

A Review on Trend in Area, Production and Productivity of Wheat in India

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ABSTRACT

Wheat crop is one of India's most important cereal crops, contributing significantly to national food security, farmer incomes, and the stability of the Public Distribution System. Using secondary data sourced from national statistical agencies, state-level records, and published research, the study evaluates temporal changes in the area under wheat, production, and yield performance across major and emerging wheat-producing states of the country. The analysis reveals three major patterns. First, the area under wheat expanded steadily during the early decades after the Green Revolution, particularly in northern states such as Punjab, Haryana, and Uttar Pradesh. However, in recent years, area expansion has slowed due to land constraints, competition from other crops, and shifts in water availability. Second, production growth has largely been driven by improvements in yield rather than expansion in area. Yield gains were substantial during the initial years of technological advancement but have exhibited signs of stagnation or moderate growth in several regions in the post-2000 period. Third, significant inter-state disparities persist in wheat productivity. While irrigated and high-input regions continue to record high yields, rainfed and resource-poor regions still lag behind, indicating a persistent yield gap that can be narrowed through targeted interventions. In the present study an ardent attempt has been made for analyzing the recent trends in area, production and productivity of Wheat in India for the period of 2015-16 to 2024-25.

Keywords: Agriculture, Wheat crop, Production, Productivity and India

INTRODUCTION

Wheat is one of the most important staple food grains in India, playing a crucial role in ensuring the country's food security. It is the second most widely cultivated cereal crop after paddy and serves as the primary source of nutrition for millions of people. India is not only one of the largest producers of wheat in the world but also among the leading consumers. The cultivation of wheat significantly contributes to the country's agricultural Gross Domestic Product, rural employment, and socio-economic development, particularly in northern and central regions. The history of wheat cultivation in India dates back to the ancient Indus Valley Civilization, where archaeological evidence suggests that wheat was grown and consumed extensively. Over the decades, with the Green Revolution of the 1960s, wheat production saw a remarkable transformation. The introduction of high-yielding varieties, improved irrigation facilities, and widespread adoption of modern agronomic practices resulted in exponential growth in productivity and production, making India self-sufficient in cereal production.

Wheat is primarily a Rabi crop in India, sown in winter (October to December) and harvested in the spring (March to April). Its cultivation requires cool temperatures during the growing period and warm, dry weather at the time of harvesting. The ideal temperature range for sowing wheat is between 10°C and 15°C, while the temperature during grain filling should range between 21°C and 26°C. Areas with an average annual rainfall of 75-100 cm are considered suitable for wheat cultivation, although supplemental irrigation is often essential. Geographically, wheat cultivation in India is concentrated in the northern plains, covering states such as Uttar Pradesh, Punjab, Haryana, Rajasthan, Bihar, and Madhya Pradesh. Punjab and Haryana lead in productivity due to advanced farming techniques, robust irrigation networks, and widespread adoption of mechanization. Madhya Pradesh has emerged as the largest producer in recent years owing to expansion in cultivated area and increased yields. Other states like Gujarat, Maharashtra, and West Bengal also contribute, albeit on a smaller scale.

Soil plays a significant role in wheat cultivation. Well-drained loamy or clay-loam soils rich in organic matter and essential nutrients are ideal. Wheat requires adequate nitrogen, phosphorus, and potassium for optimum growth. Farmers typically

use a combination of chemical fertilizers and organic manure to maintain soil fertility. With advances in agricultural technology, precision farming and soil testing are increasingly being practiced to ensure balanced nutrient application.

The government plays a supportive role in wheat cultivation through various schemes under the Pradhan Mantri Krishi Sinchayee Yojana, Rashtriya Krishi Vikas Yojana, and subsidies

OBJECTIVES OF THE STUDY

- To analyze the trends in area, production and yield of wheat in India
- To study the state wise wheat cultivation in the study area.

