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Navigating Changes: Trends and Challenges in the Indian Black Pepper Trade

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ABSTRACT

India has been a significant contributor to the global spice market, particularly renowned for its flavourful and pungent black pepper. Nonetheless, the trajectory of the Indian black pepper trade has encountered notable fluctuations in recent decades. The discernible trend towards heightened reliance on imports and a decline in export growth rates prompts concerns regarding overall net export revenues. Despite the escalating volatility in black pepper exports, import instability has diminished, indicative of a burgeoning dependency on imports. Noteworthy is the transition towards exporting value-added products, albeit predominantly to select markets, which accentuates potential vulnerabilities due to concentrated market exposure. To fortify the resilience and competitiveness of the sector, it is imperative to engage the public sector in research and development endeavours aimed at fostering product innovation and expanding market reach. Additionally, leveraging the established reputation for delivering premium-quality Indian black pepper can be a strategic asset in navigating market uncertainties and sustaining growth.

Keywords: Black pepper trade, geographical diversification, instability, product diversification, trends

JEL codes: Q17, F1, P33, O13

1

INTRODUCTION

India has been a global destination for trade in black pepper, which is considered the king of spices. During the 1960s, 25 per cent of world production and 20 per cent of world exports were from India (Anju and Elsamma, 2015; Nagoor, 2010). Consequent to trade liberalisation, the country has lost its competitiveness (Thomas and Sanil, 2019) and the share in global exports has decreased as Indonesia, Vietnam, and Brazil have taken over the position as world majors (Sabu and Kuruvila, 2016: Sabu *et al*., 2020a). By the early 1980s, more than 75 per cent of the production of black pepper in India was exported, while it declined to 40 per cent in the last decade (Yogesh and Mokshapathy, 2013; Bhatt and Valasan, 2016). Concurrently, domestic consumption and imports have increased over the years, and presently, more than 80 per cent of the black pepper produced in the country is consumed domestically (IPC, 2017). For processing, value addition and re-export of black pepper, India has allowed duty-free imports from other countries (Government of India, 2019). The exporters specialising in value-added products have been importing black pepper from Vietnam routed through Sri Lanka, taking advantage of the lower duty under the South Asian Free Trade Agreement (SAFTA), as it was cheaper than domestic black pepper (Krishnakumar, 2018). Subsequently, value-added products replaced the export share of the commodity in the primary form. But, increased global production and growing

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imports have led to falling prices in the Indian market (Government of India, 2019). This situation has greatly impacted the domestic producers of the crop, as a majority of them belong to the small and marginal groups.

Given these indications of changes in India`s global trade pattern, this paper attempts to analyse the temporal patterns and changes in import and exports of black pepper, product forms and destinations.

II

MATERIALS AND METHODS

The annual data on the global and Indian export and import of black pepper from 1988 to 2019 were collected from World Integrated Trade Solutions (WITS). The trade data on black pepper products (1996-97 to 2019-20) were collected from the Ministry of Commerce and Industry, Government of India. The study examined the export and import trends of black pepper and its products by analysing the growth and instability in trade, changing patterns of international trade and the extent of export diversification. The analysis was carried out for three decadal sub-periods (1990-1999 (Period I), 2000-2009 (Period II) and 2010-2019 (period III)) and the overall period (1990-2019). The main consideration behind dividing the total period of 31 years into sub-periods was finding out the disaggregated performance of black pepper's export and import (quantity, value and unit value terms) over time.

Compound Annual Growth Rate (CAGR)

The CAGR was used to determine the trend in the export and import of Indian black pepper and its products from 1990 to 2019. The growth in export and import of black pepper in terms of quantity, value and unit value was analysed using the exponential growth function of the form (Gujarati and Sangeetha, 2007),

$$Y = \alpha\beta^t e^u$$

$$\ln(Y) = \ln(\alpha) + t \ln(\beta) + u$$

where,

Y = Quantity/Value/Unit value of export/import of black pepper, α = Intercept, β = Regression coefficient, t = Time variable and e = Error term

$$\text{CAGR} = r = (\text{Antilog}(\beta) - 1) \times 100$$

The significance of CAGR was tested using *t* statistics, $t = \frac{r}{\text{Standard Error (SE) of } r}$

where, $\text{SE}(r) = \frac{100[\beta * SE(\ln(\beta))]}{\ln(e)}$

Instability Analysis

The degree of variation involved in the export and import of black pepper was examined using Coppock's Instability Index (CII). The CII is expressed as the antilog of the square root of the logarithmic variance (Coppock, 1966).

$$\text{CII} = \{(\text{Antilog}\sqrt{\text{Ulog}}) - 1\} \times 100$$

where, Ulog = $\frac{1}{(N-1)}$ Σ (log Y_{t+1}– logY_t – M)²

M = $\frac{1}{(N-1)}$ Σ (log Y_{t+1}– logY_t)

N = Number of years

Y= Value/Volume of annual export or import of black pepper

M = Arithmetic mean of the differences between logs of Y_t and Y_{t+1}, Y_{t+1} and Y_{t+2}*etc*.

Ulog = Logarithmic variance of the series

Commodity Diversification Index

The commodity diversification index measures the sectoral concentration of a country's exports. It states how much a country's exports are dispersed across different economic activities or commodities. Increased commodity diversification reduces the country's export earnings risk. The Gini concentration index (Gini, 1921) was used to measure the concentration in the export of black pepper from India. The value of the index ranges from zero to 100. A higher value indicates that the country is increasingly dependent on fewer products.

