

Growth and Instability Analysis of Pepper with Reference to Production and Price

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Abstract

Black pepper, the most traded spice in the world is native to South India. Though Pepper is popularly known as black gold, it does not provide value of gold to its cultivators because of several persisting problems. Market imperfections, illegal imports, ineffective implementation of minimum import duty, lack of institutional support etc are some of the problems faced by pepper growers. Production of pepper has become unremunerative due to depressed prices in the domestic and/or global markets coupled with increasing input costs. In this context, the study has focused on trends in area, production and yield of pepper, seasonal effect of price and also impact of production of pepper on its prices to diagnose reasons for price fluctuations. The main objective of the study is to examine trends in area, production and productivity in major pepper producing states and monthly price variations of pepper in India. The study relies on time series data. The data on area, production, productivity and monthly average price of pepper have been collected from Spices Board of India. In order to study the behaviour of prices of pepper in different months, seasonal effect has been constructed. In order to study the interrelationship between price of pepper with its production and different months, correlation technique has been employed. Regression analysis is being undertaken to know the present and future price trends of pepper. The time-series analysis of the monthly average prices of pepper is attempted from 2018-19 to 2022-23.

The study suggests that the pepper growers need not be panic even though the market price appears to be decreasing as the unit change in month brings about a small change in price. The study also suggests that, if the government could provide enough institutional support to stabilise the market prices, the pepper growers would certainly consider their crop as black gold.

Keywords: *Agriculture, Black Pepper, Price Fluctuation, Area, Production, Productivity.*

Introduction

The prices of agricultural produce are important for farmers as these determine their incomes. The movements of agricultural prices over the last many years' reveals two major features: rising trend and many fluctuations. It is well known that agricultural prices have a tendency to display wider fluctuations. Deficiency in supply relative to demand and increase in per-capita income are the causes for increase in

agricultural prices (Desai,1977). In a country like India where the emphasis is being laid down on planned development of economy the role of price mechanism cannot be undermined in affecting desired adjustment in production (Koshta et. al. 1990). The agricultural price policy reshapes the allocation of resources and distribution of income, not only within the agricultural sector, but also between the agricultural and non-agricultural sector (Satyasundarm, 1995). The major objective of agricultural price policy is to achieve price stability without destabilizing total revenue of the farmer and provide price support which would be economic to grower as well as agro-based industry and at the same time sub serve the interests of the consumers (Kahlon, A. S., & Singh, Karam,1980).

Black pepper, the most traded spice in the world is native to South India. Though Pepper is popularly known as black gold, it does not provide values of gold to its cultivators because of several persisting problems. Market imperfections, illegal imports, ineffective implementation of minimum import duty, lack of institutional support etc are some of the problems faced by pepper growers. Production of pepper has become unremunerative due to depressed prices in the domestic and/or global markets coupled with increasing input costs (Hema, M Kumar & Ranjit Sing, N.P., 2007). The presence of old and senile plants, lack of proper care and management, difficulty in harvests are the major reasons for the decline in acreage and production (Rageena S.,2014). Pepper growers are facing the problems such as heavy rainfall, labour scarcity, lack of finance. Scarcity of water resources, no integrated pest management system, high cost of organic farming which lead to low productivity of pepper Yogesh M S. (2017). In this context, the study has focused on trends in area, production and yield of pepper, seasonal effect of price and also impact of production of pepper on its prices to diagnose reasons for price fluctuations.

Objective and Methodology of the Study

Black pepper, being a trade dependent commodity, shows high degree of price fluctuations. The main objective of the study is to examine trends in area, production and productivity in major pepper producing states and monthly price variations of pepper in India. The study relies on time series data. The data on area, production, productivity and monthly average price of pepper have been collected from Spices Board of India. In order to study the behaviour of prices of pepper in different months, seasonal effect was constructed. Seasonal Effect helps to find out, during which season or month the price is high and favourable to the sellers. For constructing Seasonal Effect index, month-wise average price has been used and seasonal effect is computed by simple average method. In order to study the interrelationship between price of pepper with its production and different months correlation technique was employed. Regression analysis was being undertaken to know the present and future price trends of pepper. The time-series analysis of the monthly average prices of pepper was attempted from 2018-19 to 2022-23.

Results and Discussion

Pepper is considered to be originated in the hills of South Western Ghats of India. It is now extensively grown in three major states of India namely Karnataka, Kerala and Tamil Nadu. However, in all the states pepper is cultivated as a subsidiary crop along with arecanut, coconut, coffee, rubber and other plantation crops. The share of India in the World's Production of pepper was 9.24 percent in 2020 while the area under cultivation being was 22.06 percent.

