Cereal Commerce: An Indian Trade Scenario at HS 4digit level

Abstract

India's cereal trade landscape is a complex interplay of production, export, and import dynamics, reflecting both domestic priorities and global market demands. Despite historical export restrictions on staples like wheat and rice, recent policy shifts have positioned India as a pivotal player in global cereal commerce. The present study aims to understand the Indian cereal production and trade significance at HS 4-digit level. Notably the results indicated that, India's cereal production has exhibited steady growth, with a Compound Annual Growth Rate (CAGR) of 0.044 per cent over the years. This growth trajectory, coupled with fluctuations in India's share of world cereal production (hovering around 10-11%), underscores the country's consistent contribution to the global market. In terms of export composition, rice stands out as the dominant commodity, comprising a significant 76.42 per cent share of the total exported value, followed by wheat and maize. On the import front, India shows a strategic reliance on specific cereals like barley, oats, and maize, which collectively constitute over 90 per cent of the imported cereal value. This import pattern reflects targeted procurement strategies based on market needs and domestic consumption patterns. Examining trade partnerships, the United States emerges as a key exporter, while China features prominently as a significant importer of cereals. Other notable exporters include Argentina, Brazil, and Australia, contributing to a diverse distribution of cereal trade globally. The results imply that understanding product groups in specific can enhance the trade performance of any country. This diversity in trade partnerships highlights India's adaptability and its ability to navigate complex international markets. Overall, India's cereal trade dynamics demonstrate a blend of strategic production growth, export prioritization, and targeted import strategies, showcasing its pivotal role and significance in the global cereals market.

Keywords: HS, Global markets, compound annual growth rate, trade dynamics,domestic needs

INTRODUCTION

India is one of the world's leading producers of grains, including wheat and rice, among other staples. Indian exports have bright prospects because of the demand for these crops in other markets. To prioritise domestic needs, India decided to impose export restrictions on wheat

and rice in 2008. Recognising the excess output and worldwide demand, India recently relaxed the embargo, but with restrictions on the amount that may be exported. However, neither domestic prices nor storage circumstances have been greatly affected by the permissible amount. The major cereals under consideration are barley, maize, sorghum, wheat, rice, andBajra. The forecasts for 2020–21 from the Ministry of Agriculture show that main crops such as rice, maize, and Bajra comprised 102.36 million tonnes, 19.88 million tonnes, and 9.23 million tonnes, respectively. The most recent data on wheat output (2019–20) indicates an expected 107.49 million tonnes (APEDA, 2023). The final estimates from Ministry of Agriculture and Farmer Welfare, 2022-23 indicated that Food grains comprise of 3296.87 lakh tonnes with 1357.55 lakh tonnes of Rice, 1105.54 lakh tonnes of Wheat, respectively.

India is the world's biggest manufacturer and exporter of cereal products. India's cereal exports valued Rs. 111,062.37 crore (13,857.95 USD million), in the fiscal year 2022–2023. Eighty percent of India's cereal exports are made up of rice, including Basmati and Non-Basmati types. In contrast, over the same period, just 20 per cent of India's total grain exports were made up of other cereals, such as wheat (APEDA, 2023).The quality of Indian basmati rice is widely acknowledged in the global market, and its demand continues to rise as new emerging markets emerge [7-10]. Here comes to understand the trade levels at of different crops within the cereals and to compare which are the products has significant progress.India will need to take decisive action to raise productivity and local production in the region (Udhayakumar, M., & Karunakaran, K.R. (2020). Gopalsamy et. al., (2020) in their work discussed that India has further scope in wheat exports due to consistent growth in production.

METHODOLOGY

Analytical Tools and Techniques employed

The mission of the study is understanding the Indian trade dynamics of cereal at HS 4-digit level in the world. The cereal production data for 12-year time period (1999-2022) has been collected for both world and India from world bank to find out the growth. Along with this the trade data at HS 4-digit level for imports and exports was collected from ITC Trademap in order to know the Indian cereal products performance at global level. The descriptive statistics such as mean and percentage shares are calculated to obtain India’s average product

trade level and its shares at HS 4-digit. Along with this, Co-efficient of Variation (CV) and Compound Annual Growth Rate (CAGR) are calculated to obtain deeper insights of trade significance.

$$CV = \frac{Mean}{Standard\ Deviation} \times 100$$

Compound annual growth rate (CAGR) analysis

The growth rates can be specified as the percentage change of a particular variable within a given period. compound annual growth rates (CAGR) of area and production of onion crop in the study area were estimated using the following growth model:

Growth model here is,

$$Y_t = \alpha\beta^t \ldots\ldots\ldots (1)$$

Where,

Y_t = Area/ production of onion for the year t

t= Time variable (1, 2….. n) for each period.

