



Why are the pepper prices declining? An analysis of changing production and trade scenario in India

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Abstract

During the 1950s, India was the major player in the pepper market. Recently India has dropped to 4th position in production and exports. The price per kilogram of pepper in Cochin market reduced from ₹ 687 to ₹ 383 between 2014-15 and 2018-19. This manuscript attempts to study the reasons for the decline in India's share in world pepper market and the recent fall in prices. The secondary data from the Food and Agriculture Organization, World Bank - World Integrated Trade Solutions, Reserve Bank of India and Spices Board of India were used for analysis. Transitional probability matrix was deployed to analyse the change in the direction of trade, relative comparative advantage and competitive index was used to study India's market power in the international market. There has been a change in the direction of trade since 1999-2000. The results revealed a four per cent decline in area under pepper during 2000-2018, and now Indian pepper market has become import oriented with a CAGR in imports of 13 per cent during 1981 to 2000 and four per cent during 2001 to 2016. A similar trend was observed in production and exports as it got reduced from 25 per cent and 20 per cent in 1960s to ten per cent and five per cent respectively, in 2016. Increased supply in the international market, decreased production, cheaper imports and illegal imports have pulled down the domestic prices sharply in recent years. From 1995, workers' wages have increased by around 10 per cent, and with decreasing prices, the Indian pepper industry looks grim. Appropriate policies to safeguard Indian farmers' interest, such as export promotions, increasing productivity, delivering reasonable prices and incentives for processors would instil confidence in the farming community and the industry as a whole.

Keywords: Export unit value, Markov chain, pepper prices, relative comparative advantage, trade, transitional probability matrix

Introduction

Pepper (*Piper* spp.) is the most important and most widely used spice in the world, cultivated in over 42 countries, producing about 7.26 lakh tonnes of pepper and exporting US\$ 2779 million worth of produce.

Plantation crops are not so important in India's trade aspects but plays a pivotal role in uplifting the socio-economic status of millions of farmers, especially plantation workers (Nagoor, 2010). Like any other commodity, pepper has also been under tremendous pressure by heightened international competition. Due to economic integration among different nations through free trade agreements, the competitiveness of a product is often questioned. Competitiveness is not only important in terms of

exports but also in surviving in the domestic circuit as there will always be a threat of cheaper imports from other comparatively advantageous countries. In this scenario, a major question that arises is, where does the Indian pepper stand in the world market? Thus, it is important to study the competitiveness of pepper in the international market *vis-a-vis* India.

Egypt was a major tea market for India until 1992. Still, India lost the Egyptian market to Kenya with the establishment of the Common Market of Eastern and Southern Africa (COMESA) as Egypt and Kenya were the members of it (Nagoor, 2009). Similarly, due to the economic integration among countries as a result of the free trade regime, the direction of trade of Indian pepper is also changing. In such a changing scenario, it would be challenging

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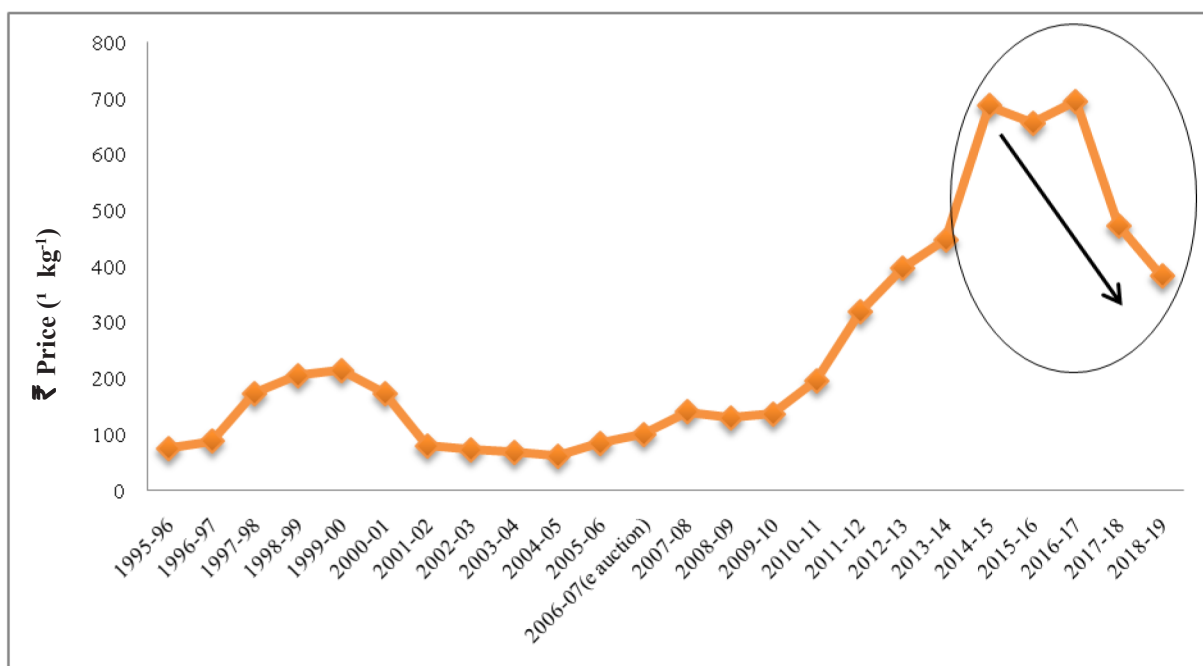
for Indian pepper to find new markets and also to maintain its share in the existing ones. Free trade agreements (FTAs) between the Association of South-East Asian Nations (ASEAN) affect Indian plantation sector adversely, as these nations are the outlets of cheaper plantation products.

