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HARVESTING VALUE :

India's Agricultural Commodity Markets



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Executive Summary

India's agricultural sector has undergone a gradual structural transformation over the past decade, driven by changing consumption patterns, rising demand for high-value crops, technological advancements, export opportunities, and sustained policy support. While cereals continue to dominate national food production, horticultural and commercial crops have expanded steadily, increasing their contribution to both agricultural output and farm income. These structural changes are reshaping the composition of India's agricultural economy and, consequently, the demand for effective price risk management tools. Against this backdrop, this report examines trends across major agricultural commodity groups to identify growth patterns, emerging opportunities, and the implications for agricultural derivatives markets.

The analysis indicates that India's agricultural growth is increasingly being driven by high-value commodities, such as spices and oilseeds, rather than staple food crops, creating greater opportunities for market-based risk management, value addition and organized trading.

The evolving patterns in production and value addition underscore the growing need for efficient market mechanisms that can support commercially significant and increasingly volatile agricultural value chains. In this context, a well-functioning agri-derivatives market serves as an essential pillar of modern agricultural market infrastructure by enabling efficient price discovery, risk management, market transparency and broader economic development. Futures markets generate transparent, forward-looking price signals that enable farmers, Farmer Producer Organizations (FPOs), processors and traders to make informed production, procurement, storage and marketing decisions. At the same time, hedging mechanisms help market participants manage price volatility, stabilize incomes and reduce uncertainty across the agricultural value chain. The integration of electronic trading platforms with warehouse receipt systems has further strengthened transparency, facilitated commodity financing and enhanced confidence in delivery-based settlement.

Beyond these core market functions, agri-derivatives contribute to economic development by improving access to finance, reducing distress sales, encouraging investment in warehousing and post-harvest infrastructure, and deepening financial market participation.

India's agri-derivatives market is well positioned for future growth, supported by ongoing regulatory reforms, expanding institutional participation, digital warehousing initiatives and the development of new risk management products. Proposed reforms—including higher position limits, revised commodity classification, phased physical settlement and broader participation by financial institutions—have the potential to improve market liquidity, strengthen hedging efficiency and expand derivatives into commercially significant, high-growth agricultural commodities.

However, several structural challenges continue to constrain market development. The prolonged suspension of futures trading in certain agricultural commodities has weakened liquidity and price discovery, while absence of full knowledge about the mechanism of hedging has been a deterrent for greater participation by commercial hedgers, including farmers, FPOs, processors and exporters. Addressing these constraints through enabling policy environment, improved physical market infrastructure and broader stakeholder participation will be critical to unlocking the full potential of India's agricultural derivatives market.





HARVESTING VALUE: INDIA'S AGRICULTURAL COMMODITY MARKETS

2. Landscape of India Agricultural Commodities Market

2.1 CEREALS

2.1.1 OVERVIEW

Cereal production maintained a steady upward trajectory throughout the decade, making it the only major agricultural category to register uninterrupted year-on-year growth. Total cereal production increased from 235.22 MMT in 2015-16 to 332.05 MMT in 2024-25, registering a steady growth of 3.51% during study period and rose by 41.2% between 2014-15 and 2024-25. While annual growth moderated to 1.06% in 2021-22, favorable production gains in recent years lifted growth to 7.79% in 2024-25, indicating continued improvements in productivity and reinforcing cereals as the backbone of India's crop production.

2.1.2 GROWTH TREND IN CEREALS PRODUCTION

Table 1: Total Cereals Production and Growth, 2015-16 to 2024-25

Year	Production (MMT)	YoY Growth (%)
2015-16	235.22	—
2016-17	251.98+	7.13%
2017-18	259.60	+3.02%
2018-19	263.13	+1.36%
2019-20	274.48	+4.31%
2020-21	285.28	+3.93%
2021-22	288.31	+1.06%
2022-23	303.63	+5.31%
2023-24	308.05	+1.46%
2024-25	332.05	+7.79%

The cereals category recorded a CAGR of 3.51% during 2015-16 to 2024-25, reflecting steady long-term growth

in production. The total cereal production is projected to reach approximately 397 MMT by 2029-30 reflecting the increasing maturity of India's cereal sector. Future production growth is expected to be constrained by limited scope for further expansion in cultivated areas, particularly under rice and wheat, while productivity gains are likely to be more incremental than in the past decade. The pace of expansion moderated in the middle of the period, production gained momentum over the last three years, culminating in a decade-high annual growth rate of 7.79% in 2024-25. This pushed total cereal production beyond 330 MMT for the first time, largely driven by higher rice output and improved productivity across major cereal crops.

Across individual cereal crops, growth rates varied considerably, reflecting differences in cultivated area, productivity improvements, market demand, and crop-specific factors. The table below ranks all cereals with complete data based on their CAGR during 2015-16 to 2024-25.

Table 2: Growth Trend in Cereals (2015-16 to 2024-25)

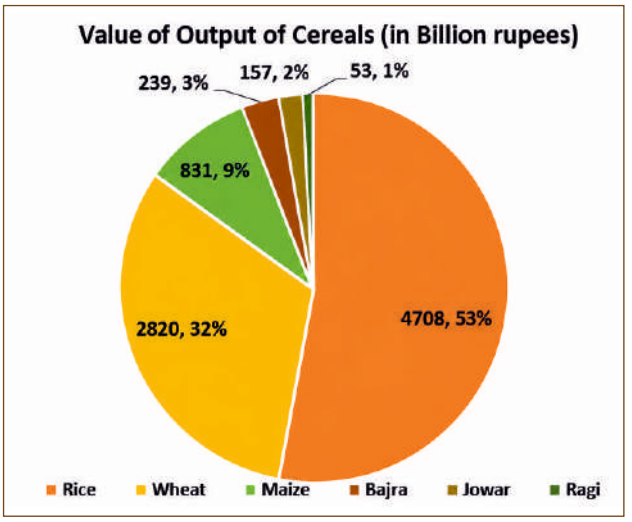
Rank	Commodity (MMT)	2015-16 (MMT)	2024-25 (%)	CAGR (%)	Total Growth
1	Maize	22.57	43.41	6.76%	+92.40%
2	Rice	104.41	150.18	3.70%	+43.80%
3	Bajra	8.07	11.21	3.34%	+38.90%
4	Barley	1.44	1.92	2.93%	+33.40%
5	Wheat	92.29	117.94	2.48%	+27.80%
6	Jowar	4.24	4.96	1.58%	+16.90%
7	Small Millets	0.39	0.46	1.55%	+16.60%
8	Ragi	1.82	1.98	0.82%	+8.50%

2.1.3 GROWTH IN MAJOR CEREALS

- Maize - Recorded the fastest growth among cereals, with a CAGR of 6.76%, increasing production from 22.57 MMT to 43.41 MMT, reflecting a cumulative growth of 92.4% over the study period.
- Rice - Maintained steady production growth, registering a CAGR of 3.70% and increasing from 104.41 MMT to 150.18 MMT, representing a cumulative growth of 43.8%.
- Bajra - Production expanded at a CAGR of 3.34%, rising from 8.07 MMT to 11.21 MMT, with a cumulative growth of 38.9%.
- Barley - Recorded moderate growth with a CAGR of 2.93%, increasing production from 1.44 MMT to 1.92 MMT, reflecting a cumulative growth of 33.4%.
- Wheat - Registered stable long-term growth, with a CAGR of 2.48%, increasing production from 92.29 MMT to 117.94 MMT, representing a cumulative growth of 27.8%.

2.1.4 ECONOMIC OUTPUT (VALUE AT CURRENT PRICES, 2023-24)

Fig 1: Value of Output of Cereals (2023-24)



- The total value of output from the cereals sector was estimated at INR 8,845.8 billion in 2023-24. Rice remained the largest contributor, accounting for INR 4,708.2 billion (53%), followed by wheat at INR 2,820.1 billion (32%) and maize at INR 830.8 billion (9%). Together, these three crops contributed around 94% of the total value of output, underscoring their dominant position in India's cereal economy.
- The remaining cereals, including bajra, jowar, ragi, barley and small millets, accounted for the balance 6%, reflecting their relatively smaller economic contribution.

India's cereals sector grew at a CAGR of 3.51% during 2015-16 to 2024-25, led by maize, with rice, bajra and barley also outperforming the category average. Growth across all major cereals, including jowar, small millets and ragi, indicates a well-diversified and steadily expanding cereal sector.

2.2 PULSES

2.2.1 OVERVIEW

Total pulse production increased from 16.32 MMT in 2015-16 to 25.68 MMT in 2024-25, registering a growth of 57.3% over the decade. Despite the strong long-term growth, pulse production remained the most volatile among the major crop categories, reflecting its high dependence on monsoon conditions and seasonal fluctuations. While production witnessed an exceptional 41.7% increase in 2016-17, the highest annual growth recorded across all categories, it also experienced three years of decline during the review period, highlighting the variability in pulse production. Based on the 10- year CAGR, pulse production is projected to reach 32.22 MMT by 2029-30.

2.2.2 GROWTH TREND IN TOTAL PULSES PRODUCTION

Table 3: Total Pulses Production and Growth, 2015-16 to 2024-25

Year	Production (MMT)	YoY Growth (%)
2015-16	16.32	—
2016-17	23.13	+41.70%
2017-18	25.42	+9.89%
2018-19	22.08	-13.14%
2019-20	23.02	+4.30%
2020-21	25.46	+10.59%
2021-22	27.30	+7.22%
2022-23	26.06	-4.56%
2023-24	24.25	-6.95%
2024-25	25.68	+5.93%

Total pulse production is projected to reach 32.92 MMT by 2029-30 from 25.68 MMT in 2024-25. Pulse production followed a highly cyclical pattern during the review period, with sharp fluctuations in annual output reflecting its greater sensitivity to monsoon performance and weather conditions. After recording an exceptional growth of 41.70% in 2016-17, production moderated in the following years before recovering on improved acreage and yields. However, consecutive declines in 2022-23 and 2023-24 interrupted the recovery, before production rebounded by 5.93% in 2024-25. The alternating phases of strong growth and contraction highlight the relatively higher production risk associated with pulse cultivation compared to other major crop categories.

Production growth rate varied across individual pulse crops, reflecting differences in productivity, acreage allocation, market demand and crop-specific production trends. The table below ranks the major pulses based on their CAGR during 2015-16 to 2024-25.

