ASEAN Journal of
Economic and Economic Education

Journal homepage: https://ejournal.bumipublikasinusantara.id/index.php/ajeee

Economic Transformation in the Amrit Kaal Era: Public–Private Investment, Structural Shifts, and India's Growth Trajectory (1950–2022)

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ABSTRACT

India's long-term development vision, articulated under the Amrit Kaal strategy (2022–2047), positions economic transformation as a central pillar for achieving Viksit Bharat @2047. This paper examines the historical and strategic evolution of India's economy from 1950 to 2022, with a focus on the role of public and private investment in driving structural shifts in GDP composition, employment, infrastructure, and productivity. Using a qualitative-descriptive approach grounded in macroeconomic indicators and government reports, the study analyzes key growth trends across multiple phases of economic development. Results reveal significant expansion in GDP, infrastructure capacity, and workforce integration, though private sector participation has declined in recent years. The findings emphasize the need for enhanced policy coherence, de-risking of infrastructure investment, and cross-sectoral collaboration to unlock long-term growth. The paper concludes that India's economic success in the Amrit Kaal era depends on balancing state leadership with private sector dynamism, aligned with the Sustainable Development Goals (SDGs).

ARTICLE INFO

Article History:
Submitted/Received 20 May 2025
First Revised 25 Jun 2025
Accepted 30 Aug 2025
First Available online 31 Aug 2025
Publication Date 01 Sep 2025

Keyword:
Amrit kaal,
Economic transformation,
Insfractructure development,
Public-private investment,
Sustainable growth.

1. INTRODUCTION

India's economic development since independence has been characterized by a series of structural transformations, guided by shifting policy frameworks, institutional reforms, and global integration (Dash, 2016). From a primarily agrarian economy in 1950, India has emerged as one of the world's fastest-growing major economies. Agriculture is one of the effective sectors that can increase economic conditions. That is the main reason many reports regarding agricultural points have been well-documented (**Table 1**). Yet, the country continues to face persistent challenges such as income inequality, infrastructure deficits, investment gaps, and uneven productivity across sectors (Reena, 2020). Addressing these issues requires a strategic, long-term vision that integrates growth with sustainability and inclusion (Singh, 2024).

In response to this imperative, the Government of India launched the Amrit Kaal initiative in 2022, outlining a 25-year roadmap toward national development by 2047, the centenary of India's independence. This framework, aligned with the Viksit Bharat @2047 vision, identifies eight key growth pillars (including infrastructure development, energy transition, innovation, and private sector participation) as foundational to India's next stage of economic transformation. Within this context, public and private investment play a critical role in shaping productivity, employment, and the modernization of economic systems (Muthu, 2017).

Table 1. Previous studies on agriculture.

No	Title	Ref
1	High unemployment records of graduated students in the development of urban agriculture in the Gaza Strip	(Al-Najar *et al*., 2019)
2	Pollutant emissions from brick kilns and their effects on climate change and agriculture	(Asif *et al*., 2021)
3	Development of a solar-powered submersible pump system without the use of batteries in agriculture	(Bhosale, 2022)
4	Food security strategy through regenerative agriculture for capacity building of farmers with "integrated nutrient management training program"	(Febriani & Pasaribu, 2024)
5	Green skills understanding of agricultural vocational school teachers around West Java Indonesia	(Handayani *et al*., 2020)
6	Influence of ICT availability, accessibility, and utilization on agriculture students' academic performance in universities	(Makinde *et al*., 2023)
7	Biochar from agricultural waste for soil amendment candidate under different pyrolysis temperatures	(Mutolib *et al*., 2023)
8	How to purify and experiment with dye adsorption using carbon: Step-by-step procedure from carbon conversion from agricultural biomass to concentration measurement using UV Vis spectroscopy	(Nandiyanto *et al*., 2023)
9	Scientific research trends of flooding stress in plant science and agriculture subject areas (1962–2021)	(Nurrahma *et al*., 2023)
10	Agricultural wastes as a source of silica material	(Permatasari *et al*., 2016)
11	Techno-economic evaluation of the production of resin-based brake pads using agricultural wastes: Comparison of eggshells/banana peels brake pads and commercial asbestos brake pads	(Ragadhita *et al*., 2023)

Table 1 (continue). Previous studies on agriculture.

