



Dynamics of Turmeric Production and Trade in India: An Analysis of State-wise Performance and Global Export Competitiveness (2015- 2025)

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Abstract

Turmeric, agricultural commodity normally called “Golden Spice” it plays a crucial role in Indian agriculture as well as in world trade. India is a global biggest turmeric producer and unique turmeric exporter, it contributes around 60 percent of world exports. This research paper examines the dynamics of turmeric production in India and its trade especially focusing on state-wise turmeric production performance and world export competitiveness during the analysed period of 2015-2025. The results revealing a structural shift in domestic turmeric production with Maharashtra is a dominating producer in volume because of notable expansion of turmeric cultivation area. But some states like Tamil Nadu, Telangana and Karnatak exhibit significant level of productivity. It indicates the effective implementation of modern methods and regional economic interventions. Even there is a fluctuation in turmeric cultivational area and its production, India has been dominating key share in world turmeric exports between 58 percent to 66 percent during the research period. The import-export ratio of turmeric consistently favorable situation. It indicates that India has a strong trade hold in international market. An important finding of this research paper, the India's turmeric exports increased sharply during 2024-25. It is understood that the world price appreciation and higher unit value is a primary driver of export earnings. This research paper concludes that India is a leader in world turmeric market is supported not only by production capabilities but by well-established trade unfractured, modern technology, procession capacity and facing international demand. Identifying low-yield regions and various promotional activities should be carried out to sustain India's world competitiveness in the turmeric trade.

Key words: *Turmeric, Trend, Area, Productivity and Exports-imports.*

JEL Code: Q13, F14, Q17, Q11, O13, F10

Introduction

Turmeric is commonly known as “Golden Spice”, is a golden stone of India’s agricultural economy as well as cultural heritage. India dominating as a world leader in turmeric production and consumption recorded over 60 percent. Furthermore, the domestic cultivation has slowly undergoing a significant transition. Telangana is a traditional power house seeing a shift in dominance towards of Maharashtra leading producer by volume, like Tamil Nadu is a predominant state producing high yield variety of turmeric. The world market unexpectedly and fluctuations in turmeric cultivational area, which dipped into approximately 290,000 hectares in 2024-25, the turmeric economic value has seen a drastically surge. It is noted that in 2024, India’s export value reached \$333.25 million, it reflects a sharp rise in world market demand as well as price. India ranks among the top world importers.

Turmeric is a medicinal plant that has very lengthy history, hardly 4000 years old plant. In Southeast Asia, turmeric is being used not only as a principal spice for cosmetics, but their component used in religious ceremonies. Because of their beautiful yellow colour known as “Indian Saffron”. In India, turmeric is used as an important component decorating all religious events. Hence, Modern medicinal world has realized turmeric usage and published more than 3000 research papers have explored the significance of the turmeric. 4000 years back in India, the Vedic culture they have used as a culinary spice. It reached China approximately 700 AD, West Africa by 1200 AD, East Africa by 800 AD and Jamaica by eighteenth century. In South Asia, the Sanskrit medical treaties, Ayurvedic and Unani systems have mentioned its usages in their holy books. There are more than 30 distinct varieties of turmeric plants are grown in across India. India’s is a world largest turmeric producer around 75 percent of world output. Major turmeric varieties including Alleppey Superme, Salem, Erode, Rajapuri and Lakadong which varied in aroma, colour and curcumin content.

Characteristics of Turmeric

Turmeric is a looking as a flowering plant belong to the ginger family, Zingiberaceae, bright golden yellow colour rhizomes. It has been using for traditional method of medicine like Ayurvedic and other form of old method. Turmeric is widely used for cooking thousands of years. Here we are providing primary characteristics of turmeric categorizes by its physical, Chemical and functional properties:

It’s Appearance: Underground stems, the rhizomes have a trough and rough, brownish skin. If sliced the interior is a vibrant and looking deep orange yellow.

Flavor: It has a pungent, earthly and slight bitter taste with a mustard like aroma. It may be described as a warm flavor.

Growth Habit: Turmeric is a perennial herbaceous plant that grows to about one meter tall, large featuring, green, lance shaped leaves and dull colour yellow flowers.

Curcuminoids: It’s most significant active compounds are curcuminoids with curcumin being a most dominant one. This type of compound is most responsible for the intense yellow colour and most its health related properties.

Essential Oils: Turmeric contains volatile oils like turmerone and atlantone it contributes distinct aroma and therapeutic potential.