Gini Concentration Index = $100\sqrt{\sum_{i=1}^{n}(\frac{X_{it}}{X_t})^2}$

Where,

X_{it} is the value of exports of black pepper product 'i' from India in year 't'

X_t is the value of export of all black pepper products from India in year 't'

The lower the value of the commodity concentration index, the more evenly the exports are distributed and vice-versa. A declining trend of the index indicates greater diversification of exports (Joshi et al., 2007).

Geographic Diversification Index

If a country is too much dependent on a few export markets or is exporting the major share of exports only to a few countries, the fluctuations in those limited markets will affect the earnings from export, making the export income unstable. The Hirschman Index (Mikic and Gilbert, 2009) was used to measure the geographic concentration in the export of black pepper from India.

Hirschman Index, HI = $100\sqrt{\sum_{i=1}^{n}(X_{it}/X_t)^2}$

where,

X_{it} is the value of exports of black pepper from India in year t to the i-th market

X_t is the total value of export of black pepper from India in year t, and

n is the number of countries importing black pepper from India

Hirschman index varies from zero to 100. A value of the index close to zero indicates increased diversification and the value of the index will be higher when a country exports only to a few markets.

III
RESULTS AND DISCUSSION

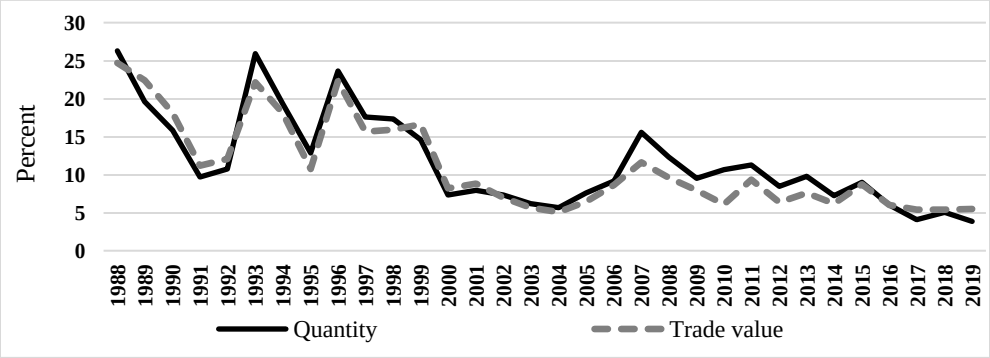
3.1. Pattern of Trade

The historical significance of the black pepper trade from India is linked to the economic and political history of the country. Indian black pepper has been enjoying a premium price in the world markets because of its intrinsic qualities, and India has been the leader in exports for a long period. But the exports almost halved from 32,980 tonnes in TE1990 to 18,210 tonnes in TE2019, though there was a short increase in between (Table 1). The decadal growth rates of exports reflect this behaviour, with values of 4.53 per cent during the nineties and 8.70 per cent during the 2000s, finally diving down to -7.10 per cent during the decade starting from 2010 (Table 2). India's relative share in global exports also decreased from around 25 per cent in 1988 to five per cent in 2019, both in quantity and value terms (Figure 1).

TABLE 1. EXPORT, IMPORT AND BALANCE OF TRADE OF INDIAN BLACK PEPPER

Trienniums	Export			Import			Balance of Trade	
	Value (1000 US$)	Quantity (tonnes)	Unit Value (US$/kg)	Value (1000 US$)	Quantity (tonnes)	Unit Value (US$/kg)	Quantity (tonnes)	Value (1000 US$)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
TE 1990	86912.40	32,980	2.59	1847.54	1190	1.59	31,790	85065
TE 2000	130303.68	29,240	4.42	13224.21	4180	3.36	25,060	117079
TE 2010	89879.81	31,540	2.90	46843.37	15,030	3.16	16,510	43036
TE 2019	101509.15	18,210	5.57	141590.47	30,140	4.7	-11,930	-40081

Source: Estimated using data from WITS.org; N*ote*: TE denotes Triennium Ending



Note: Estimated using data fromWITS.org

Figure 1. Dynamics in Share of Indian Black Pepper Exports in World Exports of Black Pepper

However, export earnings show a steady increase as they are more influenced by unit value realization than by the quantum of exports (2.59 US$/kg in TE 1990 to 5.57 US$/kg in TE 2019). The export earnings growth rates, however, reflect slowing down from 20.10 per cent in the nineties to 9.53 per cent next decade and further halving to 4.22 per cent during the second decade of this century. The performance of export unit values indicates their influence on total export earnings. In the decade

starting from 1990, the substantial growth in export earnings was primarily driven by a 14.89 per cent increase in unit value, overshadowing a modest growth in quantity. However, the subsequent decade (2000 to 2009) witnessed a significant shift. Although export quantity saw a notable increase of 8.70 per cent, the export value only grew by 9.53 per cent due to negligible growth in export unit value (0.76 per cent). Despite a decreasing trend in export quantity (-7.10 per cent), the period from 2010 to 2019 witnessed positive export earnings growth (4.22 per cent), attributable to a 12.19 per cent annual increase in unit value. Over the three decades studied, export value realisation grew at an average annual rate of 4.59 per cent, primarily due to the upward trend (5.03 per cent per annum) in export unit value despite a decrease in exported quantity (-0.42 per cent per annum). Some authors attributed this trend to factors such as rupee devaluation, export basket shifts and India's liberalisation policies (Sabu, 2015; Sabu et al., 2020a). However, despite the absence of such circumstances, the unit value increased at a higher rate of 14.89 per cent per annum during the nineties. It could be reasonably assumed that the unit value would have plummeted even further without these policy changes during the 2010-19 period (Table 2).