No	Title	Ref
12	Characteristics of jengkol peel (Pithecellobium jiringa) biochar produced at various pyrolysis temperatures for enhanced agricultural waste management and supporting sustainable development goals (SDGs)	(Rahmat *et al*., 2025)
13	Contributing factors to greenhouse gas emissions in agriculture for supporting sustainable development goals (SDGs): Insights from a systematic literature review completed by computational bibliometric analysis	(Soegoto *et al*. 2025)
14	Microwave pyrolysis of agricultural and plastic wastes for production of hybrid biochar: Applications for greener environment	(Sridevi *et al*., 2024)
15	Production and characterization of briquettes from agricultural wastes for sustainable energy solutions	(Umar *et al*., 2025)

Over the decades, India has witnessed significant shifts in macroeconomic indicators. Between 1950 and 2022, the country's GDP (in constant 2011-2012 USD) expanded from USD 64 billion to USD 1.8 trillion, while infrastructure capacity and industrial output have multiplied. However, recent trends indicate a decline in private sector participation in key areas such as infrastructure investment, even as public capital expenditure has increased. This trend raises concerns about long-term sustainability, especially given India's ambitious targets in areas such as renewable energy, digital connectivity, and logistics.

Despite these challenges, the Amrit Kaal period presents a timely opportunity to reconfigure India's economic model. By leveraging strategic investments, reforming regulatory frameworks, and enhancing institutional capacity, India can catalyze growth that is not only higher in volume but also more inclusive and resilient (Garg, 2023).

This study aims to assess India's economic trajectory through the lens of Amrit Kaal, focusing on the historical evolution of investment patterns, infrastructure development, and structural shifts in output and employment. The novelty of this paper lies in its longitudinal approach (spanning over seven decades) and its emphasis on harmonizing state-led initiatives with private sector dynamism to meet the Sustainable Development Goals (SDGs) by 2047.

2. METHODS

This study employed a qualitative-descriptive research design to analyze India's economic transformation within the framework of the Amrit Kaal strategy. Rather than relying on primary data or econometric modeling, the research is based on the systematic review and interpretation of secondary data sources, including macroeconomic indicators, policy documents, and government reports.

The primary sources of data include:

(i) National accounts and workforce statistics from the Ministry of Statistics and Programme Implementation (MoSPI),
(ii) Budget speeches and capital expenditure trends from the Ministry of Finance,
(iii) Strategic documents such as the Union Budget 2023-2024, Working Papers published by NITI Aayog, and the National Infrastructure Pipeline,
(iv) Sectoral investment data from the Reserve Bank of India and relevant industry publications.

In addition, scholarly literature on public–private investment dynamics, structural transformation, and infrastructure development was reviewed to support the interpretation

of trends and provide theoretical grounding. The reference period spans from 1950 to 2022, allowing for a longitudinal understanding of India's economic evolution across multiple phases: pre-liberalization, post-reform, and post-pandemic recovery.

The study applies thematic content analysis to synthesize patterns across time, focusing on variables such as:

(i) GDP growth and sectoral composition,
(ii) Public and private capital formation,
(iii) Labor force participation and sectoral shifts,
(iv) Infrastructure capacity indicators (e.g., highway length, power generation, digital density),
(v) Investment distribution trends by government level and sector

Tables and figures (particularly **Table 2**, which presents long-term macroeconomic trends) are used to support key insights. The analysis is further structured around the eight strategic pillars of Amrit Kaal, especially those relating to economic and infrastructure reform.

While the study does not involve empirical hypothesis testing, it provides a policy-relevant synthesis that can inform future investment strategies, fiscal planning, and development programming during India's transition to a developed economy.

Table 2. Long-term trends in agriculture and economy (1950–2022).