Bioavailability: Curcumin is absorbed into the bloodstream on its own. It contains fat soluble and is importantly better absorbed when it consumed with piperine (identified in black pepper) and healthy fats.

Uses and Applications of Turmeric

Turmeric is inseparable vegetable item always decorated in South Asian and Middle Eastern countries cuisines. It gives foundational colour for curry powders and it is used to flavour mostly all the cooked food.

Medicinal and Health Properties

Anti-inflammatory: Turmeric is widely used as a medicinal product and studied for its ability to reduce inflammation at all molecular level.

Antioxidant: In turmeric curcumin is a potent antioxidant that can neutralize free radicals and instigate the entire body's own antioxidant enzymes.

Antimicrobial: Turmeric has been using quiet a long years traditionally used as an antiseptic for cuts, burns and skin irritations.

Industrial and Cultural Use

Natural Dye: Turmeric has a strong staining power, used to dye fabrics especially silk and cotton and as a food colouring.

Ritualistic: Different types and methods of culture followed by the people across the world. In India also in the same has varieties of cultural beliefs used the turmeric in wedding festivals and religious ceremonies.

Review of Literature

Several researchers have examined turmeric production and export performance from the perspectives of agricultural economics, international trade, competitiveness, and the spice economy. The literature primarily focuses on production trends, export growth, technological advancement, genetic improvement, environmental factors, and policy interventions influencing the turmeric sector.

Angles, Sunder and Chinnadurai (2011) reported that globalization and trade liberalization improved India's turmeric exports by expanding international market access, supported by infrastructure development, technological progress, and policy reforms. However, production remained unstable due to climatic and price fluctuations. Govindaswamy (2014) observed that India's comparative advantage in turmeric production is derived from favorable agro-climatic conditions, traditional cultivation practices, and a large production base, while emphasizing the need to reduce regional productivity disparities through improved cultivation practices and extension services.

Antony Booker, Deborah Johnson and Michael Heinrich (2016) highlighted the growing global demand for turmeric in herbal and pharmaceutical industries and emphasized that value-added processing can substantially enhance export earnings. Similarly, Dessalegn Gachena, Jema Haji, Belayinch Legesse and Mengistu Ketema (2020) found that production levels, exchange rates, and international demand significantly influence spice exports, stressing the importance of export diversification for improving global competitiveness.

Priya and Thyagarajan (2020) showed that turmeric production and exports have steadily increased due to expansion of cultivated area and rising international demand. However, differences in farming practices, irrigation facilities, and technology adoption created considerable regional disparities in productivity. Arthi et al. (2020) further demonstrated that genotype–environment interactions significantly affect curcumin content and product quality, indicating that environmental adaptability is essential for improving productivity and export competitiveness.

Jadhav, Baviskar, Waghmare and Bhosale (2022) reported continuous growth in turmeric exports driven by increasing global demand and expansion of cultivation, although climate variability remains a major constraint to stable production. Technological interventions have also received considerable attention. Kumar et al. (2024) found that drip irrigation and mulching significantly improved turmeric yield and water-use efficiency compared to conventional cultivation methods. Likewise, Sharma et al. (2024) observed that rhizome yield and curcumin content vary across genotypes and production systems, recommending suitable variety selection and sustainable cultivation practices, including organic farming, to improve productivity and market value.

Recent studies have increasingly focused on genetic improvement and international trade competitiveness. Lijo Thomas, Gayathri Chandran and Ananthakrishnan (2025) emphasized the growing economic importance of turmeric in pharmaceutical and nutraceutical industries and highlighted the need for genetic improvement to enhance productivity and quality. Sachin Kumar Sharma (2025) analyzed the export dynamics of major turmeric-producing countries and reported that India continues to maintain a favorable export position despite increasing competition from emerging producers, recommending strict quality standards and market diversification. Padmaja Ponnamaneni, Revathi E., and Chakradhar Jadhav (2025) found that bilateral trade agreements, geographical proximity, and market demand significantly determine India's turmeric exports and suggested strengthening trade relations while promoting value-added products. Arthi et al. (2025) further confirmed that climatic conditions and soil characteristics significantly influence turmeric quality traits, emphasizing the importance of environmental management in enhancing market competitiveness.

