

Economic Impact of Artificial Intelligence on Unorganized sector in India

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Abstract

This paper examines the economic impact of Artificial Intelligence (AI) on the unorganized (informal) sector in India, with a specific focus on road transportation, construction, and agriculture—three sectors that together contribute significantly to employment and GDP. Drawing on secondary data, policy documents, and comparative case studies from 2018-2025, the study analyses how AI-driven technologies such as autonomous vehicles, AI-enabled logistics platforms, 3D printing in construction, and smart agricultural machinery are transforming production processes and labour demand. While AI adoption improves efficiency, productivity, safety, and income prospects for capital owners and technologically equipped firms, it simultaneously threatens large-scale displacement of unskilled and semi-skilled workers who constitute the backbone of India's unorganized workforce. The paper highlights the uneven distribution of gains from AI, growing risks of unemployment, income inequality, and increased dependence on government welfare schemes, particularly among drivers, construction labourers, and landless agricultural workers. It concludes that without adequate skill upgradation, social security mechanisms, and inclusive policy interventions, rapid AI penetration may destabilize employment structures and exacerbate socio-economic vulnerabilities in both rural and urban India

Key Words: Artificial Intelligence; Unorganized Sector; Informal Employment; Road Transport; Construction Industry; Agriculture; Technological Unemployment; India; Economic Impact; Labour Displacement

Introduction

The artificial intelligence is prevailing in every sector such as automobile, construction, agriculture, marketing, social media etc., with increasing research and development applicability of AI enhancing new capability of human being. Recently in Bangalore, Indian Post office was build using 3D-printing technology. Tesla introduces driverless car which is AI based and able to transport passenger from one end to another without the human interference. Also in agriculture

sector autonomous tractor and drones are used for agriculture and this will improve the income of the cultivator, although this leads to major unemployment amongst these sectors particularly the unorganized sector labours will face more employment related problems. The economy will get shaken due to development of advanced technology and Indian economy will not sustain at this shift change in the use of latest advance technology, which ultimately cause the distress amongst the rural as well as urban unorganized

sector employment. This paper mainly focuses on the such sectors that have workers of unorganized sectors or informal sector, as of now it's mainly three sectors is identified i.e. are 1) Road transport 2) Agriculture and allied business 3) Construction, having share in the GDP i.e.3.14%, 17.95%, 8.41 % respectively.

This research employs a mixed-methods, qualitative approach grounded in secondary data analysis and case study comparisons. We conducted an extensive review of reports, academic studies, and policy documents from 2018-2025 related to AI in transportation, Agriculture and Construction business.

AI Role in Road Transportation

AI was theoretical till it was implemented but at the beginning of 21th century, it is become reality now

our day-to-day work is based on AI and most commonly use of mobile phone which is AI enabled. The new era of AI is it can mimic like human being, work on its own based on data it had, able to take decision etc. The Tesla Company has introduced its driverless car and it's seen as future of next generation. The driverless car can take the passenger wherever he wants to go with traffic prediction in very short of time span that usually required more time as a human being. This will provide more safety to passenger and time saving too. However, as the Indian prospective if we see this is endangering to the economy, since majority of Indians are in the profession of transportation and that counts 369 out of 506 in the land transport. It has huge economical value of 294326 crores out of 457152crores from the below table-1.

Table -1 Gross Value Added by Economic Activity at Constant 2011-2012 prices
(Rupees Crore)

Economic Activity	2011-12	2012-13	2013-14
Railways	61,210	72,249	78,940
Road Transport	2,60,888	2,80,365	2,94,326
Water Transport	7,193	7,417	7,671
Air Transport	4,454	4,192	4,444
Services Incidental to Transport	63,573	69,153	71,771
Transport - Total	3,97,318	4,33,376	4,57,152
GVA - All Sectors	81,95,546	85,99,224	91,69,787
Share of Transport Sector to GVA (%)	4.8	5.0	5.0
Share of Road Transport to GVA (%)	3.2	3.3	3.2
Share of Road Transport to Transport Sector (%)	65.7	64.7	64.4

Source: *Economic Survey of India*, Ministry of Finance, Government of India, various issues (2013-14, 2014-15); based on National Accounts Statistics, Central Statistics Office (CSO), Ministry of Statistics and Programme Implementation (MOSPI).

The above table explains much more about the economic value with relation to the road transport in India. Once the AI enabled transport entered into the Indian Territory then it will change the

entire economy of the country. Companies having infrastructure for research and development can implement firstly for only the passenger segment that includes cars and buses, in

the next phase they will concentrate over the transport of goods and other allied sectors such as trucks for goods and tractors for agriculture. This leads to change our prominent job shift of unorganized sectors majorly drivers, cleaners, farm workers and there will be shift in the both sectors i.e. lot of workers from unorganized sectors becomes unemployed while very few skilled employees will be employed into

IT sector. Certainly, for this shift Indian economy is not ready and it will not handle such economical unbalance, at one point it will create very few jobs opening for skilled employees more specifically those having knowledge of AI, embedded system and Data science on other hand lakhs of employees engaged in transport sector will lose their employability.