India is the home of pepper - 'the King of Spices'. Since ancient times pepper is grown in Malabar coast of India. As a present for the King of Portugal, Vasco-da-Gama in 1498 is reported of taking pepper along with other valuable articles from India (for more history see Prange, 2011). For this reason, the Malabar coast was also called as the 'Pepper Coast' by early Europeans. Since then, the Indian pepper trade was active with many foreign countries by the sea-route. It was recorded that the Indian pepper had reached as far as Greece by the land route (Shah, 1950). India was a major producer and emerged as the major exporter of pepper. In 1951, almost the whole of the pepper consumed in America came from India overtaking Indonesia, the pre-war supplier of pepper to the US (EPW, 1953). This is not the case now. During 2017, Vietnam was the highest producer of pepper and India occupied the fourth position. There was a decrease in area

under pepper in India and an increase in Vietnam. Why are the Indian farmers moving away or proving inefficient in production of high-value crops? Why has there been a shift in major producers? These are some questions to be addressed.

The commodity prices play a defining role in farmers decision making related to the production aspects like area, quantity to be produced and marketed. There is a decline in domestic pepper prices since 2015 (Appendix 1). The price per kilogram of black pepper in Cochin market reduced from ₹ 687 to ₹ 383 between 2014-15 and 2018-19. In this backdrop, it is the need of the hour to study the reasons for the reduction in domestic prices and take the necessary steps to regain farmers confidence by delivering better prices for their product.

This study is a deliberate step towards analysing the pepper trade aspects like the direction of trade, prices, international competitiveness, the trend in export, import and other relevant factors besides finding reasons for recent fall in domestic prices. The paper is structured under three sections. The first section gives the sources of data and methodology; the second section consists of results



Source: Spices Board of India

Appendix 1. Trend in pepper domestic prices

and detailed discussions of these findings. The third section gives some important policy implications.

Materials and methods

This study was done using secondary data. The international data on production, yield, export, and import of pepper by major producing and exporting countries of the world were sourced from Food and Agriculture Organization (FAO) and World Bank - World Integrated Trade Solutions (WITS, 2019). Domestic prices and international prices were sourced from the Spices Board of India. The dollar export unit value and import unit value were converted into Indian rupees by multiplying the respective year annual average exchange rate. The series of annual average exchange rates were obtained from the Reserve Bank of India (RBI).

Revealed comparative advantage (RCA)

The term ‘revealed comparative advantage’ was first coined by (Balassa, 1965). He derived the relative export share measure of RCA using export data and defined it as

$$RCA_{am}^{iw} = \frac{XS_a^i}{XS_m^i} \bigg/ \frac{XS_a^w}{XS_m^w}$$

Where XS refers to export supply,

i - home country

w - world

a - particular commodity (pepper here)

m - all commodities

This measure assumes that the pattern of exports reflects differences in costs and non-price factors and that the structure of exports can be expected to be determined by comparative advantage. A value of more than unity indicates a country's international competitiveness, and a lower value indicates the relatively disadvantageous position a country in relation to the export of a particular commodity like pepper.

Export unit value (EUV)

EUV is the commodity's export price which is equal to export value/export quantity in the present study. In some cases, international price is considered as the world export unit value.

Import unit value (IUV)

IUV is the commodity's import price which includes the transportation and insurance costs and excludes tariffs. In the present study (IUV= import value/import quantity).

Competitiveness index

Competitiveness in the trade, as defined by Asia-Pacific Research and Training Network on Trade (ARTNet), is ‘the capacity of an industry to increase its share in international markets at the expense of its rivals. It is evaluated through a country's share in world export markets and is an indirect measure of market power. ARTNet defines the competitiveness index as the ratio of exports of a product from a country to the total world exports. Higher values (%) indicate greater market power of the country in question (Nagoor, 2009).

