Plant Archives Vol. 24, No. 2, 2024 pp. 2445-2454 e-ISSN:2581-6063 (online), ISSN:0972-5210

Plant Archives

Journal homepage: http://www.plantarchives.org

DOI Url : https://doi.org/10.51470/PLANTARCHIVES.2024.v24.no.2.349

MAJOR OILSEEDS EXPORTS' COMPETITIVENESS OF INDIA: A CONSTANT MARKET SHARE ANALYSIS

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(Date of Receiving-14-06-2024; Date of Acceptance-29-08-2024)

ABSTRACT

India has a competitive advantage in the global market, especially in light of the rise in the country's exports of important agricultural goods. To examine export competitiveness, the Constant Market Share model study was used. Except for groundnut, mustard, and castor, India's growth performance of main oilseed exports in terms of value was judged to be satisfactory from 2009 to 2021. But when it came to imports, the results showed that, except for mustard and linseed, India recorded notably positive and considerable imports all major oilseeds. Overall, the commodity-wise study states that the positive values of WDE, MDE and RCE are the reason for the major oilseeds' poor net export performance, except for mustard and linseed. It's interesting to note that, in the case of the county-wise analysis, the declining RCE values were a contributing factor to India's export reduction across the major oilseeds markets that were chosen. On the other hand, positive CCE for the vast majority of the chosen markets points to India's expertise in exporting goods whose global demand is expanding quickly over the course of the study period.

Key words : Major oilseeds, Indian exports, World exports, Export performance, Export competitiveness, Constant market share model.

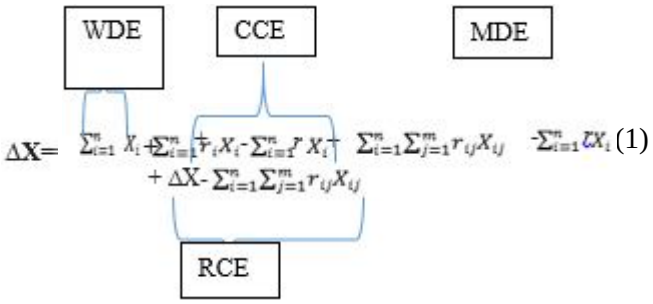
Introduction

Within the category of field crops, oilseeds rank second in importance for determining the agricultural economy, after the cereals. Oilseed self-sufficiency, achieved through the "Yellow Revolution" in the early 1990s, could not be maintained for an extended length of time. India is one of the biggest importers of vegetable oils even though it is the world's fifth-largest producer of oilseed crops. The majority of marginal and small farmers cultivate oilseeds in rainfed farming, which accounts for over 72% of the total oilseed area. Some of the main reasons for the low productivity of oilseeds are inadequate technology, input-starved agriculture, and biotic and abiotic stressors. The Technology Mission on Oilseeds (TMO) was established in 1986 to increase domestic production of edible oils due to the significant burden on the import bill and the aforementioned considerations. Following the establishment of the Technology Mission on Oilseeds, new crop production technologies, improved input supply and marketing services support, excellent coordination/ cooperation between various concerned organizations/ departments and Ministries, and post-harvest technologies were all used in an integrated approach to achieve a significant breakthrough in increasing the production of oilseeds. The production of oilseeds increased from 108.3 lakh tonnes in 1985–1986 to 361.0 lakh tonnes in 2020–21 (4th Adv est) as a result of the Technology Mission on Oilseeds and Pulses (TMOP's) coordinated efforts. Along with the area growth, productivity improved as well, rising from 570 kg/ha in 1985–1986 to 1284 kg/ha in 2017–18, 1224 kg/ha in 2019–20 and further increase to 1254 kg/ha in 2020–21, respectively. Due to favourable weather conditions, government support for oilseed production and development initiatives, and the country's record productivity level of 1284 kg/ha during 2017–18 and 1254 kg/ha during 2020–21, the nation recorded its highest-ever production of 361.0 (4th adv.est) lakh tonnes of oilseeds during 2020–21, followed by 332.192 lakh tones during 2019–20. The nation produced the most oilseeds

in the last two years, 2019–20 and 2020–21, thanks to the Government of India's efforts to implement many programs, including the National Food Security Mission (NFSM) Oilseeds, TRFA Oilseeds, Seed hubs on Oilseeds, cluster demonstrations of improved technology, Special program on Rapeseed & Mustard program during Rabi, 2020–21, etc. The previous 7-8 years have seen an increase in imports despite the vegetable oil sector's remarkable improvement over the past 20 years. Nearly all oilseed crops are grown in India. Soybean, groundnut, corn, mustard, rapeseed, sunflower, castor, safflower, linseed and niger are the main ones. Of the nine oilseed crops grown in India, soybeans account for the largest average share of total oilseed output at 38%, followed by groundnuts at 27% and Rapeseed-Mustard at 27% (Average of 2016–17 to 2020–21) (4th adv.est). In a similar vein, soybeans account for the largest average area contribution to the overall oilseed area (44%) and are followed by groundnuts (20%) and rapeseed-mustard (24%). The overall contribution of Kharif oilseed crops to total production is approximately 67% on average, with Rabi/summer oilseed crops accounting for the remaining 33%. DOD - Directorate of Oilseeds Development (dac.gov.in)