RESEARCH METHODOLOGY

The study is based on secondary data for the period 2015-16 to 2024-25. Therefore, data were mainly taken from Reserve Bank of India (RBI) reports, Ministry of Agriculture & Farmers Welfare, Government of India, books, articles, economic survey of India, websites, research papers etc. Various statistical tools and techniques like Compound Growth Rate, t-value, R² and graphical representation are used for analyzing the collected secondary data.

RESULTS AND DISCUSSION

TRENDS IN WHEAT CULTIVATION IN INDIA

The details of area, production and yield of wheat in India from 2015-16 to 2024-25 are given in Table 1.

Table No 1

Area, Production and Productivity of Wheat crop in India

Year	Area (Lakh Hectares)	Production (Lakh Tonnes)	Yield (Kg/Hectare)
2015-16	304	922.9	3034
2016-17	308	985.1	3200
2017-18	297	998.7	3368
2018-19	293	1036.0	3533
2019-20	314	1078.6	3440
2020-21	314	1095.9	3521
2021-22	305	1077.4	3537
2022-23	314	1105.5	3521
2023-24	318	1132.9	3559
2024-25	328	1175.1	3587
CGR	0.79	2.33	1.53
t-value	2.93	10.03	4.40
R²	0.52	0.93	0.71

Source: Ministry of Agriculture & Farmers Welfare, Govt. of India.

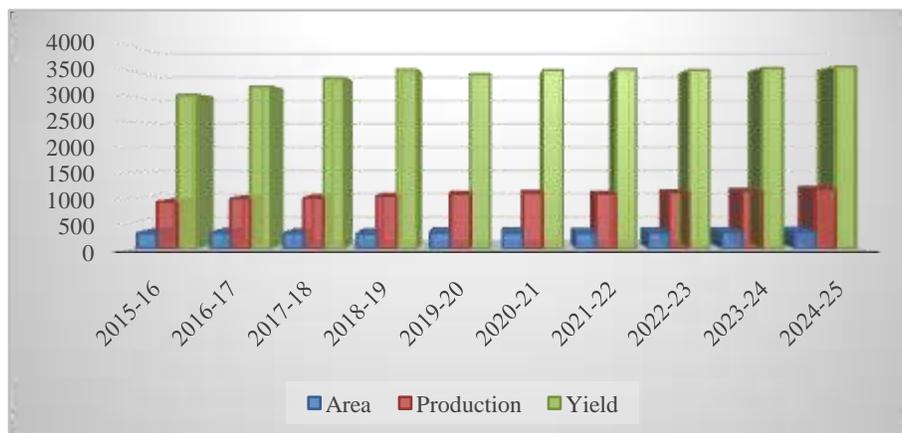


Figure 1

Trend of area, production and Yield of Wheat in Indian from 2015-16 to 2024-25

The table 1 and figure 1 presents the trends in area, production, and yield of wheat in India from 2015-16 to 2024-25. The secondary data is sourced from the Ministry of Agriculture & Farmers Welfare, Government of India. Overall, the table highlights gradual growth in wheat cultivation and significant improvements in production and productivity over the decade.

The area under wheat cultivation shows only moderate fluctuations over the years. In 2015-16, the wheat area stood at 304 lakh hectares. It slightly decreased to 297 lakh hectares in 2017-18 but later increased steadily. By 2024-25, the cultivated area increased to 328 lakh hectares, indicating a consistent upward trend in recent years. The gradual rise suggests expanding wheat cultivation due to increased demand, better irrigation, and supportive policies.

Wheat production shows a clear and considerable increase over the period. Production rose from 922.9 lakh tonnes in 2015-16 to 985.1 lakh tonnes in 2016-17, showing early growth. After some fluctuations, production continued to rise, reaching 1132.9 lakh tonnes in 2022-23. The highest production in the given period is 1175.1 lakh tonnes in 2024-25, reflecting improvements in technology, seeds, and farming practices.

Wheat productivity shows a steady upward trend, indicating improved efficiency. Productivity increased from 3034 kg/ha in 2015-16 to 3333 kg/ha in 2017-18. It continued to rise, crossing 3500 kg/ha after 2021-22. The highest yield recorded is 3587 kg/ha in 2024-25. This steady rise in productivity highlights better seed varieties, increased mechanization, improved irrigation, and effective agricultural practices.