In contrast to the export trends, imports have steadily risen over the years, escalating from 1190 tonnes in TE1990 to 30,140 tonnes in TE2019, accompanied by a threefold increase in unit value. Furthermore, the share in global imports has surged from 3.5 per cent in 1988 to 6.8 per cent in 2019 (in quantity terms) and from 1.5 per cent to 6.6 per cent (in value terms) (Figure 2). Import growth rates have consistently

TABLE 2. GROWTH IN EXPORT AND IMPORT OF BLACK PEPPER IN INDIA

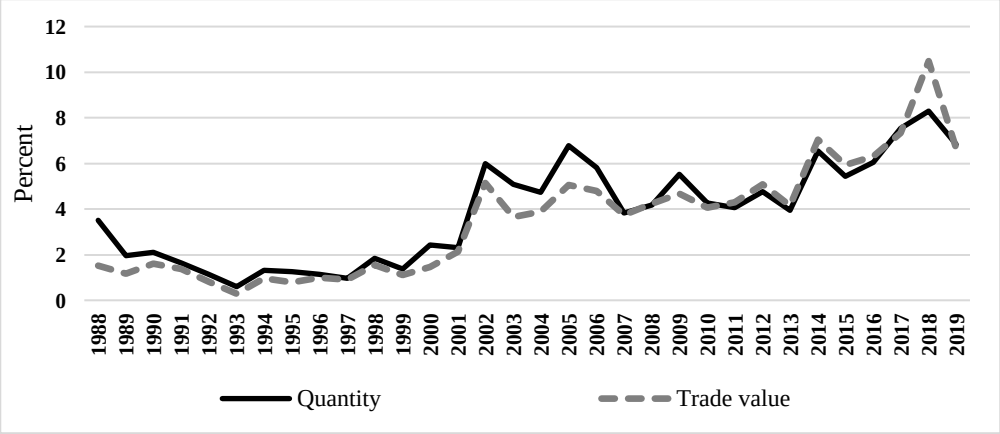
(*CAGR in per cent per annum*)

	Black pepper neither crushed nor ground			Crushed or ground black pepper			Total black pepper		
Year	Quantity	Value	Unit valu	Quantity	Value	Unit value	Quantity	Value	Unit value
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Export									
1990-1999	4.36	20.02*	15.00*	46.70*	52.51*	3.96	4.53	20.10*	14.89*
	(7.36)	(9.45)	(7.36)	(28.11)	(32.22)	(6.52)	(7.32)	(9.42)	(7.32)
2000-2009	5.68	4.99	-0.65	29.82*	34.47*	3.58	8.70	9.53**	0.76
	(10.54)	(16.05)	(7.31)	(12.15)	(8.32)	(6.16)	(14.48)	(7.81)	(7.90)
2010-2019	-12.59	-6.99	6.40	5.65	5.51	-0.13	-7.10	4.22	12.19*
	(6.69)	(11.63)	(8.34)	(7.67)	(11.82)	(8.10)	(10.85)	(16.77)	(6.33)
Overall 1990-2019	-3.20*	0.78	4.11*	23.41*	29.13*	4.63*	-0.42	4.59*	5.03*
	(1.72)	(2.82)	(1.85)	(5.15)	(4.78)	(1.99)	(1.91)	(3.32)	(2.29)
Import									
1990-1999	9.04**	28.74*	18.07*	-13.87	-3.87	11.62	9.02**	28.67*	18.02*
	(8.80)	(19.91)	(10.41)	(40.90)	(42.45)	(25.18)	(8.67)	(19.61)	(10.30)
2000-2009	9.51**	15.36*	5.34	-6.06	9.75	16.83	9.82**	15.81*	5.45
	(9.93)	(4.92)	(8.68)	(60.97)	(68.43)	(24.47)	(9.87)	(4.89)	(8.69)
2010-2019	10.70*	10.49***	-0.19	-14.56	-9.76	5.61	10.09*	18.56**	7.69
	(2.80)	(11.29)	(9.50)	(20.66)	(19.29)	(9.81)	(3.66)	(13.03)	(11.08)
Overall 1990-2019	12.28*	18.55*	5.58*	18.57*	26.92*	7.04*	12.37*	20.03*	6.82*
	(2.01)	(2.31)	(2.07)	(10.23)	(10.72)	(3.67)	(2.58)	(2.63)	(2.51)

Note: 1. *, **,*** denotes significance at one, five and ten per cent, respectively

2. Values in parentheses denote Standard Errors.

hovered around 9 to 10 per cent per annum throughout the three decades under review, consistently outpacing export growth rates (Table 2). The most rapid growth in import quantity occurred during the nineties (28.67 per cent). However, it slowed down in the subsequent decade before gaining momentum once again in the decade commencing in 2010. Additionally, the unit value of imports has shown an overall increasing trend, albeit with a decline during the 2000s followed by a subsequent increase of 7.69 per cent per annum. As observed in the long-term trend, the quantity, value, and unit value of imports have been increasing much more than export parameters.