α = Constant

β = Growth coefficient

Log transformation of (1)

$$\ln Yt = \ln \alpha + t (\ln \beta) \ldots\ldots\ldots\ldots\ldots (2)$$

Where,

$$\ln \beta = \ln (1+ t), \text{ and} \ldots\ldots\ldots\ldots\ldots (3)$$

$$t = [\text{antilog} (\ln \beta) – 1] \ldots\ldots\ldots\ldots\ldots (4)$$

$$CAGR= [\text{antilog} (\ln \beta)-1] *100\ldots\ldots\ldots (5)$$

RESULTS AND DISCUSSION

World and Indian Scenario in Cereal Production

According to early projections, the world's cereal production is expected to rise by 1.0 percent in 2023 to reach 2 813 million tonnes (including milled rice equivalent). The majority of the gain in main cereal production is expected to come from an increase in maize

production, with rises also predicted for rice and sorghum. It is anticipated that wheat and barley yields will decline from their levels in 2022, partially offsetting these increases (FAO, 2023).

Cereal production in India has shown a consistent increase over the years with a slight fluctuation in its share (10.93) of world cereal production (Table 1). Despite a rise in absolute production from 193.92 million tonnes in 1990 to 355.09 million tonnes in 2022, India's share in world cereal production has varied between 10.07 per cent and 11.60 per cent. The Compound Annual Growth Rate (CAGR) for India's cereal production stands at 0.044 per cent, indicating a steady growth trajectory. It is evident from the study that India's cereal production has been growing steadily and its relative contribution to global cereal production has remained relatively stable over the years.

Table 1: Cereal production in World and India

Year	World Cereal Production in million tonnes	India Cereal Production in million tonnes	India's share in world (%)
1990	1714.52	193.92	11.31
2000	2054.46	234.93	11.43
2013	2763.40	295.67	10.69
2014	2817.95	297.11	10.54
2015	2837.71	286.00	10.07
2016	2915.08	295.36	10.13
2017	2967.14	311.42	10.49
2018	2914.53	321.56	11.03
2019	2963.50	324.96	10.96
2020	3003.64	342.11	11.39
2021	3071.26	355.11	11.56
2022	3059.64	355.09	11.60
Average	2756.90	301.10	**10.93**
CV	**15.383**	**15.763**	**-**
CAGR (%)	**0.039**	**0.044**	**-**

Source: World Bank data, 2023

Top ten cereal-producing countries in the worldhave been named in Table 2 and per cent share contribution to the world cereal production has been represented graphically in Fig.1 Results revealed that China took first rank with 633.29 million tonnes in 2022 followed by North America and United States with 475.98 and 410.94 million tonnes respectively. While India stands at fourth with 355.09 million tonnes other countries *viz a viz*, Russia, Brazil, Argentina, Africa, Indonesia and Canada have contributed a significant portion to the global cereal production. Together all these countries produced 3059.64 million tonnes of cereals during 2022 accounting for a substantial share of global cereal production.

Table 2: Top ten cereal-producing countries in the world

Country Name	**Production in million tonnes (2022)**
China	633.29
North America	475.98
United States	410.94
India	355.09
Russian Federation	153.10
Brazil	135.49
Argentina	91.58
Africa Western and Central	81.59
Indonesia	78.31
Canada	65.04
World	**3059.64**

