

Issue No. 121 PDOS-57-XLII Sept. 2026 (3-4)

ISSN 2249-197X



सर्वेक्षण SARVEKSHANA

121st Issue
September, 2026

Journal of National Statistics Office

Government of India
Ministry of Statistics and Programme Implementation
National Statistics Office
New Delhi
www.mospi.gov.in

SARVEKSHANA

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सत्यमेव जयते

Government of India
Ministry of Statistics and Programme Implementation
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Journal of National Statistics Office (NSO), Ministry of Statistics and Programme Implementation

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‘Sarvekshana’ is generally published twice a year and is made available on the website of the MoSPI as well as NSSTA for free download. The subscription rate for hard copy is ₹300 per copy. For subscription mail to: Controller of Publications, Department of Publication, Civil Lines, Delhi - 110054. Ph. 23819689, 23817823

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Director, Sarvekshana, (email: dir.nssta@mospi.gov.in) & Tel. No. 0120-2324955
National Statistical Systems Training Academy
Ministry of Statistics and Programme Implementation
Plot No. 22, Knowledge Park-II, Greater Noida, G. B. Nagar, Uttar Pradesh-201310

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Foreword

Bringing out *Sarvekshana* has always been an enlightening endeavor. The first issue of *Sarvekshana* was released in July, 1977 and the latest released issue is 120th issue. The present 121st issue comes with three papers titled as follows: (i) Impact of in-kind social transfer on level of living of Indian households, (ii) Role of the size of the factories in efficiency – A study based on data from Annual Survey of Industries (ASI) 2022-23, and (iii) Effect of adopting PPS circular systematic sampling in Annual Survey of Industries: A Simulation Study.

In addition, the highlights of two recent survey reports, namely, (i) Annual Survey of Unincorporated Sector Enterprises (ASUSE) 2025 (January 2025 – December 2025) and (ii) Periodic Labour Force Survey (PLFS) (January – December 2025), have been included in this issue.

Referees have been very kind in examining the papers in detail as well as offering their suggestions in a short span of time and so have been the Members of the Editorial Advisory Board of *Sarvekshana*. I offer my sincere gratitude to all of them and solicit continued support for the Journal. Authors of the papers have also been cooperative in accepting the suggestions for revisions of the papers. On behalf of the Editorial Advisory Board and on my own behalf, I congratulate them for their work and I am sure that the papers would be useful to the readers. Officers of National Statistical Systems Training Academy (NSSTA) of National Statistics Office (NSO) have been meticulous at various stages of publication of this issue and their hard work deserves appreciation.

The *Sarvekshana* is a known Journal among researchers, academicians and policy makers. I welcome students, researchers, Government officials and all those working on data based on sample surveys and censuses to contribute papers for this Journal.

A handwritten signature in blue ink that reads "G. C. Manna". The signature is fluid and cursive, with the first letters of the first and last names being capitalized.

Greater Noida
September, 2026

Chairman
Editorial Advisory Board

CONTENTS

PART – I: TECHNICAL PAPERS

Page No.

1	Impact of in-kind social transfer on level of living of Indian households by Amitava Saha and Gopal Saha	1-36
2	Role of the size of the factories in efficiency – A study based on data from Annual Survey of Industries (ASI) 2022-23 by Anindita Sinharay and Rahul Kumar Gupta	37-53
3	Effect of adopting PPS circular systematic sampling in Annual Survey of Industries: A Simulation Study by Sandipan Sarkar	55-72

PART – II: HIGHLIGHTS OF THE REPORT RELEASED BY NSO

4	HIGHLIGHTS I: Annual Survey of Unincorporated Sector Enterprises (ASUSE) 2025 (January 2025 – December 2025)	75-82
5	HIGHLIGHTS II: Periodic Labour Force Survey (PLFS) (January – December 2025)	83-93

PART – III: HINDI SECTION

6	मुख्य बिंदु – I: अनियमित सेक्टर के उद्यमों का वार्षिक सर्वेक्षण (ए. एस. यू. ई) (जनवरी 2025 –दिसम्बर 2025)	99-106
7	मुख्य बिंदु – II: आवधिक श्रमबल सर्वेक्षण (जनवरी 2025 –दिसम्बर 2025)	107-117