Overall, the reviewed studies indicate that turmeric production and export performance are influenced by a combination of agro-climatic conditions, technological adoption, genetic improvement, cultivation practices, international demand, and trade policies. While modern production technologies, improved varieties, sustainable cultivation, and value-added processing have strengthened productivity and export competitiveness, challenges such as regional productivity differences, climate variability, and increasing global competition continue to affect the sector. These findings provide a strong foundation for the present study by emphasizing the importance of technological interventions and productivity enhancement in improving the performance and competitiveness of India's turmeric industry.

Research Gap

Earlier studies have analysed turmeric production trends, export performance and determinants of trade competitiveness, limited research papers have focused on recent state-wise production shifts (especially the rise of Maharashtra), productivity differences across states and the relationship between unit value and export quantity during the post 2020 period. Even though, there is a lack of integrated studies have combined state-level production dynamics with world trade competitiveness analysed used recent data up to 2025. Therefore, present study attempts this gap by analysing state-wise production, area, productivity and global export competitiveness of turmeric in India during 2015-2025, with special emphasis on trade performance, value driven export growth and production differences.

Need for the study

Turmeric has traditional plant in South India, the data indicates that a massive shift towards state of Maharashtra, which now leads in volume despite lower productivity compared to Tamil Nadu and Telangana. Indeed, there is a need to understand why turmeric production is migrating and why states with the highest yields (like Telangana at 8.10 MT/ha) are seeing a reducing cultivation area. In 2024-25, compared to 2020 the exports quantity was relatively stable. This study has to concentrate to

determine if this is because of world inflationary pressure, improved quality standard or a shift towards value added turmeric products. It is noted that India is the biggest turmeric exporter (66% share) but also a top world importer (ranking 2nd in 2023). It is suggested a complex internal demand or a growing “hub” model where India’s imports raw turmeric for value added processing and re-exports. This study examined the dual role strategy. There is a high level differences in yield across states from Andhra Pradesh at 2.34 MT/ha to Karnataka at 8.30 MT/ ha (2024-25). Finding out the causes of theses gaps is important for national food security and increasing farmers income. It is noted that India’s world export share fluctuating between 58 percent and 66 percent, there is a necessary to examine the competitive threat from emerging exporters like the Myanmar and Netherlands to ensure India once again retain its “Golden Spice” title as a monopoly.

Scope of the Study

This study spans a 10-year period (2015-2025) for world trade dynamics (Exports and Imports). It focuses on a 5-year intensive window (2020-2025) for domestic state wise turmeric production, area and productivity trends. This study is restricted to the top 11 turmeric-producing states in India, namely Maharashtra, Tamil Nadu, Telangana, Karnataka, Madhya Pradesh, Andhra Pradesh, Odisha, Assam, Mizoram, West Bengal and Gujarat). This study covers India’s trade partners, including EU (Netherlands, Germany) and USA, South East Asia of Malaysia, as well as its standing against competitors like Indonesia and Myanmar.

Objectives

1. To analyze the trends in turmeric production, area and productivity across major Indian States from 2020 to 2025.
2. To examine India’s export-import dynamics focusing on the correlation between quantity and unit value over the last decade.
3. To assess India’s competitive position in the world turmeric market related with other major exporters like Myanmar and Netherlands.

Hypotheses

H₁ : There is a significant positive correlation between state wise productivity (MT/ha) and the adoption of regional agricultural interventions, rather than just the expansion of the turmeric cultivation area.

H₂ : India’s world export share remains resilient to domestic production fluctuations because of its established infrastructure as a global hub.

H₃ : The share increase in export value in 2024-25 is driven more by global price appreciation (unit wise) than by a proportional increase in export volume.

Methodology

This study used secondary data for analysis using data collected from Ari/Horti Departments, DASD Kozhikode, the Spices Board and Lok Sabha unstarred questions. Time frame of the analysis is 2015-2016 to 2024-2025 (Long term trade) and 2020-2025 (State-wise production). Descriptive statistics were used to summarize production growth and area utilization. Comparative analysis also done to rank states by yield (Productivity Measurement) vs total output. Trade ratio analysis has been done to calculate the export to import ration to determine India’s trade balance and value – addition role. The market share calculation were also done to assess India’s percentage contribution to aggregate global exports. This study did not focusing on cost of cultivation (labour, fertilizers, seeds) at the farmers level. It excludes qualitative aspects such as curcumin content variations across

different regional varieties (e.g., Lakadong Vs Nizamabad). The study does not analyses domestic consumption pattern within Indian households.

