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Size and Composition of Gig Workforce in India and Estimation of Its Size in the State of Assam and Guwahati Metropolitan Area

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Abstract

In recent years, the gig work has emerged as a vital component of India's labour market, reshaping employment relations and creating new avenues for income generation, particularly in the service sector. However, the details about the size, growth, and composition of these emerging sectors have yet to be widely known. While some data are available at the national level, the state-level pictures are still sketchy. This paper examines the size and composition of the gig workforce at the all-India level and attempts to estimate its size in the state of Assam and the Guwahati Metropolitan Area. Further, the composition of the gig workforce, its sectoral, occupational, and skill level-based classifications, as well as their formal, informal, organised, and unorganised characteristics, have been examined at the all-India level. To estimate the gig workforce in Assam and Guwahati, a methodological framework has been developed using ratios of the state versus the national level of workforce and population. The paper uses data from the NITI Aayog (2022) report for analysis. The findings show that the gig workforce has been a growing component of the country's labour force.

Keywords: - Labour Market, Classification, Estimation, Projection, Assam & Guwahati Metropolitan Area.

I. INTRODUCTION

The rapid expansion and development of Information and Communication Technology and emergence of the digital world have given rise to a new type of job opportunities in the economy, collectively referred to as the gig economy, and the individuals involved in this segment are known as gig workers. Code on Social Security of the Government of India (2020) defines a gig worker as "a person who performs work or participates in a work arrangement and earns from such activities outside of traditional employer-employee relationships". According to NITI Aayog, the gig economy is characterized by flexibility of work and income, where long-term employer-employee relationships do not bind the worker. It includes all work arrangements outside the traditional employer-employee relationship. In short, in the gig economy, individuals engage in short-term, freelance tasks mediated through digital platforms, characterized by flexibility, autonomy, and task-specific arrangements. It offers flexibility, autonomy, and diverse income opportunities for workers while enabling firms to reduce costs and access talent efficiently (ASSOCHAM, 2020; Augustinraj & Bajaj, 2021). However, it is also associated with job insecurity, lack of social protection, and income instability, raising concerns about the quality and sustainability of such employment (Zelma, 2024). The global financial crisis of 2008 marked a pivotal moment in the growth of the gig economy, leading to an increased reliance on temporary and alternative forms of employment. The expansion of the gig economy is also evident in the Indian economy, where the COVID-19 pandemic resulted in a surge in food delivery, e-commerce, and freelance work. Platforms such as Swiggy, Zomato, and Urban Company experienced increased demand due to lockdowns (Business Standard, 2020). Mohanty & Jethy's (2022) study reveals a significant positive association between COVID cases and the number of gig workers in India. The present landscape, specifically the 2023-25 gig economy, has developed into a well-established sector of the labour market that is experiencing structural changes. It significantly contributes to workforce growth, skill specialization, technological integration, and sector expansion (Sharma & Sharma, 2025). Although several studies and

reports provide estimates of the size and composition of the gig workforce at the national level in India, comparable evidence at the state and city levels remains limited. In particular, no reliable estimates are available for the gig workforce in Assam or the Guwahati Metropolitan Area. The present study seeks to address this gap. The specific objectives of the study being:

- To understand the size, composition, and growth trajectory of the gig workforce in India.
- To estimate the size of the gig workforce in the state of Assam, with special reference to the Guwahati Metropolitan Area, Guwahati being the largest metropolis in the north eastern part of the country.

II. REVIEW OF LITERATURE

Datta et al. (2023) estimate that online gig work accounts for 4.4% to 12.5% of the global workforce, corresponding to a broad range of approximately 154 million to 435 million workers worldwide, using 545 online gig work platforms across 186 countries. Compared to industrialized nations, emerging nations have a higher participation rate in the gig economy. About 1 to 4 percent of workers in developed countries such as the USA, Germany, the UK, and Sweden rely on gig work as their main source of income. In contrast, between 5 to 12 percent of workers in developing countries like China, India, and Brazil depend on gig work as their primary income source, with around 30 percent using it as a secondary source of income (Augustinraj & Bajaj, 2021). V. V. Giri National Labour Institute (2025) projected the total number of gig workers for the year 2047. The point estimate predicts that the number will increase to 6.16 crores by 2047, representing 14.89 percent of India's non-agricultural workforce. By 2047, the sector will be sufficient to create 9.08 crores of employment. Also, according to Augustinraj & Bajaj (2021), the gig economy has the potential to support up to 90 million jobs in the non-farm sector in about 8 to 10 years in India's economy. It is expected that around 24 million jobs may transition to technology-based gig platforms in the near to medium term. Additionally, it is estimated that nearly one million net new jobs could be created over the next two to three years to address constraints in specific operational roles and to meet the significant 'latent demand' for services among households. In the coming decade, the gig economy in India is projected to witness USD 250 billion in transactions, accounting for 1.25% of the nation's gross domestic product. These projections should not be interpreted as directly comparable because they are based on different definitions of gig work, estimation methodologies, data sources, and projection horizons. The V. V. Giri projection is a long-term forecast extending to 2047, whereas the BCG estimate reflects a different forecast period and assumptions regarding the growth of the digital platform economy. Consequently, differences in the projected workforce size reflect methodological and definitional differences. However, studies of gig work at the sub-national level are few and far between. The present paper is an attempt to fill the void.