Indicator	Unit	1950-1951	2021-2022	Increase (times)	Compound Growth Rate (%)
Population	Million persons	359	1,369	3.81	1.90
Food production	Million tonnes	106	936	8.83	3.12
Agricultural output	Constant 2011–12 USD (billion)	39	280	7.27	2.83
Total economy (GDP)	Constant 2011–12 USD (billion)	64	1,800	28.44	4.83
Agricultural workers	Million persons	97	250	2.58	1.34
Total workers	Million persons	139	543	3.87	1.92

3. RESULTS AND DISCUSSION

3.1. Long-Term Structural Shift in India's Economy (1950-2022)

India's economic journey since independence has been marked by substantial structural transformation across demographic, agricultural, and macroeconomic indicators. Between 1950-1951 and 2021-2022, the country experienced a population surge from 359 million to 1.37 billion, representing a 3.81-fold increase. This demographic expansion was accompanied by significant improvements in agricultural productivity and economic output, as shown in **Table 2**. This table illustrates that while GDP expanded by more than 28 times, the agricultural sector experienced a relatively slower growth in output (7.27x), even though food production rose 8.83 times. In parallel, the labor force in agriculture expanded only modestly (2.58x), reflecting both increased productivity and a gradual shift in employment patterns toward industry and services. The compound growth rate of GDP (4.83%) notably outpaces that of agriculture (2.83%), suggesting a diversification of the economic base over time.

These dynamics point to a structural shift in India's economy, from agrarian-led growth toward a broader industrial and service-based model. However, the continued reliance of over 250 million workers in agriculture reveals lingering productivity gaps and underemployment in rural areas.

3.2. Sector Growth Trajectories Across Development Phases

To better understand India's economic evolution, it is helpful to divide it into distinct phases of agricultural and sectoral growth, each reflecting different policy priorities, technological interventions, and institutional reforms. **Table 3** presents growth rates for key subsectors across seven historical periods.

Table 3. Sectoral growth rates across economic phases (1950–2021).

Subsector/ Segment	Pre-Green Rev.	Food Crisis	First Green Rev.	Limited Green Rev.	Diversification	Globalization	BGRI & Exports
Crop sector	3.09%	0.78%	2.19%	–0.01%	2.88%	1.60%	2.55%
Fruits & vegetables	0.96%	6.15%	5.43%	1.96%	3.25%	2.86%	4.53%
Other crops	3.36%	0.09%	1.65%	–0.41%	2.81%	1.27%	1.91%
Livestock	1.45%	0.49%	2.70%	4.45%	4.41%	3.44%	5.36%
Fishery	5.43%	4.25%	4.34%	0.54%	6.12%	2.90%	7.10%
Forestry	0.68%	4.25%	2.03%	–4.51%	0.20%	1.64%	1.53%
Total (1–4)	**2.29%**	**1.61%**	**2.27%**	**–0.24%**	**2.88%**	**2.07%**	**3.44%**

The Green Revolution period (1967-1975) marked a significant increase in yield for wheat and rice, particularly in resource-rich states. However, the benefits were regionally concentrated, and growth stagnated during the subsequent phase (1975-1980), with total output declining by approximately 0.24%. The Diversification phase (1979-1997) reignited momentum, especially in livestock, fruits, and fisheries, subsectors that later outperformed traditional crop production. Notably, during the post-2005 BGRI era, livestock and fisheries recorded annual growth rates of 5.36 and 7.10%, respectively. These trends indicate a fundamental shift within Indian agriculture, from cereal-dominated systems to high-value production supported by export potential, urban demand, and improved cold-chain logistics (Ashrit, 2023). This transition aligns with the Amrit Kaal vision of transforming Indian farms into diversified, value-adding enterprises capable of serving both domestic and global markets. However, realizing the full potential of high-value agriculture also requires enabling institutional conditions and policy reforms to attract private investment in farm infrastructure, agriprocessing, and logistics (Nagarathna, 2024).