Note: Estimated using data fromWITS.org

Figure 2 Dynamics in Share of Indian Black Pepper Imports in World Imports of Black Pepper

Over these years, the country transitioned from a net exporter to a net importer of black pepper. TE 1990 exhibited a trade surplus, exporting 31,790 tonnes valued at $85,065, indicating a robust export market. However, by TE 2019, this situation had reversed, with a trade deficit of 11,930 tonnes, valued at $40,081. This reversal highlights a significant decline in both export quantity and value. The crucial factor in this shift was the decrease in unit value from TE1990 to TE2019, contributing to the nation's shift to net importation. This transformation underscores the evolving dynamics of the market, potentially influenced by changes in domestic production, consumption, global demand, and trade policies. India's increasing inclination towards imports could also be linked to decreased cultivated area and output (Sabu et al., 2020b; Cariappa and Chandel, 2020). Additionally, India's black pepper productivity is one of the lowest globally, at 320 kg/ha, compared to 4500 kg/ha in Thailand (Ravindran, 2000). Increasing domestic consumption and declining production have made the commodity more reliant on domestic markets and imports.

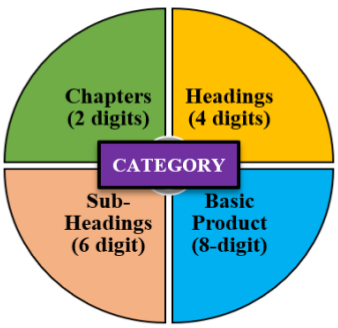
The long-term import performance indicators (growth rates in quantity, value and unit value) were much higher than the export indicators of the same order. The import payment was increasing at an annual compound growth rate of 20.03 per cent

against 4.59 per cent in export earnings. This situation cautions the urgent need for detailed analysis and appropriate policy interventions.

3.2 Evolution of India's Black Pepper Export Basket: From Dried Berries to Value-Added Products

Throughout history, India has predominantly exported black pepper in its unprocessed state, primarily as dried berries. However, alongside shifts in export volume, the composition of the export basket, comprising various black pepper products, has also changed. These changes may be attributed to evolving consumer preferences in the global market and the comparative financial benefits of value addition. Over time, the export basket has expanded from a limited selection of value-added products to a more diverse range. Presently, India exports a variety of value-added items, including ground black pepper, oils, oleoresin, and other processed forms, catering to diverse consumer preferences worldwide. It's worth noting that products like curry powders containing black pepper as an ingredient are not included in this list. This discussion is based on the international trade classification of black pepper observed in global trade practices.

The Harmonized Commodity Description and Coding System, generally called Harmonized System (HS) in global trade, is a multipurpose international product nomenclature developed by the World Customs Organization (WCO). Over 98 per cent of the merchandise in international trade is classified in terms of the HS. It comprises over 5,000 commodity groups, each identified by a six-digit code, arranged in a legal and logical structure to achieve uniform classification.



Code	Description
09	Coffee, tea, mate and spices

Code	Description
0904	Pepper of the genus *Piper*; dried or crushed or ground fruits of the genus *Capsicum* or of the genus *Pimenta pep*

Code	Description
090411	Black pepper neither crushed nor ground
090412	Crushed or ground black pepper
090421	Fruits of the genus *Capsicum* or of the genus *Pimenta*: dried, neither crushed nor ground
090422	Fruits of the genus *Capsicum* crushed or ground

Code	Description
09041110	Pepper long
09041120	Light black pepper
09041130	Black pepper garbled
09041140	Black pepper ungarbled
09041150	Dehydrated green pepper
09041160	Pepper pinheads
09041170	Freeze dried green pepper
09041180	Frozen pepper
09041190	Other pepper neither crushed nor ground

Source: WITS, 2017.

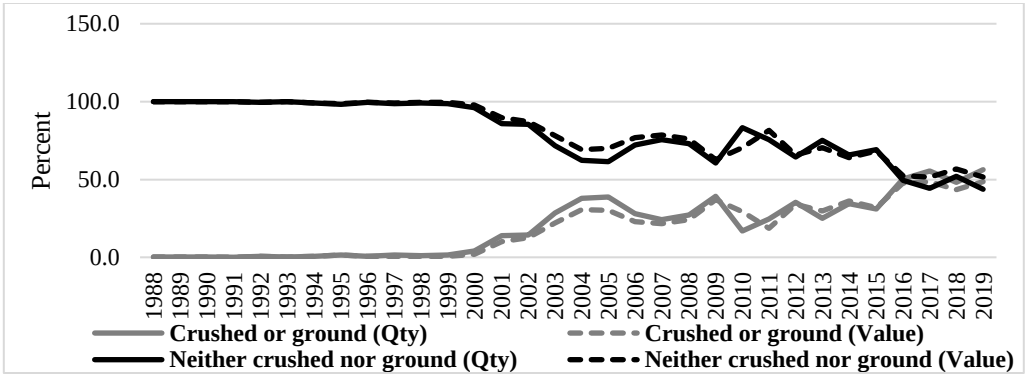
Figure 3. HS Classification For Black Pepper

The HS classifications are arranged in 2-digits (Chapters), 4-digits (Heading), 6-digits (Sub-Heading) and 8-digits or 10-digits (actual product at national tariff line). The classifications are harmonized across all the countries in the world up to 6-digit level. Above that level, the tariff lines are presented at 8-digit (e.g., in India) in some countries and 10-digit (e.g., in the USA) in others. Figure 3 above shows the HS classification for black pepper and its products. The trade data of black pepper for the study, which was collected from WITS software, was categorized up to the 6-digit level, *i.e.*, up to sub-headings. The annual data on exports and imports of black pepper collected from the Ministry of Commerce and Industry, Government of India, were classified up to the 8-digit level.