Markov chain analysis (Transitional probability matrix)

In this study, the structural change in Indian pepper trade during two time periods 1999 to 2007 and 2008 to 2017 in terms of market retention and market switching was examined by using the Markov chain approach. The calculation of the transitional probability matrix (P) is crucial to this analysis. The diagonal elements P_{ij} indicate the probability of retaining a country's share of export/import in the successive periods. It is a measure of loyalty of a particular country towards importing/exporting. The average exports/imports of pepper to a particular country was considered to be a random variable which depended only on its past exports/imports to that country (Mahadevaiah *et al.*, 2005).

$$E_{jt} = \sum_{i=1}^r E_{it-1} P_{ij} + e_{jt}$$

Where, E_{jt} = Exports from India to the j^{th} country during the year t

E_{it-1} = Exports to the i^{th} country during the year $(t-1)$

P_{ij} = Probability that exports will shift from the i^{th} country to j^{th} country

e_{jt} = Error-term which is statistically independent of e_{jt-1} , and r = Number of importing countries.

The transitional probabilities, which can be arranged in a $(c \times r)$ matrix, having following properties: $0 \leq P_{ij} \leq 1$ and $\sum P_{ij} = 1$ for all $i = 1$.

The transition probability matrix was estimated using minimisation of mean absolute deviation (MAD) method

$$\text{Min } O P^* + I e$$

$$\text{Subject to, } X P^* + V = Y$$

$$G P^* = 1$$

$$P^* \geq \phi$$

where P^*_{ij} is a vector of the probabilities P_{ij} ; O is a null vector

I , e , and Y are vectors of area, absolute errors and exports.

X and V are the diagonal matrices of lagged values of Y and vector of errors, respectively.

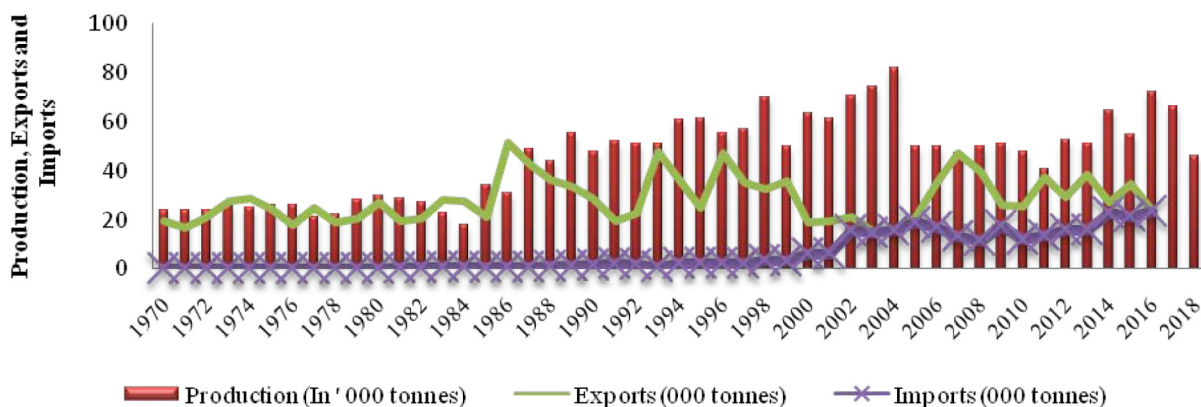
G is a matrix which groups the row elements of P in P^* to sum up to unity.

To indicate the structure of all the transitions taken place in the system, the transitional probability matrix was obtained by arranging P^* vectors. Essentially, the transitional probability matrix captures the dynamics of the changes in pepper exports from India. P_{ij} shows the probability of shift from country i to j .

Results and discussion

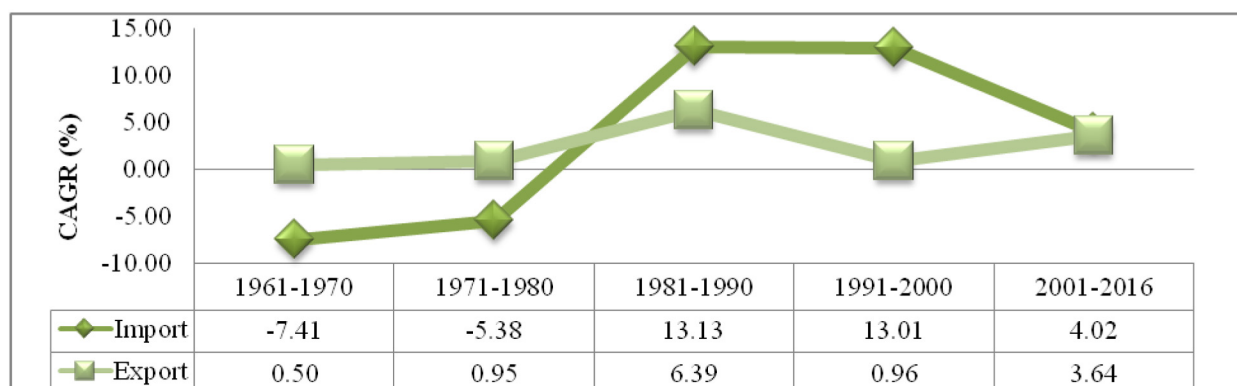
India was the major producer and exporter of pepper in the world with a quarter of a share in world production and one-fifth share in world exports during the 1960s. But 2016 marked a downward shift in India's share in world production and export to 10 per cent and five per cent, respectively. The domestic consumption increased from an annual average of around five thousand tonnes from 1961-1970 to 50-70 thousand tonnes during 2017-18. Thus, the increasing consumption and inability of current production to meet the increasing demand, the share of pepper export from domestic production has decreased from 82.2 per cent during 1961-70 to 35.3 per cent during 2001-07 and to 33.1 per cent in 2016-17.