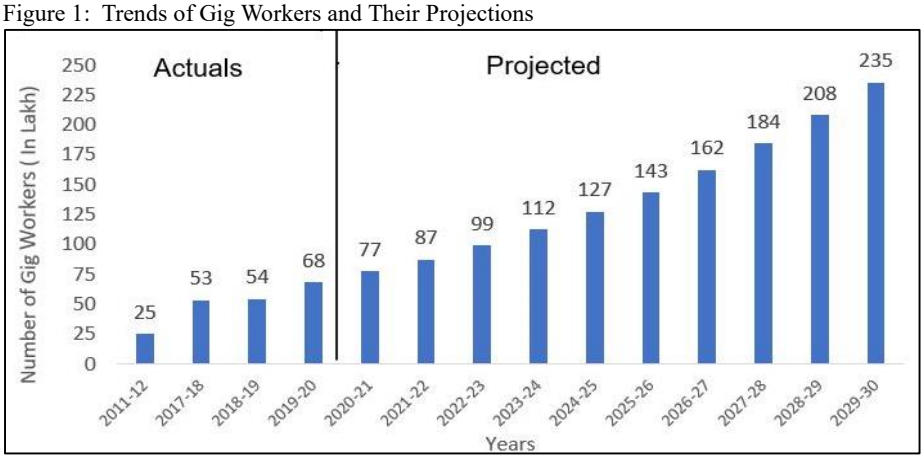
III. METHODOLOGY

The paper consists of two broad parts. The first part utilizes available secondary data to understand the size and composition of the gig workforce in India, as well as its projected growth. The basic data is taken from the NITI Aayog (2022) report, "India's booming gig and platform economy: Perspectives and recommendations on the future of work". The analysis is done by calculating ratios and making graphical presentation. The patterns emerging from the graphical presentations have induced us to seek plausible explanations of the undergoing compositional shifts within the gig workforce. The second part of the study makes assumptions for estimating the component of the all-India gig workforce, i.e., serving in the state of Assam, with special reference to the Guwahati Metropolitan Area. The details of its assumptions and the methodology for estimating them are laid out in Section 5.

IV. SIZE AND COMPOSITION OF GIG WORKFORCE IN INDIA

Estimating the size of the gig economy is a tricky problem. NITI Aayog has attempted to estimate its size and growth by sector based on the number of workers engaged. They have used the Periodic Labour Force Survey data of the NSSO to extract the number of workers engaged in gig work from the total number of workers. Their broad estimates are for the years 2011-12, 2017-18, 2018-19, and 2019-20. Based on these basic estimates, they have computed not only a time series of the number of gig workers in the Indian economy but also projected the series up to the year 2029-30. The data is presented in Figure 1. Given this obvious growth in the size of the gig economy in terms of workers engaged in it, it is pertinent to ask what proportion of the total workforce and total non-agricultural workforce gig workers constitute. This has been estimated, and the results are presented in Figure 2.

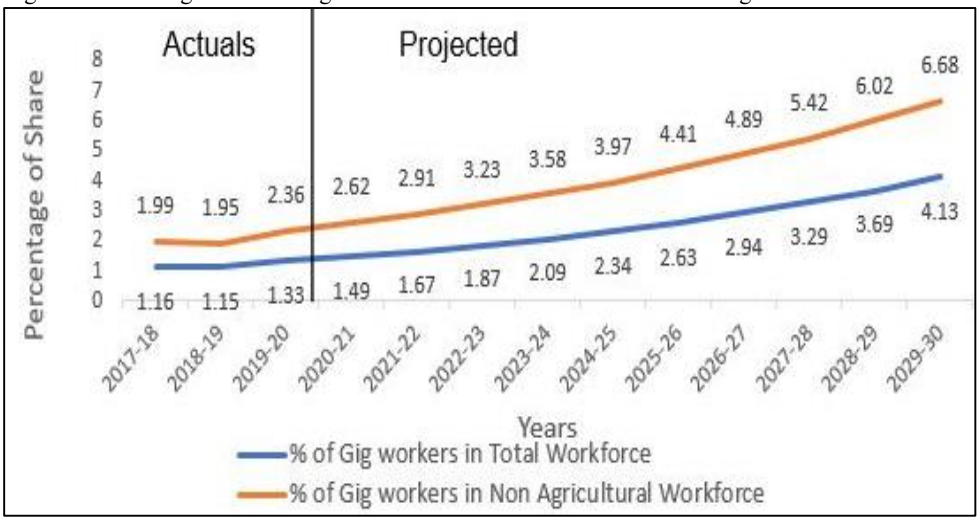
Figure 1: Trends of Gig Workers and Their Projections



Source: Author's Construction Using Data from NITI Aayog (2022).

From Figure 1, it is clear that the gig economy has the potential to increase from 25 lakh in 2011 to 2.35 crore in 2029-30. The next step involves determining the proportion of gig workers within the total workforce and specifically within the non-agricultural workforce. This can also be demonstrated from the data (actual and projected) estimated by NITI Aayog. The share of gig workers in the total workforce and the non-agricultural workforce in 2011-12 is 0.54% and 1.03%, respectively.

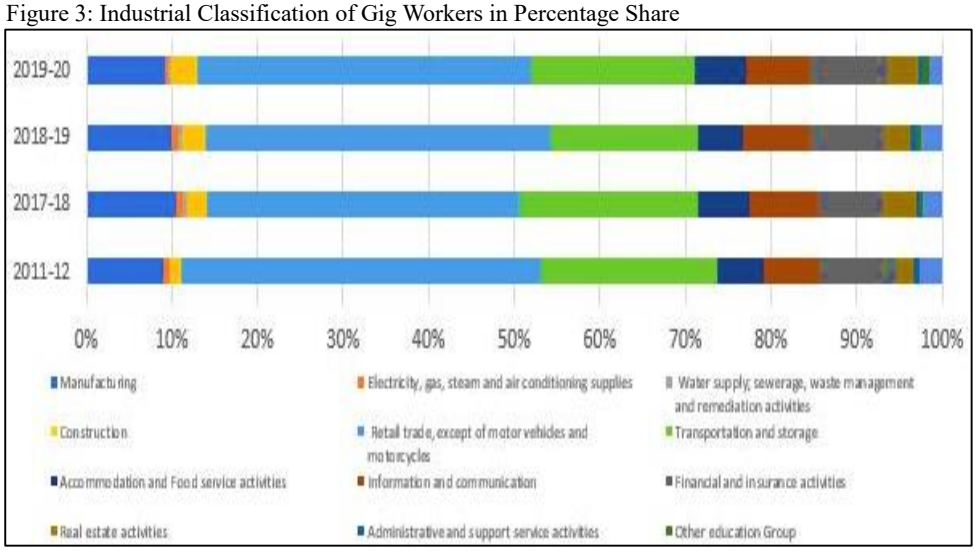
Figure 2: Percentage Share of Gig Workforce in Total Workforce and Non-Agricultural Workforce



