



ISSN: 0975-833X

RESEARCH ARTICLE

PEPPER PRODUCTION AND EXPORT FROM INDIA: GROWTH AND INSTABILITY ANALYSIS

*Anju Jacob and Elsamma Job

Department of Agricultural Economics, Kerala Agricultural University, Vellayani

ARTICLE INFO

Article History:

Received 14th June, 2015
Received in revised form
17th July, 2015
Accepted 21st August, 2015
Published online 30th September, 2015

Key words:

Pepper market,
Producing country.

ABSTRACT

India is the largest producer and exporter of spices in the world and is called as the 'spice bowl of the world'. During 1960s, with 25 per cent share in world production and 20 per cent share in world export, India was the major producer and exporter of pepper in the world but unfortunately India is losing its comparative advantage in world pepper market. Since the early 2000s, Vietnam has emerged as the leading producer and exporter of pepper in the world market. Kerala accounts for more than 90 percent of the total area and production of pepper in India. The compound growth rate analysis revealed that there was a decrease in the growth rate of area, production and productivity of pepper in Kerala. The export value showed a growth rate of 19.68 percent during 2005-06 to 2013-14 and export quantity showed a negative growth rate of 2.87 during the same period. The incidence of pest and disease was found to be the major reason for the decrease in the production of pepper. The export quantity and value of pepper exemplified high instability whereas the instability in area, production and productivity of pepper were comparatively low. Other pepper producing countries like Vietnam, Srilanka etc. Are posing serious challenge to Indian pepper export in the international market. Appropriate measures should be taken to stabilize the prices in domestic and international markets. The supply of pepper should be regulated in order to prevent fall in price. As majority of pepper growing farmers are small and marginal farmers, incentives should be given to prevent them from shifting to other crops.

Copyright © 2015 Anju Jacob and Elsamma Job. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Citation: Anju Jacob and Elsamma Job. 2015. "Pepper production and export from India: Growth and instability analysis", *International Journal of Current Research*, 7, (9), 20388-20391.

INTRODUCTION

India is the largest producer and exporter of spices in the world and is called as the 'spice bowl of the world'. Pepper is one of the most popular spices in India which is cultivated in the state of Kerala, Karnataka and Tamil Nadu. In olden times India had a prominent position in the world pepper market and was a trade destination for many countries which were attracted by the valuable Malabar Grade Black Pepper. During 1960s, with 25 per cent share in world production and 20 per cent share in world export, India was the major producer and exporter of pepper in the world (Nagoor, 2010). Recently, India is losing its comparative advantage in world pepper market especially after the trade liberalisation under the WTO regime due to competitive disadvantage in the production of pepper in India. Since the early 2000s, Vietnam has emerged as the leading producer and exporter of pepper in the world market. The average annual production of Vietnam was approximately three times higher than that of India. India ranks behind Vietnam and Indonesia in total pepper production with 53,000 tonnes in 2013 whereas it was 1,63,000 tonnes and 88,700 tonnes respectively for Vietnam and Indonesia.

Kerala accounts for more than 90 percent of the total area and production of pepper in India. The total area under pepper in Kerala declined to 84,065 ha in 2013-14 from 2,37,998 ha in 2005-06. The production and productivity of pepper also have showed a remarkable decline during the period. The highest production of pepper in Kerala was about 80,000 tons achieved in 2005 and was dropped to 29,408 tonnes in 2013-14 with the lowest production of 33,991 tonnes in 2008. The decrease in production was due to pests and diseases problems and the existence of old and unproductive vines (International Pepper Community, 2015).

India's share in world export of pepper was 8.09 percent (2002-2011). The total spices exports from India was 1029.3 thousand tonnes (0.8 percent of total exports) during 2013-14 among which pepper contributed to 2.39 percent. The quantity and value of pepper exported from India showed a highly fluctuating trend along with the price of pepper in domestic as well as international markets. Pepper was one of the major export earning crops in India and the percentage share of pepper in total spices export was 18 percent during early 1990s later it declined to 2.39 percent in 2013-14. In order to bring back the period of glory of pepper trade immediate attention should be given to the cultivation and trade aspects of pepper. In this context it is important to study the growth and instability

*Corresponding author: Anju Jacob

Department of Agricultural Economics, Kerala Agricultural University, Vellayani

in pepper production and trade. The present study was carried out with the specific objectives of analyzing the growth and instability in production and export of pepper from India.