Materials and Methods

Tysznskin and Richardson first presented it, and Ahmadi-Esfahani subsequently modified Jepma's version to examine agricultural commodities' competitiveness on the global market. This model is frequently used to examine structural shifts in global trade, both in terms of imports and exports and to determine a nation's export performance to the world's most important geographic locations. The world demand effect (WDE), the commodity composition effect (CCE), the market distribution effect (MDE) and the residual competitiveness effect (RCE) are the four categories or impacts that this model helps to break down the world exports into. It's intriguing how this model accounts for the discrepancy between real export growth and export growth calculated under the presumption that each commodity's export share in each market stays constant for the focal country. Following is the main equation of the CMSA model in terms of actual export change:



$$\Delta X = \sum_{i=1}^{n} X_i + \sum_{i=1}^{n} r_i X_i - \sum_{i=1}^{n} r X_i + \sum_{i=1}^{n}\sum_{j=1}^{m} r_{ij} X_{ij} - \sum_{i=1}^{n} \alpha X_i + \Delta X - \sum_{i=1}^{n}\sum_{j=1}^{m} r_{ij} X_{ij} \quad (1)$$

where,

ΔX = actual change in India's agricultural exports. (difference between 2021 and 2012);

r = percentage increase in total world (excluding India) exports from period 2012 to period 2021;

r_{ij} = percentage increase in world (excluding India) ex- ports of commodity "i" from period 2012 to period 2021;

R_{ij} = percentage increase in the world (excluding India) ex- ports of commodity "i" to country "j" from period 2012 to period 2021;

X_i = India's exports of commodity "i" to the rest of the world in period 2012

X_{ij} = world in period 2012, and India's exports of commodity "i" to country "j" in period 2012.

WDE: This effect examines the rise or fall in the exports of the country of attention (India) as a result of global export growth or contraction. Therefore, with a fixed market share of the focus nation (India), a positive or negative value of WDE indicates an increase or decrease in exports from the focus country as a result of a general rise or fall in global demand.

CCE: This effect quantifies the percentage of a nation's export composition in goods and services where there is a significant demand for imports. It is the total weighted export value of a certain set of commodities. The weights are determined by deducting the growth rate of each commodity from the global export growth rate as a whole (shown by "r" in the preceding formula). When the CCE is positive, it means that the target country is exporting more of the commodities whose demand is growing faster than the aggregate growth rate (r) of all global exports. The opposite circumstance is indicated by a negative CCE value.

MDE: This is a measurement of the extent to which a nation exports to those markets (importing countries), where demand is expanding at a rate that is either comparatively faster or slower than the overall growth of global exports of that specific commodity in those markets (represented by ri in the preceding calculation). It is the total weighted export value of all commodities shipped to a specific destination nation. Exports from a focus country are steered toward comparatively rising markets when the MDE value is positive. A negative number suggests that the target country's exports are concentrated in areas where demand is expanding more slowly than it is globally. This is a measurement of the extent to which a nation exports to those markets (importing countries), where demand is expanding at a

rate that is either comparatively faster or slower than the overall growth of global exports of that specific commodity in those markets (represented by ri in the preceding calculation). It is the total weighted export value of all commodities shipped to a specific destination nation. Exports from a focus country are steered toward comparatively rising markets when the MDE value is positive. A negative number suggests that the target country's exports are concentrated in areas where demand is expanding more slowly than it is globally.

RCE: This will evaluate the disparity between the actual change in exports from the focus nation and the changes that would have occurred if the focus country had maintained its constant market share in those markets. This is a residual term since the previous three effects—WTE, CCE and MDE—have been subtracted from the actual change in the focal country's exports. The competitiveness of the focus country has improved if this residual term is positive and vice versa.

Actual increase in Exports

This is the difference between agricultural exports of focus country (India) between 2021 and 2012. This is given by

$$X_A = X_1 - X_0$$

Where, X_A = Actual increase in exports of the focus country (India);

X_1 = Actual value of exports of focus country in the period 2021;

X_0 = Actual value of exports of focus country in the period 2012.

Potential increase in Exports

This is derived from the following formulae:

$$X_{PV} = \left(X_W * S_{Xf\circ}\right)/100$$

where, X_{PV} = Potential value of focus country's exports in period 2021;

X_W = Value of world exports in period 2021;

$S_{Xf\circ}$ = Share of focus country in world exports in period 2012.

