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Structural transformation and rural development in Haryana: Five decades of economic and agricultural change (1970-2024)

¹DP Malik, ²Mafi and ³Yashpal

¹ Professor and Head, Department of Agricultural Economics, CCS Haryana Agricultural University, and Hisar 125004, Haryana, India

^{2,3} PG Students, Department of Agricultural Economics, CCS Haryana Agricultural University, and Hisar 125004, Haryana, India

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Corresponding Author: DP Malik

Abstract

Haryana has witnessed a remarkable transformation from an agriculture-dominated economy to one characterized by expanding industrial and service sectors alongside significant changes in rural livelihoods. This study examines the nature and extent of rural transformation in the state by analysing long-term trends in sectoral contribution to Gross State Domestic Product (GSDP), employment structure, agricultural development, rural infrastructure, and productivity using secondary data compiled from published government sources. The findings reveal a pronounced structural shift in the state's economy, with agriculture's share in GSDP declining from more than 50 per cent during the 1970s to 15.80 per cent in 2022-23, while the industrial and service sectors increased their contributions to 29.06 and 53.00 per cent, respectively. Employment patterns also changed considerably, as the proportion of the workforce engaged in agriculture declined from 66.65 per cent in 1971 to 44.96 per cent in 2011, whereas the tertiary sector emerged as the largest employer.

The study further highlights substantial improvements in rural infrastructure and agricultural development. Expansion of road connectivity, regulated markets, electrification, irrigation facilities, and educational infrastructure contributed significantly to rural development. Cropping intensity and irrigation intensity increased to 191 and 193 per cent, respectively, accompanied by greater adoption of high-value crops, rapid mechanisation, and sustained growth in food grain and milk production. The total cropped area expanded from 49.57 lakh hectares in 1970-71 to 65.00 lakh hectares in 2022-23, while tractor adoption recorded a compound annual growth rate of 5.88 per cent, reflecting accelerated farm mechanisation.

Despite these achievements, several constraints continue to hinder inclusive rural development, including shrinking farm size, low farm profitability, rising input costs, price instability, widening rural-urban disparities, groundwater depletion, excessive dependence on chemical fertilizers, and the persistence of cereal-based cropping systems. The study recommends strengthening agro-processing industries in rural areas, promoting non-farm employment on marginal and wastelands, expanding rainwater harvesting, micro-irrigation, and solar-powered irrigation systems, encouraging diversification towards high-value crops, investing in climate-resilient agricultural technologies, strengthening Farmer Producer Organizations (FPOs), enhancing primary processing infrastructure, and promoting livestock enterprises, particularly through conservation of the Murrah buffalo and expansion of milk processing facilities, to ensure sustainable and inclusive rural transformation.

Keywords: Economic growth, GSDP, Sectoral shift, rural transformation, land use, crop productivity

Introduction

Rural transformation is a proactive and positive process of change and development of rural communities in the context of national and global social and economic changes (Long, Zou, Pykett, & Li, 2011; Wang, Khan, & Zhang, 2013) ^[18, 24]. It is usually characterized by changes in civic amenities, female literacy, gender ratio, employment structure, agricultural intensity, crop selection pattern, farm income, labour productivity and major improvements in rural housing and economic and social conditions resulting from industrialization and urbanization (Kurien, 1980; Ravallion and Datt, 2002) ^[17, 19]. Agricultural transformation as embedded in rural transformation (Jayne *et al.* 2018) ^[15] while rural transformation is embedded into a broader process of structural change (Berdegúe *et al.* 2013) ^[2]. Rural transformation embraces a combination of agricultural transformation plus growth of non-farm employment of rural

labour (Huang and Shi, 2021) ^[12]. It includes the change occurring within the agricultural sector and employment shifts between farm and off-farm activities (Huang, 2018) ^[11]. Rural transformation involves rising agricultural productivity, increasing commercialization and marketable surpluses and diversification of production patterns and livelihoods (IFAD, 2016) ^[14]. Rural transformation brings productivity improvements, develops the non-farm economy and generates benefits for migrants and their communities of origin and destination (FAO, 2017) ^[9]. Structural transformation is characterized by a shift in labour and capital from agriculture to industry and service sector is a key of sustained economic development (Timmer, 2009) ^[23]. This transition not only entails a reallocation of resources but also promotes productivity enhancements, modernization of economic systems and improvements in people's living standards. In the Indian context, the pace and pattern of such

transformations have been regionally uneven due to variations in infrastructure, governance and policy enactment (Ahluwalia, 2002; Dholakia, 2003) ^[1, 8].

Despite rampant urbanization, India is a country of villages where a staggering 69 per cent (833.50 million) of population (1210.20 million) still abides in rural areas as per census 2011 and depend on agriculture and allied activities, including animal husbandry and fisheries, for their livelihood (Birthal and Negi, 2012) ^[16]. The rural people are mostly employed in agriculture and related informal sector activities, but contribute to a disproportionately low share (16%) of gross domestic product. Also, they are characterized by low values in various development indicators.

Haryana being carved out of Punjab on November 1, 1966 is largely considered as an agrarian state. The state with a geographical area of 4.42 million ha along with limited natural resources, having location advantage, coupled with industrial-friendly policies and improved infrastructure, is evolved as a rapidly growing state of India. Initially state is largely benefited from Green Revolution supported by favourable policy initiatives as well as assured irrigation water from Bhakra Dam (1963) and Western Yamuna Canal system (1970), which figured as second largest contributor to central pool of foodgrains simultaneously resulting progressively diversified economy beyond agriculture (Goel, 2019) ^[10].