Table 4: Growth Trend in Pulses (2015-16 to 2024-25)

Rank	Commodity (MMT)	2015-16 (MMT)	2024-25 (%)	CAGR (%)	Total Growth
1	Green Gram (Moong)	1.59	4.24	10.30%	+166.40%
2	Lentil	0.98	1.65	5.42%	+69.50%
3	Chickpea	7.06	11.11	4.65%	+57.50%
4	Pigeon Pea (Tur)	2.56	3.62	3.53%	+41.50%
5	Other Pulses	2.19	2.80	2.50%	+28.00%
6	Urad	1.95	2.24	1.43%	+15.30%

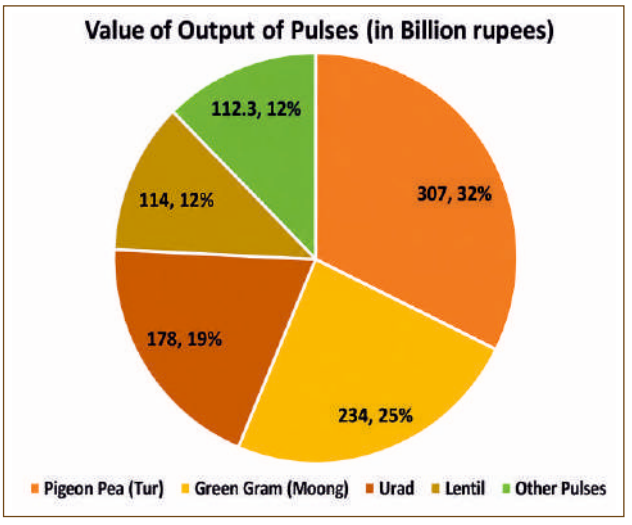
2.2.3 GROWTH IN MAJOR PULSES

- Green Gram (Moong) - Recorded the fastest growth among pulses, with a CAGR of 10.30%, increasing production from 1.59 MMT to 4.24 MMT, reflecting a cumulative growth of 166.4%.
- Lentil - Registered strong long-term growth, with a CAGR of 5.42%, increasing production from 0.98 MMT to 1.65 MMT, representing a cumulative growth of 69.5%.
- Chickpea - Continued to be the major growth driver within the pulse category, recording a CAGR of 4.65% and increasing production from 7.06 MMT to 11.11 MMT, reflecting a cumulative growth of 57.5%.
- Pigeon Pea (Tur) - Recorded steady growth, with a CAGR of 3.53%, increasing production from 2.56 MMT to 3.62 MMT, representing a cumulative growth of 41.5%.
- Other Pulses - Registered moderate growth, with a CAGR of 2.50%, increasing production from 2.19 MMT to 2.80 MMT, reflecting a cumulative growth of 28.0%.

2.2.4 ECONOMIC OUTPUT (VALUE AT CURRENT PRICES, 2023-24)

The total economic output of the pulses sector was valued at INR 1,890.4 billion in 2023-24.

Fig 2: Value of Output of Pulses (2023-24)



- Pigeon Pea (Tur) emerged as the highest-value pulse crop, contributing INR 307.5 billion (16%) to the total pulse sector value, followed by Green Gram (Moong) at INR 233.6 billion (12%) and Urad at INR 178.0 billion (9%).
- Together, the top three pulse crops accounted for 37% of the total sector value, highlighting that while these crops hold a significant share, the overall value contribution remains spread across multiple pulse categories.
- Lentil and other pulses collectively contributed around 24% of the total value, underlining the role of diverse pulse crops in supporting the overall strength and value of the sector.

India's pulses production recorded a healthy CAGR of 4.64% between 2015-16 and 2024-25, with Green Gram (Moong) emerging as the key growth driver among major pulse crops. All major pulses witnessed moderate growth, but production remained volatile, with year-on-year fluctuations including a sharp 41.70% increase in a single year and several instances of double-digit

changes. Going forward, maintaining growth momentum will require a balance between productivity enhancement and risk management through measures such as improved irrigation coverage, adoption of resilient varieties, and stronger crop insurance support.

2.3 OILSEEDS

2.3.1 OVERVIEW

Total oilseed production increased from 25.25 MMT in 2015-16 to 42.99 MMT in 2024-25, registering a cumulative growth of 70.2% over the study period, the second highest among all crop categories after Spices. Production recorded positive year-on-year growth in nine of the ten years analyzed, with the only decline of 4.08% observed in 2023-24. Based on the long-term production trend, oilseed production is projected to reach approximately 56.7 MMT by 2029-30, supported by rising domestic edible oil demand, favorable price realization, and continued policy emphasis on reducing import dependence through higher domestic production.

2.3.2 GROWTH TREND IN TOTAL OILSEEDS PRODUCTION

Table 5: Total Oilseeds Production and Growth, 2015-16 to 2024-25

Year	Production (MMT)	YoY Growth (%)
2015-16	25.25	—
2016-17	31.28	+23.86%
2017-18	31.46	+0.59%
2018-19	31.52	+0.20%
2019-20	33.22	+5.38%
2020-21	35.95	+8.21%
2021-22	37.96	+5.61%
2022-23	41.35	+8.94%
2023-24	39.67	-4.08%
2024-25	42.99	+8.37%

Oilseeds production is projected to reach 56.7 MMT by 2029-30 with a projected CAGR of 5.7%, supported by rising demand and government initiatives promoting expansion of area. Production witnessed a sharp recovery in 2016-17, rising by 23.86%, the highest annual growth during the period, driven by a strong rebound in soybean output. This was followed by a period of relative stability during 2017-18 and 2018-19, when growth remained marginal at 0.59% and 0.20%, respectively. From 2019-20 to 2022-23, production maintained a steady upward trajectory, recording consistent growth of 5.38%, 8.21%, 5.61%, and 8.94%. In 2023-24, output declined by 4.08%, before recovering strongly in 2024-25 with an 8.37% increase, marking the second-largest annual growth recorded during the study period.

Production growth across individual oilseed crops shows significant variation, driven by differences in area expansion, productivity improvements, market demand, and crop-specific factors. The table below ranks the oilseed commodities with available data based on their CAGR performance from 2015-16 to 2024-25.

Table 6: Growth Trend in Oilseeds (2015-16 to 2024-25)

Rank	Commodity (MMT)	2015-16 (MMT)	2024-25 (%)	CAGR (%)	Total Growth
1	Rapeseed & Mustard	6.80	12.67	6.42%	+86.40%
2	Soybean	8.57	15.27	5.94%	+78.20%
3	Groundnut	6.73	11.94	5.90%	+77.40%
4	Sesamum	0.85	0.89	0.49%	+5.10%
5	Castor seed	1.75	1.79	0.19%	+1.90%
6	Linseed	0.13	0.11	-1.09%	-10.40%
7	Safflower	0.05	0.04	-2.07%	-18.90%
8	Sunflower	0.30	0.24	-2.24%	-20.30%
9	Niger seed	0.07	0.04	-5.97%	-45.90%



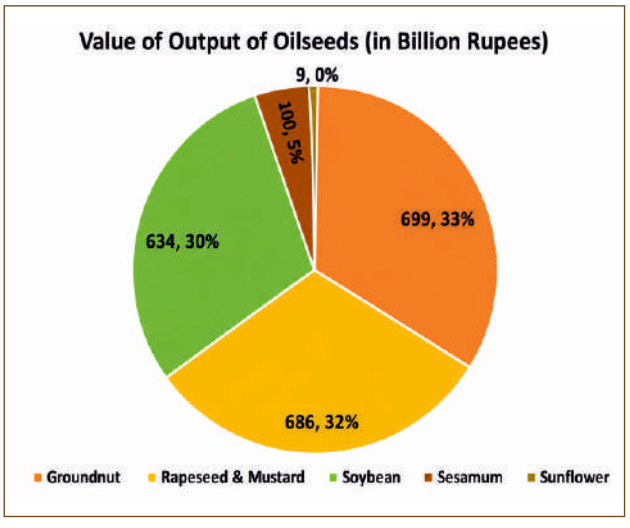
2.3.3 GROWTH IN MAJOR OILSEEDS

- Rapeseed & Mustard - Emerged as the fastest-growing oilseed crop, recording a CAGR of 6.42% and increasing production from 6.80 MMT to 12.67 MMT, reflecting a cumulative growth of 86.4%.
- Soybean - Registered strong long-term growth, with a CAGR of 5.94%, increasing production from 8.57 MMT to 15.27 MMT, representing a cumulative growth of 78.2%.
- Groundnut - Recorded sustained production growth, with a CAGR of 5.90%, increasing from 6.73 MMT to 11.94 MMT, reflecting a cumulative growth of 77.4%.
- Sesamum - Registered marginal growth, with a CAGR of 0.49%, increasing production from 0.85 MMT to 0.89 MMT, representing a cumulative growth of 5.1%.
- Castor seed - Recorded largely stable production over the study period, with a CAGR of 0.19%, increasing from 1.75 MMT to 1.79 MMT, reflecting a cumulative growth of 1.9%.

2.3.4 ECONOMIC OUTPUT (VALUE AT CURRENT PRICES, 2023-24)

The total economic output of the oilseeds sector was valued at INR 2,135.3 billion in 2023-24.

Fig 3: Value of Output of Oilseeds (2023-24)



- Groundnut emerged as the highest-value oilseed crop, contributing INR 698.6 billion (33%) to the total oilseed sector value, followed closely by Rapeseed & Mustard at INR 686.3 billion (32%) and Soybean at INR 634.3 billion (30%).
- The top three oilseed crops together accounted for 95% of the sector's total value, highlighting their dominant contribution to the overall economic value of the oilseed segment.
- The remaining oilseeds, including Sesamum, Sunflower, Linseed, and Nigerseed, collectively contributed the remaining 5%, reflecting their smaller but important role in supporting crop diversity within the sector.

India's oilseeds production recorded a 5.46% CAGR between 2015-16 and 2024-25, making it the second-fastest-growing category among the eight segments analyzed. The growth was largely driven by Rapeseed & Mustard, Soybean, and Groundnut, which together formed the key contributors to the sector's expansion. In contrast, smaller oilseed crops such as Linseed, Safflower, Sunflower, and Nigerseed witnessed a gradual decline during the period, highlighting a shift towards larger and more commercially significant oilseed crops.

2.4 FIBER CROPS

2.4.1 OVERVIEW

Fiber crop production recorded a marginal decline over the study period, with the core fiber crop basket comprising Cotton, Jute and Mesta decreasing from 40.53 MMT in 2015-16 to 38.52 MMT in 2024-25, representing a cumulative decline of 4.9%. Among all the crop categories analyzed, Fiber Crops were the only category to register an overall contraction in production, reflecting persistent challenges such as fluctuating acreage, yield variability and changing crop preferences. Based on the long-term production trend, fiber crop production is projected to decline further to approximately 37.64 MMT by 2029-30.

