

“Growth Trends in Foodgrains and Commercial Crops in India: An Analysis of Area, Production and Productivity During 1950-51 To 2024-25”

Puneeth Kumar C M¹, Dr. V. Shanmugam²

¹*Research Scholar, Department of Economics and Co-operation, Maharaja's College, University of Mysore, Mysuru-570005*

²*Professor of Economics, Department of Economics and Co-operation, Maharaja's College, University of Mysore, Mysuru-570005*

Abstract—This study examines the long-term growth trends in area, production, and productivity of major foodgrain and commercial crops in India during 1950-51 to 2024-25, with particular emphasis on agricultural development, productivity enhancement, crop diversification, and sustainable development. The study uses secondary data from Government of India agricultural statistical publications. It covers major foodgrain crops, including paddy, wheat, jowar, bajra, maize, coarse cereals, and pulses, as well as commercial crops such as total oilseeds, sugarcane, cotton, jute, and mesta. Compound Annual Growth Rate (CAGR) is used to assess changes in area, production, and productivity across different phases of Indian agricultural development. The findings indicate substantial growth in foodgrain production and productivity, with total foodgrain production increasing from 50.82 million tonnes in 1950-51 to 357.70 million tonnes in 2024-25 and productivity increasing from 522 kg/ha to 2,601 kg/ha. Wheat, paddy and maize recorded notable improvements in production, while jowar and certain traditional coarse cereals experienced declines in cultivated area and production. Among commercial crops, sugarcane and oilseeds recorded positive long-term growth in area, while jute and mesta declined. The study highlights that India's agricultural development has increasingly been supported by technological progress, improved productivity, crop diversification and changing cropping patterns rather than expansion of cultivated area alone.

Index Terms—Foodgrains, Commercial Crops, Agricultural Growth, Agricultural Development, Sustainable Development

I. INTRODUCTION

Agriculture has been the foundation of India's economic and social development, providing food, employment, raw materials, and livelihoods to a large section of the population. Since Independence, Indian agriculture has transformed from a relatively low-productivity, food-deficit system into a diversified, technologically advanced agricultural economy. The Indian Council of Agricultural Research (ICAR, 2022) observes that the Green Revolution and subsequent agricultural research and technological development played a major role in increasing foodgrain production and strengthening national food and nutritional security. Foodgrain production increased from 50.82 million tonnes in 1950-51 to more than 300 million tonnes in the recent period, while productivity growth became an increasingly important source of agricultural expansion. ICAR further notes that during the post-Green Revolution period, particularly from 1967-68 to 1985-86, foodgrain production increased from about 74.2 million tonnes to 150 million tonnes, demonstrating the substantial impact of improved varieties, irrigation, fertilizers, scientific crop management, and institutional support (ICAR, 2022). The development of high-yielding varieties and associated agricultural technologies during the 1960s, particularly in wheat and rice, consequently became an important turning point in India's agricultural development.

The transformation of Indian agriculture has not been confined to foodgrains; it has also involved significant changes in commercial crops such as oilseeds,

sugarcane, cotton, jute and mesta. These crops are important for industrial raw materials, agro-processing, employment, farm income, domestic consumption and trade. Long-term agricultural transformation has therefore involved changes not only in production volume but also in the allocation of cultivated area and improvements in yield per hectare. Swaminathan (2011) emphasized that India's agricultural progress after the Green Revolution needed to move towards an “evergreen revolution,” combining productivity gains with ecological sustainability and long-term food security. Similarly, ICAR has highlighted that India's agricultural development has increasingly been supported by agricultural research, improved crop varieties, scientific technologies and the National Agricultural Research System. Government of India agricultural statistics provide long-term series on the area, production and yield of principal crops, making it possible to examine the structural changes that have taken place in Indian agriculture over several decades. The Agricultural Statistics at a Glance 2024, published by the Department of Agriculture and Farmers Welfare, provides an important official statistical base for such long-term agricultural analysis.

Against this background, the present study, entitled “Growth Trends in Foodgrains and Commercial Crops in India: An Analysis of Area, Production and Productivity during 1950-51 to 2024-25,” examines the long-term performance and changing pattern of Indian agriculture through three interrelated indicators—area, production and productivity. The study covers major foodgrain crops, including paddy, wheat, jowar, bajra, maize, coarse cereals, and pulses, as well as major commercial crops such as total oilseeds, sugarcane, cotton, and jute and mesta. The period from 1950-51 to 2024-25 encompasses important phases of Indian agricultural development, including the pre-Green Revolution period, the Green Revolution era from the mid-1960s, agricultural diversification during the 1980s and 1990s, and the technology- and productivity-oriented developments of the twenty-first century. ICAR (2022) notes that foodgrain production increased from about 150 million tonnes in 1985-86 to 314.51 million tonnes in 2021-22, although productivity growth slowed at times after the late 1990s. The Government of India has also continued to emphasize productivity enhancement, crop diversification, scientific research,

climate resilience, and sustainable agricultural practices as important components of future agricultural development. Therefore, examining long-term changes in cultivated area, production, and productivity is essential to understanding the changing structure, growth dynamics, and performance of India's foodgrain and commercial-crop sectors.

II. REVIEW OF LITERATURE

Singh (1993) examined the relationship between the Green Revolution and instability in Indian foodgrain production using long-term time-series data covering 1950-51 to 1989-90. The study analyzed changes in foodgrain production and examined instability through variance decomposition, the coefficient of variation, and variance measures. The findings showed that total foodgrain production increased by about 236 percent, with an annual growth rate of 2.74 percent during the study period. Average production also increased substantially between the pre-Green Revolution period (1950-51 to 1965-66) and the Green Revolution period (1966-67 to 1989-90). However, the author also observed that increased production was accompanied by greater instability and production risk in some crops. The study is particularly relevant to the present research because it establishes a long-term relationship between technological transformation, foodgrain production growth, and instability in India.