The present study aims to examine the nature of rural transformation in Haryana over the decades. It evaluates sectoral contributions to GSDP, capital formation, demographic features, development in agriculture sector and rural changes since inception of state (1970-2023). The findings offer insights into regional economic development, informing policies for inclusive and sustainable growth in rural development particularly in agriculture sector.

Material and Methods

The key indicators of rural transformation include gross state domestic product (GSDP) employment, across various sectors, capital formation, per capita income, contribution of various sectors in state economy. Agriculture being key

component of rural development was evaluated using indicators such as cropping pattern, cropping intensity, irrigation intensity, extent of resource use (fertilizers and chemicals consumption), crop yield, market in structure, farm machinery & implements, storage capacity of farm produce, credit access etc. The study was based on secondary data extracted from various published and unpublished sources i.e., Directorate of Horticulture, Haryana Statistical Abstract of Haryana, Economic Survey of Haryana, Department of Animal husbandry and Dairying, Haryana, Agricultural Statistics at aGlance, for the period 1970-71 to 2023-24. The whole period of study has been divided into five sub-periods and overall period to evaluate decadal progress in rural sector. Average, percentage, compound growth rates were computed for all sub-periods and overall periods.

Results and discussion

Economic development in Haryana

Sectoral composition of GSDP: Haryana's economic structure has experienced a marked transformation over the past three decades (1990-2024). The share of agriculture and allied activities in Gross State Domestic Product (GSDP) has steadily declined from 60.00 per cent in 1970-71 to 17.92 per cent in 2023-24. In contrast, at present industrial and services sectors have emerged as primary drivers of state income, with contribution of 29.06 percent and 53.00 per cent respectively (Table 1 and Fig 1). Agriculture, once the backbone of Haryana's economy, now shared low proportion (17.92%) of state output despite retaining over 45 per cent of the workforce (Goel, 2019; Sharon, 2023) ^[10, 34].

In 1990-2000 decade, agriculture sector exhibited growth rate of 11.84 per cent which inclined to 14.06 per cent in 2010-20 decade with overall CAGR of 11.06 per cent in last three and half decades (1990- 2024). However, industry sector showed declined growth rate with 17.46 per cent in 1990-2000 to 12.41 per cent in 2010-2021 with overall CAGR of 15.43 per cent in 1990-2024. The service sector attained growth rate of 17.28 per cent in 1990-2000 which was declined to 12.30 per cent in 2010-2020 with overall growth rate of 17.64 per cent during 1990-2024.

Table 1: Contribution of various sectors in Haryana's economy: 1970-2024

Year	Agriculture sector	Industry sector	Service sector	Total
1970-71	0.60 (60.00)	0.21 (21.00)	0.19 (19.00)	1.00 (100.00)
1980-81	2.39 (53.00)	0.98 (21.70)	1.14 (25.30)	4.50 (100.00)
1990-91	5.80 (42.52)	3.57 (26.17)	4.27 (31.30)	13.64 (100.00)
2000-01	17.2531 (40)	16.04 (29.20)	21.82 (39.67)	54.96 (100.00)
2010-11	54.82 (21.04)	77.04 (29.56)	128.74 (49.40)	260.62 (100.00)
2020-21	134.36 (17.71)	237.30 (31.29)	386.83 (51.00)	758.5 (100.00)
2023-24	171.80 (17.92)	278.55 (29.06)	508.04 (53.00)	958.39 (100.00)

Note: Figures in parenthesis indicate percentage to total

This happened with the broader national pattern of structural transformation, where urbanization, industrialization, infrastructure development and growth in knowledge-based services reshape the economic landscape (Timmer, 2009; ICRISAT, 2014) ^[23, 13]. Haryana's proximity to Delhi and inclusion in National Capital Region (NCR) has amplified these changes, encouraging manufacturing clusters, IT parks and service hubs in NCR region.

Status of gross state domestic product (GSDP)

At current prices, Haryana's GSDP has grown from ₹4500 crore in 1980-81 to over ₹10 lakh crore in 2022-23 (Fig

2). This robust performance corresponded to CAGR of around 15 per cent over last four decades. Notably, the agricultural sector, though shrinking in relative share, recorded a vigorous CAGR growth of 11.55 per cent, signifying improved farm productivity through input intensification, usage of quality seed, improved agronomic practices and farm mechanization (Goel, 2019; Bhalla & Singh, 2009) ^[10, 3]. This upward economic trajectory reflected successful public-private collaborations, targeted sectoral investments, policy initiatives aimed at liberalization and diversification (Ahluwalia, 2002; Dholakia, 2003) ^[1, 8].