2.4.2 GROWTH TREND IN TOTAL FIBER CROPS PRODUCTION

Table 7: Total Fiber crops Production and Growth, 2015-16 to 2024-25

Year	Production (MMT)	YoY Growth (%)
2015-16	40.53	—
2016-17	43.54	+7.43%
2017-18	42.84	-1.61%
2018-19	37.86	-11.62%
2019-20	45.94	+21.34%
2020-21	44.60	-2.91%
2021-22	41.27	-7.48%
2022-23	43.05	+4.33%
2023-24	42.22	-1.94%
2024-25	38.52	-8.74%

Based on the core fiber crop basket of Cotton, Jute, and Mesta, production followed a fluctuating trend over the study period. Production increased by 7.43% in 2016-17, before declining by 1.61% in 2017-18 and a sharper 11.62% in 2018-19, mainly due to a reduction in cotton output. This was followed by a strong recovery in 2019-20, when production surged by 21.34%, marking the highest annual growth during the period, supported by a significant rebound in cotton production.

However, from 2020-21 to 2024-25, the sector faced production pressure due to lower cotton output, driven by adverse weather conditions and reduced acreage, with production declining in four out of the five years, including decreases of 2.91%, 7.48%, 1.94%, and 8.74%, while the only growth was a modest 4.33% increase in 2022-23. Overall, the category ended the period with production still below earlier levels, reflecting a prolonged decline in the fiber-crop segment. The broader Total Fiber Crops category also followed a similar trend, with production declining from 43.32 MMT in 2021-22 to 41.80 MMT in 2024-25.

The core fiber crop basket recorded a CAGR of -0.51% between 2015-16 and 2024-25, making it the only category among the eight analyzed to witness a decline during the period. However, the decline remained moderate, with Cotton production showing relative stability compared with earlier downward trends. If this growth rate continues, core fiber crop production is estimated to reach around 37.56 MMT by 2029-30.

CAGR performance across individual fiber crops varies significantly due to differences in acreage trends, yield improvements, demand patterns, and crop-specific challenges. The table below ranks fiber crops based on their 2015-16 to 2024-25 CAGR.

Table 8: Growth Trend in Fiber Crops (2015-16 to 2024-25)

Rank	Commodity (MMT)	2015-16 (MMT)	2024-25 (%)	CAGR (%)	Total Growth
1	Cotton	30.00	29.72	-0.09%	-0.90%
2	Jute	9.94	8.49	-1.57%	-14.60%
3	Mesta	0.58	0.31	-6.03%	-46.30%

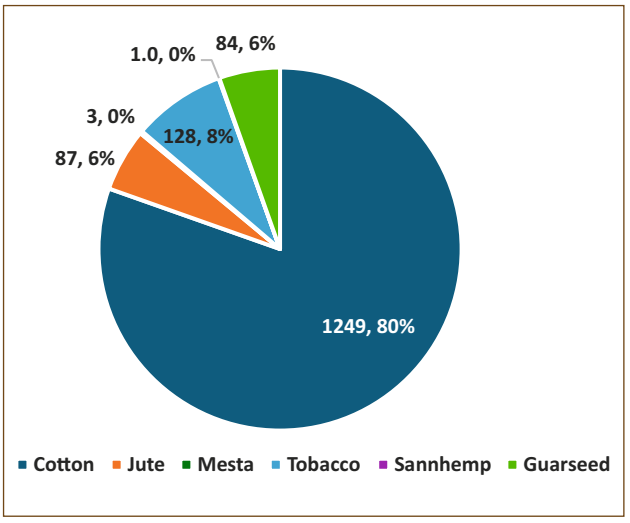
2.4.3 GROWTH IN MAJOR FIBER CROPS

- Cotton - Recorded largely stable production over the study period, with a CAGR of -0.09%, declining marginally from 30.00 MMT to 29.72 MMT, reflecting a cumulative decline of 0.9%.
- Jute - Registered a CAGR of -1.57%, with production declining from 9.94 MMT to 8.49 MMT, representing a cumulative decline of 14.6%.
- Mesta - Recorded the sharpest decline among fiber crops, with a CAGR of -6.03%, reducing production from 0.58 MMT to 0.31 MMT, reflecting a cumulative decline of 46.3%.
- Guar Seed - Emerged as the fastest-growing crop during the recent period (2021-22 to 2024-25), with production increasing from 1.18 MMT to 2.20 MMT, nearly doubling within three years.
- Tobacco - Recorded steady growth during the recent period (2021-22 to 2024-25), with production increasing from 0.82 MMT to 1.04 MMT.

2.4.4 ECONOMIC OUTPUT (VALUE AT CURRENT PRICES, 2023-24)

The total economic output of the fiber crops sector was valued at INR 1,553.2 billion in 2023-24.

Fig 4: Value of Output of Fiber crops (2023-24)



- Cotton emerged as the dominant fiber crop by value, contributing INR 1,248.9 billion (80%) to the total sector value, followed by Tobacco at INR 128.3 billion (8%) and Jute at INR 87.2 billion (6%).
- The top three fiber crops together accounted for 94% of the sector's total value, highlighting the significant economic contribution of Cotton. Guar seed, Mesta, and Sunnhemp collectively contributed the remaining 6%, reflecting their relatively smaller share in the overall value of the fiber crop sector.

Fiber Crops remained the weakest-performing category among the eight segments analyzed, recording the only negative CAGR between 2015-16 and 2024-25. However, the decline has moderated as Cotton, the dominant crop within the category, has remained largely stable rather than continuing a sharp downward trend. Jute and Mesta continued to witness structural declines, while smaller crops such as Guar seed and Tobacco showed encouraging recent growth, although their limited production volumes remain insufficient to offset the overall contraction in the fiber crop segment.

2.5 PLANTATION CROPS

2.5.1 OVERVIEW

Total plantation crop production is projected to reach 538.75 MMT by 2029-30, based on the 10-year CAGR of 3%. Growth will be primarily driven by Sugarcane, which dominates the category and is expected to contribute the majority of the production increase. Among other

plantation crops, Arecanut, Rubber, and Cocoa are projected to record stronger growth, supported by rising demand and productivity improvements, while crops such as coconut and tea are expected to witness limited growth due to slower production expansion. Overall growth in the category will remain closely linked to Sugarcane production trends due to its significant share in total output.

2.5.2 GROWTH TREND IN TOTAL PLANTATION CROPS PRODUCTION

Table 9: Total Plantation Production and Growth, 2015-16 to 2024-25

Year	Production (MMT)	YoY Growth (%)
2015-16	367.25	—
2016-17	325.19	-11.45%
2017-18	400.32	+23.10%
2018-19	424.33	+6.00%
2019-20	388.99	-8.33%
2020-21	424.36	+9.09%
2021-22	457.65	+7.84%
2022-23	510.15	+11.47%
2023-24	473.42	-7.20%
2024-25	474.15	+0.15%

The plantation crop production trajectory witnessed significant fluctuations over the period, largely influenced by changes in Sugarcane output due to its dominant share in the category. Production declined sharply in 2016-17 before recovering strongly during 2017-18 and 2018-19. This was followed by another contraction in 2019-20, after which production entered a sustained recovery phase from 2020-21 to 2022-23, reaching a decade-high of 510.15 MMT in 2022-23. Production moderated in 2023-24 and remained largely stable in 2024-25, settling at 474.15 MMT, which was still 29.1% higher than the 2015-16 level.

Total plantation crop production, including Sugarcane, recorded a CAGR of 2.59% between 2015-16 and 2024-25, indicating steady expansion over the decade despite year-to-year fluctuations. The inclusion of Sugarcane significantly influences the overall category performance due to its dominant share in total production, resulting in a stronger growth profile compared with the narrower plantation crop estimate.

Based on the 10-year CAGR, total plantation crop production is projected to reach approximately 538.75 MMT by 2029-30, representing an increase of around 64.61 MMT from 2024-25 levels. Growth is expected to remain primarily supported by Sugarcane, while individual crops such as Rubber, Arecanut, and Cocoa are also expected to contribute positively due to their higher growth potential. However, the forecast represents a trend-based projection and may vary depending on factors such as weather conditions, policy changes, and market dynamics

Table 10: Growth Trend in Plantation Crops (2015-16 to 2024-25)

Rank	Commodity (MMT)	2015-16 (MMT)	2024-25 (%)	CAGR (%)	Total Growth
1	Arecanut	0.71	1.49	7.64%	+108.80%
2	cocoa	0.02	0.03	6.86%	+94.10%
3	Rubber	0.56	0.88	4.53%	+55.70%
4	Sugarcane	348.45	454.61	2.70%	+30.50%
5	Cashewnut	0.67	0.80	1.80%	+19.50%
6	Tea	1.23	1.32	0.65%	+6.70%
7	coffee	0.35	0.36	0.45%	+4.60%
8	coconut	15.26	13.97	-0.88%	-8.40%

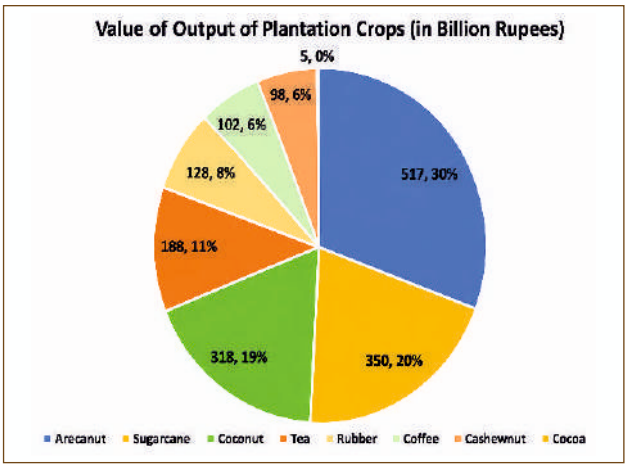
2.5.3 GROWTH IN MAJOR PLANTATION CROPS

- Arecanut - Emerged as the fastest-growing plantation crop, recording a CAGR of 7.64% and increasing production from 0.71 MMT to 1.49 MMT, reflecting a cumulative growth of 108.8%.
- Cocoa - Registered strong long-term growth, with a CAGR of 6.86%, increasing production from 0.02 MMT to 0.03 MMT, representing a cumulative growth of 94.1%.
- Rubber - Recorded sustained production growth, with a CAGR of 4.53%, increasing from 0.56 MMT to 0.88 MMT, reflecting a cumulative growth of 55.7%.
- Sugarcane - Continued to be the dominant plantation crop, registering a CAGR of 2.70% and increasing production from 348.45 MMT to 454.61 MMT, representing a cumulative growth of 30.5%.
- Cashewnut - Recorded moderate long-term growth, with a CAGR of 1.80%, increasing production from 0.67 MMT to 0.80 MMT, reflecting a cumulative growth of 19.5%.

2.5.4 ECONOMIC OUTPUT (VALUE AT CURRENT PRICES, 2023-24)

The total economic output of the plantation crops sector was valued at INR 1,707.2 billion in 2023-24.