Increasing consumption and declining production has made Indian pepper more domestic-oriented as the imports have registered a higher growth rate of 13 per cent per annum from 1981 to 2000 and 4.02 per cent during 2001-16 (Fig. 2). It can now be said that India's pepper is progressively becoming import oriented. India's pepper import orientation is evident from the decrease in area and production during the same period (2000-18) (Table 1). While in absolute terms, pepper import has raised from an annual average of fewer than one thousand tonnes until 1990 to 16 thousand tonnes during 2001-16 (Fig. 1).



Source: FAOSTAT and Spices Board of India (2019)

Fig. 1. Production and trade of Indian pepper 1970-2018



Source: Authors estimation based on data from FAOSTAT

Fig. 2. The trend of pepper imports and exports

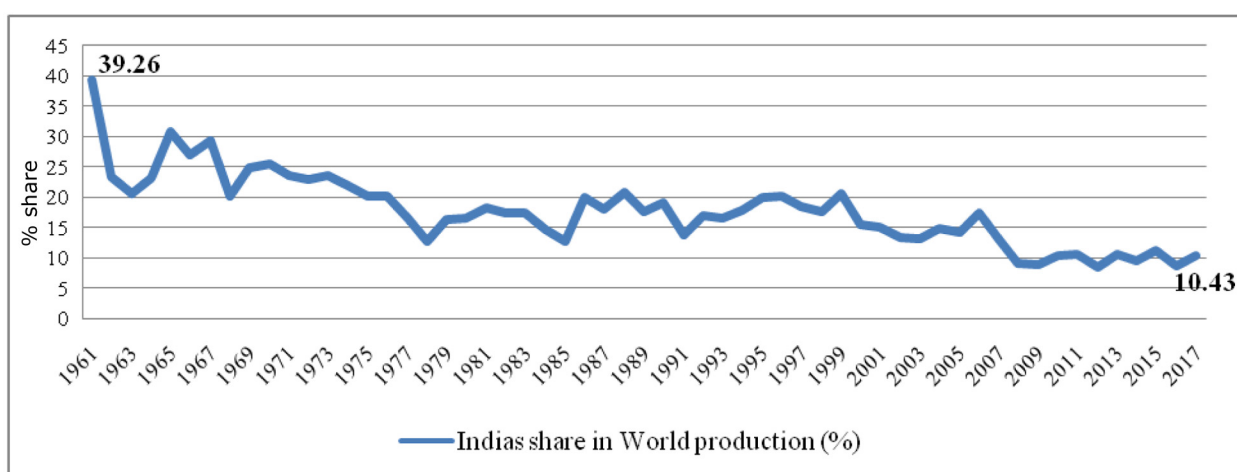
Table 1. CAGR of Pepper area, production and productivity during 1970-2018 (%)

Year	Area	Production	Productivity
1970-1985	0.37	0.50	1.87
1986-1999	2.26	3.19	0.70
2000-2018	-4.23	-0.93	3.39
1970-2018	1.19	2.27	1.14

Source: Authors estimation based on data from FAOSTAT

The transitional probability matrices obtained using yearly export data to the major pepper importers from India, *i.e.*, Germany, Russia, Vietnam, Canada, U.S.A, Sweden and U.K. between 2000-01 to 2017-18 shows a change in the pattern

of pepper exports. These analyses were carried out separately for two periods, *i.e.*, 2000-01 to 2008-09 and 2009-10 to 2017-18. The pepper trade with the remaining countries was pooled under 'others'. The results of the transitional probability matrix are presented in Tables 2 and 3. Sweden was the only stable importer of Indian pepper during the first period, as reflected by the high probability of retention (0.61). The major gainers in the first period were Vietnam, Canada and Sweden gaining from the loss of share in exports of the USA, UK and Germany. The major gainers among the importers of Indian pepper during the second period over the first period were Vietnam, Russia, Canada and 'other