Statistical analysis

Production (2.33 per cent) has the highest growth rate, followed by Yield (1.53 per cent), and then Area (0.79 per cent). This quantitatively confirms that production is growing faster than yield, which is growing faster than area. A higher t-value indicates a more statistically significant trend. The t-value for Production (10.03) is very high, confirming that the observed upward trend is strong and not due to random chance. The t-value for Yield (4.40) is also strong, while the trend for Area (2.93) is less pronounced but still statistically significant. The area (R^2 is 0.52) for a moderate fit, reflecting the higher year-to-year variability in the land area dedicated to wheat. The production (R^2 is 0.93) for trend line is an excellent fit, meaning the year is a very good predictor of production levels. The yield (R^2 is 0.71) for a good fit, showing a clear and predictable upward trend.

AREA UNDER WHEAT IN INDIA

In India various states sown wheat crop in various sizes of area. Particulars of state-wise are under wheat crop in India presented in the Table 2.

Table No 2

State –wise Area under Wheat Cultivation in India (Million Hectares)

States	2019-20	2020-21	2021-22	2022-23	2023-24
Uttar Pradesh	9.85	9.85	9.42	9.52	9.53
Madhya Pradesh	6.55	6.08	6.50	7.15	7.50
Punjab	3.52	3.53	3.52	3.53	3.52
Haryana	2.53	2.56	2.30	2.32	2.37
Rajasthan	3.12	3.00	2.58	2.79	2.74
Bihar	2.15	2.22	2.24	2.20	2.28
Gujarat	1.02	1.02	1.04	1.07	1.25
Maharashtra	1.06	1.13	1.17	1.22	1.05
All India	31.36	31.61	30.47	31.40	31.83

Source: E&S Division, DA&FW

It is quite obvious from the table 2 presents the area under wheat cultivation (in million hectares) for major wheat-growing states in India over five consecutive years from 2019-20 to 2023-24. It highlights both state-level and all-India trends.

The area under wheat cultivation in India shows minor fluctuations during the five-year period. It increased from 31.36 million ha in 2019-20 to 31.61 million ha in 2020-21, then declined to 30.47 million ha in 2021-22. This indicates a stable but slightly fluctuating trend, influenced by climatic conditions, market prices, and government policies.

Uttar Pradesh is a one of the largest wheat-producing state in the country. Area fluctuated between 9.53 to 9.85 million ha, showing a relatively stable trend. Slight decline in 2023-24 compared to 2019-20. Madhya Pradesh is second-largest contributor in India. Area ranged from 5.98 to 7.15 million ha over the period. Shows a positive trend, with a notable increase in 2022-23. Punjab state wheat area remained almost constant (around 3.52-3.55 million ha). Indicates a saturated cropping zone, with little scope for additional expansion. Haryana state wheat crop contribution is stable area: 2.30-2.56 million ha. Slight contraction in 2023-24 compared to earlier years. Rajasthan state wheat crop shows fluctuations between 2.70-3.12 million ha. Sharp drop in 2023-24, suggesting effects of drought or crop shifts. Bihar state wheat area varies between 2.15 to 2.24 million ha. Shows a relatively stable pattern with small fluctuations. Gujarat state wheat area declined slightly from 1.06 to 1.05 million ha, with minor changes each year. Indicates stagnation or a gradual shift toward other crops. Maharashtra state is the smallest wheat-growing state in the list. Very slight annual increase (from 1.02 to 1.28 million ha), showing a gradual but steady rise.

STATE-WISE WHEAT PRODUCTION IN INDIA

Production of Wheat varies from state to state depending upon several factors like irrigation facilities, soil conditions and climatic conditions. The state wise Wheat production in India has been presented in the Table 3.