Source: Authors' Construction Using Data from NITI Aayog (2022)

Figure 2 shows that in 2017-18, the share of gig workers in the total and non-agricultural workforce was 1.16% and 1.99%, respectively. However, in the next year, i.e., 2018-19, this share decreased to 1.15% and 1.95%, respectively. But in 2019-20, the share in both categories increased significantly to 1.33% and 2.36%, respectively. Platform-mediated gig work, which integrates the gig economy with mainstream economies, has risen sharply, mostly as a result of the COVID pandemic and lockdowns around the world (Mohanty & Jethy, 2022; International Labour Organization, 2024). NITI Aayog has projected that the share of gig workers in the total workforce and the non-agricultural workforce will increase to 4.13% and 6.68%, respectively, by 2029-30. Since gig work is virtually absent in the agricultural sector, it may be of interest to look at their presence in the non-agricultural workforce of the countries.

Figure 3: Industrial Classification of Gig Workers in Percentage Share



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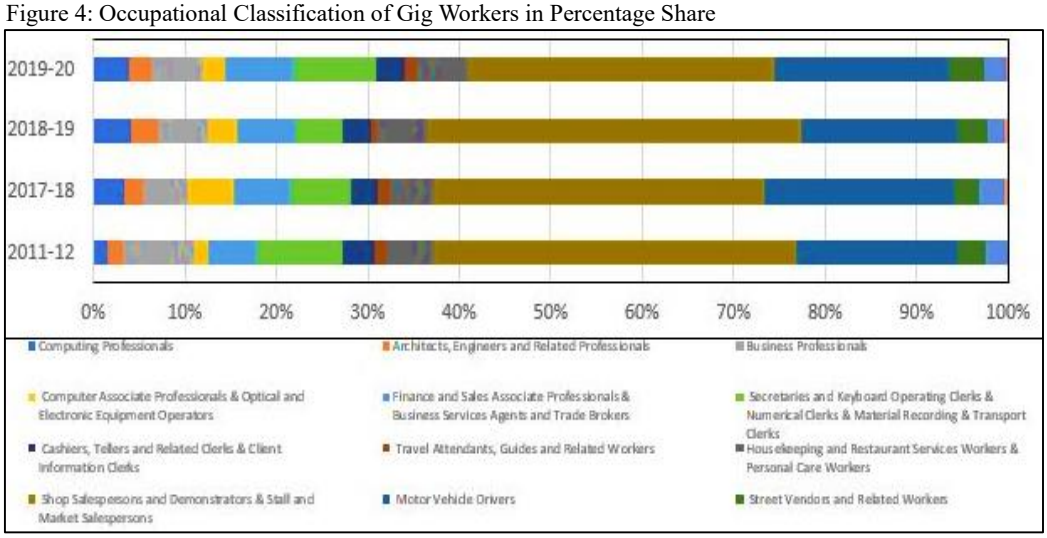
Source: Authors' Construction Using Data from NITI Aayog (2022)

The following industries and occupations are identified based on the probable characteristics of gig workers by the NITI Aayog. The share of gig workers by sectors and occupational categories are presented in Figures 3 and 4. Figure 3 presents the industrial distribution of gig workers in India over the following four years, i.e., 2011–12, 2017–18, 2018–19, and 2019–20. It shows that the retail trade sector has continuously employed the largest share of gig workers during this time, with a range of 36% to 42%. This indicates how prevalent sales, delivery, and service-related activities are in India's gig economy. Following closely behind with 17–21% of gig jobs is the transportation and storage industry, which has been greatly impacted by the rapid growth of ride-hailing and logistics platforms like Ola, Swiggy, and Amazon. The construction industry saw a notable increase from 1.24% to 3.06%, reflecting the growing use of project-based gig contracts, while the manufacturing sector maintained a stable share, rising marginally from 9.09% in 2011–12 to 9.17% in 2019–20. High-skilled, digital industries like communication and information, as well as financial and insurance operations, have consistently contributed between 7% and 9% over time. The real estate sector expanded from 1.72% in 2011–12 to 3.53% in 2019–20, and education-related activities rose modestly from 0.08% to 0.67%, showing diversification in gig opportunities. Additionally, the proportion of gig workers is increasing in sectors that previously had little or no presence of such workers.