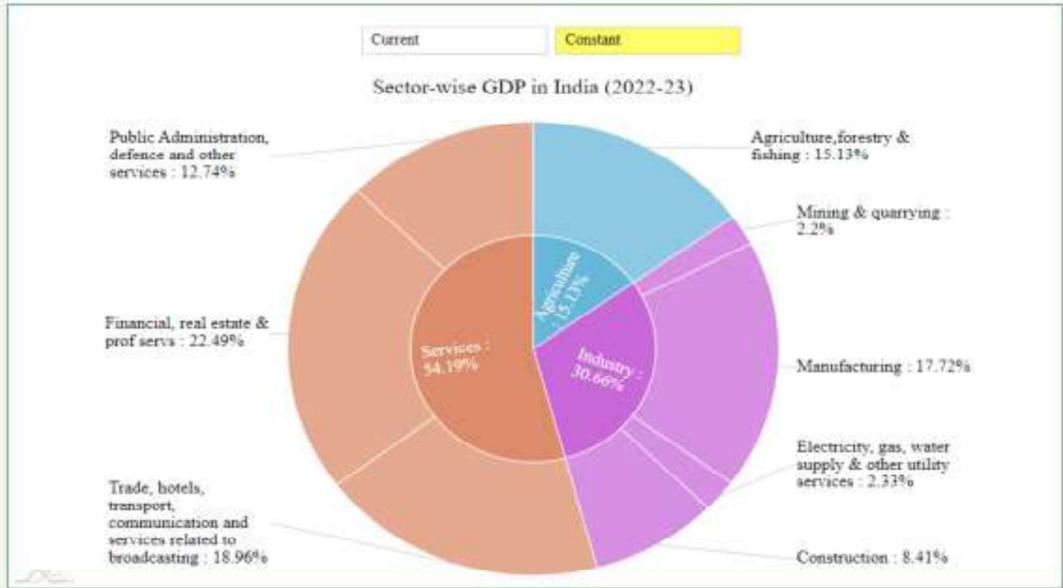


Fig.1 pie chart of GDP sector wise for year 2022-2023

Source: *Economic Survey of India 2022-23, Ministry of Finance, Government of India (based on National Accounts Statistics, MOSPI).*

The sector-wise GDP composition of India for 2022-23 clearly reveals the structural dominance of services (54.19%), followed by industry (30.66%) and agriculture (15.13%). While these sectors differ in productivity and capital intensity, they share a common characteristic: a high dependence on informal or unorganized workers, particularly in sub-sectors such as agriculture, construction, transport, trade, and personal services. Dominance of Informal Workers Across Sectors. Despite agriculture contributing

only 15.13% to GDP, it continues to absorb a disproportionately large share of India's workforce, much of it informal, seasonal, and low-skilled. Similarly, within the industrial sector, construction alone accounts for 8.41% of GDP and is overwhelmingly dependent on migrant and unorganized labour. Manufacturing sub-sectors—especially small-scale and ancillary units—also rely heavily on contract and informal workers. The services sector, which contributes over half of GDP, is often perceived as

formal and skill-intensive; however, a closer look at its composition challenges this assumption. Sub-sectors such as trade, hotels, transport, communication and broadcasting (18.96%), financial, real estate and professional services (22.49%), and public administration and other services (12.74%) encompass vast numbers of informal workers—including drivers, delivery workers, hotel staff, street vendors, construction-linked service providers, and gig workers. Thus, GDP dominance does not translate into employment security or formalization.

Segment-specific impacts:

Within the unorganized transport sector, AI's effects vary:

i) Auto-rickshaw and Taxi Drivers: For those who adopted ride-hailing apps, earnings initially rose due to access to a larger customer base and sometimes higher fares via surge pricing. Some auto drivers report earning ₹300–₹500 extra per day after joining apps. However, increased dependence on app-based rides has made them vulnerable to app policy changes. Traditional stand-based customer relationships have weakened, leading to reliance on smartphone notifications for work. Notably, women drivers – though few – have found platforms somewhat enabling due to safety features (GPS tracking, SOS buttons), with 84% of female riders in one survey saying app rides felt safe potentially opening space for more women to join this male-dominated field.

ii) Cycle-Rickshaws and E-Rickshaws: This segment remains largely low-tech, though there are initiatives to integrate e-rickshaw operators into digital marketplaces for last-mile connectivity. Some Indian cities launched pilot apps to book e-rickshaws, but widespread AI

adoption here is minimal. The economic impact of AI is indirect: the popularity of ride-hailing two-wheelers (bike taxis) in some cases has drawn passengers away from cycle rickshaws, pressuring those workers to either upgrade to e-rickshaws or partner with app services for visibility.

iii) Informal Truckers: The long-haul trucking sector in India is notoriously inefficient, with many independent truckers relying on brokers at highway dhabas (truck stops) to find return loads. AI-driven logistics platforms are changing this by providing online freight matching. Economic gains include reduced empty return trips (thus higher overall utilization) and faster payment cycles (some platforms pay drivers within days instead of weeks). Early evidence suggests participants on digital freight apps can see income increases of 20–30% due to more consistent load availability. However, many small truckers face digital literacy barriers, and the sector's adoption of AI is still nascent. The economic impact at scale is yet to be realized, but the potential is high to formalize and raise productivity in this unorganized segment.