PART – I

TECHNICAL PAPERS

Impact of in-kind social transfer on level of living of Indian households

Amitava Saha¹

Gopal Saha²

Abstract

In-kind social transfers are intended for enhancement of the standard of living of the people through an increase of disposable income of the households, thereby increasing the purchasing capacity. Researchers across the globe have time and again demonstrated the positive impact of in-kind social transfers in improvement of level of living as well as reduction of poverty. In the Indian context, Himanshu and Sen (2013), Drèze and Khera (2013) and Anders Kjelsrud and Somanathan (2016, 2017), have observed a significant positive impact of in-kind transfers like food from PDS, mid-day meal, subsidized fuel, use of government health facilities etc. on the level of living of the households across rural and urban India. Utilizing the unit level data of Household Consumption Expenditure Survey (HCES) of 2022-23, we make an attempt to assess the impact of in-kind social transfers on the households in rural and urban India. It is observed that at all-India level, about 18.8% of rural population and 8.4% of urban population, attributing to approximately 22 crores or 220 million people, have experienced an improvement in their level of living as a consequence of receipt of in-kind social transfers.

Keywords: In-kind social transfers; National Food Security Act; Public Distribution System; Monthly Per Capita Consumption Expenditure

JEL Classification Code: I38; I31; D63; H53

Receipt of Final version of paper from Author: 27th November 2025

Date of Acceptance: 25th March 2026

¹ Corresponding author, e-mail: saha_amitava@hotmail.com. The views expressed in this paper are those of the authors and not of the organization they work for.

Amitava Saha is presently working as Deputy Director General in the Household Survey Division of NSO

² Gopal Saha is working as Deputy Director in Regional Office, Guwahati, Field Operation Division of NSO.

1. Introduction

Social transfers are benefits either in cash or in kind given to the people or households who usually by their own endeavour are unable to meet their basic needs. Governments of different countries across the world have made such transfers either in kind through providing basic services like healthcare, education, public transport, housing etc. or food items either free of cost or at subsidized rate. Sometimes direct transfer of cash to the targeted beneficiaries is also made. Social transfers in kind are usually adopted to ensure a more equal access to basic services. These also result in an increase of disposable income of the households, thereby increasing the purchasing capacity of them.

In-kind social transfers, in the form of providing foodgrains at subsidised rates through Public Distribution System (PDS), provision for free mid-day meals to every child attending Government or Government aided schools upto eighth grade, fuel subsidy in the form of discounted or subsidised LPG cylinder or certain units of electricity free of cost, waiver of water charges etc. have benefitted the households in India in improving their level of living substantially. These also helped many of the households to come out of poverty.

In the Indian context, among many others, noticeable work on the impact of in-kind social transfer has been studied by researchers like Himanshu and Sen (2013), Drèze and Khera (2013), Sahoo and Nayak (2023). All of these researchers have observed a significant impact of food transfers through PDS in reducing poverty over time. In some other studies, Anders Kjelsrud and Somanathan (2016, 2017), imputed the value of benefits to families using facilities of public schools, government health facilities, subsidized fuel and food from PDS to find out positive impact of in-kind transfer on the level of living of the households across rural and urban India. Aaberge et al. (2010, 2013) and Burgess et al. (2014) observed that after including publicly provided education and healthcare services as a non-cash component, inequality and poverty measures significantly reduced in many European countries compared to measures that only include cash income. While Smeeding (1982) and Burgess et al. (2014), acknowledging the importance of in-kind social transfers, developed methods for measuring effects of these on poverty, Smeeding et al. (1993, 2008, 2014) by analysing data from seven Western nations observed the positive effect of noncash income in easing out the impact of poverty. Miežienė and Krutulienė (2019) showed that social protection transfers reduced the percentage of people at risk-of-poverty in all European Union countries. Many other researchers across the world have also noted the positive effects of in-kind social transfer in reduction of poverty and inequality.

In India, the National Food Security Act (NFSA) was introduced in the year 2013. The Act made around 80 crore or 800 million persons eligible to receive highly subsidized food grains at a cost of Rs.1.00 or Rs. 2.00 or Rs. 3.00 for coarse grains, wheat and rice, respectively. Under the provisions of NFSA, the Antyodaya Anna Yojana (AAY) households, being the poorest of the poor are entitled to 35 kg of food grains per family per month while priority households are entitled to 5 kg food grains per person per month. Further, the Pradhan Mantri Garib Kalyan Ann Yojna (PMGKAY) was operational in six phases in India from April 2020 to September 2022, providing 5kg of free food grains per month to the migrants and poor families, in addition

to the entitlement under the NFSA. With effect from 1 January 2023, the entitlement of food grains to about 81.35 crore NFSA beneficiaries have been made free and subsequently, from 1 January 2024 it has been extended for a period of five more years.