Trend of Turmeric Production

The world turmeric production is dominated by India, which is recorded for over 70% of world output. In recent years, there is high demand driven by increased healthy awareness post pandemic though production faces more fluctuations because of price volatility. Hence, the cultivated area has grown, the yields have faced pressure with a 3.24 percentage CAGR declined in production between 2012-13 and 2022-23.

State-wise Production of Turmeric (in Million Tone)

State	2020-21	2022-22	2022-23	2023-24	2024-25
Maharashtra	230.74	367.84 (59.42)	323.23 (-12.13)	310.01 (-4.09)	290.14 (-6.41)
Tamil Nadu	97.83	124.92 (27.69)	136.37 (9.17)	139.44 (2.25)	144.52 (3.64)
Telangana	319.76	216.55 (-32.28)	173.61 (-19.83)	113.73 (-34.49)	133.10 (17.03)
Karnataka	131.14	110.03 (-16.10)	119.39 (8.51)	66.83 (-44.02)	107.10 (60.26)
Madhya Pradesh	62.99	74.65 (18.51)	82.43 (10.42)	92.55 (12.28)	96.44 (4.20)
Andhra Pradesh	73.24	74.69 (1.98)	73.52 (-1.57)	38.03 (-48.27)	66.16 (73.97)
Odisha	43.62	68.86 (57.86)	69.10 (0.35)	73.75 (6.73)	59.78 (-18.94)
Assam	24.67	21.49 (-12.89)	23.33 (8.56)	57.46 (146.29)	57.83 (0.64)
West Bengal	48.18	50.94 (5.73)	53.07 (4.18)	53.39 (0.60)	50.25 (-5.88)
Mizoram	29.82	29.82 (0.00)	29.82 (0.00)	29.98 (0.54)	29.79 (-0.63)
Gujarat	18.19	19.20 (5.55)	20.21 (5.26)	25.05 (23.95)	20.17 (-19.48)
Others	54.99	62.18 (13.08)	65.90 (5.98)	63.01 (-4.39)	60.84 (-3.44)
Total	1135.17	1221.17 (7.58)	1169.98 (-4.19)	1063.23 (-9.12)	1116.12 (4.97)

Source: State Agri/Horti Departments/DASD, Kozhikode

Note: Figures in parentheses indicate the percentage growth over previous year

The table represents the state wise production trends of turmeric in India from 2021-21 to 2024-25. The data indicates that there is a significant regional variations in production levels and growth patterns among the major turmeric producing states. In India level, the total turmeric production has increased from 1135.17 million tonnes recorded in 2020-21 to 1221.17 million tonnes in 2021-22, the annual growth rate of 7.58 percentage. However, the turmeric production was declined in the subsequent years before slightly recovering to 1116.12 million tonnes in 2024-25. These fluctuations shows the

influence of factors such as market prices, climatic conditions and shifts in cropping patterns. The analysis shows a regional shift in turmeric production with Maharashtra's expanding through area growth, while Tamil Nadu stands steady growth through higher level of productivity and Telangana experiencing a contraction in output.

State-wise Area Used for Turmeric Production (Area '000 ha)

State	2020-21	2022-22	2022-23	2023-24	2024-25
Maharashtra	59.56	102.67 (72.38)	88.32 (-13.98)	85.15 (-3.59)	77.99 (-8.41)
Tamil Nadu	20.77	24.17 (16.37)	24.75 (2.40)	23.15 (-6.46)	23.61 (1.99)
Telangana	41.01	34.78 (-15.19)	22.74 (-34.62)	14.18 (-37.64)	16.43 (15.87)
Karnataka	20.56	19.40 (-5.64)	19.57 (0.88)	12.17 (-37.81)	12.91 (6.08)
Madhya Pradesh	17.76	20.53 (15.60)	22.42 (9.21)	25.06 (11.78)	26.05 (3.95)
Andhra Pradesh	30.52	25.59 (-16.15)	33.42 (30.60)	22.37 (-33.06)	28.32 (26.60)
Odisha	27.87	31.17 (11.84)	31.24 (0.22)	33.36 (6.79)	30.30 (-9.17)
Assam	17.76	16.59 (-6.59)	17.56 (5.85)	17.15 (-2.33)	17.23 (0.47)
West Bengal	18.48	18.77 (1.57)	19.69 (4.90)	19.78 (0.46)	18.91 (-4.40)
Mizoram	7.74	7.74 (0.00)	7.74 (0.00)	8.08 (4.39)	7.79 (-3.59)
Gujarat	4.69	4.95 (5.54)	5.18 (4.65)	5.39 (4.05)	4.96 (-7.98)
Others	26.03	26.66 (2.42)	28.15 (5.59)	26.99 (-4.12)	26.44 (-2.04)
Total	292.75	333.02 (13.76)	320.78 (-3.68)	292.83 (-8.71)	290.94 (-0.65)