So, $X_{PI} = X_{PV} - X_0$, X_{PI} = Potential increase in focus country's exports

Practical utility : This analysis, which divided the data across the effects of WDE, CCE, MDE and RDE, provides insight into the export performance of important agricultural commodities from India. This aids in illuminating the fundamental causes of the export performance of particular agricultural commodities as well as total exports for policymakers. Additionally, it makes it possible for scholars to assess how competitive India is in international trade by contrasting its export performance with that of other competing nations. In light of this, pertinent policy recommendations that will improve India's export competitiveness might be identified.

Results and Discussion

India's Imports and Exports of Principal Agricultural Commodities (US million $) are presented in Table 1. This table shows the trends in agricultural commodity imports and exports from India from 1990–1991 to 2021–2022. Over the years, India has continuously maintained a trade surplus in agricultural commodities. India's agri exports grew at a compound annual growth rate (CAGR) of 10.10 percent from 1990 to 2021–22, from 2991.96 in 1990 to 41584.84 US million in 2021–22. This is an increase of over 14 times in just 30 years. A little decline in agri exports occurred in 2019–20, though. India's agricultural exports increased dramatically in 2021–2022 and reached an all-time high. This was made possible by the diligent work of our farmers as well as many policies and programmes implemented by the Indian government and other organizations, such as Farmers Producer Organizations (FPOs) (Kumar, 2022). Likewise, over time, there has been an increase in the import of agricultural products. Agri-imports were valued US$ 986.01 million in 1990–91; which increased to US$ 30711.64 million in 2021–22, a 32.11% increase. Nevertheless, the value of agricultural imports decreased from 2018–19 to 2020–21, reaching US$ 21683.88 million in 2018–19. India's agricultural imports were valued at U.S. 21685.85 million in 2019–20 and U.S. 21403.08 million in 2020–21. Comparable outcomes were noted by Pavithra (2021), Singh (2024) and Bhatia (2021).

India has demonstrated a remarkable progress trajectory, moving from a food-scarce nation to one that is currently both food-sufficient and food-surplus. India is now a net exporter of agricultural products thanks to all the revolutions in agricultural productivity that have been brought about by institutions, incentives and inventions. Consequently, the value of agricultural exports surged dramatically, rising from U.S. 2991.96 million $ in 1990–1991 to 41584.84 million $ in 2021–2022. However, exports somewhat decreased as a result of declining global agri-commodity prices after reaching their peak level in 2013–14 (Vinod Kumar, 2021). However, there was also a significant increase in agricultural imports, which went from 986.01 million dollars in 1990–91 to 30711.64 million dollars in 2021–22. After rising from 16.43% of total exports in 1990–91 to 16.83% in 1996–97, the percentage

Table 1 : India's Imports and Exports of Principal Agricultural Commodities (US million $).

Year	Agricultural Imports	Total National Imports	% of Agricultural Imports to Total National Imports	Agricultural Exports	Total National Exports	% of Agricultural Exports to Total National Exports	Net Agricultural Export
1990-1991	986.01	24188.00	4.08	2991.96	18215.30	16.43	2005.95
1991-1992	697.67	19618.85	3.56	2683.59	18057.14	14.86	1985.92
1992-1993	1281.82	24082.32	5.32	2813.39	20401.54	13.79	1531.57
1993-1994	961.23	23392.00	4.11	3221.89	22320.00	14.43	2260.66
1994-1995	2092.52	27890.90	7.50	3070.67	26455.70	11.61	978.15
1995-1996	2100.00	38030.20	5.52	5247.31	32969.40	15.92	3147.31
1996-1997	2066.42	39209.62	5.27	5642.70	33535.73	16.83	3576.28
1997-1998	2450.30	42459.55	5.77	5406.06	35830.53	15.09	2955.76
1998-1999	3755.48	43221.48	8.69	5000.77	33871.34	14.76	1245.30
1999-2000	3899.83	49985.25	7.80	4403.24	37055.59	11.88	503.41
2000-2001	2814.17	51373.56	5.48	4562.99	45298.40	10.07	1748.81
2001-2002	3581.98	51960.16	6.89	4890.69	44292.85	11.04	1308.71
2002-2003	3723.39	62413.23	5.97	5165.60	53578.83	9.64	1442.21
2003-2004	4715.17	77136.00	6.11	6056.39	63015.00	9.61	1341.22
2004-2005	4932.06	105561.03	4.67	6571.02	79866.00	8.23	1638.97
2005-2006	4925.79	149780.53	3.29	8253.78	103515.60	7.97	3327.99
2006-2007	6787.59	181181.41	3.75	10357.20	124486.82	8.32	3569.61
2007-2008	7714.42	216759.00	3.56	15615.01	147034.00	10.62	7900.60
2008-2009	8742.09	321031.00	2.72	15927.03	194828.00	8.17	7184.94
2009-2010	12366.30	257202.20	4.81	14366.97	164908.70	8.71	2000.67
2010-2011	10359.16	350234.08	2.96	18028.92	226350.00	7.97	7669.77
2011-2012	16883.25	464462.60	3.64	27387.92	302905.39	9.04	10504.67
2012-2013	19710.50	488590.69	4.03	34906.65	296807.98	11.76	15196.15
2013-2014	18865.14	466042.14	4.05	37502.14	313235.12	11.97	18637.00
2014-2015	21300.52	462910.00	4.60	36178.82	322694.00	11.21	14878.30
2015-2016	22397.11	392866.00	5.70	28656.63	267444.00	10.72	6259.52
2016-2017	24081.78	361208.00	6.67	26489.54	264144.00	10.03	2407.76
2017-2018	27393.89	448423.00	6.11	30423.53	299275.00	10.17	3029.64
2018-2019	21683.88	514464.06	4.21	30740.94	324778.36	9.47	9057.05
2019-2020	21685.85	486058.52	4.46	29299.38	324249.71	9.04	7613.53
2020-2021	21403.08	372854.05	5.74	32083.78	276301.92	11.61	10680.70
2021-2022	30711.64	572519.95	5.36	41584.84	395408.07	10.52	10873.19
CAGR	**12.50**	**12.90**		**10.10**	**11.70**		**7.10**