Bhalla and Singh (2001), in *Indian Agriculture: Four Decades of Development*, examined the long-term transformation of Indian agriculture using data from 289 districts across 17 states and analyzed different phases of agricultural development from the early 1960s to the early 1990s. The authors examined changes in agricultural output, cropping patterns, land productivity and labor productivity, with particular attention to the spread of new agricultural technology, irrigation, fertilizers and high-yielding varieties. Their analysis indicated that the Green Revolution initially generated stronger agricultural growth in regions with better irrigation and infrastructure, particularly in north-western India, while technological progress subsequently spread to other regions. The study also showed that changes in cropping patterns and productivity were important components of agricultural transformation. This work provides a useful conceptual and empirical foundation for the

present study because it shows the importance of examining area, production, and productivity together when analyzing long-term agricultural growth.

Raju, Rama Rao and Venkateswarlu (2010) examined the growth performance of major rainfed crops in India during 1998-99 to 2008-09. The researchers estimated growth rates in area, production, and productivity by fitting exponential time-trend equations and decomposed changes in production into area, yield, and interaction effects. Their findings indicated considerable improvement in the productivity of coarse cereals and oilseeds, with productivity increasing by about 30 percent for coarse cereals and 13 percent for oilseeds during the study period. Pulse productivity increased by about 3 percent, while the combined productivity of coarse cereals and pulses increased by about 20 percent. The study concluded that productivity improvement was an important contributor to the growth of rainfed agriculture, although performance differed considerably across crops. The methodology of estimating compound growth rates and separating the contribution of area and yield is particularly relevant to the present study's examination of foodgrains and commercial crops over a much longer period.

Singh, Chand, Sendhil and Randhir Singh (2017) examined the performance of Indian agriculture during 1995-96 to 2015-16, focusing on production, productivity, yield gaps, efficiency and trade performance of major food commodities. The researchers compared the productivity of major agricultural commodities with benchmark levels and examined the efficiency gaps across crops and regions. The study found that staple commodities such as rice and wheat performed strongly, while pulses and oilseeds needed greater attention because of production deficiencies and rising demand. The study also identified considerable regional differences in productivity, indicating that agricultural performance was not uniform across India. The authors highlighted the importance of improving productivity and reducing yield gaps rather than relying solely on expansion of cultivated area. This finding is highly relevant to the present study because the analysis similarly evaluates long-term changes in cultivated area, production, and productivity of foodgrains and commercial crops.

Choudhary, Padhi and Mohapatra (2026) analyzed the impact of crop diversification on farm income in arid and semi-arid regions of India. The study used unit-level data from the 70th and 77th NSSO Situation Assessment Surveys, corresponding to 2012-13 and 2018-19. The research examined whether diversification into high-value crops affected agricultural households' net income. Using two rounds of nationally representative household data enabled comparison across periods and farming conditions. The study provides important evidence that diversification can influence farm economic outcomes and is therefore relevant to the present study's analysis of changing crop composition. It also strengthens the argument that agricultural development should consider not only aggregate production but also farm income, cropping diversification, and sustainability

2.1 Research Gap

Although several studies have examined the growth and performance of Indian agriculture, important gaps remain in the existing literature. Earlier studies such as Singh (1993), Bhalla and Singh (2001), Raju et al. (2010), Handral et al. (2017) and Singh et al. (2017) have mainly focused on particular periods, selected crops, specific regions, or individual dimensions such as production, productivity or instability. Comparatively little attention has been given to a comprehensive long-term analysis covering more than seven decades, from 1950-51 to 2024-25, while simultaneously examining area, production, and productivity of both foodgrains and major commercial crops.

In particular, the literature provides limited integrated evidence on how the growth patterns of paddy, wheat, jowar, bajra, maize, pulses, oilseeds, sugarcane, cotton, jute, and mesta have changed across different phases of Indian agricultural development. Therefore, this study aims to fill this gap by providing a systematic, comparative assessment of area, production, and productivity trends, along with their compound annual growth rates, for major foodgrain and commercial crops in India from 1950-51 to 2024-25. This long-term perspective is expected to provide a broader empirical understanding of the changing structure and growth dynamics of Indian agriculture.

2.2 Objectives

1. To examine the growth trends in area, production and productivity of major foodgrain crops in India during 1950-51 to 2024-25.
2. To analyze and compare the growth trends in area, production, and productivity of major commercial crops in India during 1950-51 to 2024-25.

III. GROWTH TRENDS ANALYSIS

Table-1: Area Under Foodgrains Crops in India During 1950-51 to 2024-25 (Million Hectares)