3.3. Infrastructure Investment and Capital Formation Trends

Infrastructure development is one of the cornerstone pillars of the Amrit Kaal strategy, as it enables sectoral integration, supports productivity, and stimulates employment across both urban and rural regions. Over the last decade, India has witnessed accelerated investment in physical infrastructure, particularly through increased capital expenditure (capex) by the central government. This evolution is outlined in **Table 4**, which captures India's progress from 2013 to 2023 and its projections for 2030. The data demonstrate the rapid expansion of physical infrastructure, notably in national highways, renewable energy, metro rail systems, and power generation capacity. Central capex allocation to infrastructure rose from 0.5 to 2.2% of GDP between 2013 and 2023, indicating a strategic shift toward state-led growth financing. Metro operations have expanded nearly fourfold, and renewable energy capacity has increased nearly sixfold in a decade, with ambitious projections for 2030.

While these figures reflect significant progress, they also underscore the increasing fiscal burden on the central government. Sustaining this trajectory will require effective public–

private coordination, risk mitigation in project execution, and regulatory reform to attract private capital (Reena, 2020).

3.4. Decline in Private Sector Investment: A Structural Concern

Despite policy enthusiasm for public–private partnerships (PPPs), recent trends indicate a sharp decline in private investment participation in infrastructure projects. **Table 5** presents the comparative shares of capital formation across central, state, and private actors over three investment periods.

Between 2009-2013, the private sector accounted for nearly half (46.4%) of infrastructure investments. However, its share has steadily declined to just 7.2% in the 2019-2023 period. In contrast, the central government's share has more than tripled over the same timeframe (Reena, 2020). This reversal indicates an over-reliance on public funds, potentially crowding out private participation (Dash, 2016).

Several factors have contributed to this downturn in private investment (Muthu, 2017):

(i) Project execution risks and cost overruns,
(ii) Regulatory delays in land acquisition and environmental clearances,
(iii) Weak dispute resolution mechanisms, and
(iv) Limited availability of long-term financing instruments.

These constraints have led to waning investor confidence, especially in toll-based infrastructure models such as highways and urban transit. Even where PPP frameworks exist, risk-sharing arrangements remain skewed toward the private party, discouraging participation in capital-intensive sectors.

To reverse this trend, India must restructure its PPP model by:

(i) De-risking infrastructure projects through sovereign guarantees or blended finance,
(ii) Establishing dedicated dispute resolution tribunals,
(iii) Expanding infrastructure investment trusts (InvITs), and
(iv) Streamlining approval processes through digital single-window systems.

Moreover, state governments, which now handle almost half of capital investments (48.9%), require technical and financial support to improve project appraisal, contract enforcement, and fiscal transparency.

Taken together, **Tables 4** and **5** demonstrate a clear paradox: while infrastructure expansion is accelerating under public leadership, private sector disengagement poses a long-term risk to sustainability, efficiency, and innovation in infrastructure delivery.

Table 4. Infrastructure indicators: Past, Present, and Future projections (2013-2030).

Indicator	2013	2023	2030 (Projected)
Central government capex allocation to core infrastructure (% of GDP)	0.5	2.2	–
Length of national highways (km)	97,991	146,145	~200,000
National highways construction per day (km)	12	34	–
Modernization of railways: operation of Vande Bharat trains	–	100+	800
Length of operational metro (km)	248	945	1,595
% of cargo transshipment handled by Indian ports	–	25	75
Power generation (GW)	243	442	1,100
Renewable power (GW)	30	175	500
Teledensity (% of population)	75.23	85.69	NA
Electric vehicle charging stations (units)	–	–	3.9 million

Table 5. Trends in capital investment by sector (2009–2023).

Year	Centre (%)	State (%)	Private (%)
2009–2013	14.6	39.0	46.4
2014–2018	28.3	62.9	8.8
2019–2023	44.7	48.9	7.2

3.5. Digital Economy, ICT Exports, and Innovation Capacity

India's digital economy has emerged as a critical driver of growth in the Amrit Kaal period, offering scalable solutions for service delivery, entrepreneurship, and financial inclusion. The exponential rise in mobile penetration, internet usage, digital payments, and innovation ecosystems has placed India among the global leaders in key digital indicators. **Table 6** summarizes India's current standing in core components of the digital economy.