Source: DGCI & S, 2021-2022

Note: CAGR was calculated for the period 1990-91 to 2021-22.

Table 2 : India's Exports of major oilseeds (US million $).

Year/Commodity	2009-10	2015-16	2021-22	CGR
Ground nut Shelled	287.23	622.47	680.42	**0.4**
Rapeseed	8.95	0.02	0.01	**0**
Mustard	0	10.16	29.85	**14.1**
Linseed	2.79	11.3	13.76	**2.2**
Sesame	308.83	477.62	421.54	**-4.7**
Soybean	11.92	144.64	19.99	**-23.2**
Sunflower	3.49	4.02	1.66	**-19.4**
Safflower		3.92	3.26	**-11.6**
Castor		0.03	1.62	**82.1**
Agricultural Exports	14366.97	28656.63	41584.84	**2.3**
Total National Exports	164908.7	267444	395408.1	**2.8**
% of Agricultural Exports to Total National Exports	8.71	10.72	10.52	

Source: www.fao.org

Table 3 : India's imports of major oilseeds (US million $).

Year/Commodity	2009-10	2015-16	2021-22	CGR
Ground nut Shelled	0.35	0.08	1.2	**84**
Rapeseed	0.38	0	0	**0**
Mustard	0	0.5	0.01	**-35.6**
Linseed	0.14	0.16	0.11	**-9.4**
Sesame	11.01	29.69	31.67	**6.6**
Soybean	0.04	8.53	488.37	**102.5**
Sunflower	1.08	0.95	2.09	**17.3**
Safflower		0.27	0	**0**
Castor		0	0	**0**
Agricultural Imports	12366.3	22397.11	30711.64	**1.9**
Total National Imports	257202.2	392866	572519.95	**10.27**
% of Agricultural Imports to Total National Imports	4.81	5.7	5.36	

Source: www.fao.org

of agricultural exports to total exports displayed a mixed trend until 2021–22, when it hit 10.52%. It can also be shown that from 1990–91 to 2021–22, agri-trade increased more than the nation's overall merchandise trade, despite agri-exports growing (10.10%) less than agri-imports (12.50%). Furthermore, from U.S. 2005.95 million $ in 1990–91 to U.S. 10873.19 million $ in 2021–22, India's net agri-export surplus has grown (Table 1).

Table 2 displays the increase in major oilseed exports from India from 2009–10 to 2021–22 in terms of value. According to the results, India experienced a noteworthy increase in export value for the major oilseeds, which include groundnut, mustard, linseed, and castor. Comparable outcomes were noted in the cases of Borisagar *et al*. (2023) and Gondalia *et al*. (2020). Value-added processing is a good fit for the aforementioned commodities, even though the overall market size in importing nations is still quite small due to higher production quantities. While other crops, such sesame, soybean, sunflower and safflower, showed negative growth rates between 2009-10 and 2021-22, the demand for sanitary and phyto-sanitary (SPS) requirements increased (Kumar, 2022). There were no exports in the case of rapeseed. Agricultural exports and total national exports also show positive growth.

Table 3 shows the increase in major oilseed imports from India from 2009–10 to 2021–22 in terms of value. The results showed that, except for mustard and linseed, India experienced a notably favourable and considerable increase in imports of all major oilseeds (Borisagar *et al*., 2023). Regarding castor, safflower, and rapeseed, there were no imports. Both total national imports and imports related to agriculture are growing positively.