Year	Paddy	Wheat	Jowar	Bajra	Maize	Coarse Cereals	Total Pulses	Foodgrains
1950-51	30.81	9.75	15.57	9.02	3.16	37.67	19.09	97.32
1959-60	33.82	13.38	17.71	10.70	4.34	43.79	24.83	115.82
CAGR	1.26	4.05	1.01	1.68	3.17	1.30	3.13	1.94
1960-61	34.13	12.93	18.41	11.47	4.41	44.96	23.56	115.58
1969-70	37.68	16.63	18.61	12.49	5.86	47.24	22.02	123.57
CAGR	0.83	2.25	0.12	1.41	3.38	0.66	-1.32	0.52
1970-71	37.59	18.24	17.37	12.91	5.85	45.95	22.54	124.32
1979-80	39.42	22.17	16.67	10.58	5.72	41.36	22.26	125.21
CAGR	0.88	2.39	-0.34	-1.85	-0.13	-0.87	0.59	0.46
1980-81	40.15	22.28	15.81	11.66	6.01	41.78	22.46	126.67
1989-90	42.17	23.50	14.84	10.90	5.92	37.69	23.41	126.77
CAGR	0.41	0.46	-1.00	-1.05	-0.18	-1.34	-0.10	-0.23
1990-91	42.69	24.17	14.36	10.48	5.90	36.32	24.66	127.84
1999-00	45.16	27.49	10.25	8.90	6.42	29.34	21.12	123.10
CAGR	0.67	1.72	-3.54	-1.46	0.94	-2.11	-0.60	-0.08
2000-01	44.71	25.73	9.86	9.83	6.61	30.26	20.35	121.05
2009-10	41.92	24.46	7.79	8.9	8.26	27.68	23.28	121.33
CAGR	-0.02	0.36	-3.11	-0.44	2.93	-0.76	1.16	0.29
2010-11	42.86	29.07	7.38	9.61	8.55	28.34	26.40	126.67
2019-20	43.70	31.40	4.80	7.50	9.60	24.00	28.00	127.00
CAGR	0.15	0.30	-4.89	-2.24	1.11	-1.76	2.16	0.22
2020-21	45.80	31.10	4.40	7.70	9.90	24.10	28.80	129.80
2024-25	150.20	117.90	5.00	11.20	43.40	63.90	25.70	357.70
CAGR	2.62	1.49	-1.14	0.05	5.28	2.31	-1.86	1.32
Total CAGR	0.53	1.52	-2.04	-0.65	1.33	-1.00	0.26	0.20

Source: Government of India, Various Reports of Agriculture at a Glance

Table 1 presents the area under major foodgrain crops in India during 1950-51 to 2024-25, measured in million hectares, along with the Compound Annual Growth Rate (CAGR) for different periods. During the initial period, the area under paddy increased from 30.81 million hectares in 1950-51 to 33.82 million hectares in 1959-60, registering a CAGR of 1.26 percent. Wheat recorded a relatively higher growth of 4.05 percent, increasing from 9.75 to 13.38 million hectares. Maize also expanded from 3.16 to 4.34 million hectares, with a CAGR of 3.17 percent. Total pulses increased from 19.09 to 24.83 million hectares,

up 3.13 percent. Consequently, total foodgrain area increased from 97.32 to 115.82 million hectares, with a CAGR of 1.94 percent. During the 1960s, wheat and maize continued to expand, while the area under pulses declined slightly at a CAGR of -1.32 percent. This indicates the gradual expansion of wheat and maize cultivation during the early phase of India's agricultural transformation.

From the 1970s to the 1990s, the area under paddy and wheat generally increased, while traditional coarse cereals declined substantially. Paddy area increased from 37.59 million hectares in 1970-71 to 42.17

million hectares in 1989-90, while wheat increased from 18.24 to 23.50 million hectares. In contrast, jowar declined from 17.37 to 14.84 million hectares and bajra from 12.91 to 10.90 million hectares. The negative CAGR of jowar (-1.00 percent), bajra (-1.05 percent), and coarse cereals (-1.34 percent) during 1980-81 to 1989-90 indicates a shift in cultivated area away from several traditional cereal crops. The trend became more pronounced during 1990-91 to 1999-00, when jowar recorded -3.54 percent and bajra -1.46 percent CAGR. At the same time, wheat recorded positive growth of 1.72 percent and maize 0.94 percent. However, total foodgrain area declined slightly from 127.84 to 123.10 million hectares during this period, resulting in a negative CAGR of -0.08 percent.

From 2000 to 2024-25, the area trends indicate continued structural changes in the composition of foodgrain cultivation. Between 2000-01 and 2009-10, paddy area declined marginally at -0.02 percent CAGR, while wheat increased by 0.36 percent and maize recorded relatively high growth of 2.93 percent. Jowar continued its long-term decline at -3.11 percent. From 2010-11 to 2019-20, the decline in jowar sharpened to -4.89 percent and bajra to -2.24 percent, while pulses increased by 2.16 percent and maize by 1.11 percent. The total-period CAGR shows that wheat (1.52 percent) and maize (1.33 percent) grew, while jowar (-2.04 percent), bajra (-0.65 percent), and coarse cereals (-1.00 percent) declined. Overall, the figures indicate a long-term shift in cultivated area from traditional coarse cereals towards wheat, maize and, to a lesser extent, paddy and pulses.

Table-2: Production of Foodgrain Crops in India During 1950-51 to 2024-25 (Million Tonnes)

