Variation in banana prices in the Burhanpur market, Madhya Pradesh

HC BADGUJAR[1], AA BHAGAT[2] and AM TIRMALI[2]

[1]Post Graduate Institute of Post Harvest Management
Dr Balasaheb Sawant Konkan Krishi Vidyapith, Dapoli, Ratnagiri 415712 Maharashtra, India
[2]National Agricultural Research Project, Ganeshkhind, Pune 411067 Maharashtra, India
Email for correspondence: stataab@gmail.com

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ABSTRACT

Banana (*Musa* sp) is the most important fruit crop of Maharashtra and Madhya Pradesh. The banana prices in Burhanpur market for five years (2013-14 to 2017-18) were observed for their variation and skewness. It was indicated that highest maximum and minimum banana price variation was recorded in quarter Q_1 (Jan-March) however middle price variation was more during Q_3 (July-Sept). The least variation for maximum price was during Q_3 and middle and minimal banana price variation was recorded in Q_2 (April-June). All the types of banana prices studied did not follow normal distribution curve. It was leptokurtic for all types of prices studied. The minimum and middle banana prices showed negative skewness for Q_1, Q_2 and Q_4 and positive for Q_3. However maximum price showed negative skewness for Q_2 and Q_4 (Oct-Dec) and positive for Q_1 and Q_3. The year-wise quarterly graph indicated that average minimum, middle and maximum prices were very fluctuating in nature. It was concluded that the prices of banana were not stable at Burhanpur market of Madhya Pradesh. Thus this information may be useful for further planning of banana planting, harvesting and marketing.

Keywords: Banana; prices; descriptive statistics; variation; skewness; market

INTRODUCTION

Banana and plantains are grown in about 130 countries and the total annual world production of fruits is estimated to be 86 million tonnes. India leads the world in banana production with an annual output of about 14.2 million tonnes (http://nhb.gov.in/report_files/banana/BANANA.htm). In India banana ranks first in production and third in area among fruit crops. Banana is the most important fruit crop of Maharashtra state as well as northern part of Madhya Pradesh along the bank of Tapi and Narmada rivers. Its year round availability, affordability, varietal range, taste, nutritive and medicinal value makes it the favorite fruit among all classes of the people. It has also good export potential. Crop prices in the cash and future markets are usually the lowest when it is close to harvest time due to supply pressure (Deaton and Laroque 1992). Conversely they are usually the highest when it is close to the end of marketing year when supplies are less abundant (Black 1997). Seasonal price movements will vary however depending on supply and demand fundamentals. Different seasonal indices are relevant in these different situations (Chambers and Barley 1999). Important cultivars of banana include Dwarf Cavendish, Robusta, Monthan, Poovan, Nendran, Red banana, Nyali, Safed Velchi, Basrai, Ardhapuri, Rasthali, Karpurvalli, Karthali and Grand Naine. Price strategies need to be revamped to better reflect real demand and supply. This can affect supply therefore production planning must consider this point for price elasticity protection. The present study was undertaken to investigate the variation in banana prices at Burhanpur market, a leading market of Madhya Pradesh.

METHODOLOGY

In order to determine seasonal variation in prices of banana during 2013-14 to 2017-18, that is for five years, observations were made at open sale auction system market of Bhuranpur, Madhya Pradesh. The month-wise minimum, middle and maximum banana process was collected from the Krushi Uttpanna Bazar Samittee, Bhuranpur office. The present study utilized

the month-wise minimum, middle and maximum prices of banana from 2013-14 to 2017-18. Data were analyzed statistically on quarterly simple descriptive statistics such as mean, standard deviation, range, kurtosis and skewness etc (Rangaswamy 2016).

$$\textit{Arithmetic mean } (\bar{x}) = \frac{1}{n}\sum_{i=1}^{n} x_i$$

$$\textit{Standard Deviation } (\sigma) = \frac{1}{n-1}\sum_{i} (x_i - \bar{x})^2$$

Range= Largest value - Smallest value

Measures of skewness and kurtosis:

$$\gamma_1 = \sqrt{\beta_1} = \frac{{\mu_3}^2}{{\mu_2}^3}, \gamma_2 = \beta_2 - 3$$

The yearly data were subjected to analysis and the graphs were obtained by Microsoft Excel.