Pradhan Mantri Jan Aarogya Yojana (PMJAY) was launched in 2017 with a view to achieve Universal Health Coverage through making healthcare available free for the bottom 40 per cent of poor and vulnerable population of the country. Apart from these, there are a number of other programmes run by the provincial governments across the country through which non-food items like school uniform, school shoe, textbooks, bicycle, tablet etc. are being provided free of cost to the household members. These social welfare programmes have contributed significantly in improving the level of living of the households across rural and urban areas of the country. However, quantifying the level of impact of these social welfare programmes in uplifting the level of living of the households is very difficult. Such information whenever available, may play a pivotal role in policy formulation and is critical for evaluation of effectiveness of these programmes.

The National Statistics Office (NSO) has published, the data of the Household Consumption Expenditure Survey (HCES) conducted nationwide during August 2022 to July 2023 in June 2024. Utilizing the unit level data of HCES:2022-23, we attempt to assess the impact of in-kind social transfers by comparing the relative position of the households in the Monthly Per Capita Consumption Expenditure (MPCE) fractile classes with regard to ‘without and with imputation MPCE’ figures of the households. Such a comparison is important as movements of the households from a lower MPCE fractile class to a higher one would imply that the intended benefits have reached the targeted beneficiaries, resulting in an improvement in their level of living. It is encouraging to note that the in-kind social transfers helped substantially in improvement of the level of living of the households and the benefit was more for the poorest of the poor households.

2. Data

The Household Consumption Expenditure Survey (HCES): 2022-23 has collected information on quantity of consumption figures for a number of food and non-food items received by the households either free of cost or at a subsidised price through various social welfare programmes. For the first time, NSO has made an attempt to impute the value figures of some of these food and non-food items and has published another set of estimates of the MPCE figures termed as ‘MPCE with imputation’ along with the usual MPCE values. NSO has published two sets of sector and state-wise suggested values for imputation of food and non-food items received free of cost, one using modal unit prices and the other using the 25th percentile unit prices along with the unit level data. The detailed method for computation of the suggested values has been explained in the NSS Report No. 591 (2024).

For compiling the ‘with imputation MPCE’ figures, NSO has considered the imputed values for (i) food items: Rice, Wheat/Atta, Jowar, Bajra, Maize, Ragi, Barley, Small Millets, Pulses, Gram, Salt, Sugar, Edible Oil and (ii) non-food items: Laptop/PC, Tablet, Mobile Handset, Bicycle, Motor Cycle/Scooty, Clothing (School uniform), Footwear (School shoe) etc.

However, the values of free medical services and education services received by the households have not been imputed and NSO has explicitly mentioned the reasons behind this in the report (NSS Report No. 591) of the survey released recently. Estimation of a second set of MPCE values considering the imputed value figures of the specified food and non-food items, provides an opportunity to assess the impact of various social welfare programmes of the Central as well as State Governments in improvement of the level of living of the people.

3. Methodology

Using the unit-level data and applying the modal unit price for imputing the value of free items, we first compute two MPCE figures for each of the 261,746 sample households (155,014 rural and 106,732 urban): one without imputation (denoted as $mpce_{i1}$) and another with imputation (denoted as $mpce_{i2}$). The households in rural and urban sectors are then separately arranged in ascending order of their without-imputation MPCE ($mpce_{i1}$), and grouped into 12 distinct fractile classes. The bottom two and top two fractile classes each represent 5% of the estimated population, while the remaining eight classes each account for 10%. Table 1 presents the upper limits and average MPCE for each fractile class for rural and urban India.