Figure 4: Occupational Classification of Gig Workers in Percentage Share

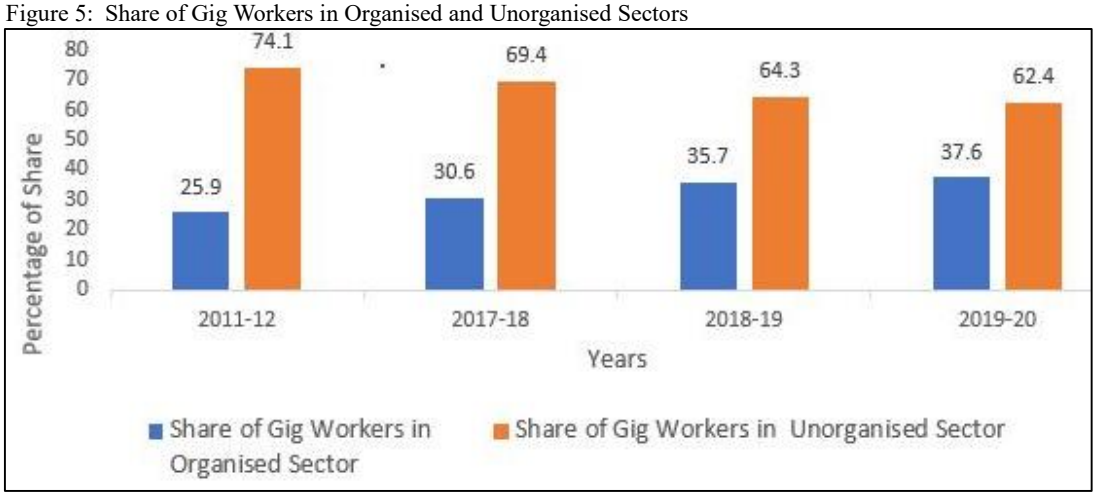


Source: Authors' Construction Using Data from NITI Aayog (2022)

When examined from an occupational perspective, Figure 4 illustrates the key occupations where the gig workforce is predominantly concentrated. Figure 4 shows the occupational distribution of gig workers in India for the years 2011–12, 2017-18, 2018-19, and 2019–20. Three occupational segments, specifically drivers, sales personnel, and restaurant service workers, collectively represented 58%-60% of gig workers across all four years of the study. This indicates a steady growth in the gig economy within these occupations. At the same time, there has been a gradual increase in the share of high-skilled gig workers, particularly computing, business, and finance professionals, reflecting the expansion of digital and knowledge-based work. In contrast, clerical and administrative jobs such as secretarial and data-entry roles have declined due to automation and digitalisation.

Despite these changes, low- and medium-skilled service jobs, like driving and sales, continue to dominate the gig economy. Overall, this trend indicates a slow but steady diversification of gig work in India, moving from purely service-based activities to a broader mix of traditional and technology-driven occupations. This industrial and occupational classification gives an idea about the nature of gig workers and their diversification. The data shows that the majority of gig workers are engaged in occupations such as sales, driving, and restaurant services, with sectoral concentration in transportation, trade, accommodation, and food services. In contrast, sectors like information and communication technology (ICT), financial services, real estate, and administrative activities, as well as occupations such as computing professionals and computer associates, though part of the broader service sector, account for a relatively smaller share of gig workers. These areas generally demand specialized skills, long-term engagement, and formal contractual arrangements. This distinction underscores that gig work primarily expands in activities that can be easily divided, outsourced, or digitally mediated, rather than in structured and professionally regulated domains of the service economy. Also, to capture the share of gig workers in the organised and unorganised sectors, the distribution is presented in Figure 5.

Figure 5: Share of Gig Workers in Organised and Unorganised Sectors

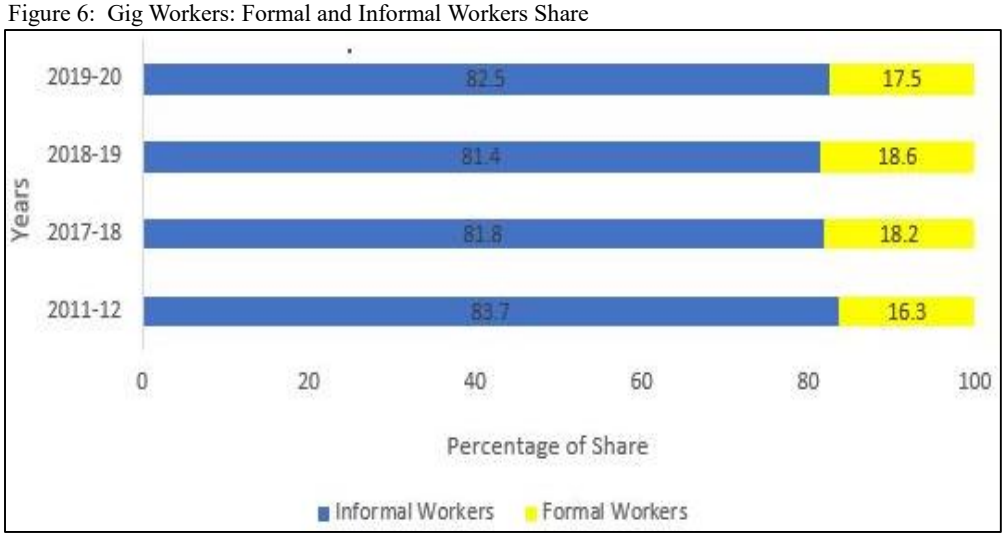


Source: Authors' Construction Using Data from NITI Aayog (2022)

Figure 5 illustrates the share of gig workers across the organised and unorganised sectors for 2011–12, 2017-18, 2018-19, and 2019–20. The data reveal that the majority of gig workers remain concentrated in the unorganised sector, accounting for about 62.4% of the total in 2019–20. However, the share of gig workers in the organised sector has been steadily increasing, indicating that more of these workers are now associated with larger firms. The proportion rose from 26% in 2011–12 to 37.6% in 2019–20, with a corresponding decline in the share of the unorganised sector. Between 2011–12 and 2019–20, India underwent a major transformation driven by rapid digitalisation, widespread smartphone adoption, and increased internet accessibility. These changes facilitated the emergence of platform-based businesses such as Swiggy, Zomato, Ola, Uber, Amazon, and Urban Company, which operate as large, organised firms. Before 2011, most “gig-type” jobs, such as delivery, driving, or household repair services, were largely concentrated in the unorganised economy, typically carried out through

small-scale or local arrangements. The growing share of the organised sector in the gig workforce is apparently a positive development. However, this positive development needs to be qualified by the fact that although gig workers now operate within the organised sector, their labour relations, particularly in terms of contracts and employment conditions, remain largely informal, even though the company structures themselves are formal and organised. This is illustrated in Figure 6.

