



AI in Agriculture, Industry and Services

Laxmi. B. Desai

Department of Economics, Guest Lecturer, New Arts College Tikota, Vijayapur.

Email:Prvdplaxmanprvdp@Gmail.Com

DOI : <https://doi.org/10.5281/zenodo.20056909>

ARTICLE DETAILS

Research Paper

Accepted: 04-04-2026

Published: 18-04-2026

Keywords:

Indian economy, AI, Agriculture sector, Industry sector, and Service sectors.

ABSTRACT

Artificial Intelligence is a key to boost the economy through productivity, manufacturing, and financial services. Artificial intelligence is changing the managerial and economic landscape of India. AI offers sustainable growth benefits like resource optimization and automation. It also looks into the development of new business models, improved decision-making, and widespread tasks. AI recognizes the need to address talent gaps and ethical issues. AI-powered systems such as machine learning and the Internet of Things help in collecting data and analyzing situations across agriculture, industry, and service domains. The growth that AI presents requires strategic policy interventions and immense opportunities for sustainable development.

Introduction:

Artificial Intelligence refers in recent years to the simulation of human intelligence in machines that are programmed to learn, think, and decision-making. AI contributes up to billions to India's GDP in future years. In India, AI is the key to economic transformation from a traditional to a modern economy. As we know, India is the fifth largest economy in the world. Agriculture take place as a primary sector industry takes place of secondary sector and lastly services as a territory sector all of the above three sectors contributed in various percentage to the economic growth and development in Indian economy is influence into all the three sectors through reducing the costs enableing data and improving efficiency.



India is the fifth largest economy in the world. where as agriculture is the main source of income. India is a developing country we look at the future Outlook projected to become the third largest economy by 2030.

Key features of Indian economy:

1. India combines both public and private sector.
2. Developing economy.
3. Agriculture dependency.
4. Service sector place a major role.
5. Large population.
6. Unemployment.
7. Income inequality.
8. Regional disparities.
9. Economic reforms.
10. Lack of infrastructure facilities.

Agriculture Sector without AI:

Aspect	Without AI
Resource Use	inefficient
Cost	higher labor cost
Accuracy	Lack in accuracy
Decision Making	Based on farmer’s experience
Productivity	Low productivity.
Labor	Manual labor-intensive
Pest Control	Traditional methods
Irrigation	Not optimized
Risk Management	High risk due to uncertainty

Industry without AI:

Aspect	Without AI
Flexibility	Less adaptable to change



Quality Control	Manual inspection
Cost	Lower tech cost,
Data Usage	Minimal
Innovation	Slow technological adoption
Error Rate	Higher chances of human error
Labor	Labor-intensive
Decision Making	Based on human experience and judgment
Productivity	Moderate to low

Service Sector Without AI:

Aspect	Without AI
Availability	Limited to working hours
Personalization	Limited
Innovation	Slow adoption of new technology
Data Usage	Minimal
Cost	Higher labor cost
Accuracy	Chances of human error
Customer Interaction	Face-to-face or phone-based
Service Delivery	Manual and human-based
Speed	Slower service delivery

Benefits of AI in agriculture:

1. Management: AI manages the forming and resource management of input usage reduce water consumption through the irrigation facilities and necessary uses of fertilizers where it needs.
2. Monitoring :AI monitoring the crop health and soil health through the computer vision and sensors analyses and detecting the symptoms of nutritional diseases to they become critical.
3. Analytics and estimation: AI estimates and anlyse weather, soil, historical Trends, crop yield, to find market demand and farmers optimising planting schedules through predictive analytics and yield estimation.



4. Sustainability: Chemical waste and optimisation of inputs AI has the sustainability.
5. Livestock management: by the system track formers identify sick animals early and improve it through the health location and feeding patterns.

Challenges:

1. High cost: AI includes the technology like Drone or automated machinery. these are unaffordable for average or small scale formers in India. because India have high percent of small scale formers so AI is very challenged to operate for the farmers.
2. Scarcity of data: AI requires accurate data. but getting the data on crops climate soils in farming environments is a major problem.
3. Four digitalization: Lack of Internet connectivity And necessary hardware electricity in rural areas Ai not driven the digital tools.
4. Lack of Technical skill: AI is depend upon the technological aspect. in India many farmers do not have the appropriate knowledge about technology to trust, analyse, and operate the AI system.
5. Small scale formers: in India there is a small and scattered forms in many region. it is a hurdle to implement automated Precision agriculture solution.

