017)**. Madhya Pradesh was the first major producer of pulses, which accounted 21.78 per cent shared of total production in India. Gram was veryimperative pulse crop of the state occupying 2.03 million hectares area with production of 3.03 million tonnes and an average yieldof1495kg/ha**(Agriculture Statistics at a Glance 2022)**.These are primarily cultivated in arid and semi-arid districts including Vidisha, Raisen, Rajgarh, Dewas, Panna, Jabalpur, Guna, Sehore,Ujjain, Damoh and Sagar. Extensive fluctuations have been observed in both

area and production of pulse crops inthe significant pulse production in Madhya Pradesh is largely influenced by changes in weather and climatic conditions. Favorable weather years typically result in a doubling of pulse production, leading to market saturation and a subsequent decrease in pulse prices. To address this issue and mitigate the fluctuations in agricultural product prices while also increasing market arrivals, it is essential to devise suitable strategies and measures. There was a high degree of variability from year to year in prices and arrivals, which meant that a farmer or a trader could not be assured of profits from storage every year. Marketing holds significant importance in economic development as it serves to stimulate production and minimize unnecessary fluctuations in output and prices. The experiences of various countries highlight that without an efficient marketing system, strategies for agricultural development may struggle to effectively boost production. Understanding price behavior, including price levels, trends, and fluctuations, is crucial for determining the competitiveness of commodities both domestically and internationally. This information helps in forecasting future prices and formulating long-term trade strategies**(Sharma Shirish, 2014)**.

Research Methodology

The study was purposively confined to the state of Madhya Pradesh.Secondary data in respect of arrivals in different markets andmonthly prices of gram for the period of ten years from2012-13 to 2021-22 was collected from Directorate ofEconomics and Statistics, Government of Madhya Pradesh, Bhopal,mandi offices of selected mandies and AGMARKNET(https://agmarknet.gov.in) to study the relationship betweenprices and arrivals. Selection of the major crops of Madhya Pradesh was done from the different commodity on the basis of rank of Madhya Pradesh in production compared to all over India crop viz. gram was selected purposively for the detailed study. Vidisha and Raisen districtfor gram were selected on the basis of rank in production of the selected agricultural commodity in whole Madhya Pradesh. Bhopal district of Madhya Pradesh having biggest mandies was also selected purposively for the comparative study. For gramVidisha and Raisenmandies were selected on the basis of maximum arrivals. Bhopal grain market wasalso selected purposively for the comparative study of prices and arrivals, as it is the biggest APMC of the Madhya Pradesh.

Analysis of Data

Relationship between prices and market arrivals of selected agricultural commodities

This objective was divided into two parts viz: Correlation coefficient and coefficient of variation.

I. Correlation co-efficient was obtained to measure the nature and magnitude of association between arrivals and prices of selected commodities of the market.

II. Coefficient of variation was used to study the variability in arrivals and prices of selected agricultural commodities in the study area over the years.

1. Correlation:

Correlation is a measure of intensity or degree of linear association betweentwovariables(priceandarrivals)for“n”pairofobservations. To know the direction and extent of association between arrivals and prices, following formula was used to calculate correlation coefficient (r):

$$r = \frac{\sum(X_i - \bar{X})(Y_i - \bar{Y})}{\sqrt{\sum(X_i - \bar{X})^2(Y_i - \bar{Y})^2}}$$

Where,

r = Correlation coefficient

X_i= Quantity of arrivals of selected commodity in i^{th} month/year (quintals).

$\bar{X}$= Mean quantity of arrivals of selected commodity (quintals).

Y_i= Price of selected commodity (Rs./qt) in i^{th} month /year.

$\bar{Y}$= Mean value of prices of selected commodity (Rs./qt).

n = Number of observations.

2. Coefficient of variation (CV)

The coefficient of variation (CV) is a relative measure of variability that indicates the size of standard deviation in relation to its mean. It is a standardized, unit-less measure that allows us to compare variability between disparate groups and characteristics. It is also known as the relative standard deviation (RSD).

The co-efficient of variation (CV) was computed to find out the extent of variations in market arrivals and prices of selected commodities in the study market.

$$\text{CV} = \frac{\text{Standard Deviation}}{\text{Mean}} \times 100$$

Result and discussion

Correlation between prices and market arrivals

The year wise correlation between monthly prices and arrivals in Bhopal, Raisen and Vidisha*madies* as shown in table-1 shows negative and statistically significant association for most of the years in gram. Maximum significant correlation between prices and arrivals was seen in Vidisha *mandi* during eight years (2012-13, 2013-14, 2014-15, 2015-16, 2016-17, 2017-18, 2020-21 and 2021-22) while it was non-significant only in two years in Vidisha *mandi* (2018-19 & 2019-20). Followed by Raisen and Bhopal mandies during six years. Similar results were found by Shukla and Rai (2014) in onion, garlic and turmeric in selected market of Uttar Pradesh.