Source: Authors estimation based on data from FAOSTAT

Fig. 3. India's share in world pepper production during 1961-2017

Table 2. The direction of Indian pepper exports during 2000-2008

Country	U.S.A	U.K	Germany	Sweden	Canada	Russia	Vietnam (south)	Others
U.S.A	0.00	0.00	0.00	0.00	0.31	0.02	0.67	0.00
U.K	0.02	0.00	0.00	0.32	0.16	0.00	0.00	0.50
Germany	0.42	0.00	0.00	0.00	0.00	0.00	0.58	0.00
Sweden	0.00	0.00	0.00	0.61	0.39	0.00	0.00	0.00
Canada	0.00	0.52	0.14	0.00	0.00	0.00	0.00	0.33
Russia	0.00	0.00	0.00	0.09	0.18	0.00	0.17	0.56
Vietnam (south)	0.00	0.00	0.00	0.00	0.00	0.92	0.00	0.08
Others	0.23	0.22	0.55	0.00	0.00	0.00	0.00	0.00

minor importers' as a group as evident by the high probability of retention of 0.67, 0.15, 0.06 and 0.12, respectively. Vietnam, in addition to its higher probability of retention, is likely to gain from the switch over from the US and Germany with a high probability of 0.67 and 0.58, respectively, in the first period. Canada has zero probability of retention of its share of imports of Indian pepper but is likely to gain 39 per cent from Sweden, 31 per cent from the US, 18 per cent from Russia and 16 per cent from the UK. Similarly, minor importing countries are likely to gain from Russia (58%), UK (50%), Canada (33%) and Vietnam (8%) while they have no probability of retention of their share of imports.

Instability in India's export to remaining importing countries, *viz*, the USA, UK and Germany, were evident from nil values in the transition probabilities matrix. The declining export from India reflects the inability in retaining the share in traditional markets and exploring new markets. This requires appropriate policy measures and marketing strategies to sustain in these competitive markets. This can be achieved by decreasing costs and improving yield and quality.

Similarly, the changing pattern of pepper imports was also analysed for the period 1999-2016. The analysis was carried out in two separate periods, first period (1999-2007) and second period (2008-2016). The results are displayed in Tables 4 and 5. In the first period, Vietnam and Brazil were the major markets with the probability of retention of 61 and 74 per cent, respectively. The major gainers in the first phase were China, Vietnam and remaining minor exporting countries. China gained from complete loss of share of Indonesia and Madagascar markets. Vietnam also gained 50 per cent of the share of the Sri Lankan pepper exports to India (Table 4). The gainers from the second period over the first period were Sri Lanka, other minor exporting countries and Brazil (Table 5). We might soon see a rise in new markets for our imports as minor exporting countries are likely to gain 85 and 70 per cent from loss in share of Indonesia and Brazil respectively. Only China (21%), Sri Lanka (13%) and Brazil (5%) retained their share of exports during the second period. An interesting finding from the second period is that Sri Lanka is likely to gain from switch over

Table 3. The direction of Indian pepper exports during 2009-2017

Country	U.S.A	U.K	Germany	Sweden	Canada	Russia	Vietnam (south)	Others
U.S.A	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
U.K	0.00	0.00	0.40	0.00	0.00	0.60	0.00	0.00
Germany	0.49	0.29	0.00	0.00	0.22	0.00	0.00	0.00
Sweden	0.09	0.00	0.00	0.00	0.00	0.91	0.00	0.00
Canada	0.00	0.00	0.42	0.00	0.06	0.00	0.16	0.36
Russia	0.00	0.63	0.00	0.00	0.00	0.15	0.22	0.00
Vietnam (south)	0.00	0.00	0.00	0.00	0.05	0.00	0.67	0.28
Others	0.00	0.00	0.00	0.46	0.42	0.00	0.00	0.12

Table 4. The direction of Indian pepper imports during 1999-2007

Country	Vietnam	Sri Lanka	Indonesia	Brazil	Madagascar	Ecuador	China	Others
Vietnam	0.61	0.25	0.00	0.00	0.14	0.00	0.00	0.00
Sri Lanka	0.50	0.00	0.00	0.00	0.50	0.00	0.00	0.00
Indonesia	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00
Brazil	0.05	0.20	0.00	0.74	0.00	0.00	0.00	0.00
Madagascar	0.05	0.00	0.54	0.01	0.00	0.40	0.00	0.00
Ecuador	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00
China	0.00	0.00	0.00	0.00	0.51	0.26	0.00	0.22
Others	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00

of whole of the Vietnamese share as the transitional probability is 1.