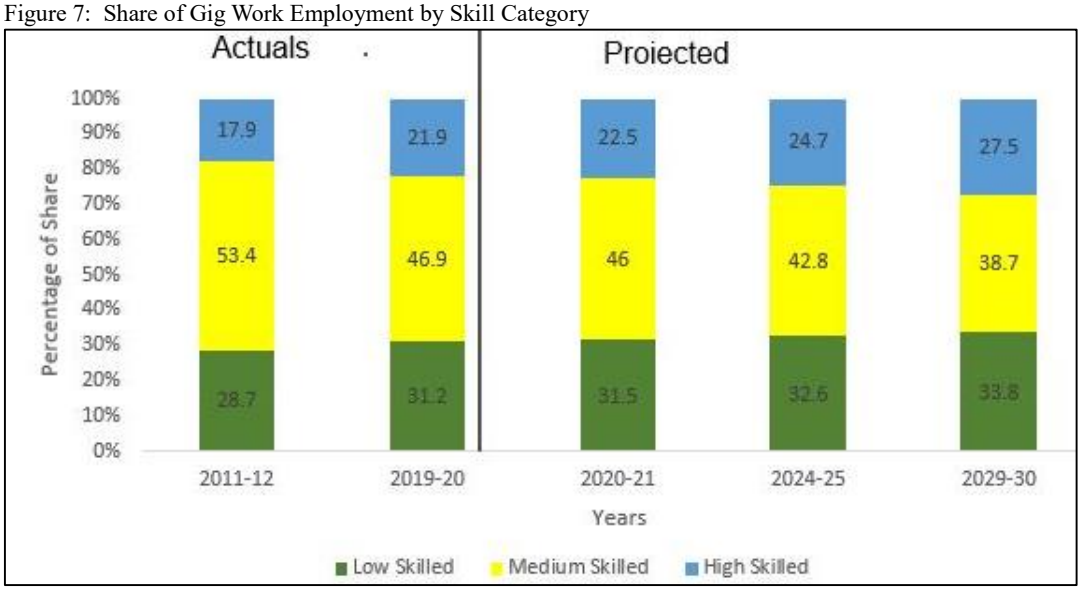
Figure 6: Gig Workers: Formal and Informal Workers Share



Source: Authors' Construction Using Data from NITI Aayog (2022)

Figure 6 presents the distribution of gig workers between formal and informal employment categories for the years 2011–12, 2017-18, 2018-19, and 2019–20, based on NITI Aayog's estimates. Across all four years, informal workers consistently dominate the gig workforce, accounting for more than 80% of all gig workers. This indicates that the majority of gig workers continue to operate without formal contracts, social security coverage, or employment-related benefits, reflecting the largely informal nature of work within India's gig economy. However, a portion, 17%–19%, of gig workers fall under the formal category, mainly representing those engaged through organised platforms or firms where some level of documentation, registration, or regulatory compliance exists, even though their employment relationships often remain contractual or semi-formal in practice. Also, high-skilled professional gig work, such as specialized consultants, software developers, and finance professionals, operates under formal, written contracts for projects, which further aligns this segment with the characteristics of formal employment despite its flexible and non-permanent nature. If we see gig work by skill-wise, which is presented in Figure 7.

Figure 7: Share of Gig Work Employment by Skill Category



Source: Authors' Construction Using Data from NITI Aayog (2022)

Figure 7 presents the actual and projected distribution of gig work by skill category for the years 2011–12, 2019-20 (Actuals) to 2020-21, 2024-25, and 2029-30 (Projected). In 2011–12, the majority of gig workers were medium-skilled (53.4%), followed by low-skilled (28.7%) and high-skilled (17.9%) workers. However, over time, the share of medium-skilled workers is expected to decline steadily to 38.7% by 2029–30. In contrast, high-skilled gig work is projected to rise from 17.9% to 27.5%, and low-skilled work from 28.7% to 33.8% during the same period. This trend suggests a polarisation of the gig economy, where over time, the proportions of high-skilled and low-skilled gig workers increase but the medium-skilled workers constitute the majority in the skilled profile, and their size is reduced. The increase in the share of high-skilled components is presumably because many medium-skilled workers upgrade their skills through learning by doing and move to the high-skilled category. As for the rising share of the low-skilled category, the possible explanation seems to be the push factor of the overcrowded unorganised sector and the pull factor of somewhat better earnings in the gig economy. The low

entry barriers for the lower skill segments of the gig economy presumably keep replenishing this segment more than the number of those who upgrade themselves to the medium-skilled category.

V. SIZE OF GIG WORKFORCE IN ASSAM AND GUWAHATI METROPOLITAN AREA

Direct estimation of the gig workforce for Assam and the Guwahati Metropolitan Area using the PLFS is constrained by the relatively small sample size available for these geographical units. Therefore, this study adopts an indirect estimation approach, using NITI Aayog's national estimates as the benchmark and adapting them to the state and metropolitan levels through a set of assumptions. The methodology for estimating the state-level and area-level size of the gig workers is outlined.

5.1. Estimation of Gig Workers in Assam for the Year 2023-24

Although gig work is largely concentrated in metropolitan and other urban centres, the estimation of the gig workforce in this study follows the methodology adopted by NITI Aayog (2022), which estimates the national gig-worker share using the total workforce identified from both urban and rural samples of the PLFS. Accordingly, the total workforce of Assam is taken as the base for estimating the state's gig workforce. Therefore, at first, we need to estimate the total workforce of Assam for the year 2023-24. The following formula is used to estimate the total workforce of Assam in 2023-24.