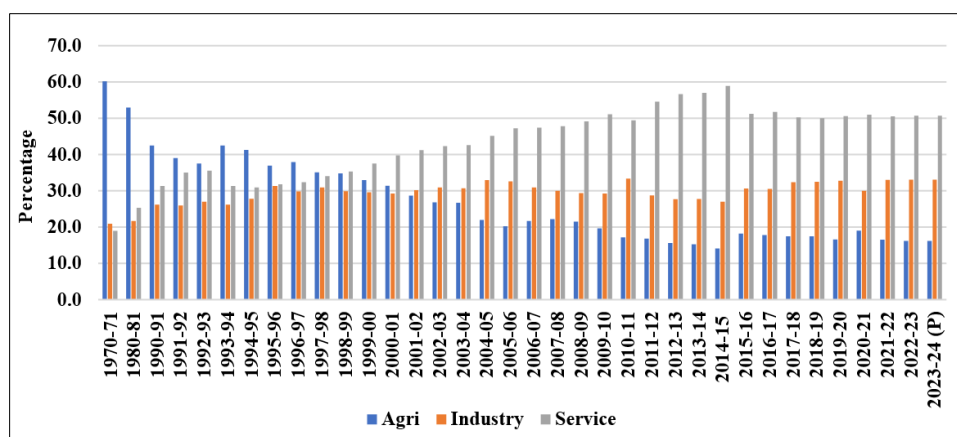


Fig 1: Contribution of Various Sectors in state's Economy

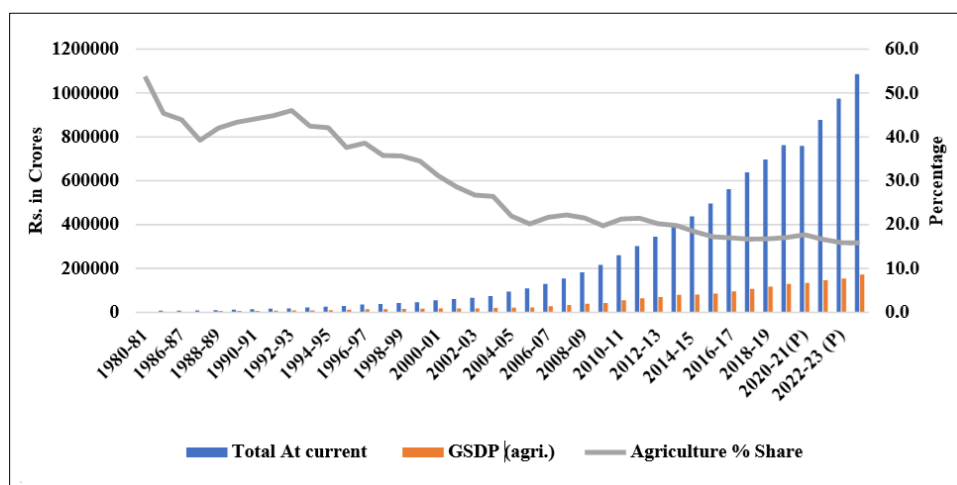


Fig 2: Status of GSDP and Agriculture Share to GSDP

Gross fixed capital formation

Capital formation has been a critical driver of Haryana's transformation. Gross Fixed Capital Formation (GFCF) considered as proxy for investment in infrastructure, machinery and productive assets inclined from ₹5462 crore in 1990-91 to ₹1.37 lakh crore in 2022-23 (Table 2), indicating long- term investment in economic activities. GFCF at current price witnessed quantum increase in first decade (2001-2011) of 20th century (390%) followed by gradual growth rate (129%) in 2020-21 and moderate growth

in last two years (2021-2023).

Public investment, particularly in agriculture & allied activities irrigation, road networks, power supply, special economic zones, industrial parks, communication and trade laid the foundation for inclusive growth. Simultaneously, private sector investments in real estate, infrastructure, automobiles, education, and healthcare have spurred growth and regional development in the state (ICRISAT, 2014; CABI, 2016) [13, 34].

Table 2: Gross Fixed Capital formation at current prices from 1970-71 to 2022-23

	Gross Fixed Capital Formation (₹ in crore)	Growth rate (%)
1990-91	5462.00	
2000-01	9335.04	71
2010-11	45698.00	390
2020-21	104865.00	129
2022-23	136668.00	30

Status of per capita income

Haryana has witnessed a steady upsurge in per capita income at current price (from ₹2,370 to ₹3, 19,363) over last four decades (1980-2024) broader economic growth and diversification, registering growth of 12.47 per cent per annum (Fig 3). CAGR of per capita income grew at more than 6 per cent throughout the study period (1970- 2023) both at

constant prices and current prices with overall CAGR of around 11.00 per cent at current prices and at constant prices. During the same period, the growth in per capita income of India also witnessed ranging from 1.14 per cent to 21.14 per cent with an overall CAGR of 12.19 per cent at current prices and 8.24 per cent at constant prices.

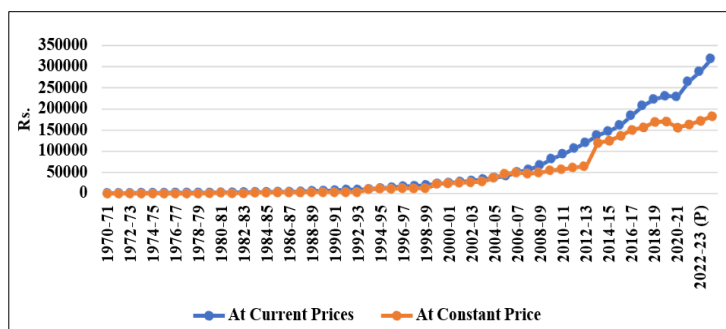


Fig 3: Status of per capita income in Haryana

Per capita income at constant price (₹1,82,816 and current price (₹3, 19,363) in Haryana was significantly higher than per capita income in the country at current price (₹1,08786) and constant price(₹1,88892) in 2023-24.

The quantum upturn in per capita increase growth attributed to increasing non-farm employment, industrial development and improvements in productivity across sectors and quantum jump in farm productivity (Goel, 2019; Sharon, 2023) [10, 34]. Despite this impressive progress, income disparities persist between urban and rural areas and across districts. Urban centres such as Gurugram, Rewari and Faridabad had benefited more from manufacturing hubs, IT sector, residential areas and proximity to Delhi, whereas rural hinterlands lagged in access to infrastructure, higher education and formal employment (Ahluwalia, 2002; Dholakia, 2003) [1, 8].