Source: WorldBank data, 2023

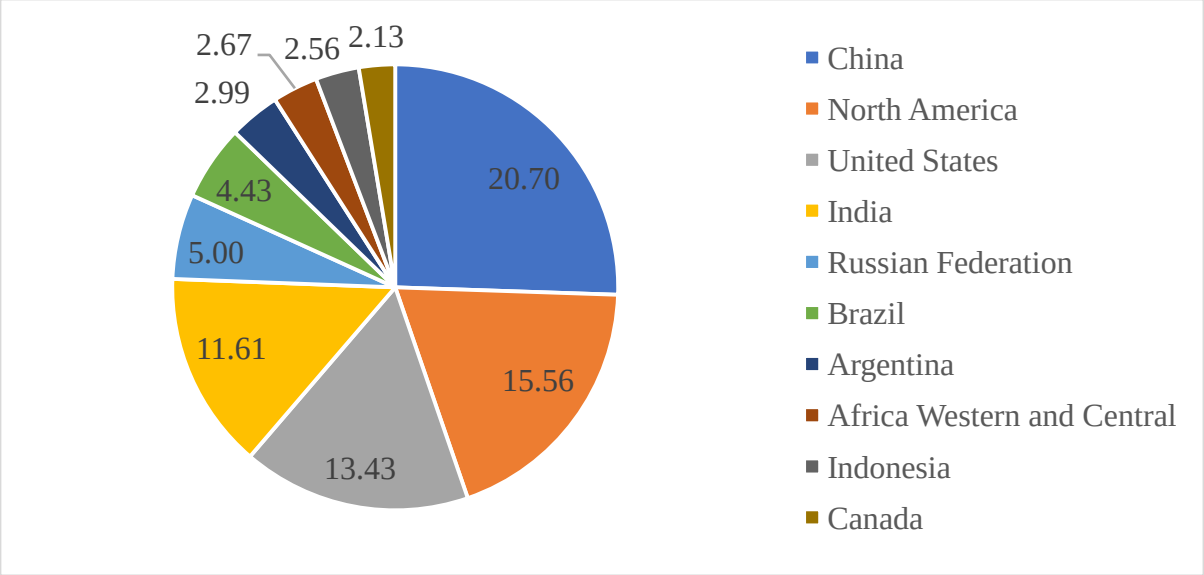

Fig 1: Percentage share of major ten cereal producing countries in the world (2022)

World trade scenario of cereal (Chapter – 10)

The trade partners for cereals across the world during the period 2022 have been presented in Table 3. United States of America emerged as the top exporter with an exported value of 2,475.13 million rupees, holding a 17.55 per cent share and China was the largest importer with an imported value of 1524.47 million rupees, representing 9.81 per cent of the total imports. Argentina, India, Brazil, and Australia also contributed prominently among the top exporters exhibiting a diverse distribution of cereal trade across the globe.

Table 3: Major exporters and importer of cereals in the world

Exporters	**Exported value in 2022 (million rupees)**	**Percentage share (%)**	**Importers**	**Imported value in 2022 (millionrupees)**	**Percentage share (%)**
United States of America	2475.13	17.55	China	1524.47	9.81
Argentina	1131.82	8.02	Japan	757.76	4.88
India	1104.18	7.83	Mexico	696.48	4.48
Brazil	1089.22	7.72	Iran	665.19	4.28
Australia	1081.23	7.67	Korea	515.51	3.32
France	929.81	6.59	Spain	513.66	3.31

Russian Federation	817.62	5.80	Egypt	502.25	3.23
Canada	797.00	5.65	Italy	487.04	3.13
Ukraine	718.80	5.10	Saudi Arabia	483.07	3.11
Romania	359.62	2.55	Turkey	420.78	2.71
Others	3601.27	25.53	Others	8974.26	57.75
World	**14105.69**	**100.00**	**World**	**15540.49**	**100.00**

Source: ITC Trademap statistics

India's cereal export composition at the HS 4-digit level reveals that rice is the dominant commodity accounting for 76.42 per cent of the total exported value followed by wheat and meslin with a 15.12 per cent share, while maize or corn holds a 7.94 per cent share. Buckwheat, millet, canary seed, and other cereals contribute 0.38 per cent to the total exported value. Grain sorghum and barley have a minimal share of 0.12 per cent and 0.01 per cent, respectively. Rye contributed an insignificant share to the total export value (Table 4).

