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Research Article

Spatial and Temporal Comparative Analysis of Agricultural Product Selling Price

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Abstract

Data mining is process of analysing the set of data for finding the trends or patterns present in data values. Data mining techniques and steps may found supportive to determine practical and effective solutions for the problems(Majumdar, Naraseeyappa, and Ankalaki 2017). Soybean production has been widely promoted in India for improving farmer's income. In Maharashtra State, the area under soybean cultivation has crossed 4124.01 hectares with total production of 4825.63 tonnes in last few years. Farmers mostly prefer soybean crop as one of the profitable crops. Most of the time, farmers produce this crop and hold for sell it for right time and right market to achieve higher commercial returns. The present study was conducted to check and find the variations of the soybean selling prices in the ten commodity markets of Marathwada region of Maharashtra, India. Primary data was collected through online portal agmarknet.gov.in for the daily selling price of selected ten commodity markets from the period of 1st November, 2023 to 15th February 2023. Statistical mean of minimum, maximum and modal prices of soybean crop were calculated for each ten markets and then compared. Deviation of ₹161.70 to ₹ 660.69 in maximum selling prices were seen among these commodity market. For minimum selling price, this deviation was from ₹ 169.55 to ₹ 560.15.

INTRODUCTION

In agriculture sector where farmers and agribusinesses have to make innumerable decisions every day like right cultivation, irrigation and harvesting time (Majumdar et al. 2017). Similarly, now it is equally important to decide the right time to sell the agriculture products. Soybean production has been widely promoted in India for improving farmer's income. It belongs to family Leguminoseae, sub-family Papilionoideae and genus Glycine. It is mainly grow in Kharif season. In Maharashtra State, the area under soybean cultivation during 2019-20 was 4124.01 hectares with total production of 4825.63 tonnes(Verma, Sharma, and Singh 2018).

Soybean is one of the most commercially popular crop among the farmers. As routine practices, farmers produce, harvest the crop and wait for right time and right market to sell it to achieve high economical returns. Commodity Markets have a crucial role to play in the price risk management process especially in Agriculture(Nadu and Nadu 2018). Study was conducted stating that knowledge about crop price found supportive to take an intelligent decision before farming a specific type of crop(Dhanapal et al. 2021). Keeping in view of importance of Soybean crop in Marathwada and region, this study analyses selling prices of Soybean at different APMCs (Agriculture Produces Market Committees) in Marathwada regions and surrounding.

Soybean selling prices in the APMCs are fickle and changes over market place and time. The fluctuation in prices affects wide variation in the income of soybean growers (Gu et al. 2022) from season to season. It is difficult for growers to decide the right time to sell the soybean as some times market goes high at the end or just after the harvesting or rates may remain declined for longer period. The growers are always in dilemma whether to wait or sell the product. The aim of this research is to obtain relationship among selling prices over time and market place to know whether variability in the prices of soybean has intensified over place and time

As per the study perform for forecasting the commodity prices, fluctuations in agricultural commodity prices affect the supply and demand of agricultural commodities and have a significant impact on consumers. Accurate prediction of agricultural commodity prices would facilitate the reduction of risk caused by price fluctuations.(Gu et al. 2022). Fluctuations in prices of agricultural commodities can affect both consumers and producers adversely. Thus, price stabilization programs are an integral part of food policy in both developing and developed countries. Since India's independence in 1947, stability of the domestic prices has been one of the main objectives of the Indian food policy(Sonam Gupta 2003). A review conducted has investigated the importance of agricultural product pricing and various methods used to analyse it(Sun et al. 2023).

Different state governments levy different taxes on transactions carried out at these market yards. As a result, the spot prices prevailing at these markets vary widely for a commodity. For example, the spot price of "fair average quality (FAQ)" wheat at four different markets can vary up to INR 850 per tonne on a given day (Rajib 2015). In agriculture sector where farmers and agribusinesses have to make innumerable decisions every day and intricate complexities involves the various factors influencing them(Majumdar et al. 2017).