Internationally, black pepper is traded in two primary forms: black pepper, neither crushed nor ground (BP-NCNG) (unprocessed form), and crushed or ground black pepper (BP-CG), which is the processed form. Before 2000, exports primarily consisted of the unprocessed form. The trade dynamics of unprocessed black pepper during the periods under examination exhibited a similar pattern to total exports during the nineties. However, there were slight differences in value estimates. Subsequently, the exports of the unprocessed form experienced a higher rate of decline than total exports, at 3.2 per cent per annum, indicating a decreasing share of unprocessed black pepper in India's export basket. Overall, annual exports of unprocessed pepper declined at a rate of 3.2 per cent. Despite unit value realization growing at 4.11 per cent per annum, export value showed only a modest increase of 0.87 per cent because of the above decline in the quantum of exports.

Over the entire period, garbled black pepper comprised a significant portion of total exports of unprocessed black pepper, both in quantity and value. However, its share has decreased from about 73 per cent to 46 per cent in quantity terms and 74 per cent to 48 per cent in value terms over two decades. Conversely, there was an increase in the shares of dehydrated green pepper and other forms of unprocessed pepper. This shift in preference may be attributed to European consumers' preference for dehydrated green pepper due to its natural green colour and fresh flavour (IPC, 2019).

By 2019, there was a notable shift in the export trend, with more than half (56.3 per cent) of black pepper exports being in the processed form (Figure 4). This change primarily reflects market signals from international markets, particularly the USA, the world's major black pepper importer. To seize this opportunity, Indian exporters began focusing on value addition and relied more on imported black pepper from Sri Lanka and Nepal (Krishnakumar, 2018). Increased demand in the domestic market limited the potential for value addition for export. At the same time, Regional Trade Agreements such as the Indo-Sri Lanka Free Trade Agreement (ISLFTA) and South Asian Free Trade Agreement (SAFTA) facilitated imports through comparative price advantages. This imported black pepper was then re-exported after value addition.



Source: Estimated using data from WITS

Figure 4. Dynamics in Share of BP-NCNG(Unprocessed) and BP-CG(Processed) in Total Black Pepper Exports from India

The value-added black pepper products exported from India are detailed in Table 3, with crushed or ground pepper being the major export item in quantity. Pepper oleoresin, a concentrated extract obtained through conventional solvent extraction or supercritical fluid extraction, and pepper oil were also significant processed forms. These oils and oleoresins are more cost-effective than whole or ground spices, as a lesser quantity can provide the same effect (Yogesh and Mokshapathy, 2014). India accounts for 90 per cent of global pepper oleoresin production (IPC, 2018) and is also a major producer of pepper oil. In 2018, the top five destinations for pepper oleoresin were the USA, Germany, France, China, and the Netherlands, with export quantities of 381, 162, 103, 96, and 89 tonnes, respectively (IPC, 2019). Pepper oil and oleoresin exports have thus seen a significant increase following liberalisation. The current Indian exports of black pepper primarily consist of processed forms, with crushed pepper dominating in quantity and pepper oleoresin in value in the export market.

Previously, akin to export patterns, predominantly unprocessed forms of black pepper were imported and subsequently processed for re-export. During TE1999-2000, India's imports mainly comprised garbled black pepper (36.78 per cent), light black pepper (30.43 per cent), and pepper long (20.62 per cent), collectively constituting 88 per cent of the value of black pepper imports. However, the share of garbled black pepper decreased in subsequent periods (Table 4). Imports of pepper oil and pepper oleoresin remained minimal until 2010 but increased thereafter. In the latest triennium, India imported 14.91 tonnes of pepper oil and 76.58 tonnes of pepper oleoresin, valued at Rs. 412.28 lakh and Rs.2464.04 lakh, respectively. Together, these accounted for one per cent and four per cent of total black pepper imports to India in quantity and value, respectively.

TABLE 3. DYNAMICS IN EXPORT OF BLACK PEPPER AND ITS PRODUCTS FROM INDIA

Commodities	HS code	Values (Rs. Lakh)			Quantity (tonnes)		
		TE 1999-00	TE 2009-10	TE 2019-20	TE 1999-00	TE 2009-10	TE 2019-20
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Pepper long	09041110	470.17 (0.79)	259.74 (0.79)	499.49 (1.50)	400.96 (1.17)	204.25 (0.76)	105.46 (1.28)
Light black pepper	09041120	9392.68 (15.73)	215.44 (0.65)	1390.93 (4.19)	5157.74 (15.09)	169.72 (0.63)	363.43 (4.40)
Black pepper garbled	09041130	44357.23 (74.31)	25734.24 (78.11)	15975.56 (48.07)	24938.89 (72.98)	22127.64 (82.04)	3835.64 (46.40)
Black pepper ungarbled	09041140	1754.72 (2.94)	606.52 (1.84)	2094.22 (6.30)	993.23 (2.91)	478.61 (1.77)	391.04 (4.73)
Dehydrated green pepper	09041150	642.57 (1.08)	1703.79 (5.17)	5166.93 (15.55)	275.85 (0.81)	781.53 (2.90)	662.29 (8.01)
Pepper pinheads	09041160	1679.69 (2.81)	89.52 (0.27)	660.31 (1.99)	1242.46 (3.64)	148.08 (0.55)	283.29 (3.43)
Freez dried green pepper	09041170	408.84 (0.68)	586.73 (1.78)	1299.07 (3.91)	93.89 (0.27)	126.39 (0.47)	78.99 (0.96)
Frozen pepper	09041180	4.52 (0.01)	60.04 (0.18)	22.74 (0.07)	2.25 (0.01)	37.00 (0.14)	12.59 (0.15)
Other pepper neither crushed nor ground	09041190	986.01 (1.65)	3688.79 (11.20)	6124.47 (18.43)	1069.21 (3.13)	2898.66 (10.75)	2532.95 (30.64)
BP-NCNG	090411	59694.91 (100.00)	32944.82 (100.00)	33233.72 (100.00)	34173.73 (100.00)	26971.89 (100.00)	8265.68 (100.00)
BP-CG	090412	373.21	12110.97	29277.35	458.55	10825.11	9357.09
Pepper oil	33012935	22.65	2000.3	3400.01	0.94	136.31	101.95
Pepper oleoresins	33019013	6582.42	11969.973	35893.05	629.51	1377.68	1442.58