AI benefits in industry

1. Increased productivity: AI perform task faster and accurately through machines and automation systems.
2. Reduction of cost: By minimising waste and optimising resource use and reducing the manual labour AI helps Industries reduces the maintenance cost very effectively.
3. Quality products: AI improves customer satisfaction and global competitiveness through detecting the defects and maintenance the consistents in production.
4. Decision making: AI analyse the data to make the industries can focused demand and supply chains efficiently.
5. Employment opportunities: AI create employment opportunities like machine learning, robotics , and data science to reduce traditional job system.

Challenges:

1. Data availability issues: In India Industries faces the problems like poor quality data, Unstructured, or incomplete data. Where as AI is depend On high and quality And accurate data.



2. The risk of Cyber attacks: in India there is a weak data protection frame or its leads to Cyber attack and not to protecting sensitive industrial data and customers data.
3. Lack of awareness: many Industries due to fear of job loss. they don't want to adopt AI. and lack of awareness about what is the importance of AI in creating the job opportunity in Indian economy.
4. Lack of infrastructure: many parts of India like rural or semi urban areas there is a lack of reliable internet and necessary digital infrastructure.it is a challenge of basic needs of AI.
5. Job displacement: replace Of manual and low skilled jobs whereas In India lot of Labours are not properly skilled.

AI benefits in services:

1. Better customer service: to support customer in banking sector ,telecom sector ,and e-commerce with quickly response and reduce the waiting time to customer satisfaction AI plays better role.
2. Efficiency: in AI there is a task of data entry scheduling and customer queries To focus on increase the efficiency and Creative task.AI works very efficiently.
3. Growth of Digital Services: through software development and Data Analytics services benefits to strengthens India's position in global level.
4. Improve access to quality education: by offering personalised learning experience virtual tutors and smart assessment and e learning education across India
5. Inclusive financial growth :through AI mobile payments, digital banking, and Micro Finance services reach rural and unwanted population in the economy.

Challenges:

1. Lack of skilled labour: in India there is a lack of Technical skillrackers to operate AI Tools and techniques this creating mismatch between reskilling and upskilling.
2. High implementation of cost: in small and medium scale industries struggle to afford investment in expensive Infrastructures software development and training the employees.
3. Digital divide:in india there is a limit of adoption Internet connectivity, technical education, and digital infrastructure in rural and undeveloped regions.its seems like the digital divideness.
4. Legal issues: in Ai there is a challenge like legal liability, clear AI policy, and data protection laws. it's created the uncertainty and legal issues.
5. Dependence on technology: AI depends upon More than Machineries on behalf of humans .It can lead to system failure.and affecting services also decrease human judgement .

**Conclusion:**

AI driven technologies have significantly enhanced agricultural productivity through resource management, Real-Time decision making ,increase deficiency, Smart manufacturing, Low cost .Ai has also highlighted the importance of strategic policy intervention investment in training and a technological Frameworks for development. Ai reshape the structure and functioning The agricultural sector, industry sector, and service sector.

References:

- Economic Survey of India.” *Government of India*, Ministry of Finance, 2024.Hossen, Md. Ismail, et al. “Artificial Intelligence in Agriculture: A Systematic Literature Review.” *Turkish Journal of Computer and Mathematics Education*, 2023.
 - “Artificial Intelligence Research in Agriculture: A Review.” *Online Information Review*, 2022.
 - Siddiqui, Arbaz, et al. “AI for Agricultural Market Forecasting and Farmer Empowerment.” *International Education and Research Journal*, 2025.
 - “National Strategy for Artificial Intelligence.” *NITI Aayog*, Government of India, 2018.
 - “Artificial Intelligence in Manufacturing: A Review.” *Journal of Industrial Information Integration*, 2022.
 - “Artificial Intelligence and Its Impact on Industrial Development in India.” *International Journal of Engineering Research and Technology*, 2023.
 - Varalakshmi, Ch., et al. “The Impact of Artificial Intelligence on the Indian Economy.” *Journal of Informatics Education and Research*, 2024.
 - Jain, Prisha. “Research Paper on Impact of Artificial Intelligence on Banking Sector.” *SSRN*, 2024.
 - Singh, Prashant Kumar. “AI and the Future of Employment in India’s IT and BPO Industry.” *International Journal for Multidisciplinary Research*, 2025.
 - World Bank. *India Development Update*. World Bank, 2024.
 - “Digital India Programme.” *Government of India*, <https://www.digitalindia.gov.in/>
- “Make in India Initiative.” *Government of India*, <https://www.makeinindia.com/>