Fig 5: Value of Output of Plantation crops (2023-24)



- Arecanut emerged as the highest-value plantation crop, contributing INR 517.0 billion (30%) to the total sector value, followed by Sugarcane at INR 349.9 billion (20%) and Coconut at INR 317.8 billion (19%).
- The top three plantation crops together accounted for 69% of the sector's total value, highlighting their significant role in driving the economic contribution of the plantation segment.
- The remaining value was contributed by Tea, Rubber, Coffee, Cashewnut, and Cocoa, which collectively accounted for 31%,

Plantation Crops emerges as a steady growth category, expanding at a CAGR of 2.59% between 2015-16 and 2024-25 and projected to reach around 538.53 MMT by 2029-30. Growth has been supported by Sugarcane, which contributes the majority of the absolute increase due to its dominant production base, despite its moderate 2.70% CAGR.

On the other hand, Coconut remains the key area of concern, with a long-term decline in production and a meaningful impact on the overall category due to its sizeable volume share. Improving productivity in coconut could provide a significant opportunity to strengthen future category growth. From a value perspective, Arecanut, Sugarcane, and Coconut together account for around 69% of the sector's output value, highlighting that production volume and economic contribution do not always move in the same order and need to be viewed together for a complete picture of the category.

2.6 SPICES

2.6.1 OVERVIEW

Spices recorded the strongest production growth among all crop categories over the past decade. Total production increased from 6.99 MMT in 2015-16 to 12.99 MMT in 2024-25, registering a cumulative growth of 85.9% during the study period. Along with Cereals, Spices was one of only two categories to record uninterrupted year-on-year production growth, without a single year of decline, reflecting sustained expansion in both cultivated area and market demand. Spices production is projected to reach approximately 18.12 MMT by 2029-30, representing a forecast CAGR of 6.87% over the next five years. The outlook is supported by favorable farm profitability, robust domestic and export demand, and continued expansion in the cultivation of high-value spice crops.

2.6.2 GROWTH TREND IN SPICES PRODUCTION

Table 11: Total Spices Production and Growth, 2015-16 to 2024-25

Year	Production (MMT)	YoY Growth ()
2015-16	6.99	—
2016-17	7.08	+1.27%
2017-18	8.50	+20.06%
2018-19	9.50	+11.80%
2019-20	10.14	+6.71%
2020-21	11.12	+9.67%
2021-22	11.15	+0.34%
2022-23	11.83	+6.05%
2023-24	12.48	+5.53%
2024-25	12.99	+4.08%

The production trend over the past decade shows an initial period of modest growth followed by rapid expansion and subsequent stabilization. Production increased by 1.27% in 2016–17 before surging by 20.06% in 2017–18, representing the highest year-on-year growth recorded across all crop categories covered in this study. The growth momentum remained strong during the following three years, with annual increases of 11.80% in 2018–19, 6.71% in 2019–20, and 9.67% in 2020–21, supported by steady expansion in cultivation and improving productivity. Growth subsequently moderated to 0.34% in 2021–22 before stabilizing in the range of 4% to 6% annually through 2024–25, indicating that production continues to expand at a more sustainable pace.

Total spices production registered a historical CAGR of 6.40% during 2015-16 to 2024-25, the highest among all crop categories covered in this study. The sustained growth reflects structural expansion in the spices sector, supported by increasing cultivation of high-value spice crops, rising domestic consumption and robust export demand, rather than short-term production fluctuations. Total spices production is projected to reach approximately 18.12 MMT by 2029-30, representing a forecast CAGR of 6.87% over the next five years.

Table 12: Growth Trend in Spices (2015-16 to 2024-25)

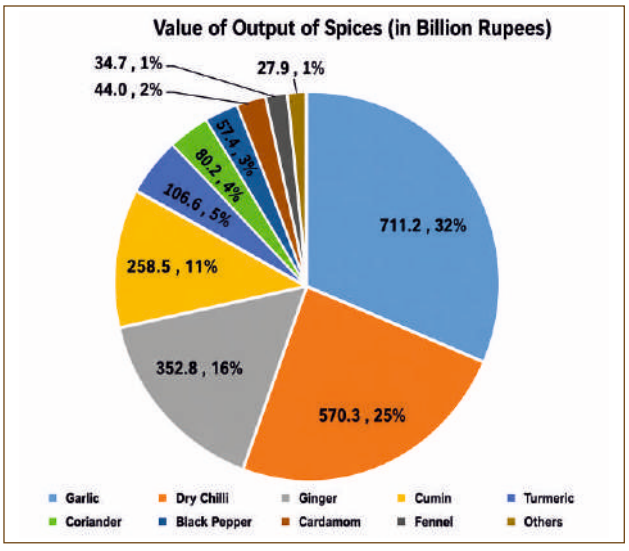
Rank	Commodity (MMT)	2015-16 (MMT)	2024-25 (%)	CAGR (%)	Total Growth
1	Ajwain	0.02	0.07	15.05%	+306.20%
2	Ginger	1.11	2.65	9.12%	+139.30%
3	Cumin	0.50	1.16	8.75%	+131.40%
4	Garlic	1.62	3.56	8.23%	+120.50%
5	Black Pepper	0.06	0.10	6.68%	+90.90%
6	Dry Chilli	1.52	2.69	5.89%	+77.30%
7	Coriander	0.58	0.84	3.73%	+44.30%
8	Celery, Dill & Poppy	0.02	0.03	3.68%	+43.50%
9	Fennel	0.13	0.18	3.39%	+39.50%
10	Nutmeg	0.01	0.02	3.10%	+35.70%
11	Cardamom	0.02	0.03	2.59%	+29.20%
12	Turmeric	0.94	1.10	1.60%	+17.20%
13	Fenugreek	0.25	0.26	0.55%	+5.70%
14	Cinnamon/Tejpata	0.01	0.01	0.00%	+0.00%
15	Clove	0.00	0.00	0.00%	+0.00%
16	Tamarind	0.19	0.12	-4.85%	-39.20%

2.6.3 GROWTH IN MAJOR SPICES

- Ajwain - Emerged as the fastest-growing spice, recording a CAGR of 15.05% and increasing production from 0.02 MMT to 0.07 MMT, reflecting a cumulative growth of 306.2%.
- Ginger - Registered strong long-term growth, with a CAGR of 9.12%, increasing production from 1.11 MMT to 2.65 MMT, representing a cumulative growth of 139.3%.
- Cumin - Recorded sustained production growth, with a CAGR of 8.75%, increasing from 0.50 MMT to 1.16 MMT, reflecting a cumulative growth of 131.4%.
- Garlic - Continued to witness robust production growth, registering a CAGR of 8.23% and increasing from 1.62 MMT to 3.56 MMT, representing a cumulative growth of 120.5%.
- Black Pepper - Registered healthy long-term growth, with a CAGR of 6.68%, increasing production from 0.06 MMT to 0.10 MMT, reflecting a cumulative growth of 90.9%.

2.6.4 ECONOMIC OUTPUT (VALUE AT CURRENT PRICES, 2023-24)

Fig 6: Value of Output of Spices (2023-24)



- The spices sector generated an economic output of ₹2,243.7 billion at current prices in 2023-24, reflecting its significant contribution to India's horticulture economy.
- Garlic emerged as the highest-value spice, contributing ₹711.2 billion (32%) to the sector's total value. Dry chilli followed with ₹570.3 billion (25%), while ginger accounted for ₹352.8 billion (16%).
- Garlic, dry chilli and ginger together contributed nearly 73% of the total value of output, indicating that the sector's economic value is concentrated in these three commodities.
- Cumin contributed ₹258.5 billion (12%), while turmeric and coriander together accounted for another 9% of the sector's total value, reflecting their continued commercial importance.

India's spices production recorded a CAGR of 6.40% during 2015-16 to 2024-25, the highest among all eight crop categories covered in this study. Growth was primarily driven by Ajwain, Ginger, Cumin, Garlic and Black Pepper, while Turmeric and Fenugreek expanded at a slower pace. Cinnamon and Clove remained largely stagnant, whereas Tamarind was the only spice to register a long-term decline.



3. Indian GDP, GVA, Agriculture and Crops: Trends, Drivers and Outlook

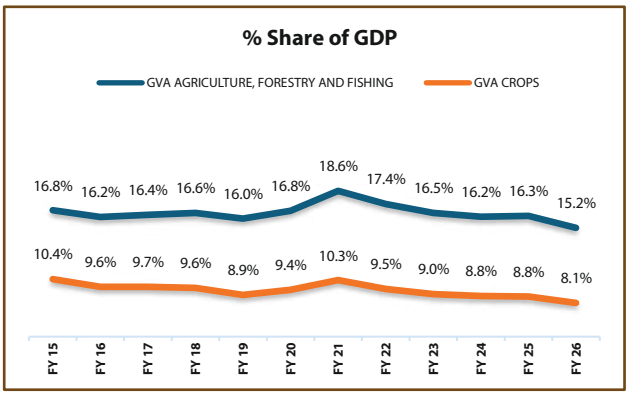
3.1. OVERVIEW

India's nominal GDP and Gross Value Added (GVA) witnessed robust expansion during FY15-FY26, reflecting sustained economic growth across major sectors. Nominal GDP increased from INR 124,680 Billion in FY 15 to INR 360,086 Billion in FY26, registering a cumulative growth of around 189%.

3.2. EVOLUTION OF AGRICULTURE, FORESTRY AND FISHING WITHIN INDIA'S ECONOMY

Agriculture, forestry and fishing continue to generate significant value addition in absolute terms. Agriculture, forestry and fishing GVA rose by more than 160% over FY2015–FY2026, indicating sustained growth driven by increasing production, improved yields, higher minimum support prices (MSPs), diversification into horticulture and allied sectors, and rising food demand.

Fig 7: Percentage share of Agri and Allied sector to GDP



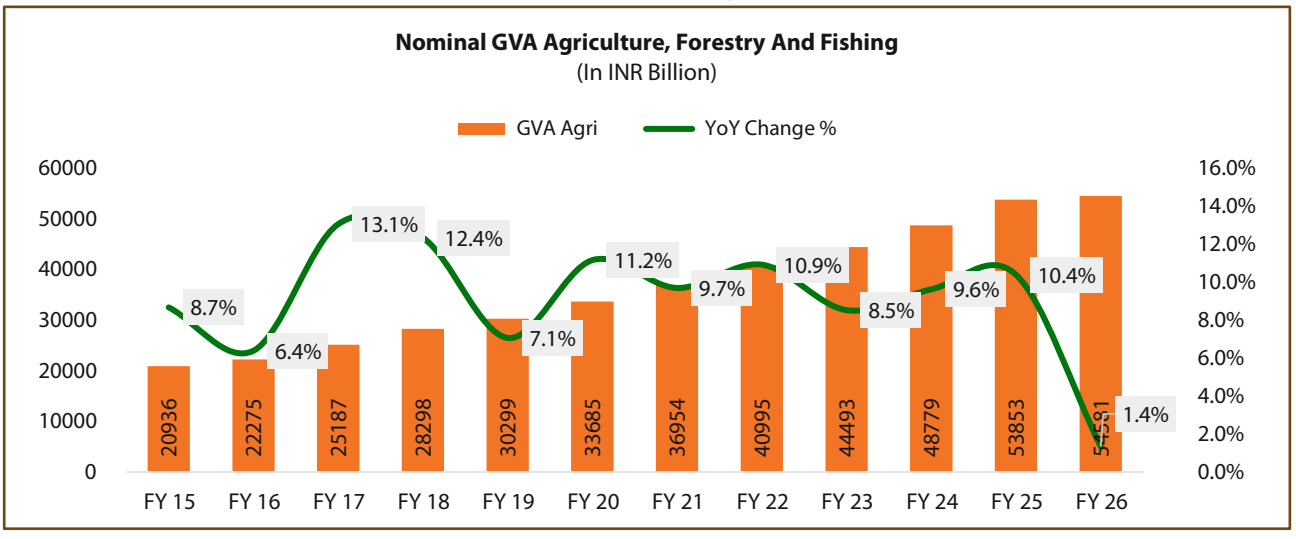
Secondly, agriculture's relative importance has gradually moderated.