Year	Paddy	Wheat	Jowar	Bajra	Maize	Coarse Cereals	Total Pulses	Foodgrains
1950-51	20.58	6.46	5.50	2.60	1.73	15.38	8.41	50.82
1959-60	31.68	10.32	8.58	3.49	4.07	22.87	11.80	76.67
CAGR	4.46	5.17	4.31	3.31	7.30	3.66	4.10	4.25
1960-61	34.58	11.00	9.81	3.28	4.08	23.74	12.70	82.02
1969-70	40.43	20.09	9.72	5.33	5.67	27.29	11.69	99.50
CAGR	1.19	6.82	0.75	3.86	4.14	1.51	-1.29	1.85
1970-71	42.22	23.83	8.11	8.03	7.49	30.55	11.82	108.42
1979-80	42.33	31.83	11.65	3.95	5.60	26.97	8.57	109.70
CAGR	1.90	4.31	5.67	-3.18	-0.63	1.11	-0.39	2.07
1980-81	53.63	36.31	10.43	5.34	6.96	29.02	10.63	129.59
1989-90	73.57	49.85	12.90	6.65	9.65	34.76	12.86	171.04
CAGR	3.62	3.58	0.28	0.02	1.91	0.35	1.49	2.73
1990-91	74.29	55.14	11.68	6.89	8.96	32.70	14.26	176.39
1999-00	89.68	76.37	8.68	5.78	11.51	30.33	13.42	209.80
CAGR	2.02	3.57	-3.07	0.95	3.29	-0.01	0.67	2.09
2000-01	84.98	69.68	7.53	6.76	12.04	31.08	11.08	196.81
2009-10	89.09	80.80	6.70	6.51	16.72	33.55	14.66	218.11
CAGR	1.59	1.90	-0.32	1.70	5.29	2.39	2.71	1.90
2010-11	95.98	86.87	7.00	10.37	21.73	43.40	18.24	244.49
2019-20	118.90	107.90	4.80	10.40	28.80	47.70	23.00	297.50
CAGR	1.87	1.87	-4.96	-0.53	3.46	1.06	3.72	1.87
2020-21	124.40	109.60	4.80	10.90	31.60	51.30	25.50	310.70
2024-25	150.20	117.90	5.00	11.20	43.40	63.90	25.70	357.70
CAGR	4.49	1.99	1.96	1.43	7.75	5.62	-1.00	3.39
Total CAGR	2.4	4.05	-0.78	1.67	3.48	1.22	1.11	2.38

Source: Government of India, Various Reports of Agriculture at a Glance

Table 2 presents the production of major foodgrain crops in India during 1950-51 to 2024-25, measured in million tonnes, along with the Compound Annual

Growth Rate (CAGR) for different periods. In the initial period, foodgrain production rose substantially from 50.82 million tonnes in 1950-51 to 76.67 million

tonnes in 1959-60, with a CAGR of 4.25 percent. Paddy production increased from 20.58 to 31.68 million tonnes, while wheat increased from 6.46 to 10.32 million tonnes. Maize registered the highest growth among the major crops during this period, with a CAGR of 7.30 percent. Total pulses also rose from 8.41 to 11.80 million tonnes, registering 4.10 percent growth. From 1960-61 to 1969-70, wheat production recorded a particularly high CAGR of 6.82 percent, while maize increased by 4.14 percent. However, total pulse production declined by 1.29 percent. Overall, the period shows substantial expansion in foodgrain production, particularly through improvements in paddy, wheat, and maize production.

During the 1970s to 1990s, production growth was increasingly dominated by paddy and wheat. Between 1970-71 and 1979-80, wheat production increased from 23.83 to 31.83 million tonnes, recording a CAGR of 4.31 percent, while jowar increased at 5.67 percent. In contrast, bajra production declined sharply, with a CAGR of -3.18 percent, and pulses declined by -0.39 percent. From 1980-81 to 1989-90, paddy and wheat production expanded considerably, recording CAGRs of 3.62 and 3.58 percent, respectively, resulting in foodgrain production increasing from 129.59 to 171.04 million tonnes at 2.73 percent annually. During the 1990s, wheat continued to perform strongly, increasing at a 3.57 percent CAGR, while maize grew at 3.29 percent. Jowar production, however, declined

considerably by 3.07 percent. Total foodgrain production nevertheless increased from 176.39 million tonnes in 1990-91 to 209.80 million tonnes in 1999-00, registering a 2.09 percent CAGR. Thus, the production pattern demonstrates a gradual shift towards high-productivity crops, particularly wheat and paddy.

From 2000 to 2024-25, foodgrain production grew faster, particularly in paddy, wheat and maize. Between 2000-01 and 2009-10, maize recorded a high CAGR of 5.29 percent, followed by total pulses at 2.71 percent, while foodgrain production grew at 1.90 percent. From 2010-11 to 2019-20, total pulses grew by 3.72 percent and maize by 3.46 percent, while jowar production declined sharply by 4.96 percent. In the latest period, 2020-21 to 2024-25, maize recorded the highest CAGR of 7.75 percent, followed by coarse cereals at 5.62 percent and paddy at 4.49 percent. Overall, for the entire period, wheat recorded the highest long-term CAGR among the major individual crops at 4.05 percent, followed by maize at 3.48 percent and paddy at 2.40 percent. Jowar was the only major crop to show negative overall growth (-0.78 percent). Total foodgrain production increased at an overall CAGR of 2.38 percent, indicating substantial long-term expansion in India's foodgrain production, driven mainly by productivity improvements and the increasing contribution of paddy, wheat, and maize.

Table-3.3: Productivity of the Foodgrains Crops in India During 1950-51 to 2024-25 (Kg. /Hectare)

Year	Paddy	Wheat	Jowar	Bajra	Maize	Coarse Cereals	Total Pulses	Foodgrains
1950-51	668	663	353	288	547	408	441	522
1959-60	937	772	484	327	938	522	475	662
CAGR	3.15	1.09	3.27	1.62	4.03	2.33	0.94	2.26
1960-61	1013	851	533	286	926	528	539	710
1969-70	1073	1208	522	426	968	578	531	805
CAGR	0.36	4.46	0.61	2.41	0.73	0.91	0.03	1.32
1970-71	1123	1307	466	622	1279	665	524	872
1979-80	1074	1436	699	373	979	652	385	876
CAGR	1.02	1.87	6.05	-1.36	-0.51	2.00	-0.98	1.61
1980-81	1336	1630	660	458	1159	695	473	1023
1989-90	1745	2121	869	610	1632	922	549	1349
CAGR	3.19	3.11	1.29	1.07	2.10	1.71	1.59	2.97
1990-91	1740	2281	814	658	1518	900	578	1380
1999-00	1986	2778	847	650	1792	1034	635	1704
CAGR	1.34	1.82	0.48	2.45	2.26	2.14	1.27	2.17
2000-01	1901	2708	764	688	1822	1027	544	1626
2009-10	2125	2839	860	731	2024	1212	630	1798
CAGR	1.61	0.69	2.90	2.13	2.28	3.17	1.54	1.60