Labour wages for agricultural operations and skilled operations:

Wage growth for both agricultural and skilled labourers in Haryana has mirrored the rising income trends. Between 2004 and 2024, average wages per day for agricultural operations for male labourer increased from ₹101 to ₹565, with a CAGR of 9.40 per cent. These wages include payment for farm operations such as ploughing, sowing, weeding, cotton picking and harvesting. Similarly, skilled labour wages per day rose from ₹166 to ₹718 for blacksmiths and from ₹175 to ₹759 for carpenters, shimmering CAGRs of 7.82 and 8.32 percent, respectively (Fig 4).

The incremental increase in wages has not only improved income security for rural workers but has also contributed to reduced migration gravity and enhanced rural consumption (Chand *et al.*, 2017; Sharon, 2023) [7, 34]. However, seasonal wage volatility and gender disparities in employment opportunities still trigger contemporary challenges to equitable labour outcomes.

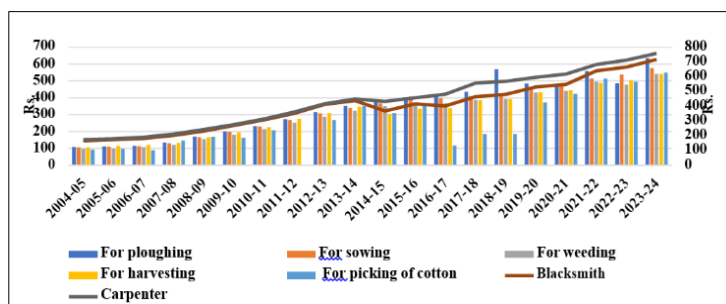


Fig 4: Average male wages payment for agricultural operations and skilled operations in Haryana

Population and occupation distribution of workforce

Haryana's population amplified more than doubled from 11.96 million in 1971 to over 25 million in 2011. The rural share of the population decreased from 82 per cent in 1971 to 65 per cent in 2011 underlining the state's growing

urbanization owing to job-opportunities. This demographic shift has been driven by migration, infrastructure expansion and reclassification of rural settlements into urban areas (Bhalla & Singh, 2009) [3].

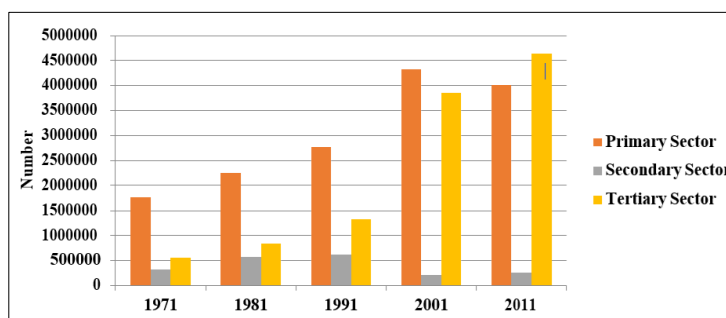


Fig 5: Occupation distribution of workforce in Haryana

The primary sector provided maximum employment opportunities to the workforce in 1971 by employing 17.69 lakh individuals sharing 66.65 percent of the total. The secondary sector accounted for 3.18 lakh individuals (11.99%) and the tertiary sector employed 5.67 lakhs individuals (21.36%), resulting in a total of 26.54 lakh individuals. The share of primary sector in employment of workforce decreased to 40.09 lakh individuals (44.96%). The secondary and tertiary sectors employed 2.62 lakh (2.94%) and 46.45 lakh (52.10%) individuals, respectively from total workforce of 89.17 lakh individuals in 2011. It is evident that number of tertiary sector in Haryana showed increasing trend for providing employment workforce during whole study period. Whereas, secondary sector showed increasing trend during initial 20 years (1971-1991) after that declining trend while in primary sector decline was observed after 2001s. Occupational changes also indicated progress in economic diversification. The proportion of the workforce employed in the primary sector declined, while engagement in secondary and tertiary activities climbed, particularly in construction, retail, transportation and services.

Rural transformation in Haryana

The rural economy in Haryana has undergone a multidimensional transformation driven by infrastructural improvements, policy support, and technological adoption. The transformation in rural areas is evaluated through various

indicators like literacy rate, educational infrastructure, road connectivity etc. Further, agriculture being main occupation of rural area in the state is assessed by various indicators like farm holding, farm machinery, irrigation devices, nutrient usage, access to credit, market infrastructure, storage for farm produce, cropping pattern, production. Productivity etc.

Literacy status and educational infrastructure

The total number of literate people in Haryana was 26.99 lakh in 1971 comprising of 56.50 per cent rural population and 43.50 per cent of urban population increased to 61.20 per cent of rural population and 38.80 per cent of urban population in 2011 (Fig 6). No doubt literacy rate both in male and female in urban area was higher however much progress also was achieved in rural area. Incremental increase was observed in educational institutes and at present 24866 schools (primary, middle and secondary), polytechnics (200), technical institutes (94), higher educational institutes like colleges (374) and universities (58). Within a radius of 20 Km of each village, one higher educational institute and polytechnic/industrial training institute is located with at least middle/higher school within village. Educational infrastructure growth in recent decade such as the increase in primary and middle schools, establishment of both public and private colleges, industrial training institutes and universities supported the development of human capital. (ICRISAT, 2014; CABI, 2016) ^[13, 34].