Table 4 shows the percentage of major oilseeds that India exports. India's exports, the overall amount of exports worldwide and the potential and actual growth of each from 2012 to 2021 in terms of value expressed in US $ millions. According to the data, India's overall exports of major oilseeds decreased from US$ 1480.44 million to US$ 1172.10 million, or a net decrease of US$ -308.34 million (5.92%). As a result, the actual increase in exports is less than the US$ 438.66 million potential that the expansion of global trade offers. However, from 2012 to 2021, India's agricultural product contribution to global agricultural exports fell from 1.96 percent to 1.11 percent. Except for mustard and linseed over the aforementioned reference period, India's proportion in world trade in 2021 compared to 2012 revealed decreasing performance in terms of commodity exports. In contrast, the share of castor and safflower in 2012 was zero. During the chosen time, the only crops whose actual exports increased beyond the potential rise (US$ 5.43 and 0.91 million) were mustard and linseed (US$ 13.97 and 11.91 million). The actual growth in exports of other commodities, however, has been far less than the potential export growth. With the exception of mustard and linseed, the real rise in exports for all major oilseeds is negative.

Table 4 : Percentage Share of India in the world exports of selected commodities (Value in US $ Million) during 2012 and 2021.

Commodities	2012				2021						
	World exports (US $ Million)	India's exports (US $ Million)	World exports excl India (US $ Million)	Share of India's exports in World exports (%)	World exports (US $ Million)	India's exports (US $ Million)	World exports excl India (US $ Million)	Share of India's exports in World exports (%)	Actual Δ in India's exports	Potential Δ in India's exports	(AΔ/PΔ) *100
Ground nut Shelled	2436.81	888.73	1548.08	36.47	3457.11	680.42	2776.69	19.68	-208.32	372.11	-55.98
Rapeseed	12376.80	16.06	12360.74	0.13	14525.22	0.01	14525.22	0.00	-16.06	2.79	-575.91
Mustard	240.21	15.88	224.33	6.61	322.31	29.85	292.46	9.26	13.97	5.43	257.39
Linseed	892.43	1.86	890.57	0.21	1329.99	13.76	1316.23	1.03	11.91	0.91	1308.95
Sesame	2380.51	517.78	1862.73	21.75	2561.17	421.54	2139.63	16.46	-96.25	39.30	-244.93
Soybean	53430.82	33.25	53397.57	0.06	77844.52	19.99	77824.53	0.03	-13.26	15.19	-87.29
Sunflower	3895.94	6.88	3889.06	0.18	5554.13	1.66	5552.46	0.03	-5.22	2.93	-178.12
Safflower	21.00	0.00	21.00	0.00	82.35	3.26	79.09	3.96	3.26	0.00	-
Castor	7.81	0.00	7.81	0.00	18.57	1.62	16.95	8.71	1.62	0.00	-
Total major oilseeds	**75682.32**	**1480.44**	**74201.88**	**1.96**	**105695.36**	**1172.10**	**104523.26**	**1.11**	**-308.34**	**438.66**	**-**

Source: www.fao.org

Regarding performance by nation (Table 5), all of the countries that were chosen—Brazil, USA, Canada, Ukraine, Paraguay, Argentina, Australia and others—showed a declining trend in India's share of global imports. As a result, these nations' actual export growth is less than their potential growth. Overall, even while India's overall soybean exports saw a significant decline in absolute (value) terms, its percentage of global oilseed exports declined from 2012 to 2021. Lower trade barriers in rich nations, which have been followed more recently by developing countries, as well as structural changes (particularly the reforms of the external sector) carried out domestically in India can mitigate the overall export performance's decline in absolute value relative to the potential growth. The devaluation of the Indian rupee (which hit a historic low of 76.91 on 1.1.2020), the creation of Export Promotion Zones (EPZs) and the elimination of tariffs and non-tariff barriers among the importing nations have all contributed to the favourable conditions that have been created for increasing the nation's overall oilseed exports. Moreover, helped by growing food costs worldwide since June 2020 as nations loosen trade restrictions and emerge from lockdowns. What is concerning, though, is the trend of India's oilseed export share dropping in relation to global agricultural exports under the liberalized regime (Nirmal Ravi Kumar, 2022). It has been observed that India's oilseed exports have decreased over the last ten years, but in order to understand why, researchers have examined India's export performance across a number of important oilseeds and nations, breaking it down into WDE, CCE, MDE and RCE using a CMSA model fit.