Table 1: Correlation between prices and arrivals of Gram in selected *mandies*of MP from year 2012-13 to 2021-22

Years	Raisen	Vidisha	Bhopal
2012-13	-0.411**	0.502**	-0.279*
2013-14	-0.144*	0.391*	0.519**
2014-15	-0.668**	0.502*	-0.187 ^{NS}
2015-16	-0.149 ^{NS}	-0.565**	-0.577**
2016-17	-0.668*	-0.654*	-0.911*
2017-18	0.273 ^{NS}	-0.064*	-0.342 ^{NS}

2018-19	-0.149 ^{NS}	-0.295 ^{NS}	0.011 ^{NS}
2019-20	0.275**	-0.003 ^{NS}	-0.187*
2020-21	-0.144*	0.391**	0.519**
2021-22	0.490 ^{NS}	0.502**	0.519 ^{NS}

** Significance at 1% level of probability
* Significance at 5% level of probability
^{NS} not significant

The results of correlation investigation on monthly prices and arrivals of gram during years (2012-13 to 2021-22) as shown in table 2 shows that only in Vidisha and Bhopal *mandies* the relationship between arrivals and price was negative (-0.2330 and -0.0327) and statistically significant while it was statistically non-significant in Raisen*mandi*. Similar results were found by Sharma and Singh (2014), that the relationship between prices and arrivals showed the negative and statistically non-significant results in Jaipur and Nagaur markets of pearl millet and positive and statistically significant in Jodhpur market.

Table 2: Correlation between prices and arrivals of gram in selected *mandies* of MP during 2012-13 to 2021-22

	Raisen	**Vidisha**	**Bhopal**
Correlation	-0.0847 ^{NS}	-0.2330**	-0.0327*

** Significance at 1% level of probability
* Significance at 5% level of probability
^{NS} not significant

2. Variations in arrivals and prices of gram

The variability in arrivals and prices of gram in Bhopal, Raisen and Vidisha*mandies* during year (2012-13 to 2021-22) was analyzed and is depicted in table 3 Results discovered that the market arrivals were highest in Vidisha *mandi* with a monthly mean of 1563.04 quintals and lowest in the Bhopal with the mean of 22.67 quintal per month. Coefficient of variation was computed to study the variations in monthly prices and arrivals gram during 2012-13 to 2021-22. The coefficient of variations in prices of gram wasoriginate to be highest (49.41%) in Vidisha, followed by (23.51%) Raisen and Bhopal (19.37%) during the period from 2012-13 to 2021-22. The highest variation in arrivals was in Vidisha (49.41%) followed by Bhopal (44.73%) and Raisen (40.93%). It can be understood that in Vidisha *mandi* maximum variations in arrivals and prices were found. Similar results were obtained by Deokate*et al.* (2020).

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Table 3: Descriptive statistics of prices and arrivals of gram in selected *mandies* of MP during 2012-13 to 2021-22

Parameters	**Raisen**		**Vidisha**		**Bhopal**	
Mean (monthly)	**Arrivals (q)**	**Prices (₹/q)**	**Arrivals (q)**	**Prices (₹/q)**	**Arrivals (q)**	**Prices (₹/q)**

	113.691	4438.6588	1563.0413	1563.0413	22.6776	4423.5870
Standard Deviation	46.5356	1043.5805	772.3858	772.3858	10.1142	856.9091
Coefficient of Variation (Per cent)	40.9314	23.5112	49.4156	49.4156	44.73	19.3714

Summary and Conclusions

Maximum significant association between prices and arrivals was seen in Vidisha *mandi* during eight years (2012-13, 2013-14, 2014-15, 2015-16, 2016-17, 2017-18, 2020-21 and 2021-22) while it was non-significant only in two years in Vidisha *mandi* (2018-19 & 2019-20). Followed by Raisen and Bhopal mandies during six years. The results of correlation analysis on monthly prices and arrivals of gram during years (2012-13 to 2021-22) that only in Vidisha and Bhopal *mandies* the correlation between arrivals and price was negative (-0.2330 and -0.0327) and statistically significant while it was statistically non-significant in Raisen*mandi*. Market arrivals were highest in Vidisha *mandi* with a monthly mean of 1563.04 quintals and lowest in the Bhopal with the mean of 22.67 quintal per month. Coefficient of variation was computed to study the variations in monthly prices and arrivals gram during 2012-13 to 2021-22. The coefficient of variations in prices of gram was found to be highest (49.41%) in Vidisha, followed by (23.51%) Raisen and Bhopal (19.37%) during the period from 2012-13 to 2021-22.

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Policy Implications

Keeping in view the above results, a following strategy measures are suggested below:

1. **Market Monitoring and Information Dissemination:**Continuous monitoring of arrivals and prices in *mandies* can help farmers, traders and legislators make informed decisions about when to vend or purchase gram crop. Timely dissemination of market information can lead to better price realization and improved market efficiency.
2. **Storage and Warehousing Facilities:**Considering the deviations in arrivals and prices there is a necessity to develop adequate storage and warehousing infrastructure. This can assistance manage the supply-demand imbalances, reduce wastage and stabilize prices during period of high arrivals.
3. **Market Diversification:**Policymakers could explore ways to encourage farmers in other *mandies* to differentiate their market channels and consider selling their products in other markets. This could potentially lead to increased competition among buyers, resulting in better prices for farmers.
4. **Price Stability Measures:**Considering the higher variability in prices, policymakers may consider implementing price stability measures. This can involve interventions such as price support programs, futures contracts, or hedging mechanisms to stabilize prices and defend farmers from sudden price fluctuations.
5. **Risk Management Tools:**Considering the variability in both prices and arrivals, policymakers should promote the practice of risk management tools among farmers. This can include

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encouraging farmers to adopt crop insurance schemes and explore agricultural futures markets to hedge against price and production risks. Providing training and education on risk management plans can help farmers mitigate losses and enhance their overall profitability.

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