Total Workforce of Assam in 2023–24 = Total Population of Assam in 2023–24 × Worker Population Ratio (WPR) (Usual Status, PS+SS, All Ages) for Assam in 2023–24.

The projected population for Assam in 2023–24 is 35,991,500(StatisticsTimes.com, 2024). According to the Periodic Labour Force Survey (PLFS) Annual Report 2023–24, the Worker Population Ratio (WPR) in usual status (ps+ss) for all ages for Assam is 47.2%. Therefore,

$$\text{Total Workforce of Assam in } 2023-24 = 35{,}991{,}500 \times 47.2\%$$
$$= 16{,}987{,}988$$

The total workforce of Assam in 2023-24 is 16,987,988. For estimating the gig workforce of Assam for the year 2023-24, this study considers the gig-worker proportion reported by NITI Aayog (2022), which indicates that gig workers constituted approximately 2.09% of India's total workforce in 2023–24 (as presented in Figure 2). If the national gig-worker share is applied directly, the estimated gig workforce of Assam is calculated as:

Estimation of Gig Workforce of Assam in 2023-24 = Total Workforce of Assam in 2023-24 × Share of Gig Workforce in Total Workforce in 2023-24

$$\text{Estimation of Gig Workforce of Assam in } 2023-24 = 16{,}987{,}988 \times 2.09\%$$
$$\approx 355{,}049$$

However, applying this national-level proportion directly to Assam may not accurately reflect the state's actual gig-workforce size, given the significant variation in urbanisation patterns between Assam and the country as a whole. Since gig work is generally more concentrated in urban and metropolitan areas, the higher urbanisation level of India compared to Assam may result in an upward bias if the national gig-worker ratio is applied without adjustment. Therefore, an urbanisation-adjusted approach is adopted to estimate. The adjusted gig-worker estimate for Assam is derived by scaling the national gig-worker share according to Assam's urban population proportion relative to the national urban population proportion. The formula is

$$\text{Estimated Gig Workforce of Assam in } 2023-24 = \text{Total Workforce of Assam in } 2023-24 \times \text{Adjusted Gig-Worker Share of Assam in Total Workforce in } 2023-24 \quad (1)$$

Where,

$$\text{Adjusted Gig-Worker Share of Assam in Total Workforce in } 2023-24 = \text{National Gig-Worker Share in } 2023-24 \times \text{Urbanisation Adjustment Ratio} \quad (2)$$

$$\text{Urbanisation Adjustment Ratio} = \frac{\text{Urbanisation Rate of Assam in } 2023-24}{\text{Urbanisation Rate of India in } 2023-24}$$

Where,

$$\text{Urbanisation Rate of Assam in } 2023-24 = \frac{\text{Urban Population of Assam in } 2023-24}{\text{Total Population of Assam in } 2023-24} \times 100$$

$$\text{Urbanisation Rate of Assam in } 2023-24 = \frac{5{,}896{,}388}{35{,}991{,}500} \times 100$$

$$Urbanisation\ Rate\ of\ Assam\ in\ 2023-24\ =\ 16.38\%$$

Also,

$$\text{Urbanisation Rate of India in } 2023-24\ =\ \frac{\text{Urban Population of Indiain } 2023-24}{\text{Total Population of India in } 2023-24}\ \times\ 100$$

Since the urban population of India in 2023-24 is 508,811,448 (Macrotrends, n.d.), and the total population of India in 2023-24 is 1,448,163,288 (Macrotrends, n.d.) Therefore,

$$\text{Urbanisation Rate of India in } 2023-24\ =\ \frac{508{,}811{,}448}{1{,}448{,}163{,}288}\ \times\ 100$$

$$\text{Urbanisation Rate of India in } 2023-24\ =\ 35.13\%$$

Now,

$$\text{Urbanisation Adjustment Ratio}\ =\ \frac{16.38}{35.13}$$

Urbanisation Adjustment Ratio = 0.4663 or 46.63%

Substituting the values into equation (2)

$$\text{Adjusted Gig} - \text{Worker Share of Assam in Total Workforce in } 2023\text{–}24\ =\ 2.09\ \%\ \times\ 46.63\%$$
$$=\ 0.974\%$$

Now, substituting the values into equation (1)

$$\text{Estimated Gig Workforce of Assam in } 2023\text{–}24\ =\ 16{,}987{,}988\ \times\ 0.974\%$$
$$\approx\ 165{,}463$$

5.2. Estimation of Gig Workforce in Guwahati Metropolitan Area for the Year 2023-24

Since official estimates of the spatial distribution of gig workers across districts and urban centres in Assam are unavailable, the estimated gig workforce of the state is allocated to the Guwahati Metropolitan Area based on its share in Assam's total urban population. This allocation criterion is adopted because the urban population serves as a proxy for the spatial distribution of gig work, reflecting the greater concentration of economic activity, consumer demand, and digital infrastructure in urban areas. In the absence of district- or city-level gig-workforce data, this approach provides a practical basis for estimating the gig workforce of the Guwahati Metropolitan Area. However, the estimate should be interpreted as an approximation, as it assumes that the spatial distribution of gig workers is proportional to the distribution of the urban population. Accordingly, the first step is to estimate the share of the Guwahati Metropolitan Area in Assam's total urban population for the year 2023–24, which is calculated as follows:

-

$$\text{Share of Urban population of Guwahati Metropolitan Area in Assam's Total Urban Population in } 2023-24 = \text{Urban Population of Guwahati Metropolitan Area / Total Urban Population of Assam in } 2023-24\ \times\ 100 \quad (3)$$

Since the official annual population projections for the Guwahati Metropolitan Area (GMDA) are not available. Therefore, the projected population of the Guwahati Urban Agglomeration (UA), estimated at 1,345,500 for 2023–24 (Census2011.co.in, n.d.), is used as a proxy for estimating the size of the gig workforce in the Guwahati Metropolitan Area. Since the UA substantially overlaps the metropolitan urban core, this proxy is considered appropriate, although it may introduce some measurement error. The total urban population of Assam for the year 2023-24 is not directly available. Therefore, we need to estimate this number. To estimate the urban population of Assam for the year 2023–24, the compound growth rate method was used, based on the decadal growth rate of Assam's urban population for the 2001–2011 period and taking Assam's urban population of 2011 as the base year.