RESULTS and DISCUSSION

The results of quarterly descriptive statistics for prices of banana at Burhanpur market are presented in Table 1. The minimum prices of banana for quarter Q_1 (Jan - March) ranged from Rs 101 to 971/q with a mean of Rs 566.93/q. For quarter Q_2 (April - June) these ranged from Rs 121 to 531/q with mean of Rs 347.67/q while for quarter Q_3 (July - Sept) these ranged from Rs 221 to 751/q with mean of Rs 456.27/q and finally for quarter Q_4 (Oct - Dec) prices varied from Rs 101 to 801/q with mean of Rs 457.93/q. It indicated that variation in minimal prices of banana at Burhanpur market were highest during quarter Q_1 (Jan - March) followed by Q_4 and Q_3. However the lowest variation in prices was observed in quarter Q_2. This could be due to the reason that availability of banana fruits in market was least as harvesting of October-planted banana was over; very few banana fruits were available from late planting and early Mrig Baugh planting (May planting). Similarly it is a season of mango and less consumption of banana. The quarterly minimal prices of banana did not follow normal distribution. The quarters Q_1, Q_2 and Q_3 showed the curve platykurtic ($\gamma_2 < 0$). It means that minimal quarterly prices of banana were more flatten than normal curve. However in last quarter, Q_4 it observed leptokurtic curve ($\gamma_2 > 0$) that means curve was more peaked than normal. The negative value of skewness (γ_1) indicated that the distribution for prices was negatively skewed for quarters Q_1, Q_2 and Q_4 while positively skewed for quarter Q_3.

The middle prices of banana for quarter Q_1 (Jan - March) ranged from Rs 450 to 1,700/q with a mean of Rs 1,223.20/q. For quarter Q_2 (April - June) these ranged from Rs 481 to 1,275/q with mean of Rs 949.13/q while for quarter Q_3 (July - Sept) these ranged from Rs 750 to 1,754/q with mean of Rs1,072.80/q and finally for quarter Q_4 (Oct - Dec) prices varied from Rs 380 to 1,595/q with mean of Rs1,039.07/q. It indicated that variation in middle prices of banana at Burhanpur market was highest during quarter Q_3 (July - Sept) followed by quarters Q_1 and Q_4. However the lowest variation in prices was observed in quarter Q_2. The quarterly middle prices of banana did not follow normal distribution. The quarter Q_2 showed the curve platykurtic ($\gamma_2 < 0$). It means that middle quarterly prices of banana were more flatten than normal curve. The quarter Q_1 (0.02) showed nearly mesokurtic curve just like the normal one. However Q_3 and Q_4 observed leptokurtic curve ($\gamma_2 > 0$) that means curve was more peaked than normal. The negative value of skewness (γ_1) indicated that the distribution for prices was negatively skewed for quarters Q_1, Q_2 and Q_4 while positively skewed for quarter Q_3 .

The maximum prices of banana for quarter Q_1 (Jan - March) ranged from Rs 692 to 2,490/q with a mean of Rs 1,526.53/q. For quarter Q_2 (April - June) these ranged from Rs 695 to 1,811/q with mean of Rs 1,279.73/q. For quarter Q_3 (July -Sept) these ranged from Rs 1,153 to 2,300/q with mean of Rs 1,620.87/q and finally for quarter Q_4 (Oct - Dec) prices varied from Rs 480 to 1,760/q with mean of Rs 1,402.60/q. It indicated that variation in maximum prices of banana at Burhanpur market was highest during quarter Q_1 (Jan - March) followed by quarters Q_4 and Q_2. However the lowest variation in prices was observed in quarter Q_3. In this quarter the harvesting of June planting and early Kande Baugh occurred and there was abundant availability of fruits in the market. The

Table 1. Quarterly descriptive statistics of minimum, median and maximum prices of banana in Burhanpur market of Madhya Pradesh (2013-14 to 2017-18)