Table1:
Area, Production and Productivity of Pepper in Major states

State	(Area in Hectare, production in Tons)	Year				
		2018-19	2019-20	2020-21	2021-22	2022-23
Karnataka	Area	148379	160770	211497	190000	180000
	Production	21000	30000	36000	39000	36000
	Yield	0.14	0.18	0.17	0.20	0.20
Kerala	Area	82761	83770	82124	76351	82000
	Production	17000	20000	22000	21000	21000
	Yield	0.20	0.23	0.26	0.27	0.26
Tamil Nadu	Area	5571	6080	6576	6973	6098
	Production	3000	3000	1750	2000	2000
	Yield	0.53	0.49	0.26	0.29	0.33
India	Area	244209	259148	309335	283962	278050
	Production	48000	61000	65000	70000	64000
	Yield	0.19	0.23	0.21	0.25	0.23

Source: Spices Board of India

Table1 presents state-wise area, production and productivity of pepper from 2018-19 to 2022-23. The data clearly indicates that Karnataka had highest area under pepper during 2018-19 with 148379 hectares which had significantly increased to 190000 hectares during 2022-23. Kerala state had 82761 hectares of area under pepper cultivation which fell down to 76351 hectares during 2022-23. The data shows that there was no significant increase in the area under pepper cultivation in Tamil Nadu.

Trends in Production

The data reveals that Karnataka is the major producer of pepper in all the studied years. The production was 21000 tons in 2018-19 which increased to 39000 tons in 2021-22 and there was a slight decrease to 36000 tons during 2022-23. However, as far the yield is considered Tamil Nadu has highest yield of pepper with 0.33 compared to Kerala with 0.26 and Karnataka with 0.20 per hectare during 2022-23. While the yield of pepper in Kerala and Tamil Nadu has been constantly increasing in spite of no significant increase in the area under cultivation. Hence, proper measures must be taken either to increase productivity of pepper or cultivation of alternative crop instead of pepper in Karnataka.

Table 2
Month-wise Seasonal Effect of Black Pepper Price in India

Months	Year						5 Years Total	Seasonal effect
	2018-19	2019-20	2020-21	2021-22	2022-23			
April	387.54	352.87	330.23	402.09	534.86	2007.59	0.98307385	
May	384.5	366.57	327.64	396.84	523.85	1999.4	0.97906338	
June	377.54	366.5	334	421.26	508.95	2008.25	0.98339704	
July	352.46	355.11	324.68	418.92	509.48	1960.65	0.96008834	
August	379.52	354.72	335.33	415.78	516.88	2002.23	0.98044917	
September	400.73	346.65	344.62	418.45	517.88	2028.33	0.99322979	
October	393.45	331.64	341.64	440.52	509.91	2017.16	0.98776008	
November	394.36	339.07	348	515.54	503.61	2100.58	1.02860906	
December	386.96	354	353.76	536.38	513.51	2144.61	1.05016961	
January	371.38	343.14	346.11	510.5	513	2084.13	1.02055385	
February	363.58	333.37	346.67	518.14	508.33	2070.09	1.01367876	
March	346.52	321.26	375.04	531.95	508.08	2082.85	1.01992706	
Total	4538.54	4164.9	4107.72	5526.37	6168.34	24505.87	12	

Source: <http://www.indianspices.com/monthly-price-domestic.html> accessed on 17.07.2023

The average price of pepper has been decreasing over the years. Table 2 gives data on the month-wise average price of pepper in India since 2018-19. The data reveals that the price is high from November to March as seasonal effect is more than one and low from April to October as the seasonal effect is less than one.

The time-series analysis of the monthly average prices of pepper was attempted from 2018-19 to 2022-23. The result and figure indicate that there is a strong positive correlation between the prices of pepper and different months. The regression equation indicates that there is negative relationship between X and Y variables (month and price respectively).

Model Summary		
Model	1	
R	.755 ^a	
R Square	.569	
Adjusted R Square	.562	
Std. Error of the Estimate	48.57249	
Change Statistics	R Square Change	.569
	F Change	76.668
	df1	1
	df2	58
	Sig. F Change	.000

a. Predictors: (Constant), Month

Table 3
Regression Analysis

	Model		1	
			(Constant)	MONTH
Coefficients^a	Unstandardized Coefficients	B	311.732	3.170
		Std. Error	12.700	0.362
	Standardized Coefficients	Beta	0	0.755
	t		24.546	8.756
	Sig.		.000	.000
	a. Dependent Variable: Price			

Source: SPSS output

The obtained correlation value is $r = 0.75$, which indicates that there is a strong positive relationship between two variables i.e., between price and different months.