According to 2011 Census data, Assam's urban population is 4,388,756 (Government of Assam, Directorate of Town & Country Planning, n.d.), and the decadal growth rate of Assam's urban population from 2001 to 2011 is 27.9% or 0.279 (Census2011.co.in, n.d). For the projection, it has been assumed that the 2001–11 decadal growth rate continues at a uniform rate in the following years.

The projection formula used is as follows:

$$P_t = P_{2011} \times (1\ +\ r)^{t/10} \quad (4)$$

Where,

P_t = Projected urban population of Assam in 2023–24

P_{2011} = Assam's urban population in 2011 according to census data

r = Decadal growth rate of Assam's urban population from 2001 to 2011

t = Time period since 2011 (12 years)

Substituting the values in equation (4)

$$P_{2023-24} = 4{,}388{,}756 \times (1 + 0.279)^{12/10}$$

$$P_{2023-24} = 4{,}388{,}756 \times (1.279)^{1.2}$$

$$P_{2023-24} = 4{,}388{,}756 \times 1.3436$$

$$P_{2023-24} = 5{,}896{,}388$$

Hence, the projected urban population of Assam for the year 2023–24 is 5,896,388
Now, substituting the value in equation (3)
Share of Urban population of Guwahati Metropolitan Area in Assam's Total Urban Population in 2023-24

$$= 1{,}345{,}500 / 5{,}896{,}388 \times 100$$

$$= 0.2282 \times 100$$

$$= 22.82\%$$

Now, to estimate the Gig workforce of the Guwahati Metropolitan Area for the year 2023-24, the following formula is used. i.e.
Gig Workforce in the Guwahati Metropolitan Area for the Year 2023-24
= Estimated Gig Workforce of Assam in 2023-24 × Share of Urban population of Guwahati Metropolitan Area in Assam's Total Urban Population in 2023-24

$$= 165{,}463 \times 22.82\%$$

$$\approx 37{,}758$$

Hence, the estimated gig workforce of the Guwahati Metropolitan Area for the year 2023–24 is 37,758.

The urban population share-based estimate assumes that gig workers are distributed across urban areas in proportion to their share of the urban population, implying uniform penetration across urban centres. However, it is common knowledge that the penetration of gig work increases more than proportionally with the population size of urban centres. Guwahati Metropolitan Area, being the principal metropolitan, commercial, and service centre of Assam, the concentration of gig workers here will be much higher than in the other urban centres of the state. Therefore, an alternative estimate is developed by adjusting Guwahati's urban population share using the Urban Primacy Index, which measures the dominance of the largest urban agglomeration relative to the second-largest urban agglomeration (Jefferson, 1939; Dick & Rimmer, 2019; Tewari, n.d.). This Index is used to account for the likelihood that gig workers are disproportionately concentrated in Guwahati due to its dominant position within Assam's urban system. It is calculated as:

$$\text{Actual Urban Primacy Index} = \frac{\text{Population of the Largest Urban Agglomeration in } 2023-24}{\text{Population of the Second} - \text{largest Urban Agglomeration in } 2023-24}$$

According to the Census of India 2011, Guwahati and Silchar are the first- and second-largest Urban Agglomerations in Assam, respectively. The projected population of the Silchar Urban Agglomeration for 2023–24 is estimated at 318,500 (Census2011.co.in, n.d.).The Actual Urban Primacy Index is therefore calculated as follows:

$$\text{Actual Urban Primacy Index} = \frac{\text{Population of Guwahati Urban Agglomeration in } 2023-24}{\text{Population of Silchar Urban Agglomeration in } 2023-24}$$

Substituting the projected population values:

$$\text{Actual Urban Primacy Index} = \frac{1{,}345{,}500}{318{,}500} = 4.22$$

The calculated Urban Primacy Index of 4.22 indicates that the population of the Guwahati Urban Agglomeration is approximately 4.22 times larger than that of the Silchar Urban Agglomeration. This highlights the dominant position of Guwahati within Assam's urban hierarchy. According to the rank-size rule (Zipf's Law), a balanced urban hierarchy is expected to have a primacy index of approximately 2.0, where the largest urban agglomeration is about twice the size of the second-largest urban agglomeration (Zipf, 1949; Dick & Rimmer, 2019; Tewari, n.d.). The relative urban primacy factor is therefore calculated as:

$$\text{Relative Urban Primacy Factor} = \frac{\text{Actual Urban Primacy Index}}{\text{Zipf} - \text{expected Primacy Index}}$$

$$\text{Relative Urban Primacy Factor} = \frac{4.22}{2} = 2.11$$

A value greater than one indicates that Guwahati's dominance exceeds the level expected under a balanced urban hierarchy. The Relative Urban Primacy Factor of 2.11 suggests that Guwahati's dominance is approximately twice the level implied by the rank-size rule. Accordingly, this factor is used to adjust Guwahati's urban population share to examine the possible implications of a higher concentration of gig workers in the Guwahati Metropolitan Area. The adjusted allocation share of the Guwahati Metropolitan Area is calculated as follows:

Adjusted Allocation Share = Share of Guwahati's Urban Population in Assam's Total Urban Population × Relative Urban Primacy Factor

$$= 22.82\% \times 2.11$$

$$= 48.15\%$$

Accordingly, the estimated gig workforce of the Guwahati Metropolitan Area based on the adjusted allocation share is calculated as follows:

= Estimated Gig Workforce of Assam in 2023–24 × Adjusted Allocation Share

= 165,463 × 48.15%

= 79,670

Thus, the estimated gig workforce of the Guwahati Metropolitan Area ranges from 37,758 workers under the urban population share-based estimate and approximately 79,670 workers based on the adjusted allocation share. The latter is presented as an alternative estimate to illustrate the possible implications of a higher concentration of gig workers in the Guwahati Metropolitan Area.