Component	Q_1 (Jan to March)	Q_2 (April to June)	Q_3 (July-Sept)	Q_4 (Oct to Dec)
Minimum price (Rs/q)				
Arithmetic mean ($\bar{x}$)	566.93	347.67	456.27	457.93
Range	870	410	530	700
Minimum	101	121	221	101
Maximum	971	531	751	801
Standard deviation (σ)	287.32	128.15	153.84	187.51
Kurtosis	-1.01	-1.23	-0.22	0.12
Skewness	-0.18	-0.10	0.26	-0.03
Median price (Rs/q)				
Arithmetic mean ($\bar{x}$)	1,223.20	949.13	1,072.80	1,039.07
Standard deviation (σ)	367.94	222.57	282.74	309.77
Range	1,250	794	1,004	1,215
Minimum	450	481	750	380
Maximum	1,700	1,275	1,754	1,595
Kurtosis	0.02	-0.36	1.04	0.28
Skewness	-0.90	-0.40	1.13	-0.19
Maximum price (Rs/q)				
Arithmetic mean ($\bar{x}$)	1,526.53	1,279.73	1,620.87	1,402.60
Standard deviation (σ)	469.59	330.18	320.04	338.75
Range	1,798	1,116	1,147	1,280
Minimum	692	695	1,153	480
Maximum	2,490	1,811	2,300	1,760
Kurtosis	0.22	-0.81	-0.03	3.08
Skewness	0.19	-0.06	0.37	-1.73

Q= Quarter

demand for banana fruits was also more due to more religious functions and fasts during these months. The quarterly maximum prices of banana did not follow normal distribution. The quarter Q_2 and Q_3 showed the curve platykurtic ($\gamma_2 < 0$). It means that maximum quarterly prices of banana were more flatten than normal curve. However quarters Q_1 and Q_4 obtained leptokurtic curve ($\gamma_2 > 0$) that means curve was more peaked than normal. The negative value of skewness (γ_1) indicated that the distribution for prices was negatively skewed for quarters Q_2 and Q_4 while positively skewed for quarters Q_1 and Q_3.

The year-wise quarterly average minimum, middle and maximum prices of banana at Burhanpur market are displayed in Figs 1 to 3 which indicate that out of five years for quarters Q_1, Q_2 and Q_4 lowest average minimum prices of banana were observed during the year 2015-16 and highest during the year 2013-14. However for quarter Q_3 highest prices were observed during year 2016-17 and lowest during 2015-16 (Fig 1). The highest middle prices of banana were observed during the year 2016-17 and minimum during 2015-16 in the quarter Q_1 (Jan - March). For quarters Q_2 and Q_3 lowest average middle prices were observed during year 2013-14 and highest during 2016-17. However lowest prices were observed during 2015-16 and highest during 2013-14 (Fig 2). The highest maximum average prices of banana for Q_1 were observed during 2016-17 and lowest during 2015-16. In quarter Q_2 these were highest during 2016-17 and lowest in 2013-14 while in quarter Q_3 highest average prices were observed in 2016-17 and lowest in 2013-14. For quarter Q_4 lowest average maximum prices of banana were observed during 2015-16 and highest during 2013-14 (Fig 3). It means that year-wise average minimum, middle and maximum prices were very fluctuating in nature. It was thus concluded that banana prices fluctuated and variation was observed in them. The findings of the study may be helpful to the agricultural economics researchers to consider carefully on estimation of prices of banana in different seasons.

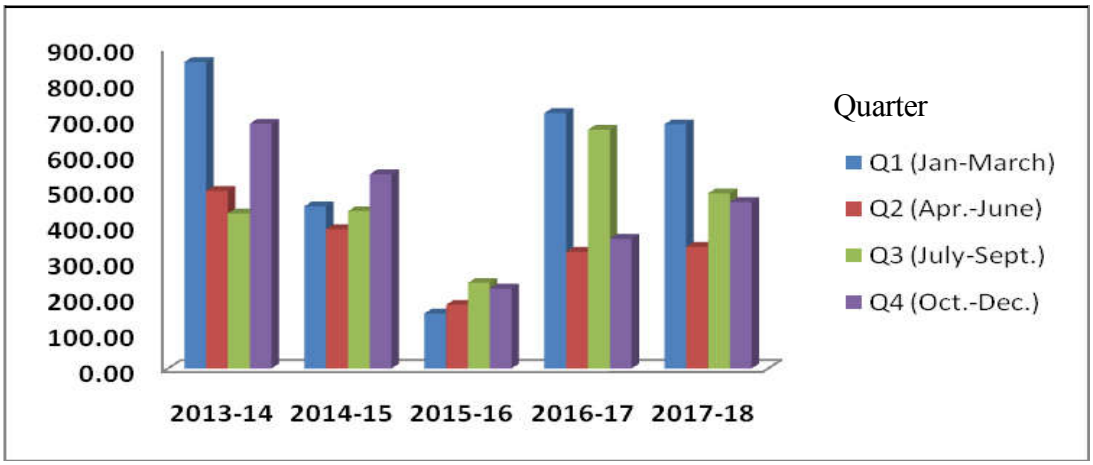

Fig 1. Year-wise quarterly average minimum banana price (Rs/q) in the Burhanpur market