Table 4: India's cereal export composition categories at HS 4-digit level

HS Code	**Product label**	**Exported value in million rupees**	**Percentage share (%)**
1006	Rice	843.87607	76.42534
1001	Wheat and meslin	167.00498	15.12475
1005	Maize or corn	87.65206	7.93818
1008	Buckwheat, millet, canary seed and other cereals	4.21898	0.38209
1007	Grain sorghum	1.32648	0.12013
1003	Barley	0.08998	0.00815
1004	Oats	0.01481	0.00134
1002	Rye	0.00016	0.00001
Total		**1104183524.15**	1104.18

Source: ITC Trademap statistics 2022

India's cereal import composition at the HS 4-digit level revealed that significant reliance on barley, oatsand maize, which collectively constitute over 90 per cent of the imported cereal value. Barley dominates the import market with a remarkableshare contribution of 65.85 per cent followed by oats and maize with 18.17 per cent and 9.58 per cent respectively. Despite

rice being a staple in Indian cuisine its imported value is comparatively lower, standing at 6.14 per cent. Other cereals like buckwheat, millet, canary seed, and wheat contribute minimally to the import portfolio (Table 5).

Table 5: India's cereal import composition categories at HS 4-digit level

Code	Product Label	Imported value in million rupees	Percentage share (%)
1003	Barley	6.2339	65.853
1004	Oats	1.7198	18.167
1005	Maize or corn	0.9067	9.578
1006	Rice	0.5815	6.143
1008	Buckwheat, millet, canary seed and other cereals	0.0223	0.235
1001	Wheat and meslin	0.0020	0.022
1007	Grain sorghum	0.0002	0.002
1002	Rye	0.0000	0.000
	Total	**9.47**	

Source: ITC Trademap statistics 2022

The major countries that export barley and oats to India have been presented in Table 6. It is evident from the study that Argentina is the leading exporter of barley with an imported value of Rs. 3.71 million thousand followed by France and Uruguay. Meanwhile, Australia emerges as the dominant oats exporterwith an imported value of Rs. 1.70 million thousand followed by Ukraine. The total imported value for barley from all countriesisRs. 6.23 million thousand, while for oats it stands at Rs. 1.72 million thousandemphasizing the significant contribution of these countries to India's cereal import market.

Table 6: Major barley and Oats exporters to India

Barley (1003)		**Oats (1004)**	
Exporters	Imported Value (000, Rs.)	Exporters	Imported Value (000, Rs.)
Argentina	3708654.41	Australia	1702076.19
France	2125635.77	Ukraine	17792.01
Uruguay	288199.22	World	1719789.82
Australia	111533.17	-	-

World	6233944.19	-	-

Source: ITC Trademap statistics 2022

Major Rice, Wheat and Meslin importers of India have been displayed in Table 7 and per cent share of different importing countries also have been graphically represented in Fig 2 and Fig 3. India is a significant importer of rice and wheat/meslin, with major import partners including Iran, Saudi Arabia, China, and Benin for rice, and Bangladesh, Indonesia, Korea, and the United Arab Emirates for wheat and meslin. India imported rice worth 843.88 million rupees, with Iran being the largest exporter at 90.54 million rupees, followed by Saudi Arabia, China, and Benin. India imported wheat and meslin worth 167.00 million rupees, with Bangladesh as the largest exporter at 57.57 million rupees, followed by Indonesia, Korea, and the United Arab Emirates. Despite significant imports from various countries, India also trades substantially with other partners in both categories.

Table 7: Major Rice and Wheat and Meslin importers of India

Rice (1006)		**Wheat and Meslin (1001)**	
Importers	Exported value (million rupees.)	Importers	Imported value (million rupees.)
Iran	90.54	Bangladesh	57.57
Saudi Arabia	77.58	Indonesia	23.74
China	52.54	Korea	15.53
Benin	43.18	United Arab Emirates	14.07
United Arab Emirates	33.94	Yemen	11.08
Others	546.11	Others	45.01
World	843.88	World	167.00