From the above results of Indian pepper exports and imports, it can be inferred that there is a structural change in terms of the direction of trade. The export market has seen a shift from Sweden to Vietnam as the major destination of Indian pepper from the first period to the second period of exports, *i.e.*, 2000-2017. Similarly, the import market has seen a shift from Brazil to China and Sri Lanka as the major exporters to India during 1999-2016. High probability of retentions can be seen in export markets in both the periods whereas in the imports markets the probabilities are very low. This indicates that despite the change in the direction of trade, export markets are stable, and import markets are highly volatile. The change in the direction of trade shows that India has shifted from farther markets to the nearer ones. This description fits the gravity theory of international trade. Distance is inversely proportional to the value of trade between two countries (Krugman *et al.*, 2012).

Another interesting finding is that Sri Lanka has been able to gain due to the switch over from

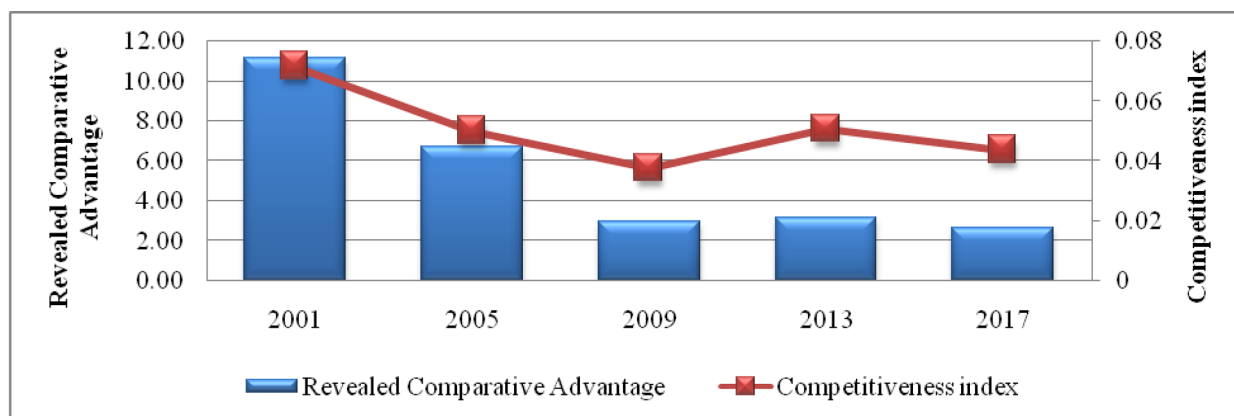
Vietnam, Indonesia and Ecuador in 2008-2016 period much more than the gain in the first period. Even in absolute terms, Sri Lankan exports to India has grown 227 per cent in value terms (adjusted for exchange rate) in this period. This can be attributed to the final tariff liberalisation commitment under Indo-Sri Lankan Free Trade Agreement (ISFTA) which came into effect since November 2008. Under this agreement, Sri Lanka can export up to 2500 tonnes of pepper to India duty-free. Above 2500 tonnes, only eight per cent of duty is levied under this arrangement. Later it was reported that ISFTA contributed to the decrease in domestic pepper prices and resulted in government imposing quota restrictions on Sri Lankan imports (Razzaque and Basnett, 2014).

The RCA index (Fig. 4) value is greater than one from the year 2001 to 2017, indicating the international competitiveness of Indian pepper to export. The relative lower domestic price of pepper shows that India still has a price advantage in the international market. However, the export unit value of Vietnam is lowest compared to all the countries highlighting the fact that Vietnam pepper is most

Table 5. The direction of Indian pepper imports during 2008-2016

Country	Vietnam	Sri Lanka	Indonesia	Brazil	Madagascar	Ecuador	China	Others
Vietnam	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00
Sri Lanka	0.42	0.13	0.00	0.00	0.00	0.05	0.40	0.00
Indonesia	0.00	0.15	0.00	0.00	0.00	0.00	0.00	0.85
Brazil	0.00	0.00	0.00	0.05	0.26	0.00	0.00	0.70
Madagascar	0.00	0.00	0.05	0.00	0.00	0.00	0.95	0.00
Ecuador	0.18	0.07	0.00	0.00	0.45	0.04	0.26	0.00
China	0.00	0.00	0.00	0.51	0.00	0.28	0.21	0.00
Others	0.00	0.00	0.32	0.45	0.00	0.00	0.03	0.20

Why are the pepper prices declining?