2010-11	2239	2988	949	1079	2542	1531	691	1930
2019-20	2722	3440	989	1374	3006	1991	823	2343
CAGR	1.69	1.57	-0.29	1.71	2.37	2.86	1.52	1.64
2020-21	2717	3521	1099	1420	3199	2128	885	2394
2024-25	2929	3595	1240	1523	3590	2482	926	2601
CAGR	1.81	0.48	3.08	1.57	2.22	3.27	0.83	2.04
Total CAGR	1.86	2.48	1.29	2.34	2.13	2.24	0.84	2.17

Source: Government of India, Various Reports of Agriculture at a Glance

Table 3 presents the productivity of major foodgrain crops in India during 1950-51 to 2024-25, measured in kilograms per hectare, along with the Compound Annual Growth Rate (CAGR) for different periods. In 1950-51, productivity was relatively low, with paddy at 668 kg/ha, wheat at 663 kg/ha, jowar at 353 kg/ha, bajra at 288 kg/ha, and maize at 547 kg/ha. By 1959-60, productivity had increased considerably, particularly in paddy (937 kg/ha), wheat (772 kg/ha) and maize (938 kg/ha). During this period, maize recorded the highest CAGR of 4.03 percent, followed by jowar at 3.27 percent and paddy at 3.15 percent. Foodgrain productivity rose from 522 kg/ha in 1950-51 to 662 kg/ha in 1959-60, with a CAGR of 2.26 percent. During the 1960s, wheat productivity grew strongly, increasing from 851 to 1,208 kg/ha, with a CAGR of 4.46 percent, while overall foodgrain productivity increased by 1.32 percent annually.

During the 1970s to 1990s, productivity improvements became more pronounced, particularly for wheat and paddy. Wheat productivity increased from 1,307 kg/ha in 1970-71 to 1,436 kg/ha in 1979-80 and subsequently reached 2,121 kg/ha by 1989-90. Paddy productivity also increased from 1,123 kg/ha in 1970-71 to 1,745 kg/ha in 1989-90. From 1970-71 to 1979-80, jowar recorded a high productivity growth rate of 6.05 percent, whereas bajra and maize recorded negative growth of -1.36 and -0.51 percent, respectively. The 1980s saw substantial productivity improvement, with paddy and wheat recording CAGRs of 3.19 and 3.11 percent, respectively, and

foodgrain productivity increasing by 2.97 percent. From 1990-91 to 1999-00, foodgrain productivity increased from 1,380 to 1,704 kg/ha, recording a CAGR of 2.17 percent. Wheat productivity reached 2,778 kg/ha by 1999-00, demonstrating its increasing productivity advantage among major foodgrain crops. From 2000 to 2024-25, productivity continued to improve across most crops, although the rate of growth varied considerably. Between 2000-01 and 2009-10, coarse cereals recorded the highest productivity growth of 3.17 percent, followed by jowar at 2.90 percent and maize at 2.28 percent. From 2010-11 to 2019-20, paddy productivity increased from 2,239 to 2,722 kg/ha, while wheat increased from 2,988 to 3,440 kg/ha. Maize productivity rose substantially from 2,542 to 3,006 kg/ha, with a CAGR of 2.37 percent. In the latest period, 2020-21 to 2024-25, jowar recorded the highest productivity growth at 3.08 percent, followed by coarse cereals at 3.27 percent and paddy at 1.81 percent. Over the entire period, wheat recorded the highest overall productivity CAGR of 2.48 percent, followed by bajra at 2.34 percent, coarse cereals at 2.24 percent, maize at 2.13 percent, and foodgrains at 2.17 percent. Foodgrain productivity increased from 522 kg/ha in 1950-51 to 2,601 kg/ha in 2024-25, indicating a substantial long-term improvement in agricultural productivity. Overall, the pattern suggests that technological progress, improved varieties, irrigation, fertilizer use, and better cultivation practices contributed to sustained productivity gains across India's foodgrain sector.

Table-4: Area Under Major Commercial Crops in India During 1950-51 to 2024-25 (Million Hectares)

Year	Total Oilseeds	Sugarcane	Cotton	Jute and Mesta
1950-51	10.73	1.71	5.88	0.57
1959-60	13.95	2.14	7.30	0.98
CAGR	2.50	2.58	3.04	5.75
1960-61	13.77	2.42	7.61	0.90
1969-70	14.81	2.75	7.73	1.09
CAGR	0.40	0.64	-0.13	-1.50
1970-71	16.64	2.62	7.61	1.08

1979-80	16.94	2.61	8.13	1.22
CAGR	0.40	1.90	0.42	1.53
1980-81	17.60	2.67	7.82	1.30
1989-90	22.80	3.44	7.69	0.91
CAGR	2.44	1.46	-1.26	-2.87
1990-91	24.15	3.69	7.44	1.02
1999-00	24.28	4.22	8.71	1.04
CAGR	0.17	1.67	2.71	0.66
2000-01	22.77	4.32	8.53	1.02
2009-10	25.96	4.17	10.13	0.91
CAGR	2.45	0.74	2.03	-1.60
2010-11	27.22	4.88	11.24	0.87
2019-20	27.10	4.60	13.50	0.70
CAGR	-0.62	-0.71	1.10	-3.01
2020-21	28.80	4.90	13.30	0.70
2024-25	30.40	5.50	11.50	0.60
CAGR	1.50	3.28	-2.63	-4.52
Total CAGR	1.32	1.57	0.75	-0.38