Source: Export-Import data bank, Government of India

Note: Values in parentheses indicate share in per cent to the black pepper neither crushed nor ground

TABLE 4. DYNAMICS IN IMPORT OF BLACK PEPPER AND ITS PRODUCTS TO INDIA

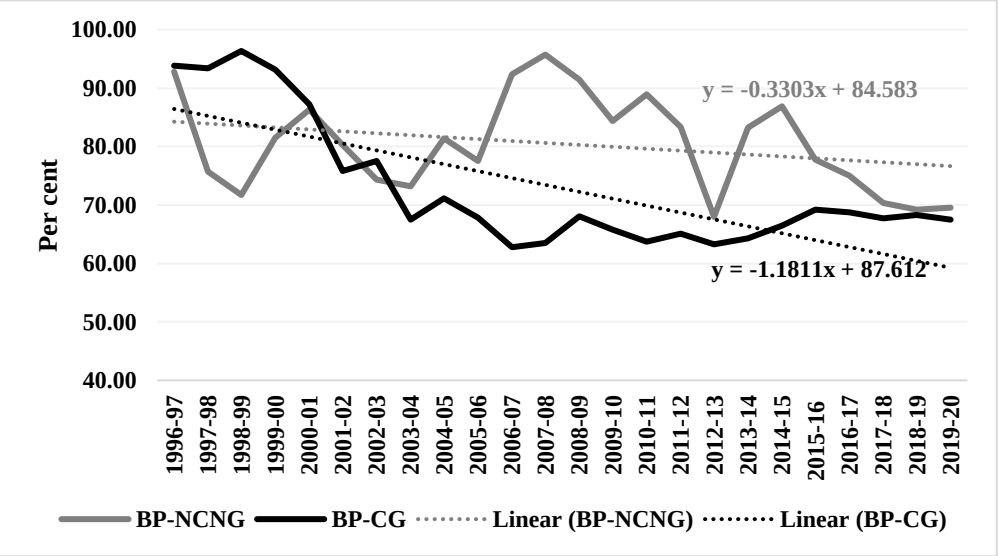
Commodities	HS code	Values (Rs. Lakh)			Quantity (tonnes)		
		TE 1999-00	TE 2009-10	TE 2019-20	TE 1999-00	TE 2009-10	TE 2019-20
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Pepper long	09041110	947.68 (20.62)	308.10 (1.62)	2003.60 (2.36)	774.56 (26.89)	787.78 (5.68)	1574.44 (5.44)
Light black pepper	09041120	1398.77 (30.43)	9455.89 (49.61)	36014.49 (42.34)	730.99 (25.37)	6559.69 (47.31)	12034.94 (41.61)
Black pepper garbled	09041130	1690.60 (36.78)	1713.56 (8.99)	14472.0 (17.01)	1055.18 (36.63)	1270.22 (9.16)	5723.97 (19.79)
Black pepper ungarbled	09041140	343.99 (7.48)	4746.88 (24.90)	10839.50 (12.74)	190.18 (6.60)	3650.98 (26.33)	3181.47 (11.00)
Dehydrated green pepper	09041150	-	-	120.15 (0.14)	-	-	86.78 (0.30)
Pepper pinheads	09041160	6.49 (0.14)	7.26 (0.04)	503.20 (0.59)	21.00 (0.73)	18.00 (0.13)	257.26 (0.89)
Freez dried green pepper	09041170	-	0.32 (0.002)	9.02 (0.011)	-	0.03 (0.000)	0.35 (0.001)
Frozen pepper	09041180	-	2.14 (0.01)	48.01 (0.06)	-	1.23 (0.01)	11.33 (0.04)
Other pepper neither crushed nor ground	09041190	213.51 (4.64)	2820.99 (14.80)	21057.65 (24.75)	123.02 (4.27)	1570.68 (11.33)	6053.10 (20.93)
BP-NCNG	090411	4596.72 (100.00)	19061.56 (100.00)	85064.64 (100.00)	2880.93 (100.00)	13864.39 (100.00)	28923.62 (100.00)
BP-CG	090412	13.05	384.22	467.73	10.15	239.20	112.02
Pepper oil	33012935	0.22	45.09	412.28	0.09	1.88	14.91
Pepper oleoresins	33019013	-	2.22	2464.04	-	0.15	76.58

Source: Export-Import data bank, Government of India
Note: Values in parentheses indicate share in per cent to the black pepper neither crushed nor ground.