Decomposition of India's Exports across selected major oilseeds

Table 6 and Fig. 1 reveal an intriguing trend: India's major oilseeds saw a reduction in overall exports in absolute terms of US$ -308.34 million between 2012 and 2021. The very negative RCE (US$ -1555.98 million) and WDE (US$ 808.98 million) were mostly responsible for this. And MDE (US$438.66 million) is discovered to be favourable, nevertheless. Lower agricultural product competitiveness in India during the reference period is implied by the lower value of actual export growth relative to potential

Table 5 : Percentage share of India in the overall imports of selected countries (Value in US$ Million) during 2012 and 2020.

Countries	2012				2021						
	Overall imports	India's exports (US$ Million)	World imports excl India (US$ Million)	Share of India's exports in World imports(%) excluding India	Overall imports	India's exports (US$ Million)	World imports excl India imports (%)	Share of India's exports in World imports(%) excluding India	Actual Δ in India's exports	Potential Δ in India's exports	(AΔ/PΔ) *100
Brazil	17560.18	4.88	17555.30	0.03	39061.71	2.87	39058.85	0.01	-2.01	5.97	-33.70
USA	25449.12	50.76	25398.35	0.20	28223.52	54.17	28169.35	0.19	3.41	5.53	61.54
Canada	7786.72	18.51	7768.20	0.24	7964.70	15.01	7949.69	0.19	-3.51	0.42	-828.91
Ukraine	1698.99	23.65	1675.34	1.39	2047.68	13.08	2034.60	0.64	-10.57	4.85	-217.78
Paraguay	1655.96	0.00	1655.96	0.00	3047.52	0.00	3047.52	0.00	0.00	0.00	
Argentina	3718.92	0.69	3718.23	0.02	3069.36	0.33	3069.03	0.01	-0.36	-0.12	298.73
Australia	1608.24	8.98	1599.26	0.56	2254.34	10.71	2243.63	0.47	1.73	3.61	47.82
Others	16204.19	1372.96	14831.23	8.47	20026.54	1075.94	18950.60	5.37	-297.02	323.86	-91.71
Total major oilseeds	**75682.32**	**1480.44**	**74201.88**	**1.96**	**105695.37**	**1172.10**	**104523.27**	**1.11**	**-308.34**	**344.14**	**-**

Source: www.fao.org

growth. Therefore, it can be concluded that WDE and MDE, as opposed to CCE and RCE because of changes in the external environment, are the primary sources of India's major oilseeds export performance.

When the export performance of a few major oilseeds is broken down, the percentage change in global exports (r) and the percentage increase in global exports of commodity i (ri) are equal, meaning that (r = ri). As a result, the CCE is equal to zero. The results showed that only mustard experienced the largest actual value rise of US$ 13.97 million. It was followed by castor (US$ 1.62 million), safflower (US$ 3.26 million), linseed (US$ 11.91 million) and mustard (US$ 13.97 million). Conversely, there was a downward trend in the export values for sunflower (US$ –5.22 million), sesame (US$ –96.25 million), rapeseed (US$ –16.06 million), soybean (US$ –13.26 million) and shelled groundnuts (US$ –208.32 million). With the exception of safflower and castor, the WDE was found to be positive for each of the nine major oilseeds that were examined, ranging in price from US$ 0.89 million (linseed) to US$ 705.33 million (groundnuts, shelled). In a similar vein, all major oilseeds showed positive MDE results. For five major oilseeds-groundnuts shelled (US$ –1285.76 million), sesame (US$ –212.51 million), soybeans (US$ –43.67 million), rapeseed (US$ –21.66 million) and sunflower (US$ –11.09 million)—the RCE was found to be negative. Overall, the commodity-wise study states that the positive values of WDE, MDE, and RCE are the reason for the major oilseeds' poor net export performance, except mustard and linseed.

Decomposition of India's Exports across selected Countries (Markets)

Table 7 and Fig. 2 reveal an intriguing fact: in the case of a country-wise study, the MDE equals 0 since ri = rij. The United States experienced the largest actual rise in India's exports during this period ($3.41 million), followed by Australia ($1.73 million). Except for Argentina, all of the chosen nations' WDEs are found to be positive, indicating that from 2012 to 2021, the size of the global market will expand along with each country's increases in the export of chosen oilseeds. The outcomes align with the

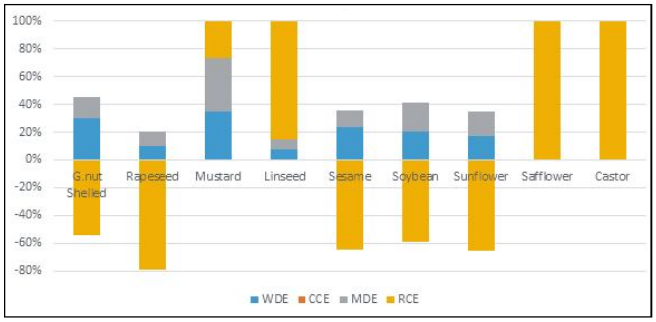


Fig. 1 : Decomposition of India's total major oilseeds exports across selected commodities during 2012-2021 (Value in US$ Million).