Artificial Intelligence in Construction as 3d Printing

In the early 2000 the Mumbai-2 i.e., Navi Mumbai was under developing. The building was constructed using pre-casted room, bedroom, hall, kitchen and toilets at the ground and lifted by cranes and placed accordingly the plan map at each floor. This was the beginning of modernization and adopting latest technology in the field of construction. However, the technology is more advance now and that too it can print the house, building, bridge, flyover, sewer system, dams and disaster shelters using 3D printing mechanism with the help of BIM (building

information modeling) having principle of layered material, with the help of AI and machine Learning thickness is generated in one direction with print command and also prepare 3D map of the structure.

In the year 2016, ACCION company, has prepared the world's first 3D printed pedestrian bridge, 12 meter in length, 1.75 meter wide. Another company involved in this was IAAC, who played a central role in designing the bridge. The bridge was created by using 3D printed microscale reinforced concrete powder with thermoplastic polypropylene, to bear the weight. Based on the generative algorithm porous structure was created to only where it is necessary to strength and efficiency of bridge. In 2020, a 3D 2-story building was constructed in a single piece by L&T Company in Belgium. Till date it is the largest 3D printed structure in the world. Such technology needs very less human interference and manual work. It will have other benefits like prevention of human errors, less accidents, sustainability of business, more efficient in terms of work. Companies are fast to adapt the advance technology to increase their profits and to mitigate human errors.

In India large numbers of unskilled labours migrate from rural area to urban cities in the search of employment. Mostly, class of labors is employed in construction sites. The advance technology will have great impact on the Indian labour market this will create large unemployment in this sector. Since large population of India depends upon the unskilled work due to their educational levels and this population works in unorganized sectors. Labor population has significant contribution in the economy. Adopting

to advance technology like AI enabled 3D printing will lead to more unemployment amongst the unorganized sector and this can unbalance the economy of India. In such situation it will create more burdens on the government schemes like MGREGA, PMAY-G, PMUY and PMGKAY that ultimately hamper the growth of the country. For the year 2022-23 the Government of India allocated 2 lakh Crore towards the PMGKAY scheme for free distribution of 5 kg of rice or wheat for the beneficiary of scheme. Due to unemployment this will create more demand of such schemes and resources for livelihood of unemployed unskilled labours. This advance technology will impact the society at large and economic gaps in the society will increase rapidly.

Artificial Intelligent in Agriculture

Predominately agriculture was the only source for livelihood of the Indians before colonial era. After various evasions and during colonial era trade and commerce was introduced in India but the rural labours were engaged in agriculture and allied works. Bull was used for agriculture later on bull was replaced with tractor along with latest harvesting machines. Now the AI has significant role in agriculture.

In this area *Autonomous Tractors, Fleet of Agribots and Smart drones* are used in farming. The Autonomous Tractor is GPS-controlled autonomous tractor charts, it's automatically ploughs the land, saving fuel and reduce soil erosion and maintain soil quality. Fleet of Agribots, tends to crop, weeding, fertilization and harvesting reduces fertilizer cost up to 90% and eliminate human labour. Smart Drones, survey fields, map weeds, yield and soil variation, enable application of inputs and map productivity. Drones are also used for applying pesticide and

herbicides. These are the Artificial Intelligence empowered equipments used for agriculture activities. This impact the employment of rural areas, particularly in agriculture labours having solely depended upon the agriculture based employment. Since Indian agriculture is the major contributor of employment accounts for 49% of Indian workforce and 16% of the country's GDP. During pandemic it was the only sector that has the positive GDP growth and it maintained rural employment of workforce.

Due to advent of this advance technology, there is lack of opportunity in this field and labour forces migrate towards the urban cities for livelihood and employability. This sector is major employment provider for rural area and it facilitates various a schemes such as PM-KISAN, PMKMY, PMFBY, MISS, and AIF which ultimately leads to frustrate the purpose of scheme, which ensure more income generation for the cultivator and agriculture labours. This advance technology will disturb rural eco-system and there will be more distress in rural employment market, ultimately it will be chaotic and panic situation in rural development. Although it will be very possible, that it will create income disparity within the same eco-system. The cultivator having his own land and equipment becomes more prospers than one who is landless labour. This shows that the artificial intelligence enabled agricultural equipment will definitely increase the income of cultivator but on other hand it will eliminate the jobs of landless labours. These labours are the part of unorganized sector having major contribution to the economic development and growth.

Conclusion:

Artificial intelligence having pros and cons but the issue is about the economic status of unorganized sector workforce and the impact it will create over the economy. To answer the first issue, it will give aloft status to those who having the company and infrastructure for development of new technology that is AI based and to those who are having big construction companies, also to those cultivators having land and equipment. It will be disastrous to those employees engaged in road transport like driver and cleaner and labours at the construction site and landless labours in the agriculture sector. Indian economies will not be going to sustain if AI becomes in the reach of these sectors and ultimately lead to more unemployment in urban as well as rural areas of the country.

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