MATERIALS AND METHODS

The study is based on the data of selling prices of Soybean from Marathwada and surrounding region of Maharashtra State of India recorded at government agriculture commodity portal. Primary data was collected through online portal www.agmarknet.gov.in for the daily selling price of selected ten commodity markets. Ten random APMC including Jalna, Paithan, Chakur, Bhokar, Chikhali, Dharmabad, Jintur, Purna, Manwat and Kannad were selected for the soybean selling price.

This data was collected for soybean selling season period from 1st November, 2023 to 15th February 2023. Daily recorded 60-70 samples of selling prices from these markets making total 539 samples were considered for this study.

Table 1: List of APMCs and number of entries

Sr.No.	Name of APMC	No of Entries
1	Jalna	62
2	Chikhali	55
3	Paithan	60
4	Chakur	68
5	Bhokar	73
6	Dharmabad	50
7	Jintur	63
8	Purna	15
9	Manwat	34
10	Kannad	59
	Total	539

Data mining technique plays vibrant role in the data analysis. These techniques vary from statistical to artificial intelligence based methods. In current research, statistical techniques are used for data processing. Initially, data collected from the portal were pre-processed to remove outliers and incomplete entries. Applying statistical formulas on the collected entries, mean values and standard deviations (SD) for maximum price, minimum price and modal (most occurred) price for the said period were calculated as shown in table 2 for each APMC. Equation 1 and 2 were used to calculate the mean and SD values

$$Mean = \sum_{i=1}^{n} Xi/n \quad \text{..... (1)}$$

$$SD = \sqrt{\frac{\sum(Xi-Mean)^2}{n}} \quad \text{.....(2)}$$

Table 2: Mean of max, min and modal selling prices of each APMC

APMC	Avg. Min Price	Avg. Max. Price	Avg. Modal price	SD Min	SD Max	SD Modal
Jalna	4281.85	5505.82	5254.84	363.62	259.84	171.71
Chikhali	4721.42	5522.31	5127.35	161.70	303.30	192.47
Paithan	4998.03	5191.87	5137.97	660.69	560.15	556.77
Chakur	4982.76	5506.47	5379.91	368.93	185.08	160.55
Bhokar	4334.85	5365.66	4850.33	542.39	196.26	256.75
Dharmabad	5015.60	5500.40	5265.30	262.86	209.84	195.75
Jintur	4700.00	5430.76	5287.56	0.00	169.55	139.73
Purna	4973.40	5415.87	5334.40	365.68	212.38	165.08
Manwat	4779.76	5416.00	5242.65	260.38	184.58	165.66
Kannad	4919.53	5302.81	5126.76	501.42	284.53	350.86

RESULTS & DISCUSSION

For easy comparison of variations in APMCs, Table values for minimum and maximum SD values were plotted in the graph as shown in figure 1 and figure 2 respectively.