3.3 Diverse Products and Expanding Destinations

Export diversification is the change in the composition of a country's existing export product mix or export destinations (Ali et al., 1991; Berthelemy and Chauvin, 2000). Commodity diversification means the addition of value to a commodity by not only changing its original form through processing but also by packaging and branding or other efforts to enhance the product value (Jana, 2006; Singh et al., 2009). A decreasing commodity concentration index indicates a higher degree of export diversification. The declining indices for processed and unprocessed black pepper suggest an expanding array of products within the export basket (Figure 5), signalling a positive trajectory for future exports. Notably, the increase in product diversification is more pronounced in processed black pepper, as evidenced by the lower commodity

concentration index values. This points to a significant broadening of the range of processed black pepper products within the export portfolio, underscoring the industry's shift towards a more diverse and resilient market presence. This observation highlights the dynamic nature of the black pepper sector, emphasizing the importance of processed forms in contributing to a varied and robust export profile. Generally, commodity diversification is influenced by two primary factors: demand/consumption factors and production/supply factors. Demand factors encompass population growth, rising per capita income, urbanisation, and trade liberalisation, all shaping consumption patterns (Joshi et al., 2007). Additionally, commodity price shocks are associated with the risks of over-reliance on a few commodities (IMF, 2003).



Note: Estimated using data from Export-Import data bank, Government of India

Figure 5. Trend in commodity concentration of export of BP-NCNG and BP-CG from India

Geographic diversification assesses the breadth of export destinations for a particular product. The Hirschman Index measures this concentration, where a value close to zero indicates well-diversified export destinations (Kadyrova, 2011). Conversely, an index value of 40 or higher suggests a higher degree of concentration (OECD Secretariat, 2018; Mohandas et al., 2018). Figure 6 displays the estimated Hirschman indices for the export of BP-NCNG and BP-CG, respectively. Throughout all periods, BP-CG exports exhibited greater concentration than those of unprocessed forms. The average concentration indices exceeded 40, indicating that India predominantly exports BP-CG to only a handful of markets. This concentration poses risks to exports due to price volatility and political factors, making countries vulnerable to potential instability in domestic markets (Hinlo and Arranguez, 2017). Post-2010, India expanded the number of markets to which BP-NCNG was exported, while

exports of processed forms remained concentrated in a few markets during the same period.

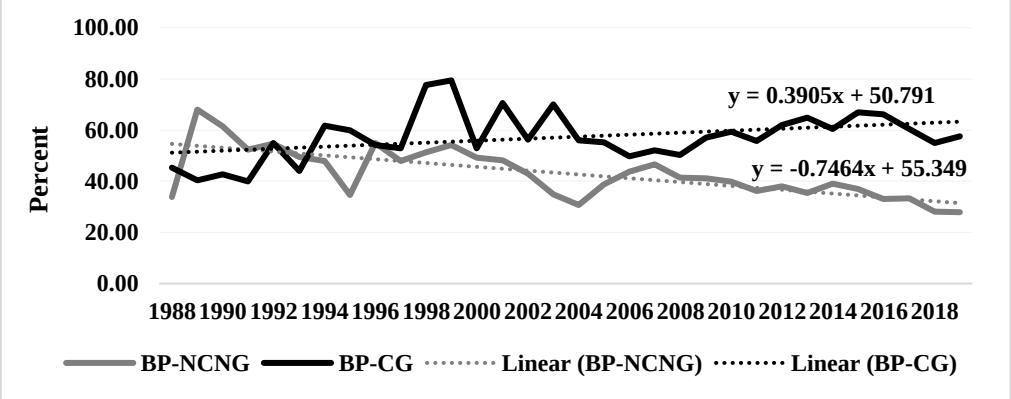


Figure 6. Trend in Geographic Concentration of Export of BP-NCNG and BP-CG from India

From 1990 to 2019, the estimated geographic concentration indices for India's export of unprocessed black pepper displayed a consistent and gradual decline (Figure 6). This decline may stem from the limited export quantity of black pepper, leading to its scarcity in international markets and various destinations. Examining country-wise exports from India reveals that in the 1970s, the USSR was the largest importer of Indian black pepper. However, the dissolution of the USSR in the 1990s hurt Indian black pepper exports. Similarly, economic crises in European nations, followed by foreign exchange crises, had similar effects (Raju, 2000; Burger and Smith, 2000). In TE 1990, India exported nearly 50 per cent of BP-NCNG to the USSR and the USA in TE 2000 (Figure 7). Subsequently, India diversified its exports to various markets worldwide, resulting in a decrease of more than half in the share of major importers such as Russia and the USA over the past decade. Thus, recent diversification can be attributed to entering new markets such as Germany, Japan, and the UK. It can be concluded that India benefits from diversified destinations and trading relationships, which help mitigate risks associated with unstable prices and trade shocks.