Source: Estimation based on data from WB-WITS (2019) and Spices Board of India (2019)

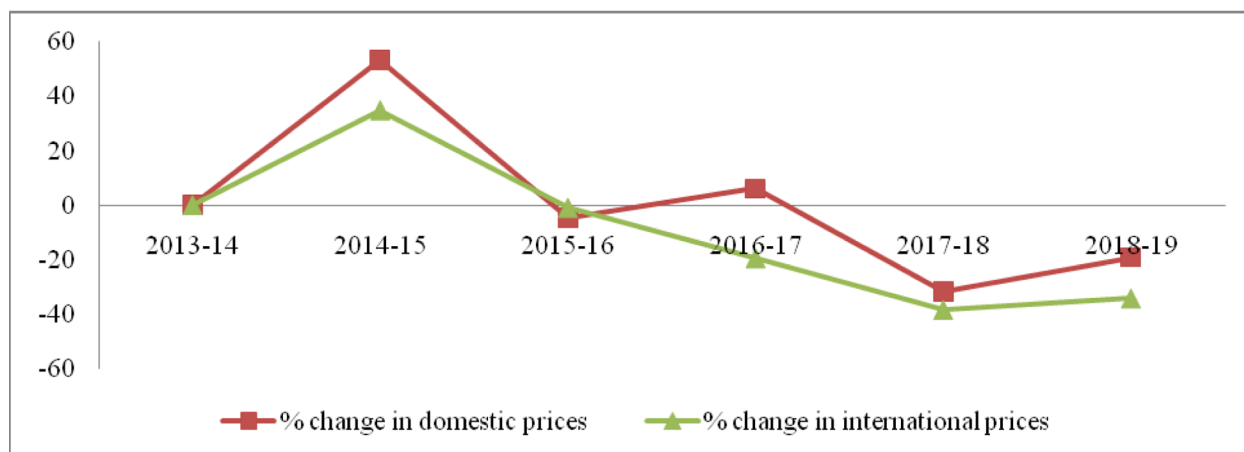
Fig. 4. Relative share measure of revealed comparative advantage and competitiveness index of India in world pepper market

competitive in export markets. The comparison of Vietnam pepper export unit value with India's domestic pepper price during 2013-16 reveals that the export unit value of pepper of Vietnam is 10 to 45 per cent (Table 6) less than that of India. This causes concern for India's pepper economy.

Imports from Indonesia, Sri Lanka and Vietnam constitute 98 per cent of India's pepper imports. These countries export at a very low price, particularly Vietnam. With the rapid expansion in production, area and export, it can export pepper at a minimal price. Further reduction in tariffs which is coming up under India-ASEAN FTA, will lead to a greater import of pepper from Vietnam. Now

the question is, whether this cheaper import of Vietnam pepper affects India's domestic price of pepper. Is India capable enough to add value to such low priced pepper and re-export? India has given concessions to these countries under the free trade agreements, and special concessions are given to Indian companies for processing, value addition and re-exports (Nagoor, 2010). Thus re-exports creates the need for cheaper imports. Hence, a dire need was felt, and we urge researchers to evaluate the impact of duty-free imports on domestic prices and in re-exports.

Because of decreased competitiveness of India, changing the direction of trade and emergence of



Source: Estimation based on data from WB-WITS (2019) and Spices Board of India (2019)

Fig. 5. Year on year (YOY) growth in domestic and international prices

Table 6. The price difference between Indian and Vietnam pepper

Year	India domestic price (₹ kg ⁻¹)	Export unit value of Vietnam (₹ kg ⁻¹)	The price difference (%)	International price (₹ kg ⁻¹)
2013	448	402.73	-10.10	465.97
2014	687	379.00	-44.83	637.40
2015	655	490.21	-25.16	662.91
2016	695	448.98	-35.40	558.62

Source: Estimation based on Spice Board of India and FAOSTAT database

south-east Asian producing countries, there has been a decline in domestic as well as international prices of pepper (Fig. 5). Another major reason for the decrease in domestic prices is the illegal import of pepper across the border by unregistered traders (Sanjeev Kumar, 2019).

Of late pepper producing countries are facing problems due to the unfavourable trend in prices. International price fluctuations of pepper are due to changes in supply conditions rather than due to the demand factor. World demand for pepper does not vary greatly because of its specific and limited nature of uses. Hence, the introduction of an efficient supply management system either by maintaining a buffer stock by the International Pepper Community (IPC), like before, or voluntary retention by the producing countries is required for earning higher prices and stabilising inter and intra year variations. Product diversification tends to be a potential solution to the falling export market of India as demand for value-added products is increasing. Hence, there is a need to provide appropriate encouragement to processing industries.

The above suggestions on import quotas, anti-dumping laws or export promotions makes us think about which trade policy to follow. Should it be free or protective trade? Unfair trade practices by some of the nations might force us into protective trade regimen, but it is still unclear about which is the best policy. We, therefore, urge researchers to find more evidence on the effect of trade on the plantation sector.