MATERIALS AND METHODS

For analysis purpose, the collected data were divided into three period's viz., Period 1 (1985-86 to 1994-95), Period 2 (1995-96 to 2004-05) and Period 3 (2004-05 to 2013-14).

Compound Annual Growth Rate (CAGR)

In the present study, compound growth rates in area, production, productivity and export quantities of pepper were estimated by using the exponential growth function of the form,

$$Y = a b^t$$

Where,

Y = area, production, productivity and export quantities of pepper in year 't'

a = intercept

b = regression coefficient

t = time variable

The equation was estimated after transforming as follows

$$\log Y = \log a + t \log b$$

Then, the per cent compound growth rate (G) was calculated using the relationship

$$G = [(\text{antilog of } b) - 1] \times 100$$

Instability analysis

The variability in the area, production, export value, export quantity and price have been measured using Cuddy-Della Valle index (CDVI) which is used as a measure of variability in time series data. CDVI was originally developed by John Cuddy and Della Valle for measuring the instability in time series data that is characterized by trend (Cuddy and Della Valle, 1978). The simple coefficient of variation (CV) overestimates the level of instability in time series data characterized by long-term trends, whereas the Cuddy-Della Valle Index corrects the coefficient of variation by the equation,

$$I = (CV) (1 - \bar{R}^2)^{0.5}$$

Where,

I is the Cuddy-Della Valle Index

CV is the coefficient of variation in %

CV = (Standard deviation/Mean) *100

\bar{R}^2 is the adjusted coefficient of determination from time trend regression adjusted by the number of degrees of freedom.

RESULTS

Growth in area, production, productivity and export of pepper

The results of the analysis of growth rate in area, production and productivity of pepper in the three sub periods are

presented in Table 1. Area showed a growth rate of 4.9 percent in period 1. During 1985-86 the area under pepper in Kerala was 1,21,565 ha and increased to 1,86,720 ha in 1994-95. The growth rate decreased into 2.58 percent in period 2 and further decelerated in period 3 as indicated by the negative growth rate of 12.94 percent. Production recorded a growth rate of 5.65 percent in period 1 and declined to 2.37 percent in period 2. An alarming negative growth rate of 8.43 percent was observed in period 3. The massive destruction of pepper vines as a result of a disease caused by *Phytophthora capsici* since 1990s was a major reason for the negative growth rate in pepper production. Study by Soumya *et al.*, on the growth and instability of spices, also reported that the decrease in area and productivity of pepper was due to incidence of phytophthora foot rot and pest attacks. Price crisis and unfavorable weather conditions were found to be the other major reasons for the decline in the production of pepper in the recent years. Sudheer (2014) in his study revealed that there is a negative correlation between the annual rainfall and the pepper production. Heavy rain fall in North West monsoon season always badly affects the pepper fructification of pepper.

In the case of productivity negative growth rate was observed only in the second period and the growth rate increased to 3.55 percent in period 3. Productivity showed a very low yet positive growth rate when compared to the negative growth rates of area and production. The productivity of pepper in Vietnam and China is around 2000 kg/ha and productivity of pepper in Kerala is about 334 kg/ha on an average which is another challenge which has to be met with. The low productivity in Kerala was mainly due to the incidence of pests and diseases, senility of plants, ill maintained farms and poor farm management, non-popularization of elite cultivars, depletion of soil fertility, damage of live standards due to pest attack, lack of long term investments for improving the crop etc. According to the evaluation report of Kerala state planning board (2011), the very poor and declining performance of pepper production in the state is attributed to higher production cost, increased cost of labour, market uncertainty, lack of proper manuring, poor marketing facilities and lack of processing industries and warehousing facilities in rural areas. The export of pepper from India in terms of value and quantity showed a fluctuating nature.