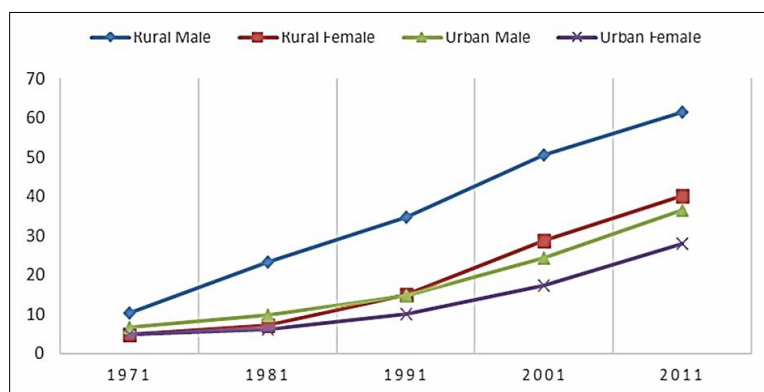


Fig 6: Literacy status in urban and rural area in Haryana

Haryana's literacy rate has significantly improved over the years due to targeted educational policies and initiatives. The improvements might be attributed to government programs promoting education, such as providing infrastructure, scholarships, and support for female education. These measures increased school enrollment and retention rates, contributing to higher literacy, particularly among rural females. Additionally, growing urbanization and economic development have emphasized the importance of literacy for economic opportunities, further boosting education. Service sector also created demand of skilled labour and ultimately favour promotion of education in the state.

Farm holdings: The total number of operational holdings increased 13.47 lakh (1985-86) to 15.65 lakh (2015-16) in Haryana (Fig 6). The distribution pattern showed a significant shift, with marginal holdings accounting for the highest share at 51.26 per cent, followed by small holdings at 20.06 per cent, semi- medium holdings at 13.74 per cent, medium

holdings at 9.92 per cent, and large holdings comprising only 5.02 per cent of the total (15.65 lakh) in 2015-16. This trend highlighted the continuing fragmentation of land due to population pressure and inheritance laws. The dominance of marginal and small holdings reflects a structural challenge in agriculture, affecting economies of scale and productivity (Chand *et al.*, 2011) ^[6].

Land use pattern, cropping intensity and irrigation intensity: Land use dynamics in Haryana have undergone notable transformations over the decades, reflecting shifts in agricultural intensity, urban expansion, and ecological balance (Sidhu *et al.*, 2020).. The total reported area has shown a steady decline, decreasing from 4,402 thousand ha in 1970-71 to 4,354 thousand ha in 2022-23 (Table 3). Land allocated for non-agricultural purpose increased over the period to expansion of infrastructure, residential areas, industrial units, IT sector and public amenities.

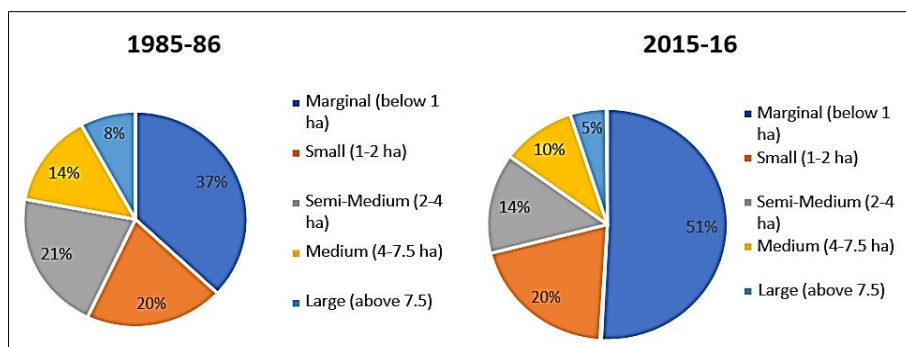


Fig 7: Number of farm holdings under different categories of farm in Haryana

Table 3: Land use pattern in Haryana (In 000'ha)

Year	Total area as village Papers	Forests	Net area sown	Cultural area	Total cropped area
1970-71	4402 (100.00)	99 (2.24)	3565 (81.20)	3813 (78.28)	4957 (103.23)
1980-81	4405 (100.00)	132 (2.99)	3602 (81.77)	3839 (86.61)	5462 (110.37)
1990-91	4378 (100.00)	169 (3.88)	3575 (81.85)	3792 (87.14)	5919 (129.08)
2000-01	4402 (100.00)	115 (1.02)	3526 (81.74)	3817 (86.51)	6115 (136.96)
2010-11	4370 (100.00)	39 (0.89)	3518 (81.50)	3681 (85.22)	6505 (145.33)
2020-21	4371 (100.00)	32 (0.73)	3611 (82.61)	3847 (88.01)	6528 (149.35)
2022-23	4354 (100.00)	31 (0.71)	3585 (82.33)	3951 (90.74)	6863 (157.62)

Note: Figures in parenthesis indicates percentage to total area

The net area sown increased slightly from 81.20 per cent to 82.33 per cent of total area in same period converting barren and problematic land for crop cultivation suggesting sustained reliance on agricultural land for livelihood and agriculture production.

Haryana's net irrigated area have expanded significantly over the decades due to manifold increase in number of tube wells from 1.04 lakh in 1970-71 to 8.37 lakh in 2023-24 (Fig 7). Irrigation infrastructure, especially tube well has been crucial, with diesel and electric pump sets growing at CAGRs of 3.68 and 2.99 per cent, respectively. Besides, solar pumps (1.55 lakh) have been installed up to March, 2025 as incentivised by state govt to reduce burden on thermal power generation for agriculture sector. Solar pump technology not only ensure irrigation water to crops but also 100% savings on fuel, zero carbon emissions and lower maintenance cost. By 2023-24, over 85 per cent of the net sown area was under irrigation underlining the expanded irrigation facilities.