The change in prices will have more effect on the livelihood of high-value crop growers than any other crops like cereals or pulses because of

Table 7. Effect of change in domestic price (per acre)

Sl. Particulars No.	Quantity (kg)	Value (₹)
At 2015 Price = ₹ 550		
1. Gross returns	300	165000
2. Annual maintenance cost		67254
3. Net returns	300	97746
4. Benefit-cost ratio		2.45
At 2019 Price = ₹ 300		
5. Gross returns	300	90000
6. Net returns	300	22746
7. Benefit-cost ratio		1.34

Source: Authors' calculation (at 2019 prices) based on the results of (Yogesh, 2017) at 2015 prices

the annual nature of the crop and higher cost of production. The effect has been illustrated in Table 7. At 2015 prices, the net return per acre of pepper cultivation in Karnataka was around ₹ 97,746 with a benefit-cost ratio (BCR) of 2.45. Because of the above-said reasons, the prices have crashed, and at 2019 local prices of Kodagu district of Karnataka (₹ 300 kg⁻¹) the net returns and benefit-cost ratio dropped to ₹ 22,746 and 1.34, respectively. Hence, an average pepper grower with two acres of land will lose around ₹ 1.5 lakhs a year because of the decrease in prices, keeping other things constant. According to the labour bureau, the workers' wages have increased by around 10 per cent every year, since 1995. If this is also accounted, the BCR nears one, and shortly pepper production in India becomes economically infeasible. Thus, there is an urgent need to address this issue and resolve the plight of millions of pepper growers in the country.

Summary and conclusions

India's share in world pepper production and export has drastically reduced. It can be attributed mainly to the emergence of new world powers like Vietnam and the unfavorable trend in both domestic and international prices. The present study analysed the direction of trade, competitiveness and effect of falling prices. The study concluded that there was a structural change in the direction of pepper trade and export markets were stable, but import markets were highly volatile. The exports have shifted from Sweden to Vietnam while imports have shifted from

Brazil to China and Sri Lanka during 1990-2017 due to FTAs following the gravity theory of international trade. At the same time, Vietnam and other ASEAN have increased their area and production of pepper, and their prices are 10 to 45 per cent lesser than Indian domestic prices. This low priced and poor quality pepper is shipped through Sri Lanka which enjoys duty-free status under ISFTA up to 2500 tonnes. It was estimated that the decreased prices have significantly reduced the BCR of pepper production from 2.45 in 2015 to 1.34 in 2019, not accounting for increased wages. Any further decrease in BCR shortly might make pepper production economically infeasible in India.

Though India is losing its relative advantage and share in the world market, given lower domestic prices, India still holds a chance to increase its exports. The loyal import markets of Indian pepper-like Vietnam, Russia, Canada and other minor importing countries should be targeted for maintaining the stability of exports and income. The measures taken in the past like capping imports from specific countries, e.g. Sri Lanka (2006) can be reinstated to check dumping of cheaper products and violation of rules of origin. The study concludes that appropriate policies to safeguard Indian farmers interest like export promotions, creation of farmers interest groups, increasing the productivity, delivering reasonable prices and providing incentives for processors would instil confidence in the farming community and the pepper industry as a whole to restore the lost economy.

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References

- Balassa. 1965. Trade Liberalization and revealed comparative advantage. *The Manchester School of Economic and Social Studies* **33**: 99-123.
- EPW. 1953. Indian Pepper. *Economical and Political Weekly* **5**(1): 11-13.
- FAO. 2019. FAOSTAT. <http://www.fao.org/faostat/en/>.
- Krugman, P.R., Obstfeld, M. and Melitz, M.J. 2012. World Trade: An overview. In: *International Economics: Theory and Practice*. 9th Edition, Boston, USA. Addison-Wesley, Pearson, pp. 8-23.
- Mahadevaiah, G.S., Ravi, P.C. and Chengappa, P. . 2005. Stability analysis of raw cotton export markets. *Agricultural Economics Research Review* **18**(2): 253-259.
- Nagoor, B.H. 2009. Performance of India's tea exports: A comparative study of major tea exporting countries. *IGIDR Proceedings* PP-062-21.
- Nagoor, B.H. 2010. Trade aspect of plantation sector in India. *NRPPD Discussion Paper*: 5-6.
- Prange, S.R. 2011. Measuring by the bushel: reweighing the Indian Ocean pepper trade. *Historical Research* **84**(224): 212-235.
- Razzaque, M.A. and Basnett, Y. 2014. *Regional Integration in South Asia: Trends, Challenges and Prospects*. Charlesworth Press, London.
- Sanjeev Kumar 2019. January 10. Illegal pepper imports hit domestic prices, demand. Kochi, Kerala, India: *The Hindu*. Accessed on July 25, 2019.
- Shah, N.A. 1950. The pepper trade. *Economical and Political Weekly*: 612-614.
- Spices Board 2019. Ministry of Commerce and Industry, Government of India. <http://www.indianspices.com/>.
- WITS. 2019. World Bank, World integrated Trade Solutions. HYPERLINK <https://wits.worldbank.org/CountryProfile/en/Country/WLD/Year/2013/Summary>.
- Yogesh, M.S. 2017. Management of black pepper economy in Kodagu district of Karnataka, India. *International Journal of Current Microbiology and Applied Sciences* **6**(4): 1124-1131.