Source: State Agri/Horti Departments/DASD, Kozhikode

Note: Figures in parentheses indicate the annual percentage growth over previous year

Maharashtra is a prominent Indian state that yields 77.99 thousand hectares of turmeric. The production of turmeric is anticipated to experience a dual transformation in 2022–2023. Tamil Nadu secured the second position in turmeric output, covering 23.61 thousand hectares. In Maharashtra, the annual growth rate exhibited significant fluctuations over the analyzed time. In 2022-23, turmeric was cultivated on 102.67 thousand hectares, however it significantly decreased to 77.99 thousand hectares in 2024-25. In Tamil Nadu, there was minimal fluctuation during the analyzed time. Telangana, the third largest turmeric producer, recorded 41.01 thousand hectares in 2020-21, but this figure quickly decreased to 16.43 thousand hectares in 2024-25, exhibiting significant fluctuations throughout the analyzed period. These fluctuations underscore the impact of factors like as weather circumstances, market prices, and changes in cropping patterns. Tamil Nadu has sustained consistent development with increased production. Overall,

the data indicates that changes in turmeric production across states are largely influenced by variations in cultivation area and regional agricultural practices.

State-wise Turmeric Productivity Measurement (MT/ha)

State	2020-21	2022-22	2022-23	2023-24	2024-25
Maharashtra	3.87	3.58	3.66	3.64	3.72
Tamil Nadu	4.71	5.17	5.51	6.02	6.12
Telangana	7.80	6.23	7.63	8.02	8.10
Karnataka	6.38	5.67	6.10	5.49	8.30
Madya Pradesh	3.55	3.64	3.68	3.69	3.70
Andhra Pradesh	2.40	2.92	2.20	1.70	2.34
Odisha	1.57	2.21	2.21	2.21	1.97
Assam	1.39	1.30	1.33	3.35	3.36
West Bengal	2.61	2.71	2.70	2.70	2.66
Mizoram	3.85	3.85	3.85	3.71	3.82
Gujarat	3.88	3.88	3.90	4.65	4.07
Others	2.11	2.33	2.34	2.33	2.30
Total	3.88	3.67	3.65	3.63	3.84

Source: Spices Board, Ministry of Commerce & Industry, Government of India.

Productivity is the measurement of how the production of turmeric MT/ha has been changing over the years. The first three states productivity increased gradually through out the analysed period. Even all the rest of the states also witnessed in same scenario from 2020-21 to 2024-25. But Maharashtra the productivity level has slowly declined and finally reached 3.72. It is suggested that the respective authorities should concentrate to improve the productivity level year by year.

Regression Analysis (Strongly Recommended for Hypothesis Testing)

Use **Multiple Regression**:

$$Production = f(Area, Productivity)$$

Model:

$$Y = a + b_1X_1 + b_2X_2$$

Where:

- Y = Production
- X_1 = Area
- X_2 = Productivity

Linear Regression co-efficient of India's Turmeric Production

Variables	Beta Value	Std.Error	t- value	Sig.
β_1	.010	.094	.103	.928
β_2	-28.26	15.69	-1.801	.214

Source: Computed

ANOVA

Model	Sum of squares	df	Mean Square	F-value	Sig.
Regression	46.501	2	23.250	2.534	.283 ^b
Residual	18.350	2	9.175		
Total	64.851	4			

Model Summary

Model	R	R ²	Adjusted R ²	Std error of the estimation
1	.84	.71	.43	3.0239

The linear regression model was formulated $y = a + b_1x_1 + b_2x_2 + u$ and examined the impact of acreage (x_1) on turmeric production (y) in India. The estimated beta co-efficient for area ($\beta_1 = 0.010$) signifies a positive yet negligible correlation between area and productivity. The t-value (0.103) and significance value ($p = 0.928$) indicates that association is statistically negligible, implying that variations in area do not significantly affect turmeric production over the study period. The co-efficient for productivity ($\beta_2 = -28.26$) indicates a negative correlation with production, suggesting that an increase in productivity correlates with a decrease in production. However, the t-value (-1.801) and p-value (0.214) suggest that this effect is not statistically significant, indicating that productivity does not meaningfully account for differences in production within this model.