Table No 3

Major Wheat producing States in India (Million Tonnes)

States	2019-20	2020-21	2021-22	2022-23	2023-24
Uttar Pradesh	33.82	35.51	33.95	33.61	35.34
Madhya Pradesh	19.61	18.18	22.42	22.73	22.58
Punjab	17.62	17.19	14.82	16.78	17.74
Haryana	11.88	12.39	10.45	10.93	11.19
Rajasthan	10.92	11.04	9.48	10.64	9.70
Bihar	5.58	6.15	6.22	6.51	7.17
Gujarat	3.33	3.26	3.33	3.46	3.77
Maharashtra	1.79	2.07	2.47	2.37	1.99
All India	107.86	109.59	106.84	110.55	113.29

Source: E&S Division, DA&FW

The table 3 presents that on major wheat-producing states from 2019-20 to 2023-24 in million tonnes, along with India’s total production. India’s total wheat production shows an increasing trend over the five years: 107.86 MT in 2019-20 and 113.29 MT in 2023-24. There was a slight decline in 2021-22 (106.84 MT), but production recovered strongly in subsequent years.

Uttar Pradesh state is a one of the largest wheat producer consistently. Production increased from 33.82 MT (2019-20) to 35.34 MT (2023-24). Remains the backbone of India’s wheat output. Madhya Pradesh state is the second highest contributor. Notable rise from 18.18 MT to 22.73 MT between 2020-21 and 2022-23. Slight marginal increase to 22.58 MT in 2023-24. Punjab state was declining trend initially (17.62 MT to 14.82 MT in 2021-22), followed by recovery up to 17.74 MT in 2023-24. Production rebounds after challenges, likely due to improvements in farming practices. Haryana state was moderate fluctuations with rise from 11.88 MT to 12.39 MT (2020-21). Latest value 11.19 MT indicates stable yet slightly fluctuating performance. The Rajasthan state was slight instability: 10.92 MT and 9.48 MT in 2021-22, then improvement to 9.70 MT (2023-24). The Bihar state shows slow but consistent growth from 5.58 MT to 7.17 MT over the period. Emerging as an improving wheat-producing state. The Gujarat state shows gradual improvement from 3.33 MT (2019-20) to 3.77 MT (2023-24). The Maharashtra state shows lowest contributor with fluctuations. From 1.79 MT to 2.47 MT in 2021-22, then reduction to 1.99 MT in 2023-24.

WHEAT YIELD IN INDIA

The state-wise yield of wheat in India has been presented in the Table 4.

Table No 4

Major Wheat producing States in India (Kg/Hectare)

States	2019-20	2020-21	2021-22	2022-23	2023-24
Uttar Pradesh	3432	3604	3604	3531	3708
Madhya Pradesh	2993	2989	3449	3179	3012
Punjab	5003	4868	4206	4748	5045
Haryana	4687	4836	4533	4704	4723
Rajasthan	3501	3676	3676	3807	3540
Bihar	2595	2855	2780	2958	3150
Gujarat	3268	3204	3206	3248	3027
Maharashtra	1697	1782	2117	1948	1899
All India	3440	3521	3507	3521	3559

Source: E&S Division, DA&FW

The table 4 presents the yield of wheat per hectare (kg/ha) across major wheat-producing states from 2019-20 to 2023-24. It reflects the productivity of wheat cultivation rather than total production. India's average wheat yield increased from 3440 kg/ha in 2019-20 to 3559 kg/ha in 2023-24. There was a slight dip in 2021-22 (3507 kg/ha), but yield recovered and showed a steady upward trend from 2022-23 onward.