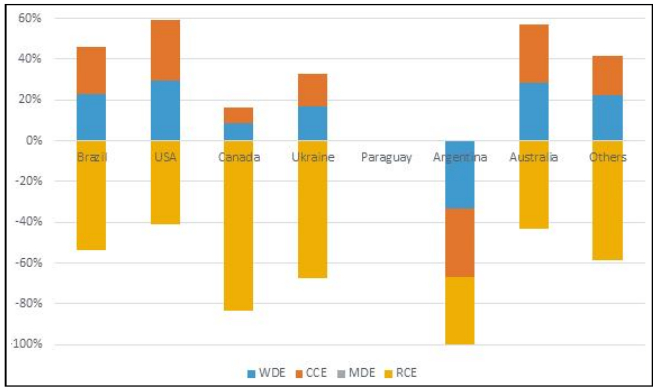


Fig. 2 : Decomposition of India's total major oilseeds exports across selected countries during 2012-2021 (Value in US$ Million).

Table 6 : Decomposition of India's total major oilseeds exports across selected commodities from 2012 to2021 (Value in US$ Million)

Commodities	Actual change India's exports	WDE	CCE	MDE	RCE
G.nut Shelled	-208.32(100.00)	705.33(-338.59)	0.00(0.00)	372.11(-178.63)	-1285.76(617.22)
Rapeseed	-16.06(100.00)	2.81(-17.52)	0.00(0.00)	2.79(-17.36)	-21.66(134.88)
Mustard	13.97(100.00)	4.82(34.52)	0.00(0.00)	5.43(38.85)	3.72(26.63)
Linseed	11.91(100.00)	0.89(7.45)	0.00(0.00)	0.91(7.64)	10.11(84.91)
Sesame	-96.25(100.00)	76.97(-79.97)	0.00(0.00)	39.30(-40.83)	-212.51(220.80)
Soybean	-13.26(100.00)	15.21(-114.69)	0.00(0.00)	15.19(-114.56)	-43.67(329.25)
Sunflower	-5.22(100.00)	2.94(-56.42)	0.00(0.00)	2.93(-56.14)	-11.09(212.56)
Safflower	3.26(100.00)	0.00(0.00)	0.00(0.00)	0.00(0.00)	3.26(100.00)
Castor	1.62(100.00)	0.00(0.00)	0.00(0.00)	0.00(0.00)	1.62(100.00)
Total	-308.34(100.00)	808.98(-262.36)	0.00(0.00)	438.66(-142.26)	-1555.98(504.62)

Note: Figures in parentheses indicate the per cent to the respective total change.

Table 7 : Decomposition of India's total major oilseeds exports across selected countries during 2012-2021 (Value in US$ Million).

Countries	Actual Δ India's exports	WDE	CCE	MDE	RCE
Brazil	-2.01(100.00)	5.98(296.88)	5.97(296.77)	0.00(0.00)	-13.96(693.66)
USA	3.41(100.00)	5.54(162.62)	5.53(162.49)	0.00(0.00)	-7.67(-225.11)
Canada	-3.51(100.00)	0.43(-12.33)	0.42(-12.06)	0.00(0.00)	-4.36(124.40)
Ukraine	-10.57(100.00)	5.07(-47.98)	4.85(-45.92)	0.00(0.00)	-20.50(193.90)
Paraguay	0.00(100.00)	0.00(0.00)	0.00(0.00)	0.00(0.00)	0.00(0.00)
Argentina	-0.36(100.00)	-0.12(33.46)	-0.12(33.47)	0.00(0.00)	-0.12(33.06)
Australia	1.73(100.00)	3.62(209.75)	3.61(209.13)	0.00(0.00)	-5.50(-318.88)
Others	-297.02(100.00)	381.34(-128.39)	323.86(-109.04)	0.00(0.00)	-1002.23(337.42)
Total	**-308.34**(100.00)	**401.86**(-130.33)	**344.14**(-111.61)	**0.00**(0.00)	**-1054.34**(341.94)

Note: Figures in parentheses indicate percent to the respective total change.