The ANOVA results further validate the general insignificance of the regression model. The computed F-value recorded 2.534 with a significance level of 0.283 exceeds the conventional threshold of 0.05, suggested that the joint influence of area and productivity does not significantly forecast turmeric production. It indicates that the regression model in its entirety, lacks statistical reliability in elucidation differences in production.

The model summary reveals that R-value of 0.84, signifying robust positive connection between the dependent variable (production) and the independent variable (area and productivity). An R^2 value recorded 0.71 indicate that 71 percent of the variability in turmeric production is accounted for by the independent variables in the model. The Adjusted R^2 value of 0.43, which considers the number of predictors and sample size, signifies that the explanatory power diminishes to 43 percent, which indicates a moderate degree of model fit. The standard error of estimation 3.0239 signifies the mean divergence of observed data from expected values.

Despite the model exhibiting a comparatively elevated R^2 value the individual co-efficients and the model as a whole lack statistical significance, indicating that area and productivity do not substantially affect turmeric production during the study period; moreover, other unaccounted factors may be more pivotal in influencing turmeric production in India.

Import and Export of Turmeric

India is the world's leading producer of turmeric and exporter, it controlling roughly 80 percent of world production. The top destinations for Indian turmeric (whole and powder) include UAE, Bangladesh, USA, Malaysia, Morocco and Iran. Other notable turmeric importers include the UK, Japan, Germany and Sri Lanka.

Turmeric Export and Import

Year	Export Quantity (‘000 MT)	Value (Rs. Crore)	Import Quantity (‘000 MT)	Value (Rs. Crore)
2015-16	88.51	92.17	15.33	146.35
2016-17	116.58 (31.71)	124.19 (34.71)	14.05 (-8.35)	164.98 (12.73)
2017-18	107.38 (-7.89)	103.58 (-16.60)	17.12 (21.85)	184.34 (11.73)
2018-19	133.65 (24.46)	141.62 (36.73)	30.58 (78.62)	299.47 (62.46)
2019-20	137.65 (2.99)	128.69 (-9.13)	28.58 (-6.54)	245.79 (-17.93)
2020-21	183.87 (33.58)	172.26 (33.86)	25.71 (-10.04)	229.17 (-6.76)
2021-22	152.76 (-16.92)	153.44 (-10.93)	24.48 (-4.78)	245.77 (7.24)
2022-23	170.08 (11.34)	166.70 (8.64)	24.58 (0.41)	186.35 (-24.18)
2023-24	162.02 (-4.74)	187.59 (12.53)	28.58 (16.27)	212.18 (13.86)
2024-25	176.33 (8.83)	286.85 (52.91)	24.58 (-14.00)	334.20 (57.51)

The data indicates that India's turmeric exports have generally shown an increasing trend over the analysed period, even though there is a some fluctuations. Quantity of exports have increased from 88.51 thousand MT in 2015-16 to 176.33 thousand MT recorded in 2024-25. The turmeric exports value rose significantly from Rs.92.17 crore to Rs.286.85 crore. There was a sharp rise in exports 52.91 percentage in 2024-25. It is suggested that there is a strong global demand and higher international prices. Import quantity increased significantly in 2018-19, reached 30.58 thousand MT, before stabilizing in later years. Despite these fluctuations, India consistently maintained a strong trade surplus in turmeric, reinforcing its position as a major international exporter and an important hub for spice trade and processing.

Export – Import Ratio

This exports and imports ration indicates how many units are exported for every unit imported; a value is greater than 1.0 indicates a trade surplus for that specific data set.

Export – Import Ratio Analysis

Fiscal Year	Export	Import	Ratio (Exp/Imp)
2015-16	88.51	15.33	5.77
2016-17	116.58	14.05	8.30
2017-18	107.38	17.12	6.27
2018-19	133.65	30.58	4.37
2019-20	137.65	28.58	4.82
2020-21	183.87	25.71	7.15
2021-22	152.76	24.48	6.24
2022-23	170.08	24.58	6.92
2023-24	162.02	28.58	5.67
2024-25	176.33	24.58	7.17

Source: Spices Board, Ministry of Commerce & Industry, Government of India.

The highest ratio occurred in 2016-17 (8.30), driven by a significant jump in exports alongside the lowest import figure in the series. The ratio dipped to its lowest point in 2018-19 (4.37), primarily due to a sharp spike in imports (\$ 30.58). While the export volume has grown significantly over the decade, the ratio has fluctuated between roughly \$4.4 and \$8.3. ending the period on a strong note at \$7.17.