Source: ITC Trademap statistics

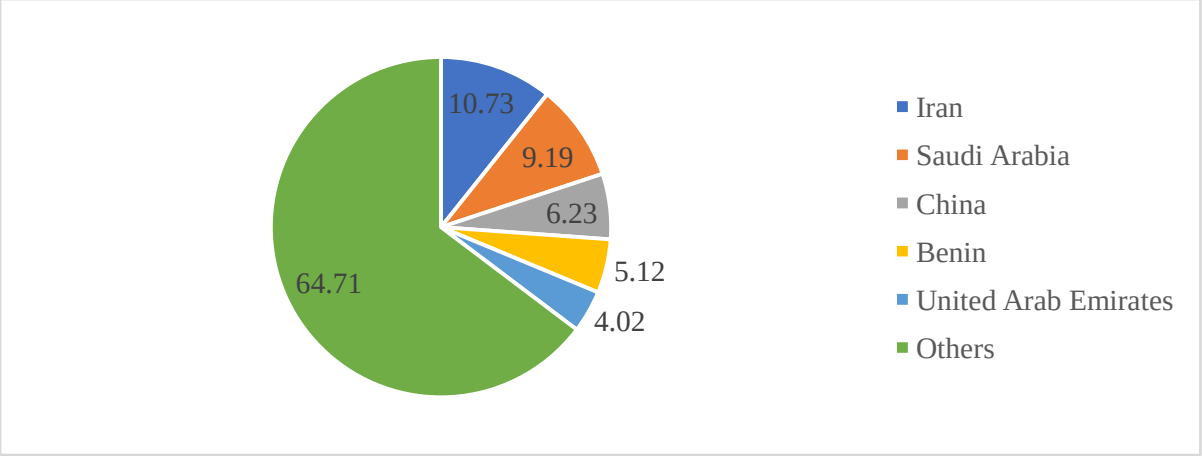

Fig 2: Percent share of major cereal (Rice – 1006) import destinations in 2022

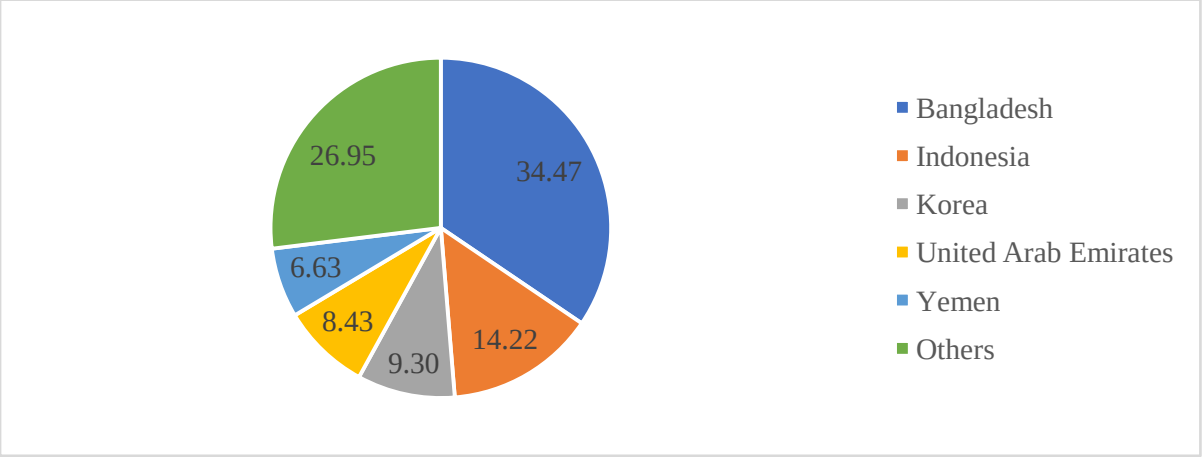

Fig 3: Percent share of major cereal (Wheat and meslin – 1001) import destinations in 2022

CONCLUSION

India's cereal trade scenario at the HS 4-digit level reflects a dynamic and evolving landscape driven by both domestic production capabilities and international market dynamics. The relaxation of export restrictions on staples like wheat and rice has enabled India to capitalize on its position as a major producer and exporter of cereals. Despite fluctuations in global market shares, India has maintained a steady growth trajectory in cereal production, contributing significantly to the global cereal market. The dominance of rice in India's export composition underscores the strategic focus on high-value commodities. On the import side, India's reliance on specific cereals like barley, oats, and maize reflects targeted procurement strategies. The diverse trade partnerships, with countries like the United States and China playing pivotal roles, highlight India's adaptability and strategic positioning in the global

cereals trade. Overall, India's cereal commerce presents a balanced approach, leveraging domestic strengths while actively participating in and contributing to the global cereals market.The study signifies that Cereals are playing major role in world market and the traders or other agencies should take export activities or implication by understanding individual product groups at various level instead of overall product category which can increase India or any country's trade performance.

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