Source: Government of India, Various Reports of Agriculture at a Glance

Table 4 presents the area under major commercial crops in India during 1950-51 to 2024-25, measured in million hectares, and shows the Compound Annual Growth Rate (CAGR) for different periods. In 1950-51, the area under total oilseeds was 10.73 million hectares, followed by cotton at 5.88 million hectares, sugarcane at 1.71 million hectares, and jute and mesta at 0.57 million hectares. By 1959-60, the area under all four commercial crop groups had increased. Total oilseeds increased to 13.95 million hectares at a CAGR of 2.50 percent, sugarcane to 2.14 million hectares at 2.58 percent, cotton to 7.30 million hectares at 3.04 percent, and jute and mesta to 0.98 million hectares at the highest CAGR of 5.75 percent. This indicates a broad expansion of commercial crop cultivation during the first decade.

From the 1960s to the 1990s, the area under commercial crops varied considerably across crop groups. Total oilseed area increased from 13.77 million hectares in 1960-61 to 22.80 million hectares in 1989-90, although the growth rate varied across periods. Sugarcane area increased consistently from 2.42 million hectares to 3.44 million hectares during the same period. Cotton area, however, fluctuated, increasing from 7.61 million hectares in 1960-61 to 8.13 million hectares in 1979-80, but then declining to 7.69 million hectares by 1989-90. Jute and mesta also fluctuated considerably, with their area reaching 1.30 million hectares in 1980-81 before falling to 0.91 million hectares in 1989-90. During 1990-91 to 1999-

00, cotton registered the highest growth among the selected crops at 2.71 percent CAGR, while sugarcane grew at 1.67 percent. Oilseed area remained almost stable, recording only 0.17 percent growth. These trends indicate that commercial crop area expanded unevenly and depended heavily on crop-specific economic and technological conditions.

During the 2000s to 2024-25, oilseeds and sugarcane generally expanded, whereas the area under jute and mesta continued to decline and cotton showed considerable fluctuations. Between 2000-01 and 2009-10, total oilseed area increased from 22.77 to 25.96 million hectares, registering a CAGR of 2.45 percent, while cotton increased from 8.53 to 10.13 million hectares at 2.03 percent. From 2010-11 to 2019-20, cotton continued to expand at a 1.10 percent CAGR, while oilseeds (-0.62 percent), sugarcane (-0.71 percent), and jute and mesta (-3.01 percent) recorded negative growth. In the latest period, 2020-21 to 2024-25, sugarcane area increased by 3.28 percent and oilseeds by 1.50 percent, while cotton (-2.63 percent) and jute and mesta (-4.52 percent) declined. Over the period, sugarcane recorded the highest overall CAGR of 1.57 percent, followed by total oilseeds at 1.32 percent and cotton at 0.75 percent, while jute and mesta recorded a negative overall CAGR of -0.38 percent. Overall, the table indicates a gradual long-term expansion of oilseed and sugarcane cultivation, moderate growth in cotton area, and a persistent contraction in the area devoted to jute and mesta.

Table-5: Production of Major Commercial Crops in India During 1950-51 to 2024-25 (Million Tonnes).

Year	Total Oilseeds	Sugarcane	Cotton	Jute and Mesta
1950-51	5.16	57.05	3.04	3.31
1959-60	6.56	77.82	3.68	5.69
CAGR	4.10	4.35	4.30	5.72
1960-61	6.98	110.00	5.60	5.26
1969-70	7.73	135.02	5.56	6.79
CAGR	0.29	1.82	0.30	-2.18
1970-71	9.63	126.37	4.76	6.19
1979-80	8.74	128.83	7.65	7.96
CAGR	0.74	2.56	3.68	2.60
1980-81	9.37	154.25	7.01	8.16
1989-90	16.92	225.57	11.42	8.29
CAGR	5.45	2.71	2.80	0.15
1990-91	18.61	241.05	9.84	9.23
1999-00	20.72	299.32	11.53	10.56
CAGR	2.25	2.73	2.30	1.79
2000-01	18.44	295.96	9.52	10.56
2009-10	24.88	292.30	24.02	11.82
CAGR	5.14	1.21	13.61	0.14
2010-11	32.48	342.38	33.00	10.62
2019-20	33.20	370.50	36.10	9.90
CAGR	0.28	0.98	-0.87	-1.43
2020-21	35.90	405.40	35.20	9.40
2024-25	43.00	454.60	29.70	8.80
CAGR	1.04	1.03	0.97	0.98
Total CAGR	1.03	1.03	1.03	1.01

Source: Government of India, Various Reports of Agriculture at a Glance

Table 5 shows that production of major commercial crops in India grew considerably from 1950-51 to 1959-60. Total oilseeds production rose from 5.16 million tonnes in 1950-51 to 6.56 million tonnes in 1959-60, with a CAGR of 4.10 percent. Sugarcane production increased from 57.05 million tonnes to 77.82 million tonnes, with a CAGR of 4.35 percent. Cotton production also rose from 3.04 million tonnes to 3.68 million tonnes, registering a CAGR of 4.30 percent. Jute and mesta production increased from 3.31 million tonnes to 5.69 million tonnes, recording the highest CAGR of 5.72 percent during this period. From 1960-61 to 1969-70, sugarcane production continued to rise from 110.00 million tonnes to 135.02 million tonnes, while oilseeds and cotton increased only marginally, recording CAGRs of 0.29 and 0.30 percent, respectively. In contrast, jute and mesta production declined, with a negative CAGR of -2.18 percent.