Correlation between Quantity and Unit Value

Based on the Turmeric trade data given in the table from 2015 to 2025, here is the calculated correlation between quantity and unit value. (Calculated as Value/Quantity):

Export Correlation (Correlation between Export Quantity and Export Unit Value)	0.31
Import Correlation (Correlation between Import Quantity and Import Unit Value)	-0.41

Export Correlation

The correlation between Export Quantity and Export Unit value is 0.31. It indicates a weak positive correlation. It suggested that as the volume of turmeric exports increased over the decade, there was a slight tendency for the price per unit to also increase. However, the relationship is not very strong, that means, other market factors (like global demand or domestic supply shocks) likely played a more significant role in price setting than just the volume exported.

Import Correlation

The correlation between import quantity and Import Unit is -0.41. It is indicated a moderate negative correlation. It is suggested that when India imported huge quantity of turmeric, the unit price of turmeric tend to be lower. This often happens in trade when a country buys in bulk or imports cheaper, lower -quality of raw material during domestic shortage to keep processing costs lower.

India's Contribution in the World Exports of Turmeric (Value in million US\$)

Year	India	World	India's Share
2020	232.38	349.58	66%
2021	225.54	367.70	61%
2022	214.82	373.24	58%
2023	212.69	342.67	62%
2024	333.25	502.74	66%
CAGR	9.42%	9.50%	--

Source: Spices Board, Lok Sabha Unstarred Question No. 3848 for answer on 12.08.2025

The data provided illustrated that India's pre-dominant position in the world turmeric market, characterized by a significant recovery in 2024 after a three-year period of slight decline. India is consistently maintaining a lion's share of the world market, with its contribution never dropping below 58% during the five-year period. After hitting a low point on 2023 (\$212.69 million), India's export value increased by approximately 56.7 percent in 2024 to reach \$333.25 million. This jump restored India's market share to its 2020 peak of 66 percent. The world export market for turmeric closely follows India's performance. The total world market value saw a massive expansion in 2024, crossing the \$500 million mark for the first time in this dataset. The CAGR for India: -9.42 percent and for the world : -9.50 percent. The near-identical growth rates suggested that the world turmeric trade is fundamentally driven by Indian supply dynamics.

Top 10 Global Exporters and Importers for Turmeric “Curcuma” HS 091030 in 2023 Value
in USD Million, Share in Per cent

Exporters			Importers		
Country	Value	Share	Country	Value	Share
India	212.65	66.56	USA	50.82	18.98
Netherlands	13.28	4.16	India	15.41	5.76
Myanmar	12.68	3.97	Germany	15.02	05.61
Fiji	10.25	3.21	Malaysia	12.91	04.82
Indonesia	8.47	2.65	Morocco	12.73	04.75
Germany	8.27	2.59	China	11.36	04.24
Peru	5.29	1.66	Netherlands	11.20	04.18
USA	5.19	1.62	United Kingdom	11.11	04.15
UAE	4.55	1.42	Saudi Arabia	10.43	03.89
Spain	4.46	1.39	UAE	10.13	03.78
Share of Top 10	285.09	89	Share of Top 10	161.13	60.17
Total Global Exports	319.50	100	Total Global Imports	267.80	100

Source: Volza Import Trade Data

India acts as the undisputed central hub for supply of turmeric, while the demand side is distributed across a diverse range of high level income and emerging markets. The data suggested that for any new player entering the market, there is a barrier to entry in production is extremely high due to India's scale. However, the import data shows a burgeoning middle class of consumers (Morocco, Malaysia, UAE), indicating that the market expansion is happening in developing regions, not just the West.

India is dominating in the turmeric export market is statistically overwhelming. India exports \$212.65 million, which is roughly 16 times folded the value of second biggest exporter (Netherlands). It is noted that the top 10 turmeric exporter controls 89 percent of the world market. Outside India, only Myanmar and Fiji hold a market share above 3 percent. Netherlands (\$ 13.28 Million), Germany (\$8.27 Million) and USA (\$5.19 Million) appear as top exporters are despite not being primary growers. This indicates significant value-addition through processing, packaging and regional distribution.