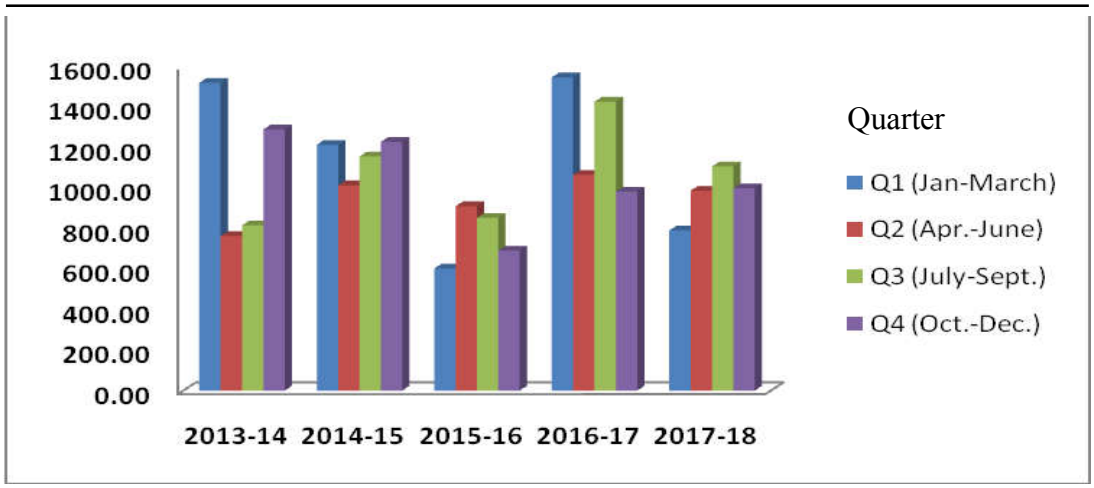

Fig 2. Year-wise quarterly average middle banana price (Rs/q) in the Burhanpur market

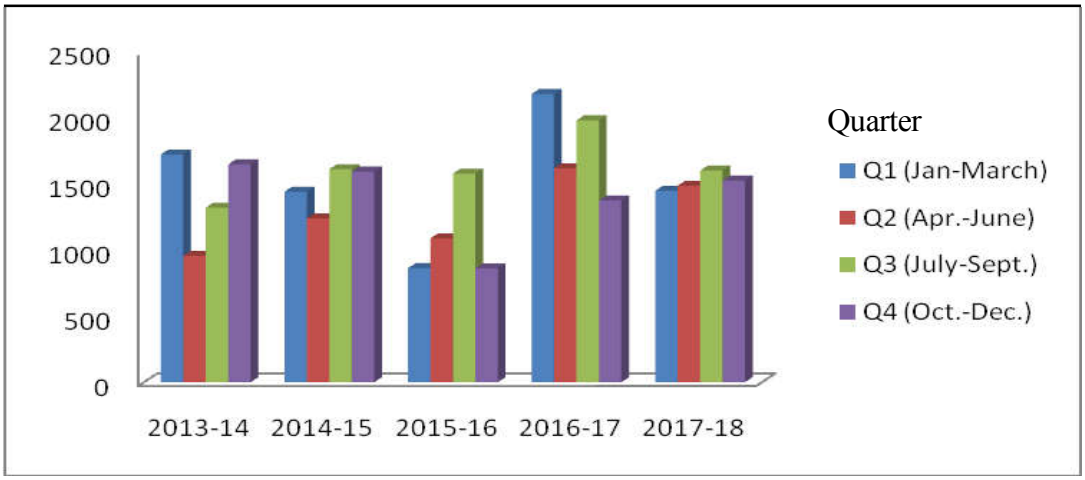

Fig 3. Year-wise quarterly average maximum banana price (Rs/q) in the Burhanpur market

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