Table 1. Period wise compound growth rate of area, production and productivity of pepper

Particulars	Period 1 (1985-86 to 1994-95)	Period 2 (1995-96 to 2004-05)	Period 3 (2005-06 to 2013-14)
Area	4.9*	2.58*	-12.94*
Production	5.65*	2.37	-8.43**
Productivity	0.71	-0.2	3.55
Export value	7.87	-12.01	19.68*
Export quantity	-1.68	-10.04*	-2.87
Export unit value	-1.88	-2.19	23.22*

*Significant at 1% level of significance

** Significant at 5% level of significance

A high growth rate of 19.68 percent was observed for export value in period 3. Export value of pepper was 12,14,000 thousand INR in 2004-05 which boost in to 94,00,230 thousand INR in 2013-14. It is noteworthy to mention that this high

growth rate was obtained after a negative growth rate witnessed in period 2. The high growth rate in export value was attributed to the increase in price of pepper in both international and domestic markets. Export quantity demonstrated negative growth rate in all the periods and the growth rate improved in period 3 (-2.87 percent) than that of period 2 (-10.04 percent). Export unit value showed a growth rate of 23.22 percent in period 3 while both the other periods showed a negative growth rate. In 2005-06 the export unit value was 84.13 Rs/kg and 442.36 Rs/kg in 2013-14.

Asian countries like Vietnam, Srilanka and Thailand have emerged as major producers of pepper and their domestic consumption is practically nil. Therefore, major portion of the total pepper produced in these countries are exported. Especially, Vietnam's pepper export of more than 1,20,000 tonnes accounts for 40% of volume and 50% of market share worldwide and exports of pepper in 2014 set a record of 1 billion USD (Vietnam Trade Promoting Agency, 2015). Also, the prices of pepper exported from these countries are low when compared to Indian pepper and these cheap exports have adversely affected the market of Indian pepper. The FOB (Freight on Board) price of Indian pepper was 9680 USD/MT and that of Vietnam and Indonesia were 8294 USD/MT and 8394 USD/MT respectively during early 2015. Many of the regular buyers for Malabar pepper like USA have switched over to cheaper pepper from other origins to satisfy their requirements.

Compared to India, the annual domestic consumption of pepper in Vietnam is very less. Their annual domestic consumption is around ten per cent of their production. But in the case of India the two dimensions of the emerging problems related to the Indian pepper industry can be attributed to the sharply declining production of pepper and constantly increase in its domestic consumption (Sudheer, 2014). From the above facts it is evident that other producing countries like Vietnam, Srilanka etc. are posing serious challenge to Indian pepper export in the international market.

Instability in area, production, productivity and export of pepper

Table 2 presents the results of estimated instability in area, production, productivity and export of pepper from India. It was observed that area, production and productivity have registered the lowest instability in period 1 than in the other two periods. It is interesting to observe that the instability in area increased to 14.62 in period 3 from 3.08 and 3.05 in period 1 and period 2 respectively. Production showed maximum instability of 13.06 in period 3 whereas productivity showed maximum instability of 14.7 in period 2. The trend in area, production and productivity is illustrated in Fig. 1. Area showed an increasing trend until 2005-06 and thereafter it started declining. Production and productivity showed slight variability over the years. The productivity showed high instability during this period due to the pest and disease infestation (Spices board, 2014) and due to senile plantations. The fluctuation in price is found to be one of the major reasons due to which farmers shifted from pepper cultivation to other crops leading to increase in area instability. Further, frequent

droughts and fluctuating temperature adversely affected the yield of pepper. Although it is a rainfed crop, the yield can be increased by about 50 per cent through irrigation in summer. Contrastingly, a majority of spice-growing farmers being small and marginal, making big investment in sprinkler irrigation remains a daunting task for them (Hema, et. al, 2007).

Table 2. Period wise instability index in area, production, productivity and export of pepper

Particulars	Period 1 (1985-86 to 1994-95)	Period 2 (1995-96 to 2004-05)	Period 3 (2005-06 to 2013-14)
Area	3.08	3.05	14.62
Production	10.76	12.96	13.06
Productivity	10.39	14.7	13.80
Export value	80.72	40.74	34.26
Export quantity	22.28	24.16	22.56
Export unit value	8.26	26.61	13.12

A high instability of 80.72 was observed for export value in period 1 which stabilized to 34.26 in period 3. Export quantity showed maximum instability during period 2 (24.16) and for export unit value the instability was maximum in period 2 (26.61).