From 1970-71 to 1999-00, commercial crop production generally increased, although the growth

rate varied considerably across crops. Oilseeds production increased from 9.63 million tonnes in 1970-71 to 8.74 million tonnes in 1979-80, then rose substantially to 16.92 million tonnes by 1989-90 and 20.72 million tonnes by 1999-00. Sugarcane production rose from 126.37 million tonnes in 1970-71 to 128.83 million tonnes in 1979-80, then to 225.57 million tonnes in 1989-90 and 299.32 million tonnes in 1999-00. Cotton production improved notably, rising from 4.76 million tonnes in 1970-71 to 11.53 million tonnes in 1999-00, with the highest growth from 1970-71 to 1979-80 at 3.68 percent. Jute and mesta production also increased during the 1970s and 1990s, although its growth was relatively modest. During the 1990s, oilseeds, sugarcane, cotton, jute, and mesta recorded CAGRs of 2.25, 2.73, 2.30, and 1.79 percent, respectively, indicating broad-based expansion in commercial crop production.

During 2000-01 to 2024-25, the production pattern shows substantial changes among the major commercial crops. Oilseeds production increased from

18.44 million tonnes in 2000-01 to 24.88 million tonnes in 2009-10 and further to 43.00 million tonnes in 2024-25. Sugarcane production rose from 295.96 million tonnes in 2000-01 to 454.60 million tonnes in 2024-25, indicating sustained growth, although the growth rate varied across sub-periods. Cotton production grew particularly rapidly from 2000-01 to 2009-10, rising from 9.52 million tonnes to 24.02 million tonnes, with a CAGR of 13.61 percent; however, production later fluctuated and stood at 29.70 million tonnes in 2024-25. Jute and mesta production remained comparatively stable in the

earlier part of the period but declined from 10.62 million tonnes in 2010-11 to 8.80 million tonnes in 2024-25. From 2020-21 to 2024-25, oilseeds, sugarcane, cotton and jute and mesta recorded CAGRs of 1.04, 1.03, 0.97 and 0.98 percent, respectively. Overall, during 1950-51 to 2024-25, all four major commercial crops recorded positive long-term growth, with total CAGRs of 1.03 percent for oilseeds, 1.03 percent for sugarcane, 1.03 percent for cotton and 1.01 percent for jute and mesta, indicating an overall expansion in the production of major commercial crops in India.

Table-6: Productivity of Major Commercial Crops in India During 1950-51 to 2024-25 (Kg. /Hectare)

Year	Total Oilseeds	Sugarcane	Cotton	Jute and Mesta
1950-51	481	33422	88	1043
1959-60	470	36414	86	1049
CAGR	1.56	1.72	1.23	-0.03
1960-61	507	45549	125	1049
1969-70	502	49121	122	1120
CAGR	-0.68	0.73	0.44	-0.69
1970-71	578	48322	106	1032
1979-80	516	49358	160	1177
CAGR	0.38	0.64	3.30	1.06
1980-81	532	57844	152	1130
1989-90	771	65612	252	1646
CAGR	3.55	1.23	4.10	3.10
1990-91	719	65395	225	1634
1999-00	810	70935	225	1834
CAGR	1.43	1.05	-0.41	1.11
2000-01	913	68577	190	1868
2009-10	1193	70020	403	2349
CAGR	3.09	0.47	11.34	1.79
2010-11	1133	70091	499	2197
2019-20	1224	80	455	2641
CAGR	1.76	-62.79	-1.91	1.66
2020-21	1247	84	451	2542
2024-25	1412	83	440	2758
CAGR	2.53	-0.97	-0.31	1.64
Total CAGR	1.64	-4.53	2.53	1.57

Source: Government of India, Various Reports of Agriculture at a Glance

Table-6 reveals that the productivity of major commercial crops in India showed varying trends during the initial decades from 1950-51 to 1969-70. Total oilseeds productivity declined slightly from 481 kg/ha in 1950-51 to 470 kg/ha in 1959-60, although the reported CAGR for the period was 1.56 percent; it then increased to 507 kg/ha in 1960-61 before falling to 502 kg/ha in 1969-70. Sugarcane productivity

increased consistently from 33,422 kg/ha in 1950-51 to 36,414 kg/ha in 1959-60 and further to 49,121 kg/ha in 1969-70. Cotton productivity increased from 88 kg/ha to 86 kg/ha during 1950-51 to 1959-60, then rose to 122 kg/ha by 1969-70. Jute and mesta productivity remained comparatively stable, increasing from 1,043 kg/ha in 1950-51 to 1,049 kg/ha in 1959-60 and 1,120 kg/ha in 1969-70. From 1970-71 to 1979-80, cotton

productivity recorded a relatively high CAGR of 3.30 percent, while jute and mesta recorded 1.06 percent. Oilseeds and sugarcane recorded comparatively moderate growth rates of 0.38 and 0.64 percent, respectively.

During the 1980s and 1990s, productivity improvements were more pronounced for several commercial crops. Oilseeds productivity increased substantially from 532 kg/ha in 1980-81 to 771 kg/ha in 1989-90, with a CAGR of 3.55 percent. Sugarcane productivity increased from 57,844 kg/ha to 65,612 kg/ha, while cotton productivity increased from 152 kg/ha to 252 kg/ha, recording CAGRs of 1.23 and 4.10 percent, respectively. Jute and mesta productivity also increased from 1,130 kg/ha to 1,646 kg/ha, with a CAGR of 3.10 percent. From 1990-91 to 1999-00, oilseeds productivity rose from 719 kg/ha to 810 kg/ha, and sugarcane productivity rose from 65,395 kg/ha to 70,935 kg/ha. Jute and mesta productivity also increased from 1,634 kg/ha to 1,834 kg/ha. Cotton productivity, however, remained at 225 kg/ha in both 1990-91 and 1999-00, resulting in a reported negative CAGR of -0.41 percent. Thus, the 1980s saw stronger productivity gains, particularly in cotton, oilseeds, and jute and mesta, while productivity growth in the 1990s was comparatively moderate.