The assured irrigation contributed to a rise in cropping intensity, which now exceeds 180 per cent, enabling multiple cropping and higher land productivity. However, these gains have also raised concerns regarding groundwater depletion and ecological sustainability (ICRISAT, 2014; Sharon, 2023) [13, 34]. Meanwhile, the total cropped area witnessed a

significant rise from 4,957 thousand ha (78.28%) in 1970-71 to 6,863 thousand ha (157.62%) in 2022-23, indicating cropping intensity of 191 per cent through multiple cropping in a year. The net irrigated area increased manifold from 1532 thousand ha in 1970 to 3360 thousand ha in 2020 indicating irrigation intensity of 193 per cent in last five and half decade. However, the area under forest cover declined substantially from 99 thousand ha (2.24%) in 1970-71 to 31 thousand ha (0.71%) in 2022-23, reflecting growing environmental concerns.

Nutrients and chemical usage, Farm mechanization and credit access for agriculture

The consumption of nutrients was 70.06 thousand tonnes in 1970-71 augmented to 1380.37 thousand tonnes in 2023-24 indicating significant upsurge in nutrient consumption. The consumption of nutrients per ha also increased manifold from 19.60 kg in 1970-71 to 430.40 kg in 2023-24 owing to diversion of area towards nutrient intensive crops like wheat, rice, cotton, sugarcane as well as usage of recommended dose etc. The usage of plant protection chemicals was 5164 tonnes in 1980-81 declined slightly to 4440 tonnes in 2023-24 due to cultivation of Bt-cotton, biotic stress tolerant varieties and adoption of IPM technology.

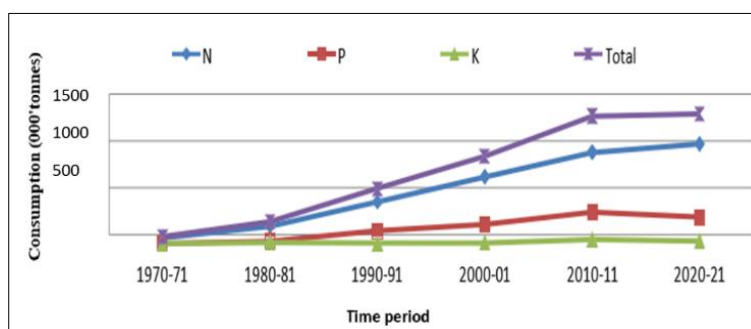


Fig 8: Status of consumption of nutrients in Haryana: 1970-2021

Mechanization of farm operations has advanced rapidly, as evidenced by steady upswing in the number of tractors and modern implements. The number of tractor has increased tremendously over period from 12 thousand to 3.30 lakh

during 1970-2024 (Fig.8) Tractor usage alone recorded growth rate of 5.88 per cent from 1970-71 to 2023-24, and a year-on-year increase of 10.58 per cent in 2023- 24.

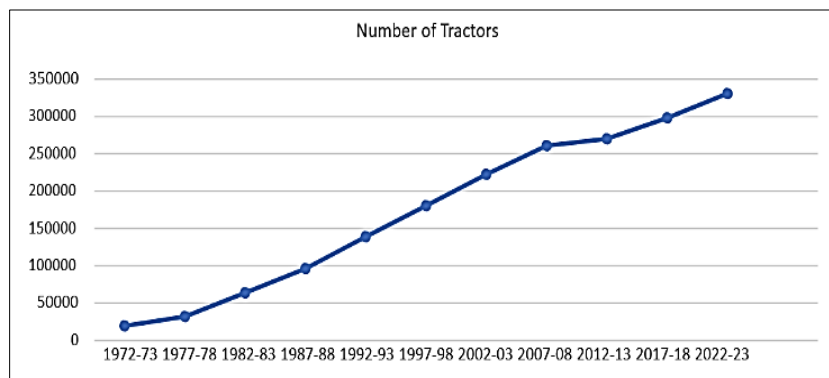


Fig 9: Number of tractors in Haryana

Better access to institutional credit at reasonable interest rate through PACS located in each village as well as a network of branches of Regional Rural Bank (697) private and commercial banks (5643) in the state played a key role in enabling farmers to invest in farm machinery and inputs (Chand *et al.*, 2017) ^[7].

The significant increase in nutrients and chemical usage as well as farm mechanisation revealed adoption of HYVs/hybrid, improved production and protection technologies in the state for attaining higher farm productivity. Timely availability and adequate amount of credit also triggered the use of modern inputs and latest farm technologies at field level.

Road connectivity, market infrastructure and storage for farm produce: Rural area is well connected with towns and cities in Haryana with metalled roads. Each village of the state is linked to adjoining villages as well as near towns or cities or regulated market with metalled roads. State has vast network of state and national highways along with rail connectivity to each district headquarter for timely reach and fast movement. The number of regulated markets showed tremendous increase and at present, 114 principal markets and 92 sub-yards are located in state for timely disposal of farm produce, ensuring price transparency and fair trade. At present 108 out of 114 regulated market connected with e-NAM portal. State has made an investment of 2,978.28 crores for roads and bridges sharing 15-94 percent of total capital expenditure in 2023-24 for smooth fast flow of transport and public vehicles. The road length enlarged from 11516 km to 32616 km in last five and half decade (1970-2024).