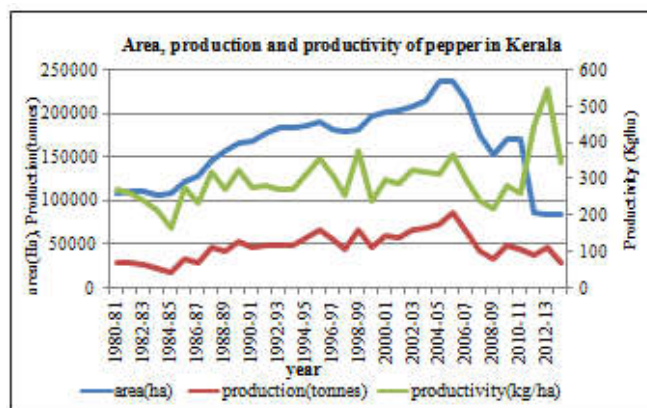


Fig. 1. Area, production and productivity of pepper in Kerala

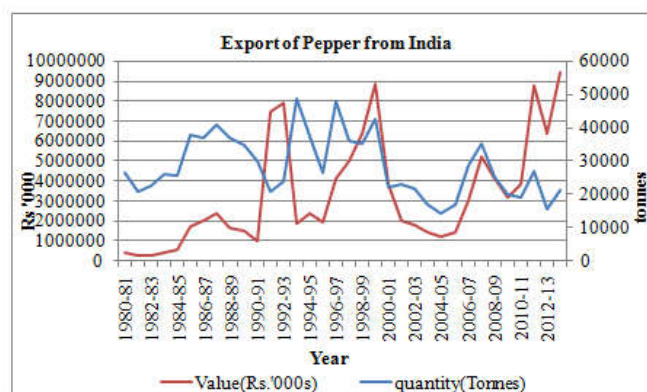


Fig. 2. Export of pepper from India

Fig. 2 shows the trend in export of pepper from India in terms of quantity and value. The main factor responsible for variation in export quantity is the ups and downs taking place in the production of pepper. Total production of pepper in Kerala was subjected to inter year variations (Fig. 1). The short supply in

global market and cautious pricing by major countries like Vietnam has pushed up the pepper prices in the international markets. Krishnadas, 2010 in his study revealed that the main sources of instability in pepper exports were the change in mean export quantity, change in mean export price and change in export quantity-price covariance. Fig. 2 shows the trend in export of pepper from India in terms of value and quantity. Both export quantity and value showed high variability. The instability in export was high whereas instability in area, production and productivity were low.

Conclusion

The growth rate of pepper showed a significant negative value for area and production in period 3 revealed that there was a decline in area and production of pepper during 2005-06 to 2013-14. Instability in area and production also marked an increase in this period. Measures should be taken to enhance the area and production of pepper in Kerala. Export quantity showed a negative growth rate which is attributed to the decrease in production of pepper. The export quantity and value of pepper exemplified high instability whereas the instability in area, production and productivity of pepper were comparatively low. Appropriate measures should be taken to stabilize the prices in domestic and international markets. The supply of pepper should be regulated in order to prevent fall in price. As majority of pepper growing farmers are small and marginal farmers incentives should be given to prevent them from shifting to other crops.

REFERENCE

- Cuddy, J. D. A. and Della, P.A. 1978. Measuring the Instability of Time Series Data. *Oxford Bulletin of Econ. Stat.*, 40(1): 79-85.
- Hema, M., Kumar, R., and Singh, N. P. 2007. Volatile Price and Declining Profitability of Black Pepper in India: Disquieting Future. *Agric. Econ. Res. Rev.* 20: 61-76.
- Kerala State Planning Board. 2011. *Time Series Analysis of the Trend in Agriculture Production Kerala*. Government of Kerala.
- Krishnadas, M. 2010. Production and Export Performance of Major Indian Spices – An Economic Analysis. MSc Thesis. Department of Agricultural Economics. University of Agricultural Sciences, Dharwad.
- Nagoor, B. H. 2010. Trade aspects of plantation sector of India. NRPPD Discussion paper No. 8. Centre for development studies, Thiruvananthapuram. 29 p.
- Soumya, C., Burark, C. C., Sharma, L., and Jain, H. K. 2014. Growth and Instability in Production and Export of Selected Spices of India. *Int. J. Seed Spices.* 4(2):1-10
- Sudheer, S. P. 2014. Export Potential of Black Pepper-A Comparative Study of India and Vietnam. *Int. J. Business and Management.* 2(4): 3-7.
- Vietnam Trade Promoting Agency. 2015. Vietnam's pepper export in first four months of 2015. Available: http://www.vietrade.gov.vn/en/index.php?option=com_content&view=article&id=2304. [25/07/2015].