Agriculture, forestry and fishing GVA accounted for approximately:

- 16.8% of GDP in FY2015
- Peaked above 18.6% during FY2021 (COVID period)
- Eased to around 15.2% by FY2026



Fig 8: Nominal GVA – Agriculture, Forestry and Fishing (INR Billion)



3.3. STRUCTURAL TRENDS AND OUTLOOK

Several structural factors are expected to shape agricultural GVA over the coming decades.

Climate Change

Increasing frequency of:

- Heat waves
- Erratic rainfall
- Floods
- Droughts

may increase output volatility, making irrigation expansion and climate-resilient farming increasingly important.

Mechanization

Growing labor shortages in rural India are accelerating mechanization, improving productivity while lowering production costs.

Digital Agriculture

Remote sensing, satellite monitoring, AI-based advisory services and precision farming are expected to improve input efficiency and crop yields.

Crop Diversification

Indian agriculture is gradually shifting from low-value cereals toward:

- Horticulture
- Diary
- Fisheries
- High-value commercial crops.

This transformation supports higher agricultural GVA despite limited land availability.

Food Processing

Expansion of food processing industries increases value addition across the agricultural supply chain, creating stronger linkages between agriculture and manufacturing.

Government Vision 2047

Under the Viksit Bharat 2047 vision, agriculture is expected to focus increasingly on:

- Higher productivity,
- Water-use efficiency,
- Digital agriculture,
- Climate resilience,
- Export competitiveness,
- Value-added agriculture,
- Supply chain modernization,
- Farmer income enhancement.

These structural improvements are likely to sustain positive agricultural GVA growth even as agriculture's share of GDP gradually declines due to faster expansion of manufacturing and services.

India's GDP and GVA have recorded strong nominal growth over the past decade, with agriculture remaining one of the economy's foundational sectors. Agricultural GVA has expanded consistently in absolute terms, supported by favorable monsoons, productivity improvements, irrigation expansion, government support policies and rising domestic food demand. Crop production continues to account for most of the agricultural value addition and remains highly sensitive to weather conditions, acreage, yields and commodity prices.

Looking ahead, India's agricultural growth will increasingly depend less on expanding cultivated area and more on productivity gains, technological adoption, climate resilience and diversification toward higher-value crops. While agriculture's share in GDP is likely to decline gradually as India industrializes, the sector will remain central to food security, inflation management, rural incomes and inclusive economic growth, making agricultural GVA and crop output indispensable indicators of India's long-term macroeconomic performance.



4. Role of Agri-Derivatives in Price Discovery, Risk Management and Economic Development

A well-functioning Agri-commodity derivatives market serves as an essential component of agricultural market infrastructure by facilitating efficient price discovery, risk management, market transparency, and economic development. Futures markets aggregate information from producers, traders, processors and investors to generate transparent, forward-looking price signals that support informed production, procurement and marketing decisions. They also enable market participants to hedge against price volatility, thereby reducing income uncertainty and improving market efficiency. Transparent exchange-based trading further enhances price dissemination, strengthens market confidence and reduces information asymmetry across the agricultural value chain.[1]

Evidence from Indian Agri-commodity contracts traded on domestic exchanges suggests that futures markets often lead spot markets in price formation. [2] The integration of electronic spot platforms like e-NAM has further strengthened market transparency through improved access to real-time price information.[3]

However, the effectiveness of derivatives markets depends on adequate liquidity, active participation from all types of market participants, including hedgers, robust delivery infrastructure and an enabling regulatory and policy framework. Strengthening these fundamentals will be crucial for enhancing agricultural competitiveness, improving farm incomes and supporting India's long-term economic development.

4.1. PRICE DISCOVERY

A futures price is a forward-looking estimate, formed as buyers and sellers with different information, expectations and risk appetites converged on a single agreed price for delivery at a future date. Because this process pools information from a wide range of participants, including processors, traders and speculators, the resulting price is typically a more complete summary of expected supply and demand conditions than any single participant could arrive at alone.

Academic studies of Indian agricultural commodity futures establish that, for many commodities, futures prices lead spot prices, meaning the futures market is where new information gets impounded first before it flows through to physical (cash) markets.[2]

Empirical work on exchange-traded futures contracts has found comparable price-discovery efficiency between cash and futures markets for commodities including Crude Palm Oil, cotton, chana, jeera, maize, moong, and soybean, with futures leading price formation in several cases; for a few commodities such as coriander and cotton cake the cash market was found to lead instead, illustrating that price-discovery strength varies by commodity and depends on the liquidity and structure of each specific contract.[2] Separate research examining the interaction between futures and spot prices and the newer E-NAM electronic spot platform found the futures and spot markets to be dominant in price discovery relative to E-NAM spot prices, with information flowing from futures market toward the newer platform[3]

These findings indicate that a maturing derivatives market can serve as a benchmark for price formation across the wider agricultural marketing ecosystem, including emerging digital spot trading platforms.

4.1.1 IMPORTANCE OF PRICE DISCOVERY

Farmers and traders who have never placed a single futures order still benefit indirectly, because futures prices are widely quoted and used as reference points for negotiating physical/mandi transactions. [1] Better price discovery reduces information asymmetry between farmers and better-informed buyers, narrowing one source of bargaining-power imbalance in agricultural value chains. Forward-looking price signals help farmers make better planting and storage decisions for instance, whether to sell immediately after harvest or store produce and sell later rather than relying solely on prices observed at the point of distress sale. Reliable price benchmarks support downstream uses such as index-linked contracts, minimum support price design discussions, and insurance product pricing.

4.2. EFFICIENT RISK MANAGEMENT

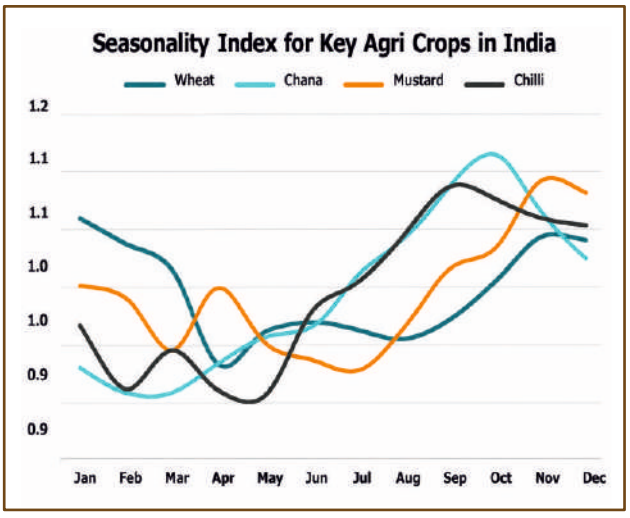
4.2.1 THE CORE HEDGING MECHANISM

Agricultural prices are inherently volatile, influenced by factors such as weather variability, pest and disease incidence, changes in domestic production, global supply-demand dynamics and government policy interventions. Futures and options contracts enable producers, processors and other market participants to

transfer price risk by locking in a price today for a transaction that will occur at a future date. By taking an opposite position in the derivatives market relative to their exposure to the physical market, hedgers can substantially reduce the impact of adverse price movements during the production and marketing cycle.[1]

Unlike speculative trading, the primary objective of hedging is to reduce uncertainty rather than maximize profits. By providing greater price certainty, derivatives enable farmers, processors, traders and exporters to make more informed production, procurement, inventory and marketing decisions while improving financial planning and reducing income volatility.

Fig 9: Seasonality Index of Key Agri Crops in India

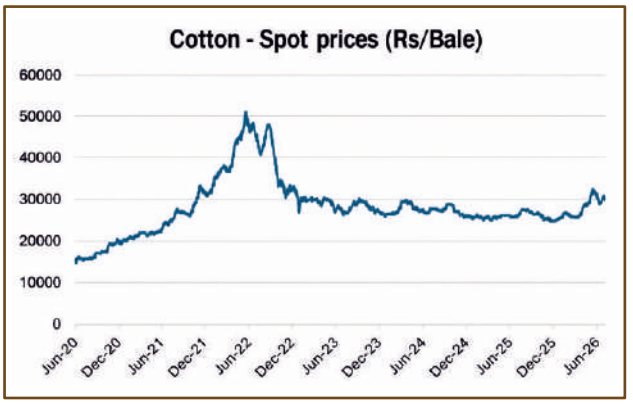


The importance of hedging becomes evident when examining the seasonal behavior of agricultural prices. Most agricultural commodities experience increased market arrivals immediately after harvest, placing downward pressure on prices. As arrivals decline over the marketing season, prices generally recover because of tightening supplies.

Figure 14 illustrates this seasonal pattern for major agricultural commodities such as wheat, chana, mustard and chilli. Wheat prices typically weaken during the peak harvest months before gradually strengthening in subsequent months. Consequently, farmers who are unable to store their produce or manage price risk are often compelled to sell immediately after harvest, resulting in lower price realization.

While the Minimum Support Price (MSP) provides a government procurement benchmark, actual market prices frequently fluctuate above or below MSP depending on prevailing supply-demand conditions. Figure 15 shows that average wheat market prices have moved both above and below MSP during different marketing years, exposing farmers to significant price uncertainty.

Fig 10: Cotton Spot Prices



Illustrative Example – Hedging Cotton Price Risk

A cotton ginner can lock in a selling price for processed cotton bales using futures contracts. This protects their profit margins from falling market prices while they hold physical inventory.

On 30 June 2026, a ginner holds or expects to produce 100 bales of cotton to establish a baseline market scenario. At this time, the Rajkot spot market price is at Rs. 30,280 and the prevailing futures price stand at Rs. 30,330 per bale. Facing the risk that heavy market arrivals or weak demand might crash physical prices before the inventory can be sold, the ginner takes a hedging action by selling futures contracts equivalent to 100 bales at Rs. 30,330 per bale.