From 2000-01 to 2024-25, oilseeds and jute and mesta productivity generally increased, whereas sugarcane and cotton figures show substantial fluctuations. Oilseeds productivity increased from 913 kg/ha in 2000-01 to 1,193 kg/ha in 2009-10 and further to 1,412 kg/ha in 2024-25, with a CAGR of 2.53 percent during 2020-21 to 2024-25. Jute and mesta productivity increased from 1,868 kg/ha in 2000-01 to 2,349 kg/ha in 2009-10 and reached 2,758 kg/ha in 2024-25. Cotton productivity rose sharply from 190 kg/ha in 2000-01 to 403 kg/ha in 2009-10 and reached 499 kg/ha in 2010-11, but subsequently declined to 440 kg/ha in 2024-25. Sugarcane productivity increased to 70,091 kg/ha in 2010-11; however, the table reports a sharp fall to 80 kg/ha in 2019-20, 84 kg/ha in 2020-21, and 83 kg/ha in 2024-25. These sugarcane figures and the reported total CAGR of -4.53 percent appear inconsistent with earlier sugarcane productivity values and should therefore be verified against the original data source before final submission. Based strictly on the reported total CAGR values, oilseeds recorded 1.64 percent, sugarcane -4.53 percent, cotton 2.53

percent, and jute and mesta 1.57 percent during the overall period.

IV. MAJOR FINDINGS

1. Expansion of foodgrain production: Total foodgrain production increased from 50.82 million tonnes in 1950-51 to 357.70 million tonnes in 2024-25, recording an overall CAGR of 2.38 percent. This indicates substantial long-term growth in India's foodgrain production.
2. Growth in foodgrain productivity: Foodgrain productivity increased from 522 kg/ha in 1950-51 to 2,601 kg/ha in 2024-25, with an overall CAGR of 2.17 percent. This indicates that productivity improvement has been an important component of long-term foodgrain growth.
3. Wheat showed strong long-term performance: Wheat recorded an overall CAGR of 1.52 percent in area, 4.05 percent in production, and 2.48 percent in productivity. Among the major individual foodgrain crops, wheat therefore showed strong long-term growth in production and productivity.
4. Maize recorded substantial growth: Maize registered an overall CAGR of 1.33 percent in area, 3.48 percent in production and 2.13 percent in productivity. Production growth was particularly strong from 2020-21 to 2024-25, with a CAGR of 7.75 percent.
5. Decline in traditional coarse cereals: Jowar recorded negative long-term growth in area (-2.04 percent) and production (-0.78 percent), while bajra area also declined at -0.65 percent. This indicates a long-term reduction in the cultivated area of some traditional coarse cereals.
6. Paddy remained an important foodgrain crop: Paddy recorded an overall CAGR of 0.53 percent in area, 2.40 percent in production and 1.86 percent in productivity. Thus, its production growth was considerably higher than its area growth, indicating the importance of yield improvement.
7. Commercial crop area showed mixed changes: Sugarcane recorded the highest overall area CAGR among the selected commercial crops at 1.57 percent, followed by total oilseeds at 1.32 percent and cotton at 0.75 percent. Jute and mesta recorded a negative area CAGR of -0.38 percent, indicating a long-term contraction in cultivated area.

8. Commercial crop production generally increased: All four selected commercial crop groups recorded positive overall production growth. Oilseeds, sugarcane and cotton each recorded an overall CAGR of approximately 1.03 percent, while jute and mesta recorded 1.01 percent.
9. Productivity improvements were evident in commercial crops: Oilseeds, cotton and jute and mesta recorded positive overall productivity CAGRs of 1.64 percent, 2.53 percent and 1.57 percent, respectively. Cotton recorded particularly rapid productivity growth from 2000-01 to 2009-10, with a CAGR of 11.34 percent.
10. Long-term agricultural transformation is evident, but data verification is necessary: The overall trends indicate a shift towards higher productivity and changing crop composition, with wheat, maize, paddy, oilseeds, and sugarcane making important contributions. However, the 2024-25 area figures in Table 1 and the sugarcane productivity figures from 2019-20 onward in Table 6 contain apparent inconsistencies. These figures should be verified against the original Government of India source before final publication or hypothesis testing.

V. CONCLUSION

The study concludes that Indian agriculture has undergone substantial structural and technological transformation during 1950-51 to 2024-25, reflected in changes in cultivated area, production and productivity of both foodgrain and commercial crops. Foodgrain production increased considerably, supported mainly by growth in wheat, paddy, and maize, while foodgrain productivity more than quintupled over the study period. At the same time, the cultivated area under traditional crops such as jowar and bajra declined, indicating changes in the composition of foodgrain cultivation. Commercial crops also expanded overall, with sugarcane and oilseeds showing positive long-term area growth and oilseeds, cotton, jute, and mesta showing productivity gains. The findings indicate that agricultural growth has increasingly depended on productivity improvements and changes in crop composition rather than simply expanding cultivated area. However, the apparent inconsistencies in some reported 2024-25 area figures and sugarcane productivity figures require

verification from the original government statistical publications. Overall, the study highlights the importance of sustained productivity enhancement, technological development, crop diversification, and reliable agricultural statistics for understanding India's long-term agricultural growth.

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