5.3. Projected Gig Workforce in Assam and the Guwahati Metropolitan Area up to 2030

Based on the estimates for the year 2023–24, the gig workforce is projected for the period 2024–25 to 2029–30 using the forward projection method. Annual growth rates specific to these geographical units are not available; however, NITI Aayog (2022) provides projected estimates of India's gig workforce up to 2029–30, from which the corresponding year-to-year national growth rates can be derived. In the absence of state- and city-level growth projections, it is assumed that the gig workforce in Assam and the Guwahati Metropolitan Area follows the same annual growth pattern as the national gig workforce. Accordingly, the estimated gig workforce for 2023–24 is projected forward to obtain estimates for the period 2024–25 to 2029–30.

The forward projection is carried out using the following formula:

$$P_t = P_{t-1} \times (1 + r_t) \tag{5}$$

Where,

P_t = Projected population in year t

P_{t-1} = Population in the previous year

r_t = Annual growth rate (NITI Aayog's year-specific national growth rate for year t)

t = Number of years into the future (Per year)

Based on this, we calculate the gig workforce for Assam and the Guwahati Metropolitan Area for the years 2024-25 to 2029-30. This will be shown in Table 1.

Table 1. Projected Size of Gig Workforce in Assam and Guwahati Metropolitan Area

Year	Growth Rate (%)	Projected Gig Workforce: Assam	Projected Gig Workforce: Guwahati Metropolitan Area	
			Urban Population Share-Based Estimate	Estimate Based on Adjusted Allocation Share
2023-24	-	165,463	37,758	79,670
2024-25	13.39%	188,000	43,000	90,000
2025-26	12.60%	211,000	48,000	102,000
2026-27	13.29%	239,000	55,000	115,000
2027-28	13.58%	272,000	62,000	131,000
2028-29	13.04%	307,000	70,000	148,000

From Table 1, which presents the projected gig workforce for Assam and the Guwahati Metropolitan Area, it is observed that, for the year 2026–27, the projected gig workforce is approximately 239,000 in Assam, and between 55,000 and 115,000 in the Guwahati Metropolitan Area.

VI. LIMITATIONS

In the absence of reliable state- and city-level data on the gig workforce, the authors had to make a number of assumptions to estimate the size of the gig workforce in Assam and the Guwahati Metropolitan Area. As more comprehensive survey-based or administrative data become available in the future, these estimates can be further revised and refined. The principal limitations of the present estimates are as follows:

First, the estimated gig workforce is derived indirectly using the national gig-worker share projected by NITI Aayog (2022), which is based on occupation-code proxies rather than direct identification of gig workers. Consequently, all subsequent estimates inherit the assumptions underlying the NITI Aayog methodology.

Second, although the study adjusts the national gig-worker share for Assam using the urbanisation ratio, the estimation assumes that urbanisation is appropriate for the spatial concentration of gig work. Actual penetration may differ across states and cities because of variations in digital infrastructure, economic activity, and platform availability.

Third, the allocation of Assam's estimated gig workforce to the Guwahati Metropolitan Area is based primarily on its share of the state's urban population. This approach assumes a proportional distribution of gig workers across urban centres. Since larger metropolitan areas generally exhibit higher concentrations of economic activities, an alternative estimate is presented to illustrate the possible implications of a higher concentration of gig workers in the Guwahati Metropolitan Area.

VII. CONCLUSION

Though the gig workers as yet comprise a small part of the total workforce in India, their share in the workforce has been rising rapidly and is expected to rise even faster in the coming years. This gig workforce is primarily concentrated in sectors such as transportation, retail trade, accommodation, and food services. Occupation-wise, it is largely engaged in driving, sales, and restaurant service activities, etc. The majority of gig workers are concentrated in the unorganised sector. But the share of gig workers in the organised sector has been rising in the recent years with the rise of the digital economy and the emergence of platforms such as Swiggy, Zomato, Ola, and Uber etc. These platforms act as intermediaries between sellers and buyers of goods or services and are classified under organised sector activities. However, it is important to note that despite serving the organised sector, the employment relationships and working conditions of these workers remain largely informal in nature. It is therefore no surprise that an overwhelming number of gig workers are found located in the informal sector when we do a formal-informal classification of the gig workforce. Skill-wise, the gig workforce mostly falls in the medium-skilled category; however, the skill-wise composition of these workers has changed over time. There have been increases in the shares of high-skilled and low-skilled workers, resulting in some decline in the share of medium-skilled workers. The increased shares of the high-skilled category can be understood in terms of upward mobility of the skill level among workers over time from the process of "Learning by Doing". Increased share of the low-skill segment, on the other hand, can be ascribed to the push factor of the overcrowding in the general unorganised sector and the pull factor of somewhat better labour earnings in the gig economy. The estimate of the size of the gig workforce in Assam in general and the Guwahati Metropolitan Area in particular, for the year 2023-24, and projections up to the year 2030, are expected to assist policymakers and researchers in designing informed strategies and policies related to the gig economy there.

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