Scenario 1: Physical Market Prices Decline

- **Spot Market Event:** Heavy crop arrivals push the Rajkot spot price down to **Rs. 28,280 per bale.**
- **Physical Market Sale:** The ginner sells the physical bales at the lower market price of Rs. 28,280.
- **Futures Market Gain:** The ginner buys back (closes) the futures contracts at Rs. 28,330, generating a gain of **Rs. 2,000 per bale.**
- **Net Effective Realization:** The Rs. 2,000 futures gain completely offsets the Rs. 2,000 physical market loss. The ginner successfully realizes the original price of **Rs. 30,280 per bale.**

Scenario 2: Physical Market Prices Increase

- **Spot Market Event:** Strong export demand pushes the Rajkot spot price up to **Rs. 32,280 per bale.**
- **Physical Market Sale:** The ginner sells the physical bales at the higher market price of Rs. 32,280.
- **Futures Market Loss:** The ginner closes the futures contracts at Rs. 32,330, incurring a loss of **Rs. 2,000 per bale.**

- **Net Effective Realization:** The extra Rs. 2,000 earned in the physical market is offset by the Rs. 2,000 loss in the futures market. The ginner still realizes an effective price of Rs. 30,280 per bale.

In both scenarios, the hedge reduces the impact of price fluctuations and provides greater certainty over farm income, allowing producers to make better production, financing and marketing decisions.

The objective of hedging is not to maximize profits, but to protect producers from adverse price movements and stabilize revenues during the marketing season. Price certainty enables farmers, Farmer Producer Organizations (FPOs), processors and other commercial participants to undertake better production planning, inventory management and financial decision-making.

4.2.2 RISK MANAGEMENT AS A PUBLIC POLICY TOOL

From a policy perspective, well-functioning futures markets offer a market-based alternative to direct price-stabilization interventions such as procurement operations or export-import controls, which can be fiscally expensive and administratively complex. Where liquid, reliable futures markets exist, governments need not be the sole absorber of agricultural price risk processors, exporters, large trading houses, and eventually a broader base of aggregated farmers (through FPOs) can share that role, in principle freeing public resources for other rural development priorities.

4.2.3 PRE-REQUISITES FOR ENHANCING HEDGING

- **Sufficient contract duration relative to the crop cycle:** Hedging is most effective when contract maturities align with the production and marketing cycle of the commodity. Contracts that expire well before harvest or lack deferred maturities limit the ability of farmers and commercial participants to hedge price risk throughout the production cycle.
- **Adequate liquidity across the contract's life:** Liquidity should extend beyond the near-month contract to deferred maturity so that hedgers can establish, maintain and unwind positions efficiently. Concentration of trading activity only in nearby contracts reduces the practical effectiveness of hedging.[6]
- **Accessible aggregation mechanisms:** Because most Indian farmers cultivate small landholdings and cannot individually satisfy exchange lot sizes, margin requirements or delivery specifications, Farmer Producer Organizations (FPOs), cooperatives, processors and aggregators play an important role in consolidating produce and undertaking hedging on behalf of farmers.[7]

4.3. ENHANCED MARKET TRANSPARENCY

Traditional agricultural trade in India has often occurred through fragmented, state-specific mandi systems and bilateral negotiations, where price information travels slowly and unevenly. Organized commodity exchanges replace this with continuously disseminated exchange-verified prices visible to all participants simultaneously, which improves market transparency and reduces the scope for information to be selectively withheld or manipulated by better-connected intermediaries.[8]

4.3.1 WAREHOUSE RECEIPTS AND TRACEABLE CUSTODY

Transparency extends beyond price into the physical infrastructure underpinning delivery. The shift from paper-based Negotiable Warehouse Receipts (NWRs) to Electronic Negotiable Warehouse Receipts (eNWRs), issued through repositories under Warehousing Development and Regulatory Authority (WDRA) oversight, directly addresses a historical trust deficit: physical warehouse receipts were vulnerable to manipulation and duplication, which made banks reluctant to lend against stored stock.[8] An electronic registry that tracks goods deposited into and withdrawn from every registered warehouse gives lenders verifiable, tamper-resistant visibility into collateral — industry participants involved in building this infrastructure have described it as one of the more significant confidence-building steps for the sector, drawing an explicit parallel to how dematerialization and electronic settlement transformed transparency and trust in India's capital markets.

A Warehouse Receipt (WR) is a document issued by a registered warehouse acknowledging that a specified quantity and quality of a commodity have been deposited for storage. Under the Electronic Negotiable Warehouse Receipt (eNWR) system regulated by the Warehousing Development and Regulatory Authority (WDRA), this receipt is issued electronically and serves as a secure, tamper-proof proof of ownership, enabling commodities to be traded, pledged for finance, or delivered through commodity exchanges. The eNWR ecosystem was introduced to improve transparency, reduce fraud associated with paper receipts, and facilitate warehouse receipt-based financing through a centralized digital repository.[8]

Illustrative Example: Warehouse Receipt Lifecycle in the Agricultural Derivatives Ecosystem

Consider a soybean farmer who harvests 100 tons of soybean during the peak marketing season. Immediately

after harvest, market arrivals are high, resulting in relatively lower spot prices. Instead of selling the produce immediately at a discounted price, the farmer transports the commodity to a WDRA-accredited warehouse, where it undergoes quality inspection, grading and weight verification based on prescribed standards. Once the warehouse confirms the quantity and quality of the deposited stock, it electronically issues an Electronic Negotiable Warehouse Receipt (eNWR) that records the commodity details, grade, quantity, warehouse location and ownership in a secure digital repository.

The farmer now holds a legally recognized electronic proof of ownership without having to physically move the commodity. Since the commodity remains stored in a registered warehouse under monitored conditions, the eNWR can be pledged to a bank or financial institution to obtain warehouse receipt-based financing. This enables the farmer to meet immediate cash requirements, repay short-term borrowings or finance the next cropping season without being compelled to undertake distress sales immediately after harvest.

As market conditions improve, the farmer has multiple options. The eNWR may be transferred electronically to a processor, exporter or trader, allowing ownership of the commodity to change without requiring physical movement of goods until final delivery. Alternatively, if the commodity corresponds to the specifications of an exchange-traded futures contract, the farmer or another market participant can tender the warehouse stock against the futures contract through the exchange delivery mechanism. Since the commodity has already been inspected, graded and stored in an accredited warehouse, buyers, banks and the commodity exchange can independently verify the quality, ownership and location of the stock through the electronic repository, thereby reducing disputes and settlement risks.

This integrated process creates value for all stakeholders within the agricultural ecosystem. Farmers benefit from improved liquidity and better price realization by avoiding distress sales; banks obtain secure and verifiable collateral for lending; processors and exporters receive assured quality and traceability of commodities; and commodity exchanges benefit from greater confidence in delivery-based settlement. By linking warehousing, financing, physical trade and futures markets, the eNWR ecosystem strengthens transparency, improves market efficiency and supports more effective price discovery and risk management across the agricultural value chain.

Transparency is not a stand-alone benefit; it is what makes price discovery credible and risk management trustworthy. A hedger will only rely on a futures price to plan production or lock in margins if they trust that the price reflects genuine, broad-based trading activity rather than the actions of a few large players. Similarly, a bank will only extend low-cost credit against a warehouse receipt if it trusts that the receipt reliably represents real, unencumbered stock. In this sense, transparency functions as the connective tissue that allows price discovery and risk management to deliver economic value rather than remaining theoretical benefits of the market structure.



4.4 CONTRIBUTION TO BROADER ECONOMIC DEVELOPMENT

4.4.1 UNLOCKING WORKING CAPITAL THROUGH COMMODITY FINANCE

Warehouse receipt financing allows farmers and aggregators to borrow against stored produce rather than being forced into distress sales immediately after harvest, when prices are typically at their seasonal low. Estimates from the period around the launch of India's electronic repository infrastructure put financing against collateralized agricultural stock at roughly Rs 40,000 crore, with industry expectation that a credible, electronic receipt system could expand this market considerably by reducing the cost and risk of collateral management for lenders. More recent reporting on pledge-financing through the eNWR ecosystem has cited annual volumes exceeding Rs 3,300 crore in the modern digital system, alongside continuing efforts to widen smallholder access. [8]

Illustrative Example – Commodity Finance through Warehouse Receipts

A depositor, such as a farmer, trader or processor, deposits an agricultural commodity in a WDRA-registered warehouse, where the commodity undergoes quantity verification, quality assessment and grading. Following successful inspection, the warehouse issues an Electronic Negotiable Warehouse Receipt (eNWR) through an authorized electronic repository, establishing a secure and verifiable record of ownership.

The depositor can pledge the eNWR to a participating bank or financial institution to obtain warehouse receipt-based finance while the commodity continues to remain in scientific storage. Since the warehouse receipt is electronically maintained and linked to the stored commodity, the lender has confidence in the quality, quantity and ownership of the collateral, thereby reducing the risk associated with lending. Once the loan is repaid, the pledge on the eNWR is released and the depositor may either withdraw the commodity for physical sale or transfer ownership of the warehouse receipt to another buyer. Where the commodity is exchange-accredited, the stored stock may also be delivered against commodity exchange contracts through the approved delivery mechanism. This integrated process enables warehouse receipts to function simultaneously as proof of ownership, collateral for financing and an instrument for facilitating efficient commodity trade.

4.4.2 REDUCING DISTRESS SALES AND IMPROVING FARMER INCOMES

When farmers can store produce and access financing against it rather than selling immediately to meet cash needs, they gain the option to sell later at potentially better prices, or to use futures/forward information to time sales more effectively. Research on India's E-NAM and futures markets ecosystem specifically links improved price discovery and real-time information flow to a documented shift: farmers who previously sold immediately at whatever price was available are, through electronic spot and warehouse-receipt mechanisms, 9 increasingly able to capture better prices later, alongside more direct account-based payments that reduce dependence on intermediaries.



4.4.3 BUILDING INSTITUTIONAL AND FINANCIAL MARKET DEPTH

A maturing Agri-derivatives market draws in a widening set of institutional participants viz., VCPs, mutual funds, portfolio managers, and Alternative Investment Funds have already been permitted to access commodity derivatives, and further reforms such as potential bank participation are under regulatory discussion. [10] Each incremental widening of the participant base deepens liquidity, which in turn improves the reliability of the price discovery and risk management functions described above - a virtuous cycle in which market depth and market usefulness reinforce one another and thereby enhancing the contribution to the economy.