In the export market, the import side is decentralized. United States of America is the largest turmeric importer recorded \$50.82 Million, accounting for nearly 19 percent of global imports. It reflects the high demand for turmeric in the western health-supplement supplemented nutraceutical sectors. India is the second largest turmeric importer in the world (\$15.41 Million). This is a common feature in major commodity hubs where a country imports lower cost raw materials for industrial extraction or processing while exporting higher value premium varieties. The top ten importers account for only 60.17 percent of the market. It is suggested that the remaining 40 percent of

demand is highly fragmented across many other nations, it is confirmed that the turmeric's status as a global staple.

Important Findings

- There is a clear shift in turmeric production leadership from Telangana to Maharashtra. Maharashtra emerged as the largest producer by volume, largely due to the expansion of cultivation area rather than higher productivity.
- States such as Tamil Nadu, Telangana, and Karnataka demonstrate significantly higher productivity levels. Telangana recorded around 8.10 MT/ha and Karnataka 8.30 MT/ha, which are far above the national average productivity of around 3.8 MT/ha.
- Total cultivation area for turmeric declined slightly from 333.02 thousand hectares in 2021–22 to 290.94 thousand hectares in 2024–25.
- Despite this contraction, production levels remained relatively stable due to improved yields in certain states.
- A significant productivity gap exists between states. High-yield states such as Telangana and Karnataka contrast sharply with low-yield states like Odisha and Andhra Pradesh, where productivity remains below 2.5 MT/ha.
- India continues to dominate the global turmeric market with a share ranging from 58% to 66% of global exports. Export value increased dramatically to \$333.25 million in 2024, reflecting strong international demand and higher global prices.
- The export–import ratio consistently remained above 4.0, indicating a strong trade surplus.
- The ratio peaked at 8.30 in 2016–17 and remained strong at 7.17 in 2024–25.
- The correlation between export quantity and unit value (0.31) indicates that global prices are influenced more by demand and market conditions than by export volumes alone.
- India is the world's second-largest importer of turmeric, suggesting that it imports raw turmeric for processing, value addition, and re-exporting.
- The global turmeric market expanded significantly, crossing \$500 million in 2024, with India playing the central role in driving global supply.
- Countries like Myanmar, Indonesia, and re-export hubs like Netherlands are emerging as competitive players in the international turmeric trade.

Suggestions

- ❖ Adoption of advanced cultivation techniques, improved seed varieties, and precision agriculture should be encouraged in low-productivity states to reduce yield disparities.
- ❖ Greater investment in turmeric research, particularly in varieties with higher curcumin content, disease resistance, and climate adaptability.
- ❖ India should focus on exporting processed turmeric products such as curcumin extracts, turmeric oil, and nutraceutical supplements to increase export value.
- ❖ Establish more modern processing units and spice parks in major producing regions to enhance quality, packaging, and global competitiveness.
- ❖ Agricultural extension programs should provide training on improved agronomic practices, organic cultivation, and post-harvest management.
- ❖ Better storage, logistics, and cold chain infrastructure can reduce post-harvest losses and stabilize supply.
- ❖ India should diversify export destinations beyond traditional markets such as the United States and Malaysia by exploring emerging markets in Africa and Latin America.
- ❖ Regional turmeric varieties should be branded and marketed internationally to increase

price premiums and recognition in the global spice market.

Overall Hypothesis Outcome

Hypothesis	Result	Evidence
H1	Supported	High productivity in Telangana and Karnataka despite smaller area
H2	Supported	India maintained 58-66% global export share despite production fluctuation
H3	Strongly Supported	Export value rose 52.91% while quantity rose only 8.83%

Conclusion

India continues to hold an unparalleled position in the global turmeric industry, dominating both production and exports. The study reveals a significant transformation in the domestic production landscape, with Maharashtra emerging as the leading producer by volume while states such as Tamil Nadu, Telangana, and Karnataka maintain superior productivity levels. Despite fluctuations in cultivation area and regional disparities in yields, India has successfully maintained a strong presence in international markets, controlling more than 60% of global turmeric exports. The surge in export value in recent years reflects growing global demand for turmeric in the food, pharmaceutical, and nutraceutical industries. At the same time, India's role as both a major exporter and importer indicates the emergence of a complex value-addition and re-export model within the global spice trade. However, maintaining this dominance will require strategic efforts to improve productivity, promote value-added exports, strengthen supply chains, and support farmers through modern agricultural practices. By addressing regional yield disparities and investing in processing and branding, India can further consolidate its position as the global hub of turmeric production and trade in the coming decades.

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