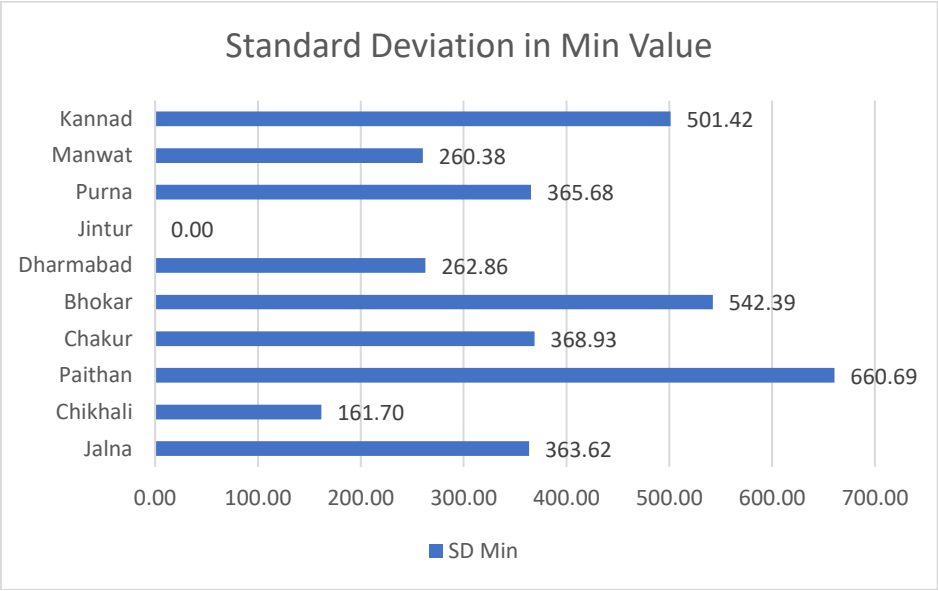

Figure 1: APMC wise Deviation in Minimum Soybean Selling Price

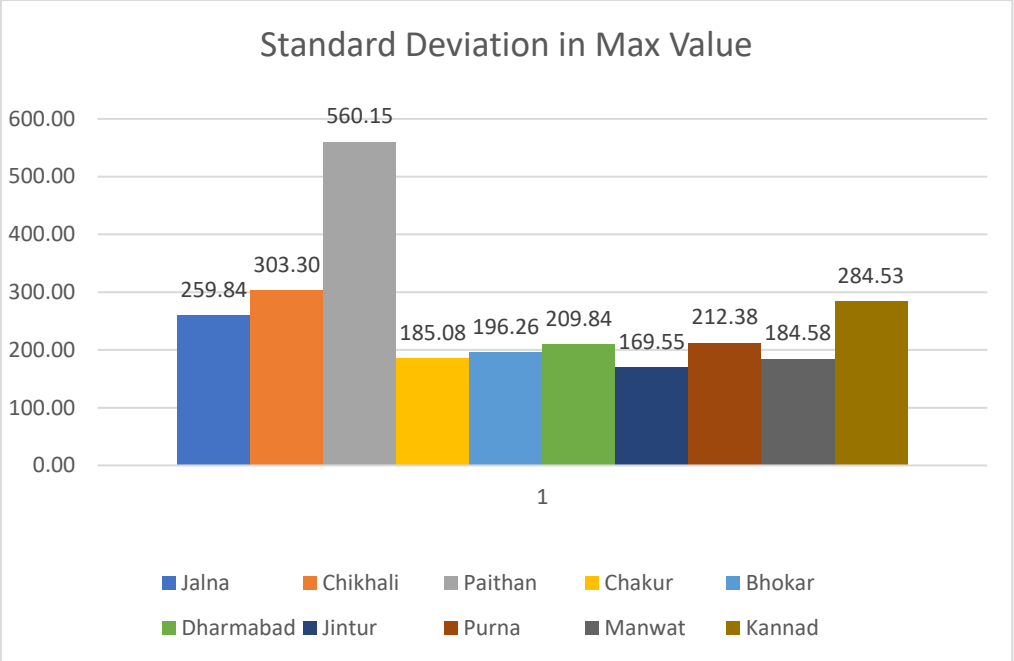

Figure 2: APMC wise Deviation in Maximum Soybean Selling Price

Conclusion

From the figure 1 and figure 2, it is clearly observed that largest fluctuation of ₹ 560.15 is found in maximum soybean selling price of Paithan APMC whereas lowest deviation was in Jintur APMC with ₹ 169.55. Similarly, In Paithan APMC, more deviation of ₹ 660.69 and no change is found for Jintur APMC in the minimum soybean selling price.

Overall, from the figure, it is found that Paithan APMC selling prices were more fluctuating than rest of the nine APMCs for the given period whereas Chakur, Bhokar, Jintur and Manwat APMC selling prices were comparatively more stable throughout the period. In future, the study can been extended to investigate with data from more growing season.

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