4.4.4 NATIONAL ECONOMIC AND STRATEGIC POSITIONING

At a macro level, deeper and more liquid Agri-commodity derivatives markets can help India transition from being predominantly a price-taker absorbing prices set on international exchanges despite being a major global producer or consumer of many commodities toward exerting greater influence over price formation for commodities where it has genuine scale. This has implications for food-price policy, trade negotiation leverage, and the stability of foreign exchange outflows tied to commodity imports. [11]

4.4.5 RURAL INFRASTRUCTURE AND FORMALIZATION SPILLOVERS

The growth of exchange-linked commodity trading has historically been credited with catalyzing investment in modern warehousing, grading, and quality-assaying infrastructure, as both public institutions (including NABARD-backed lending for warehousing and cold-chain infrastructure) and private players have built capacity to support exchange-based delivery. This infrastructure has been used well beyond derivatives trading itself, supporting the broader formalization of agricultural supply chains, food processing, and export logistics. [11]

The benefits described bellow are not automatic outcomes of simply having a derivatives exchange, they depend on a market that is genuinely vibrant, liquid, and broad-based. Where liquidity is thin, concentrated in a few near-month contracts, or dominated by speculative rather than hedging activity, price discovery can become noisy or manipulable, hedging can become expensive or unreliable due to poor liquidity at the point of exit, and the transparency and economic-development gains described above can fail to reach the farmers and smallholders which the market is ultimately meant to serve. [6]

A vibrant Agri-commodity derivatives market functions as connective economic infrastructure rather than a narrow trading exercise. Sound price discovery gives the entire agricultural value chain not just active traders better information for decision-making. Effective risk management shifts price volatility away from the farmers and processors least able to absorb it. Genuine transparency, reinforced by digitized warehouse infrastructure, builds the trust that both preceding functions depend on. Together, these functions compound into broader economic development: unlocked working capital, deeper financial market participation, more resilient rural incomes, and a stronger negotiating position for India in global commodity markets. Realizing this full potential, however, depends on sustained attention to the structural precondition's liquidity, broad participation, adequate infrastructure, and regulatory consistency that determine the effectiveness of a derivatives market.

Table 13: Core Functions of a Vibrant Agri-Derivatives Market

Function	Direct Benefit	Results
Price discovery	Forward -looking, information-rich reference prices	Better planting/storage decisions; credible basis for hedging and lending
Risk management	Transfers price risk away from farmers/processors	More stable incomes and margins; less reliance on state price interventions
Transparency	Verifiable prices and traceable warehouse custody	Trust that enables both hedging and formal credit against stored stock
Economic development	Unlocked working capital, deeper financial markets, stronger positioning	Reinforces incentives for further participation, investment, and liquidity

5. Opportunities and Challenges for commodity derivatives in India

5.1 INTRODUCTION AND BACKGROUND

India has a long history of organized commodity trading, dating back to 1875 with the establishment of the Bombay Cotton Trade Association, making 2025 the 150th anniversary of organized commodity trading in the country. The modern regulatory framework evolved through the Forward Contracts (Regulation) Act, 1952, administered by the Forward Markets Commission (FMC), before transitioning to the Securities and Exchange Board of India (SEBI) in 2015. Subsequent reforms, including the introduction of commodity options in 2016 and rationalization of the Securities Transaction Tax (STT) in 2019, have strengthened the regulatory and trading ecosystem. 11 Despite possessing well-established exchange infrastructure, India's agricultural derivatives market remains relatively small compared to the size of the country's agricultural economy and its potential. [12]

As one of the world's largest producers and consumers of agricultural commodities, India possesses significant untapped potential for expanding agricultural derivatives. However, market development has been constrained by the continued suspension of futures trading in seven major agricultural commodities since December 2021 (extended until March 2027), limited contract liquidity and fragmented spot markets. At the same time, increasing digitalization, improvements in warehousing, greater institutional participation, and ongoing regulatory reforms present significant opportunities to deepen market liquidity, strengthen price discovery, and enhance the role of agricultural derivatives in supporting efficient risk management across the agricultural value chain. [13]

5.2 OPPORTUNITIES

5.2.1 REGULATORY REFORM MOMENTUM

SEBI has initiated one of the most comprehensive reviews of the commodity derivatives regulatory framework in recent years through a series of actions aimed at improving market liquidity, participation and ease of doing business. Some proposed reforms include revising the classification of agricultural commodities, increasing client-level position limits, reviewing penalty provisions for position limit breaches and introducing phased physical settlement for selecting agricultural commodity contracts. [15]

The Working Group on Agricultural Commodity Derivatives and the Commodity Derivatives Advisory Committee (CDAC) have recommended several structural reforms to improve market depth and participation.

The key recommendations include:

Doubling client-level position limits across all agricultural commodity categories:

·Broad commodities: 1% → 2% of deliverable supply

·Narrow commodities: 0.5% → 1%

·Sensitive commodities: 0.25% → 0.5%

Introducing phased physical settlement in selected agricultural commodity contracts to strengthen convergence between futures and spot markets.

Reviewing penalties relating to position limit violations to make the regulatory framework more proportionate and business friendly.

In parallel, market participants and industry bodies have advocated the resumption of futures trading in the seven agricultural commodities suspended since December 2021. Although no final regulatory decision has been announced, these reforms could significantly strengthen price discovery, improve hedging opportunities and deepen participation in India's agricultural commodity derivatives market.

5.2.2 BROADER INSTITUTIONAL PARTICIPATION

The gradual expansion of eligible market participants represents an important structural opportunity for India's commodity derivatives market. Mutual funds, Portfolio Management Services (PMS), Category III Alternative Investment Funds (AIFs) and eligible foreign entities have already been permitted to participate in commodity derivatives under SEBI's regulatory framework. [14]

SEBI is also working with the Reserve Bank of India (RBI) and other financial sector regulators to facilitate the participation of banks and other large financial institutions in commodity derivatives markets. Such reforms are expected to improve market liquidity, enhance hedging efficiency and broaden institutional participation across both agricultural and non-agricultural commodities. [16]

5.2.3 DIGITAL WAREHOUSING AND POST-HARVEST FINANCE

The shift from paper-based Negotiable Warehouse Receipts (NWR) to Electronic Negotiable Warehouse Receipts (eNWR), issued through repositories such as NeRL and CCRL under Warehousing Development and Regulatory Authority (WDRA) guidelines, is easing pledge financing against stored produce and reducing distress sales by farmers. Complementary initiatives such as the e-Kisan UPAJ Nidhi gateway, launched in 2024, are pushing the sector toward a hybrid "phygital" model of physical storage backed by digital title and financing rails. Annual pledge-financing volumes through this ecosystem have reportedly crossed ₹3,300 crore, though smallholder uptake still lags. [8]

5.2.4 OPTIONS CONTRACTS AND FINANCIALIZATION OF THE SEGMENT

The introduction of commodity options by SEBI, followed by subsequent tax rationalization and product innovation, has expanded the range of risk management instruments available to market participants. Options provide hedgers with an asymmetric risk management tool, allowing price protection while preserving price potential. Continued development of options and index-based products could attract a broader range of farmers, processors, traders and financial investors to commodity derivatives markets. [11]

5.2.5 IDENTIFYING EMERGING COMMODITY SEGMENTS, MARKET TRENDS AND GROWTH OPPORTUNITIES

India's agricultural sector is undergoing a structural transformation driven by changing consumption patterns, expanding processing industries, increasing export orientation and greater commercialization of agriculture. These developments are creating opportunities for organized commodity derivatives market presenting commodities with growing market size, active value chains and increasing demand for price risk management.

5.3 CHALLENGES

5.3.1 EXTENDED TRADING BAN

The most significant constraint on the development of India's agricultural derivatives market has been the suspension of futures trading in seven agricultural commodities, initially imposed in December 2021. Although introduced as a temporary measure, the suspension has been successively extended and currently remains in force until 31 March 2027. [17]

Industry participants and market experts have argued that the prolonged suspension has weakened market liquidity, reduced opportunities for price discovery and limited the availability of organized risk management tools for producers, processors and traders. While the policy possibly aimed to moderate inflationary pressures, several stakeholders contend that spot prices are influenced more directly by underlying demand conditions, weather events, trade policies and global market developments than by futures trading alone. [18]

5.3.2 LOW PARTICIPATION OF VCPS

A persistent structural challenge in India's agricultural derivatives market is the relatively low participation of commercial hedgers, including farmers, Farmer Producer Organizations (FPOs), processors and exporters. [1] This keeps the benefits of derivatives as instruments for price discovery and risk transfer, away from the real agricultural economy.

5.3.3 FRAGMENTED SPOT MARKETS AND PHYSICAL INFRASTRUCTURE GAPS

The effectiveness of commodity derivatives depends fundamentally on the efficiency and integration of the underlying physical markets. India's Agricultural Produce Market Committee (APMC) system continues to vary across states in terms of regulations, market fees and trading practices, contributing to fragmented price formation and uneven market integration. [19]

In addition, disparities in warehousing, grading, assaying and logistics infrastructure across commodities and regions weaken confidence in physical delivery mechanisms and contribute to basis risk between futures and local spot markets. [8]

5.3.4 HISTORICALLY LIMITED INSTITUTIONAL PARTICIPATION

Participation in India's commodity derivatives market has historically been restricted to institutional investors. Banks - which are natural providers of market liquidity, commodity financing and credit-linked hedging – are not permitted in exchange-traded commodity derivatives. This has constrained the depth and diversity of market participants, limited liquidity and increased transaction costs relative to more mature international commodity

derivatives markets. These reforms remain under consideration.[20]

5.3.5 LOW AWARENESS AMONG FARMERS

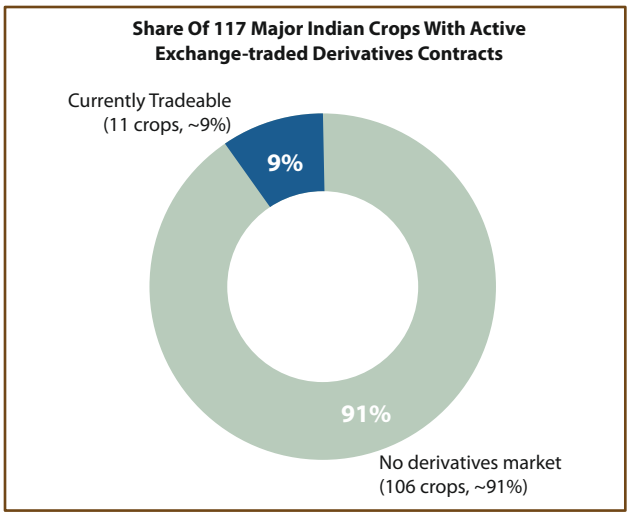
Direct participation by farmers in organized commodity derivatives markets remains limited owing to low awareness of hedging instruments, small operational landholdings, limited financial literacy and the operational complexity associated with futures trading. In addition, margin requirements and brokerage charges increase the cost of market access for smallholders.[21] As a result, the primary beneficiaries of agricultural price risk management continue to be underrepresented among direct market participants, limiting the broader adoption of derivatives as a farm-level risk management tool.Overall, India's agricultural derivatives market possesses strong structural fundamentals supported by a large agricultural economy, increasing production of high-value commodities and improving market infrastructure. However, sustained growth will depend on addressing liquidity constraints, expanding commodity coverage, improving stakeholder participation and ensuring an enabling regulatory framework.