Storage infrastructure has also expanded rapidly in the state. At, present, total storage capacity of farm produce in the state comprising of FCI storage (11.63 lakh tonnes), State food & supply department (5.22 lakh tonnes), HAFED (22.62 lakh tonnes), State warehousing (16.64 lakh tonnes), central state warehousing (4.55 lakh tonnes) and privet Entrepreneur Grantee Scheme (PEGS) (34.02 lakh tonnes) is 104.37 lakh tonnes increased from 1.79 lakh in 1970-71 due to requirement of bulk storage of foodgrain to regulated supply for PDS, Mid-Day Program and Supplementary Nutrition Programme. Warehousing reduced post-harvest losses and enabled farmers to secure loans by using warehouse receipts as collateral often covering 75-80 per cent of the stored produce's value (Sharon, 2023) ^[34] as well as to harvest better prices in lean period. The development of regulated markets, cold storage facilities, and warehousing infrastructure has further improved agricultural value chains, reduced post-harvest losses and boosted farmer incomes (CABI, 2016) ^[34].

4.1 Area, production and productivity of principal crops

Haryana's agricultural landscape during the early Green Revolution period was characterized by a strong focus on food grain production, particularly wheat and rice (Kumar *et al.*, 2019) ^[16]. In 1970- 71, wheat dominated the cropping pattern, covering 11.29 lakh ha accounting for 22.77 per cent of the total cultivated area (4,957.00 thousand ha). Rice occupied 2.70 lakh ha contributing 5.43 per cent to the total (Table 4). Other crops cultivated in the state like pulses (23.37%), total food grains (78.02%), sugarcane (3.14%), cotton (3.89%), oilseeds (2.88%) and horticultural crops (0.70%).

Table 4: Status of area coverage under major crops in Haryana (000' ha)

Year	Wheat	Rice	Pulses	Total food grain	Sugarcane	Cotton	Oilseeds	Horticulture crops	Total cropped area
1970-71	1129.00 (22.77)	269.20 (5.43)	1158.90 (23.37)	3867.70 (78.02)	155.70 (3.14)	193.00 (3.89)	143.00 (2.88)	35.05 (0.70)	4957.00 (100.00)
1980-81	1479.00 (27.07)	484.00 (8.86)	794.80 (14.55)	3962.50 (72.54)	113.10 (2.07)	316.00 (5.78)	311.20 (5.69)	63.22 (1.15)	5462.00 (100.00)
1990-91	1850.00 (31.25)	661.00 (11.16)	742.00 (12.53)	4079.30 (68.91)	147.80 (2.49)	490.60 (8.28)	488.50 (8.23)	68.05 (1.14)	5919.00 (100.00)
2000-01	2355.00 (38.51)	1054.00 (17.23)	157.00 (2.56)	4335.00 (70.89)	143.00 (2.33)	555.40 (9.08)	414.00 (6.77)	181.11 (2.96)	6115.00 (100.00)
2010-11	2504.00 (38.49)	1243.00 (19.10)	175.60 (2.69)	4702.00 (72.28)	84.50 (1.29)	493.30 (7.58)	521.00 (8.01)	415.93 (6.39)	6505.00 (100.00)
2020-21	2564.00 (39.27)	1528.00 (23.40)	87.57 (1.34)	4595.14 (70.39)	99.00 (1.51)	739.60 (11.32)	671.57 (10.29)	417.85 (6.40)	6528.00 (100.00)
2022-23	2400.00 (36.55)	1777.70 (27.07)	57.00 (0.86)	4798.06 (73.08)	107.70 (1.64)	587.30 (8.94)	903.60 (13.76)	419.30 (6.39)	6565.00 (100.00)

Note: Figures in parenthesis indicates percentage to total area

The trend continued in subsequent years, with fluctuations in the area coverage under various crop. After 53 years (2022-23), area coverage under wheat improved to 24.00 lakh ha sharing 36.55% of total cropped area (6565.00 thousand ha) followed by rice (27.07%), pulses (0.86%), total food grain (73.08%), sugarcane (1.64%), cotton (8.94%), oilseeds (13.76%) and horticultural crops (6.39%). The area twisted towards wheat and rice due to evolution of HYVs, expansion of irrigation facilities, amount of risks involved and procurement at MSP by govt agencies. Sharp decline in pulses area was reported over years due to risk involved, low profitability and vulnerability to biotic and abiotic stresses. Area under high value crops also increased significantly over the period due to various initiatives and incentives of state government, increased domestic demand and changes in consumer dietary habit and export potential.

Haryana's agricultural production has undergone significant structural changes over the decades, driven by policy incentives, technological advancements, and market-oriented shifts in cropping patterns (Singh and Hooda, 2021) [22]. In 1970-71, the total agricultural output stood at 59.29 lakh

tonnes, with wheat contributing 39.50 per cent, rice 7.76 per cent, pulses 14.03 per cent, and total food grains accounting for 47.71 lakh tonnes or 80.47 per cent of the total production (Table 5). Other key contributors included sugarcane (11.92%), cotton (1.06%), oilseeds (1.67%), and horticultural crops (4.87%).