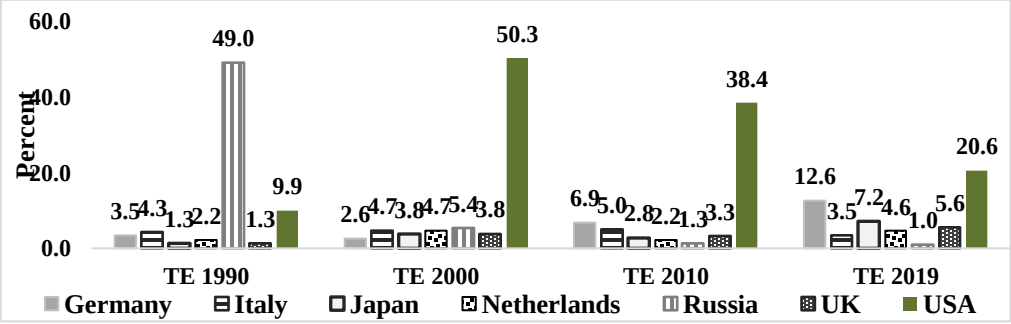
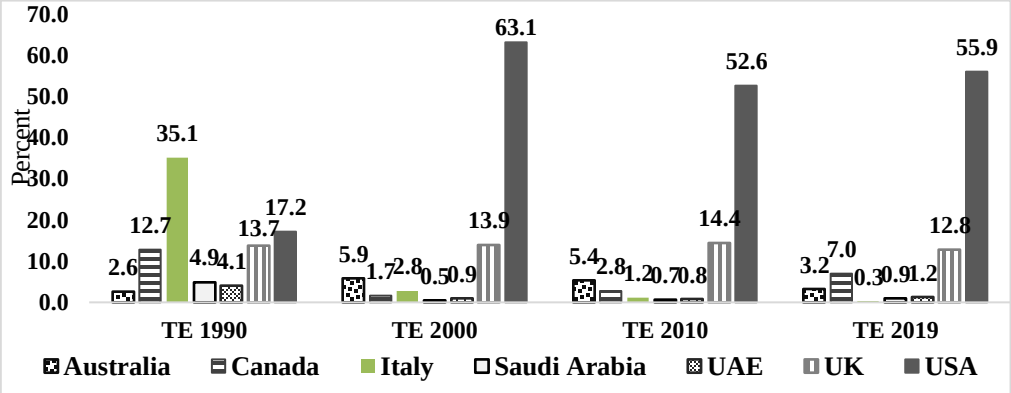


Figure 7. Dynamics in Share of Different Countries in the Indian Exports of BP-NCNG

In TE 1990, the primary markets for BP-CG from India were Italy (35.1 per cent), the USA (17.2 per cent), and the UK (13.7 per cent) (Figure 8). However, by TE 2019, the export share to these markets had declined significantly. During the 1990s, Italy was the major importer of BP-CG from India. However, since 2000, Italy's share has substantially decreased, and the USA has emerged as the major importer, with India exporting over 50 per cent of its BP-CG to the USA. Over the long term, Indian BP-CG exports remained concentrated in a few markets, rendering exporters increasingly vulnerable to economic and political shocks in international markets.



Note: Estimated using data from WITS

Figure 8. Dynamics in Share of Different Countries in the Indian Exports of BP-CG

3.4 Unstable Patterns of Trade

Over time, alongside fluctuations in growth rates, there has been an escalation in the instabilities observed in both the quantity and value of exported products, contrasting with a decrease in such instabilities in imports. Specifically, trade in BP-CG displayed notably higher instability compared to BP-NCNG. Various factors contributed to the declining growth rates and increased instability in black pepper exports, including rising domestic demand, diminished production, competition from new players such as ASEAN countries, fluctuating shares in global exports and imports, and the delayed response of production to price changes (Thomas and Sanil, 2019; Sabu et al., 2020a). The escalating instabilities in exports and the heightened instability in exporting processed forms warrant a more thorough analysis.

TABLE 5. INSTABILITY IN EXPORT OF BLACK PEPPER FROM INDIA (COPPOCK'S INSTABILITY INDEX)

Year	Black pepper neither crushed nor ground			Crushed or ground black pepper			Total black pepper		
	Quantity	Value	Unit Value	Quantity	Value	Unit Value	Quantity	Value	Unit Value
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Exports									
1990-1999	49.19	49.22	25.94	207.15	241.11	36.41	48.50	48.91	25.83
2000-2009	41.96	59.30	28.18	50.14	40.67	19.24	29.52	48.83	29.12
2010-2019	55.62	78.96	38.71	41.64	40.80	35.34	51.83	65.82	20.90
Overall 1990-2019	49.42	62.98	30.60	115.30	116.37	37.23	43.70	55.41	27.20
Imports									
1990-1999	59.22	108.25	38.88	1443.37	1358.89	119.73	58.21	105.5	38.10
2000-2009	44.99	30.95	30.31	3308.27	1925.56	211.40	45.20	30.73	30.12
2010-2019	17.97	47.71	41.88	153.49	187.04	87.85	15.20	38.12	33.30
Overall 1990-2019	45.09	64.13	37.95	1864.56	1109.94	220.52	44.60	60.80	35.31

Note: Estimated using data from WITS.

IV

CONCLUSION

Over the past two decades, the Indian black pepper trade has experienced significant fluctuations. While the growth rate in black pepper exports has decreased, import growth has increased, causing concerns about the growth behaviour of net export earnings. Additionally, there has been an increase in the instability of black pepper exports, while import instability has decreased, signalling a shift towards import dependency. Recent periods have witnessed a diversification in Indian black pepper exports, with an apparent decline in the share of unprocessed black pepper and an increase in the share of value-added products, which paints a positive aspect. However, it is a matter of concern that exports remain concentrated in a few markets, signalling the chances of high-risk exposure.

Since 90 per cent of black pepper area and production is concentrated in the states of Karnataka and Kerala, with Kerala being the conventional centre of production, the investments for black pepper development need to be ensured in these states. R&D efforts towards product development and market expansion are to be facilitated by the public sector, while the private sector is currently making such efforts. The historical stamp of high-quality black pepper from India is already a good investment, and it can be further tapped by registering it as a GI product.

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