6. India's Agricultural Commodity Derivatives Ecosystem: MCX Product Portfolio

India's agricultural commodity derivatives market forms a relatively small segment of the country's broader commodity derivatives ecosystem.[22] This chapter examines the structure of India's agricultural derivatives ecosystem, MCX's product portfolio and market positioning, and the participation patterns of key stakeholder groups to assess the current state of market development.

Fig 11: Major Indian crops with active exchange traded derivative contracts



Despite being one of the world's largest producers and consumers of agricultural commodities, India's derivatives market covers only a limited proportion of commercially important crops. Of the 117 major agricultural commodities identified under the Ministry of Agriculture's classification, only 11 commodities (approximately 9%) currently have active exchange-traded derivative contracts. Most cereals, pulses, fruits, vegetables and plantation crops remain outside the organized derivatives market, limiting hedging opportunities for market participants and reducing the role of exchanges in domestic price discovery.[24]

Agricultural derivatives are also concentrated within a limited number of commodities such as spices, cotton, maize and selected oilseeds, while several major crops continue to remain outside the exchange ecosystem due to limited commercial adoption or regulatory restrictions.

6.1 PRODUCT PORTFOLIO AND MARKET POSITIONING

MCX is India's largest commodity exchange; its agricultural product portfolio includes contracts such as Cardamom, Cotton, Cotton Seed Wash Oil, Kapas and Mentha Oil[15]

Table 14: Traded commodities in MCX

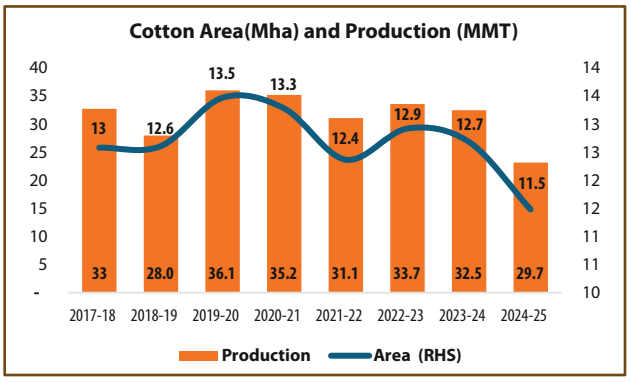
Category	MCX products
Spice (launched July 2025; cash/physically settled; Vandanmedu, Idukki reference center)	Cardamom
Fiber	Cotton
Oilseed by-product	Cotton Seed Wash Oil
Edible Oil (currently within SEBI's suspended list)	Crude palm oil
Raw Cotton	Kapas
Aromatic/medicinal	Mentha oil

6.2 COMMODITY FUNDAMENTALS OF KEY PRODUCTS TRADED ON MCX

Area and Production trends of agri-commodities whose futures contracts are traded on MCX, are provided in the next sections, along with commodity balance sheet parameters. Together, these indicators provide insight into market depth, supply situation, and the potential for sustained participation in derivative markets.

6.2.1 Cotton: AYP Trends and Commodity Balance Sheet

Fig 12: Area and Production of Cotton



Source: Department of Agriculture & Farmers' Welfare, Govt of India

The trends in cotton cultivation indicate considerable year-to-year variation in both area under cultivation and production, reflecting the influence of weather conditions, pest incidence, market prices, input costs, and technological adoption. While the cultivated area has remained relatively stable over the past few years, cotton production has exhibited greater fluctuations, suggesting significant changes in productivity across years.

Cotton production followed a more variable trend compared with area. The lowest production during the period was

recorded in 2018-19 at 28.04 million tons, despite a cultivated area of 12.61 million hectares, indicating a

significant decline in productivity due to pest infestation, particularly pink bollworm, and adverse weather conditions. Production improved significantly during 2019-20 and 2020-21, reaching 36.07 million tons and 35.25 million tons, respectively, supported by higher acreage, favorable rainfall, and improved crop conditions. However, production declined in subsequent years, reaching 29.72 million tons in 2024-25, mainly due to lower yields caused by climatic variability, pest pressures, and rising cultivation costs.

Table 15: Cotton Balance Sheet

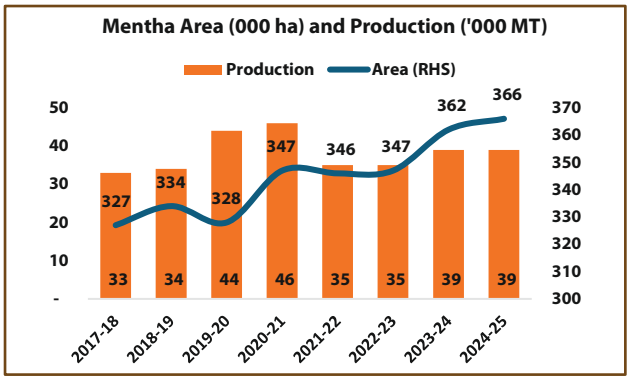
Cotton Balance Sheet (000 MT)				
Particular	2022-23	2023-24	2024-25	2025-26
Opening Stock	671	1040	807	774
Crop	5722	5529	5053	4934
Import	248	258	704	935
Total Supply	6642	6827	6564	6643
Mill Consumption	3363	3686	3622	3774
S.S.I Consumption	1697	1580	1590	1666
Non-Textile Consumption	272	272	272	272
Total Consumption	5332	5538	5483	5712
Export	270	482	307	204
Total Demand	5602	6020	5790	5916
Closing Stock	1040	807	774	727

Source: Cotton Association of India

6.2.2 MENTHA OIL

The area under Mentha cultivation increased steadily from 327 thousand hectares in 2017–18 to 366 thousand hectares in 2024–25, registering an overall growth of 12%, indicating sustained farmer interest supported by stable demand from the pharmaceutical, cosmetics, food, and flavor industries. In contrast, production exhibited greater variability, increasing from 33 thousand tons in 2017–18 to a peak of 46 thousand tons in 2020–21, before declining to 35 thousand tons during 2021–22 and 2022–23 and recovering to 39 thousand tons in the last two years.

Fig 13: Area and Production of Mentha



Source: Department of Agriculture & Farmers' Welfare, Govt of India

The divergence between stable acreage and fluctuating production suggests that yield variability, rather than area, has been the primary driver of output changes. Production fluctuations were influenced by weather conditions, irrigation availability, Mentha oil prices, pest incidence, and export demand. The decline after 2020–21 reflects lower yields and price corrections, while the subsequent recovery indicates improved crop conditions and market demand. Overall, the expanding cultivation area coupled with variable production highlights the need to improve productivity through better agronomic practices and efficient crop management.

During **2024–25**, Mentha prices recovered and traded mostly in the **₹900–1,200/kg** range, supported by expectations of lower crop output, tightening inventories, and improved demand from the pharmaceutical, FMCG, and export sectors.

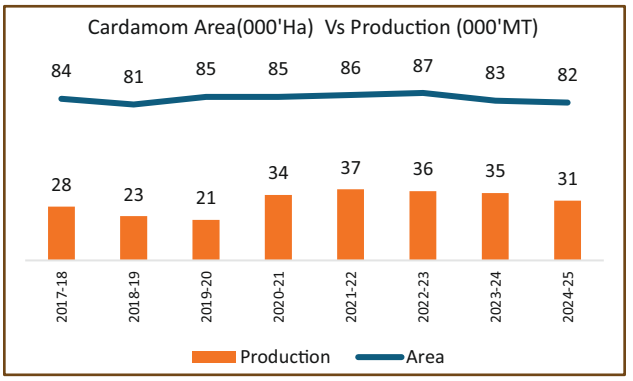
Table 16: Mentha Oil Balance Sheet

Mentha Oil Balance Sheet (000 MT)						
Attribute	2022-23	2023-24	2024-25	2025-26 P	2026-27	% Devn
Beginning stocks	5	10.9	19.5	26.3	34.8	34%
Production	39	33	27	24	23.6	-11%
Imports (Oil equivalent)	6.9	16.5	19.9	21.5	22.15	8%
Total supply	50.9	60.4	66.4	71.8	80.5	8%
Domestic consumption (Oil equivalent)	17.2	17.9	18.7	20	21	7%
Exports (in terms of oil)	22.8	23	21.5	17	16.49	-21%
Total demand	40	40.9	40.2	37	37.5	-8%
Ending stocks-Oil equivalent	10.9	19.5	26.3	34.8	43.02	32%

Source: TransGraph estimates

6.2.3 CARDAMOM

Fig 14: Area and Production of Cardamom



Source: Department of Agriculture & Farmers' Welfare, Govt of India

The area under cardamom cultivation remained relatively stable during 2014-15 to 2024-25, fluctuating between 81 thousand hectares and 100 thousand hectares, with an overall decline of 18% from 100 thousand hectares in 2014-15 to 82 thousand hectares in 2024-25. In contrast, production exhibited significant variability, ranging from 21 thousand tons to 37 thousand tons, indicating that yield fluctuations rather than acreage were the primary driver of output. Production remained stable at around 24-28 thousand tons during 2014-15 to 2017-18, declined to a low of 21 thousand tons in 2019-20, and subsequently increased sharply to a

record 37 thousand tons in 2021–22 following favorable weather and improved crop conditions, before moderating to 31 thousand tons in 2024–25. The fluctuations in production were primarily influenced by variations in rainfall, temperature, pest and disease incidence (particularly capsule rot and thrips), and the alternate bearing nature of cardamom plantations. Since the cultivated area remained largely unchanged, the production trend highlights the significant role of climatic conditions and productivity

6.3 TRADE STATISTICS

Trade statistics of major agricultural commodities traded on MCX during 2025-26 are provided in Table 17 below:

Table 17: Trade Statistics of MCX Agri-Futures Contracts: 2025-26

	Average Daily Turnover (₹ crore)	Avg Daily Open interest	Delivery during the year
Cotton	0.4	1,287 bales	3000 bales
Cardamom	1	14 tonnes	3 tonnes
Mentha Oil	5	169 tonnes	481 tonnes

6.4 KEY AREAS TO FOCUS

India's agricultural commodity derivatives ecosystem is gradually evolving but remains significantly underdeveloped relative to its agricultural economy. While commodity exchanges provide robust platforms for commodity trading, there is considerable room for further growth of agricultural derivative contracts. Looking ahead, strengthening the ecosystem will require a combination of broader commodity coverage, improved warehousing and quality infrastructure, enhanced participation from institutional and value-chain stakeholders, and continued regulatory support. A deeper and more liquid agricultural derivatives market will not only improve price discovery and risk management but also contribute to greater market efficiency, enhanced income resilience and a more competitive agricultural sector.



ANNEXURE

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