The overall growth in production attained 1.71 per cent in wheat followed by rice (3.46%), total food grains (0.01%), while minor positive growth in area under sugarcane (0.03%), cotton (0.05%) and oilseeds (0.77%) in same period. The incremental increase in production of wheat, rice, cotton, oilseeds and total horticultural crops was due to assured procurement at MSP, high yield potential and profitability, expansion of irrigation, shift in cropping pattern, govt missions, introduction of Bt cotton etc. Total agricultural production had risen significantly to 322.68 lakh tonnes in 2022-23. The share of wheat declined marginally to 34.76 per cent, while rice showed a substantial surge to 21.34 per cent. In contrast, the share of pulses declined sharply to 0.15 per cent, whereas oilseeds grew to 5.29 per cent of total production.

Table 5: Status of productivity of major crops in Haryana: 1970-2021 (Kg ha-1)

Year	Wheat	Rice	Pulses	Foodgrains	Sugarcane	Cotton	Oilseeds
1970-71	2074 (100.00)	1709 (100.00)	718 (100.00)	1234 (100.00)	4541 (100.00)	326 (100.00)	691 (100.00)
1980-81	2361 (13.75)	2601 (52.23)	632 (-11.94)	1523 (23.49)	4067 (-10.43)	345 (5.67)	604 (-12.56)
1990-91	3480 (47.43)	2775 (6.66)	730 (15.47)	2343 (53.83)	5277 (29.76)	400 (15.82)	1306 (116.19)
2000-01	4107 (18.02)	2557 (-7.84)	636 (-12.93)	3067 (30.88)	5713 (8.26)	423 (5.91)	1360 (4.12)
2010-11	4625 (12.62)	2788 (9.02)	872 (37.16)	3524 (14.89)	7150 (25.15)	602 (42.22)	1852 (36.20)
2020-21	4834 (4.53)	3690 (32.36)	880 (-4.83)	4039 (20.57)	8598 (20.53)	419 (-30.38)	1995 (8.45)
2022-23	4655 (-3.70)	3564 (-3.41)	853 (-3.07)	3945 (-2.33)	8598 (0.00)	438 (4.40)	1888 (-5.36)

Note: Figures in parenthesis indicate the percentage increase over previous.

The percentage increase in wheat productivity over previous year was highest in 1990-91 accounting to be 47.43 per cent over 1980-81, while rice recorded a substantial rise to 52.23 per cent in first decade. However, pulses and oilseeds experienced decline of 11.94 per cent and 12.56 per cent, respectively during 1970-71 to 1980-81.

The growth rate in productivity was 6.99 per cent in rice followed closely by pulses (3.67%), wheat (2.98%) and total food grains (2.96%), while sugarcane experienced negative growth of 2.47 per cent in first decade (1970-1980). The growth in productivity of oilseeds in last five decades (1970-2021) was recorded to be 2.73 per cent followed by wheat (2.07%), sugarcane (1.63%), cotton (1.32%), pulses (1.30%), rice (1.00%) with growth of 2.89 per cent in total food grains. The productivity of rice and wheat crops touched either at highest level or next to productivity level in Punjab while in case mustard & rapeseed (17.01 qtls ha -1) next to Gujarat (19.66 qtls ha -1)

Milk production and health Infrastructure for animals

Murrah buffalo is well known breed of buffalo in Haryana. The number of buffalo increased from 19.30 lakh to 43.68 lakh in last four decades (1980-2024). The milk production in the state has registered octuple upsurge from 211.80 lakh litres in 1980-81 to 2088.03 lakh litres in 2023-24. State has adequate number of milk plants (06) with capacity of 9.45 lakh litres coupled with 16 milk chilling centres having capacity of 7.16 lakh litres for collection, preservation, distribution and production of milk and milk based products.

Over the past two decades (2005-2024), the number of government veterinary hospitals (GVHs) and dispensaries (GVDs) in Haryana grown at CAGR of 1.73 and 1.82 per cent, respectively. This reflected the state's priority for keeping sound health of livestock to support farming community for encouraging rearing of animals as supplementary activity in addition to crops cultivation. Improved veterinary services have enhanced animal health, dairy productivity, and supplementary rural income (Sharon, 2023) [34].

Conclusion and policy implications

The results offers a comprehensive analysis of Haryana's agrarian transformation over the five-decade period (1970-2023) reflecting significant structural, technological and institutional changes in state's agricultural economy. GSDP showed an exponential rise, increasing from ₹1.00 thousand crores in 1970-71 to ₹958.39 thousand crores in 2023-24 at current prices, indicating robust economic growth. Per capita income at current prices also showed substantial improvement, reflecting higher economic well-being, rising from ₹2,370 in 1980-81 to ₹3.19 lakh in 2023-24.

Moreover, socio-economic indicators improved significantly. Literacy rate in Haryana rose substantially in rural area from 15.25 lakh (56.50%) literates in 1971 to over 101.58 lakh literates (61.20%) in 2011. Workforce composition also shifted dramatically, with the tertiary sector surpassing the primary sector in employment share. Area under cultivation slightly inclined, but total cropped area and irrigation

coverage increased, indicating a shift towards intensive crop cultivation. The cropping pattern showed diversification with expansion in area under wheat, rice, oilseeds and horticulture crops, and sharp decline in pulses. Adoption of mechanization of farm operations and improved production and protection technologies was evident from the sharp increase in tractors, irrigation devices, fertilizers and plant protection chemicals consumption. The number of regulated markets, connectivity with metalled roads and expanded storage capacity, along with considerable growth in milk production, indicating improved agri-infrastructure and allied sectors performance. Despite declining forest cover and rising input dependence, state's agriculture moved towards commercialization and integration with markets. The findings suggest a pressing need for climate-resilient strategies, balanced input use, investment in high-value crops and policy support for smallholders and farm mechanization to ensure sustainable and inclusive growth in the coming decades.

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