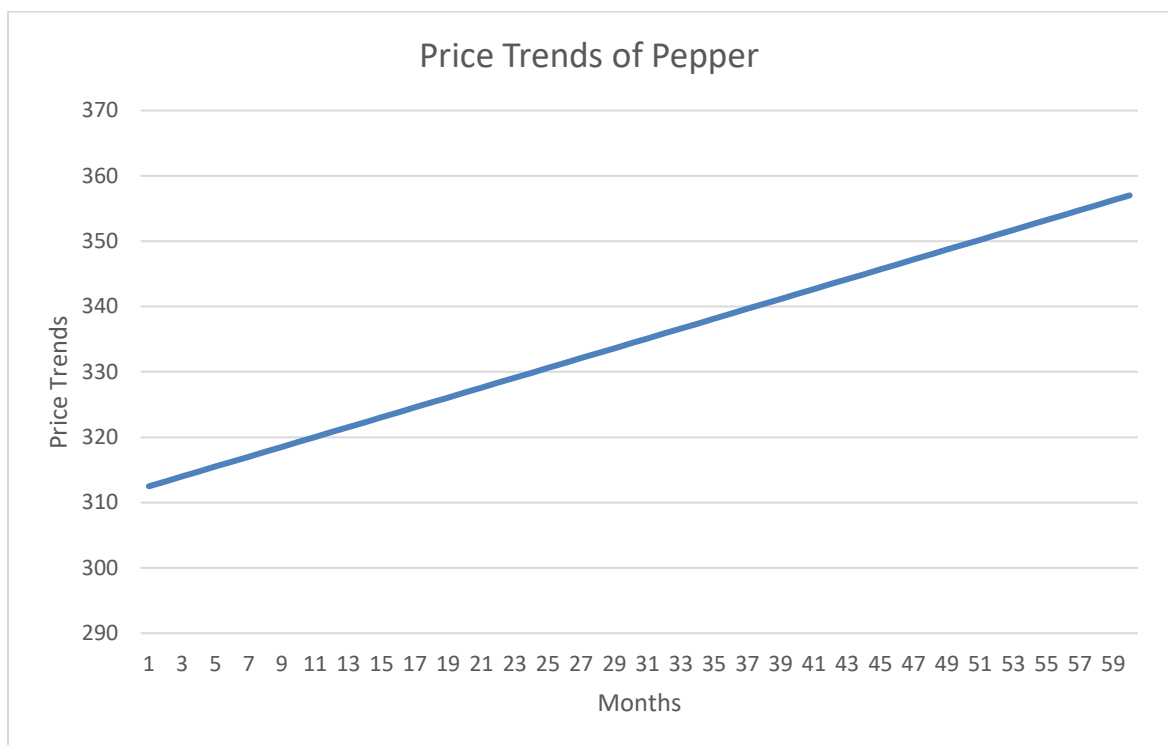


Figure 1:
Price Trends of Pepper

The obtained Regression equation of Y on X is $Y = 311.732 + 0.75X$. This regression equation indicates that there is positive relationship between X and Y. As shown in the Figure 1, a unit change in X brings about a change in Y in the same direction to the tune of 0.75 units.

Impact of Production on Price

To analyse the association between production and price of pepper, correlation technique has been used. The obtained correlation value is $r = 0.36$, which indicates that there is a weak positive relationship between two variables i.e., between price and production of pepper. Hence, the data and correlation result clearly indicate that price has not affected much on production of pepper.

Major Findings and Suggestions

The study revealed that Karnataka is the major producer of pepper in all the studied years. However, the productivity has fell down due to significant increase in the area under cultivation of pepper. Whereas, the yield of pepper in other states has been constantly increasing as there was no significant increase in the area under cultivation in Kerala and Tamil Nadu. Therefore, the reasons must be traced out for significant increase in the area under cultivation of pepper in Karnataka.

The study showed that price of pepper is more favourable from November to March as seasonal effect is more than one and less favourable to the growers from April to October as seasonal effect is less than one. This type seasonal price variation would affect small and marginal farmers who always sell their produce immediately after the harvest. Hence, there should be an institutional support from the government to support such growers and also to stabilise the price throughout the year. Proper awareness to farmers on post-harvest handling and value addition of pepper also can help them to realise better income from the crop (Rageena S, 2013).

The study revealed that there is a strong positive correlation between the prices of pepper and different months.

Regression analysis has been undertaken to know the present and future price trends of pepper in the study. The regression equation indicates that there is positive relationship between X and Y variables (month and price respectively).

The study has analysed the association between production and price of pepper, in order to understand the impact of production on the price of pepper. The obtained correlation indicates that there is a positive relationship between two variables i.e., between price and production of pepper. However, the value clearly shows weak positive correlation between price and production.

Government should establish institutions to procure agricultural crops when they fetch lower prices and sell when the market price jumps up. So that the governments could use that money so received for developmental activities in the country.

There should ban on poor quality pepper imported from other countries. Systematic mechanism with the help of modern technology should be evolved to check the quality of pepper.

The government has already fixed Rs 500 as the import duty on pepper. The government must strictly adhere to the import duty during the time of importation. There should be proper checking on the illegal imports of pepper into the country.

Database network for the entire country and each block should be developed so as to enable the flow of produce to the point of demand, avoiding any speculations in prices. This needs proper funding from the

governments. However, database network cannot be maintained when the produce is sold to private traders in the outside market.

The privately owned business houses must come up to bolster the growers, especially small and medium growers of black pepper. Processing units should be developed for wide expansion of value-added products of pepper.

Conclusion

Though Pepper is popularly known as black gold, it does not provide values of gold to its cultivators because of several persisting problems. Market imperfections, illegal imports, ineffective implementation of minimum import duty, lack of institutional support etc are some of the problems faced by pepper growers. In this context, the study has focused on trends in area, production and yield of pepper and also seasonal effect of price to diagnose reasons for price fluctuations. The study suggested that the pepper growers need not be panic even though the market price appears to be decreasing as the unit change in month brings about a small change in price. The study also suggested that, if the government could provide enough institutional support to stabilise the market prices, the pepper growers would certainly consider their crop as black gold.

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