The Punjab state highest yielding state in the country. It consistently exhibits the highest yield, starting from 5003 kg/ha in 2019-20, with a minor decline in 2021-22 (4206 kg/ha). The highest value was 5045 kg/ha in 2023-24, indicating strong agricultural efficiency and effective modern farming. The Haryana is second highest state. It is also maintains high productivity, fluctuating between 4687 kg/ha (2019-20) and 4723 kg/ha (2023-24). The maximum yield recorded in 2022-23 (4704 kg/ha). The Uttar Pradesh state is yield increased from 3432 kg/ha (2019-20) to 3708 kg/ha (2023-24) and shows continuous improvement and strong performance in recent years. The Madhya Pradesh state yield improved significantly from 2993 kg/ha to 3449 kg/ha in 2021-22 but declined slightly thereafter to 3012 kg/ha in 2023-24 and the indicates scope for agronomic improvements. The Rajasthan state productivity showed varied performance. Maximum at 3807 kg/ha in 2022-23, falling to 3540 kg/ha (2023-24). The Bihar state increasing trend was 2595 kg/ha to 3150 kg/ha (2023-24) and shows steady improvement, likely due to irrigation expansion. The Gujarat state yield ranged from 3268 kg/ha (2019-20) to 3027 kg/ha (2023-24) and the slight fluctuations, with a marginal decrease in productivity in recent years. The Maharashtra state was lowest yield in the country. It is historically the lowest among listed states. Increased from 1697 kg/ha to 2117 kg/ha by 2021-22. Declined again to 1899 kg/ha (2023-24) due to likely water scarcity or climatic variations.

CONCLUSION

The study concludes that wheat cultivation in the data clearly shows positive growth in wheat production in India over the decade. While the area under cultivation increased gradually, the production and productivity increased at faster pace, indicating more efficient farming methods. Enhanced technology, government support, availability of quality seeds, and improved irrigation systems likely contributed to the rising yield trends. The present study reflects a mixed pattern of wheat cultivation across Indian states, with stability in traditional wheat belts and gradual increases in states like Madhya Pradesh and Maharashtra. Overall, India maintains a consistent wheat area, ensuring stable production capacity despite yearly fluctuations caused by climate and economic factors. This research article indicates a positive growth trajectory in India's wheat production, with strong performance by Uttar Pradesh and Madhya Pradesh. The recovery in Punjab and the gradual improvement in Bihar and Gujarat highlight diversification and regional development in agriculture. Despite minor fluctuations, India's wheat productivity is expanding steadily, contributing to food security and agricultural growth. Finally, clearly indicates that India's wheat yield has improved over the last five years, reflecting significant progress in agricultural technology, better irrigation, and enhanced seed varieties. While Punjab and Haryana dominate wheat productivity, states like Uttar Pradesh and Bihar are emerging with promising trends. However, Maharashtra and Gujarat require greater focus on improving wheat yields, especially through sustainable irrigation and modern cultivation methods.

REFERENCES

[1]. Handbook of Statistics on the Indian Economy, Published by Manjusha Senapati Director, Data Management and Dissemination Division, Department of Statistics and Information Management, Reserve Bank of India, 2025.
[2]. Ministry of Agriculture and Farmer's Welfare, [cited 2022 Dec 25]. Available from: https://agricoop.nic.in/sites/default/files/Web%20copy_eng.pdf, 2024-25.



- [3]. Gurnam Singh, Mehak Kang, Smt. Surinder Kaur and Ankush, A study on the economic performance of wheat cultivation in the Shivalik Belt of Haryana, *International Journal of Statistics and Applied Mathematics* 2025; SP-10(7): 27-30.
- [4]. Kumar, A., Gill, J. G. and Sharma, M. , Economics of Wheat Cultivation at Village Badyal Brahmna of R. S. Pura Block in Jammu District of Jammu & Kashmir State. *A National Level Quarterly Journal on Agricultural Marketing*, XLVI(1), 2-5, 2003.
- [5]. Nagaraja., S, Can India Produce enough Wheat even by 2020. *Current Science*, 89(9), 1467-1471, 2005.
- [6]. Kumar. S, Raising Wheat Production by Addressing Supply-Side Constraints in India. *National Centre for Agricultural Economics and Policy Research (NCAP) PME Notes No. 16* Published by Director, NCAP-2008.
- [7]. Patidar. M, An Economic Analysis of Marketing of Wheat production in Indore district of Madhya Pradesh. M.Sc. Agr. Department of Agricultural Economics and farm Management, Jawaharlal Nehru Krishi Vishva Vidyalaya, Jabalpur (M.P.), 2012.