Table 6. India's digital economy and global position (as of 2024).

Component	Description
Mobile subscriptions	Of the latest estimated 8.36 billion mobile cellular subscriptions worldwide, 1.14 billion are in India (second only to China).
Internet traffic	India ranks third globally with 16.0 GB of average monthly data usage, after Saudi Arabia and Russia.
5G deployment	India became the second-largest market for 5G smartphones in Q1 2024, behind China.
Digital identity	Over 1.3 billion biometric Aadhaar IDs have been issued as of January 2024.
Digital payments	More than 1,644 billion digital transactions were recorded in FY 2023–24, the highest volume globally.
ICT service exports	India ranked second globally in ICT service exports in 2023, with USD 162 billion, just behind Ireland (USD 236 billion).
AI projects	India led globally in contributions to AI projects on GitHub (23%), ahead of the US (14%).
Unicorns	As of April 2024, India had the third-highest number of homegrown unicorns, after the US and China.

These figures reflect India's transition from a technology consumer to a global digital innovator. Government programs such as Digital India, India Stack, and the Unified Payments Interface (UPI) have laid a strong foundation for this transformation (Smita, 2023). With over 1.3 billion digital IDs and a growing number of startups, India is well-positioned to expand its presence in fintech, healthtech, agritech, and edtech markets.

The contribution of the ICT sector to GDP and exports is also significant. In 2023, India's ICT services exports reached USD 162 billion, becoming the second largest in the world. This not only strengthens India's external account but also diversifies its export base beyond traditional goods. Moreover, India's leadership in AI development, with 23% of global GitHub contributions, underscores its innovation potential. However, this growth has also revealed structural constraints:

(i) Digital divide across rural-urban and gender lines,
(ii) Inadequate data protection laws,
(iii) Limited availability of deep-tech venture capital, and

(iv) Uneven distribution of tech clusters beyond major metros.

To fully leverage the digital economy for inclusive growth, the following policy areas require attention:

(i) Expanding rural digital infrastructure through BharatNet and satellite internet,
(ii) Strengthening data governance frameworks (e.g., Personal Data Protection Bill),
(iii) Fostering innovation ecosystems in Tier 2 and Tier 3 cities, and
(iv) Linking digital skilling initiatives with industry demand (e.g., through Skill India Digital and NDEAR platforms).

India's robust digital infrastructure also opens pathways for efficiency gains in governance, real-time agricultural advisories, smart logistics, and green technology adoption, all of which are central to Amrit Kaal goals.

By integrating digital tools with physical infrastructure and public services, India can accelerate the shift toward a high-productivity, service-driven economy. This digital-led transformation complements traditional sectors and enhances resilience to external shocks, including pandemics and climate-related disruptions (Garg, 2023).

4. CONCLUSION

This study analyzed India's economic transformation under the Amrit Kaal framework, focusing on structural shifts in output, employment, infrastructure, and investment from 1950 to 2022. The findings highlight a remarkable expansion in GDP and infrastructure capacity, accompanied by a gradual sectoral shift from agriculture to services and digital innovation. Public investment has emerged as the main engine of growth in recent years, particularly in infrastructure, renewable energy, and digital connectivity. However, the declining share of private sector participation raises concerns about long-term sustainability, innovation capacity, and financing gaps. Addressing these issues requires reforming public–private partnership models, streamlining approvals, and fostering a stable investment climate. India's strong performance in digital identity, payments, ICT exports, and AI innovation reflects its transition toward a knowledge-based economy. Yet, this momentum must be supported by inclusive policy design, bridging digital divides, and strengthening subnational governance. Achieving the Viksit Bharat @2047 vision will depend on harmonizing state-led initiatives with private sector dynamism, backed by coordinated investment, smart regulation, and sustained institutional capacity aligned with the SDGs.

5. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. Authors confirmed that the paper was free of plagiarism.

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