research carried out by Mamta PJ in 2017. Brazil (US$ 5.98 million) has the highest WDE, followed by the USA (US$ 5.54 million), Ukraine (US$ 5.07 million), and Australia (US$ 3.62 million). Conversely, Argentina has the lowest amount at US$ -0.12 million, followed by Paraguay at 0.00 and Canada at US$ 0.43 million. All of the chosen countries—aside from Argentina—recorded positive CCEs, indicating that the export of selected oilseeds is concentrated in markets where demand is growing more quickly than the global average. The outcomes align with the research carried out by Mamta in 2017. Brazil had the largest amount ($5.97 million), followed by the USA ($5.53 million), Ukraine ($4.85 million), Australia ($3.61 million) and Paraguay ($0.00

million) and Canada ($0.42 million). Argentina had the lowest amount ($-0.12 million). Due to India's inability to diversify its exports across the aforementioned three export destinations, the CCE recorded values that were minute, zero, and negative. Once more, the RCE was noted as negative in each of the markets that were chosen. Argentina had the lowest recorded negative value (US$ –0.12 million) and Ukraine had the highest (US$ –20.50 million). Intriguingly, the drop in India's exports to the major oilseeds markets that were chosen was a result of the RCE's negative values. Positive CCE, however, in the case of most of the selected markets highlights India's expertise in exporting goods with rapidly expanding global demand over the study period.

Conclusion

The trends in India's imports and exports of agricultural commodities from 1990–1991 to 2021–22 was shown by the CMSA. Over the years, India has continuously maintained a trade surplus in agricultural commodities. Likewise, over time, there has been an increase in the import of agricultural products. Except for groundnuts, mustard, linseed, and castor, India's growth record of major oilseed exports in terms of value was judged to be satisfactory from 2009 to 2011. But when it came to imports, the results showed that, except for mustard and linseed, India recorded notably positive and considerable imports for all major oilseeds. From 2012 to 2021, the proportion of India's agricultural products in global agricultural exports fell. Exporting commodities, India's share of global commerce in 2021 compared to 2012 revealed falling performance for all major oilseeds throughout the aforementioned reference period, except mustard and linseed. From 2009–10 to 2021–22, India experienced a notably favourable and large increase in the value of its exports of the principal oilseeds, namely ground nuts, mustard, linseed and castor. It is encouraging that despite the COVID-19 epidemic and the importing countries' export restrictions, India's export performance was outstanding exclusively to the USA and Australian markets. WDE was primarily blamed for this in contrast to CCE, MDE, and RCE. This means that in light of the COVID-19 epidemic and shifting import restrictions, India's export competitiveness remained very inconsistent (Kumar, 2022). Overall, the commodity-wise study states that the positive values of WDE, MDE and RCE are the reason for the major oilseeds' poor net export performance, except mustard and linseed. It's interesting to note that, in the case of the county-wise analysis, the declining RCE values were a contributing factor to India's export reduction across the major oilseeds markets that were chosen. Positive CCE, however, in the case of most of the chosen markets highlights India's expertise in exporting goods with rapidly expanding global demand over the study period. Considering these results, increasing CCE, MDE and RCE is a distinctive way to support India's agricultural export performance. This will undoubtedly depend on both the domestic circumstances in India and the state of global demand. It would also rely on whether the importing nations keep up trade barriers and export limitations. However, poor infrastructure and a lack of cogent government strategy have plagued oil seed and oil producers in India for the past ten years, making the country's key oilseed export performance unsatisfactory (Radheshyam, 2024). To ensure higher production efficiency for their oil seed produce, the government should make the necessary changes to its export policies and domestic supportive measures. Additionally, it should adopt appropriate value additions and market diversification strategies to improve the global performance of the Indian oil seed industry. (Kumareswaran *et al.*, 2022). To promote population health, there is a need to minimize the use of saturated oils; this will also lower the need for oil imports (News of apeda.gov.in). Important agricultural production-related organizations will be involved in agricultural export policy, to promote exports through extra efforts. To provide farmers with export-oriented technology, Krishi Vigyan Kendras would be involved. The US Food and Drug Administration (USFDA) and US Department of Agriculture (USDA), the European Food Safety Authority (EFSA) in the EU, Russia and the USA, respectively, and the Federal Service for Veterinary and Phytosanitary Surveillance (FSVPS) in the USA are frequently mentioned as outstanding examples of exclusive organisations with the authority to formulate, oversee, and carry out policies of agricultural production and trade. Aiming for Indian organisations that effectively and candidly address every facet of agri-food production and trade (Agriculture Export Policy) may be desirable. To establish India as a significant player in world trade, it is urgently necessary to strengthen export competitiveness in established markets and investigate new ones in order to grow the export share. India should therefore concentrate on nations where it has a competitive advantage going forward in order to boost foreign exchange in the years to come. In order to achieve competitive trade in the global market, public and private stakeholders throughout the value chain of each agricultural commodity should be informed about novel solutions to address the challenges of upgrading the products, technologies, business models, policy

environments, etc. (Neven, 2014 and Kumar, 2022.)

A significant constraint of CMSA is its recognition of demand as an external factor. Additionally, exporters contribute to demand generation by igniting processes related to product differentiation and innovation (Fagerberg, 1985). Therefore, price competitiveness by itself is unable to account for market penetration because the exporting countries' various policies have an impact on the evolution of demand.

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