Table 1: Lower and upper limits for different fractile classes: All-India determined based on Without Imputation MPCE

Fractile class of MPCE	Rural		Urban	
	Lower limit (Rs.)	Upper limit (Rs.)	Lower limit (Rs.)	Upper limit (Rs.)
0-5%	-	1,638	-	2,382
5-10%	1,638	1,912	2,382	2,813
10-20%	1,912	2,289	2,813	3,467
20-30%	2,289	2,612	3,467	4,053
30-40%	2,612	2,927	4,053	4,647
40-50%	2,927	3,268	4,647	5,286
50-60%	3,268	3,657	5,286	6,061
60-70%	3,657	4,138	6,061	7,036
70-80%	4,138	4,819	7,036	8,425
80-90%	4,819	6,043	8,425	11,089
90-95%	6,043	7,411	11,089	14,189
95-100%	7,411	-	14,189	-

Using the modal unit prices available in the data, we impute values for the free items (excluding health and education) and compute the with-imputation MPCE for every household. For the i^{th} household, the difference ($mpce_{i2} - mpce_{i1}$) can be regarded as a measure of the benefits received through various Government social welfare schemes.

Each household is first assigned to a fractile class based on its without-imputation MPCE. Its relative position in the distribution of the fractile classes based on the without imputation MPCE values, is then reassessed using its with-imputation MPCE. This may cause the household to move to a higher fractile class as a consequence of increase in the MPCE figure. This allows the construction of a transition matrix, which records the movement of households across fractile classes once imputed values of in-kind social transfers are included. The procedure consists of three key steps:

1. Constructing fractile classes using $mpce_{i1}$, with lower and upper boundaries determined separately for rural and urban sectors.
2. Determining the relative position of households within these classes (as determined in step 1) using $mpce_{i2}$, noting any upward movement.
3. Measuring the transition due to social transfer benefits – The estimated number of households that move from a lower to a higher class (e.g., from the 1st to the 2nd class) is computed as $\sum_{i=1}^n h_i \times w_i$

where, w_i is the survey weight associated with i^{th} household, h_i is the size of the i^{th} household and n indicates number of households that moved to an upper class based on $mpce_{i2}$ values.

For illustration, consider a rural household with $mpce_{i1} = ₹1,770$, placing it in the 2nd fractile class. After imputation, suppose its $mpce_{i2}$ becomes ₹1,920. When classified using the imputed MPCE value and the same fractile class distribution determined using without imputation values, this household moves from the 2nd to the 3rd fractile class. Tracking such movements across the entire sample yields the transition matrices as presented in Tables 2R and 2U. In these matrices, values inside parentheses represent the percentage of the estimated population based on without-imputation MPCE, while the values outside parentheses represent corresponding percentages based on with-imputation MPCE.

**Table 2R: Percentage Distribution of Estimated Population across Fractile Classes:
Rural**

Fractile class	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	4.04 (5)	0.93	0.03									
05-10		3.36 (5)	1.64	0.00								
10-20			7.45 (10)	2.52	0.02							
20-30				7.31 (10)	2.63	0.05	0.01					
30-40					7.21 (10)	2.76	0.03	0.01				
40-50						7.54 (10)	2.43	0.03				
50-60							7.90 (10)	2.08	0.01			
60-70								8.27 (10)	1.72	0.01		
70-80									8.87 (10)	1.13		

Fractile class	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
80-90										9.49 (10)	0.51	
90-95											4.79 (5)	0.21
95-100												5.00 (5)
Total	4.04	4.29	9.12	9.84	9.86	10.3 5	10.3 7	10.3 9	10.6 0	10.6 3	5.30	5.21

**Table 2U: Percentage Distribution of Estimated Population across Fractile Classes:
Urban**

Fractile class	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	4.18 (5.0)	0.80	0.02									
05-10		3.87 (5)	1.13	0.00								
10-20			8.58 (10)	1.41	0.01							
20-30				8.73 (10)	1.26	0.01	0.00					
30-40					8.83 (10)	1.16	0.00	0.00				
40-50						8.99 (10)	1.01	0.00				
50-60							9.28 (10)	0.72	0.00			
60-70								9.51 (10)	0.49	0.00		
70-80									9.78 (10)	0.22		
80-90										9.91 (10)	0.09	
90-95											4.97 (5)	0.03
95-100												5.00 (5)
Total	4.18	4.67	9.73	10.1 4	10.1 1	10.1 6	10.2 9	10.2 4	10.2 7	10.1 3	5.06	5.03

Had there been no change in the MPCE figures of the households after considering the imputed values of the in-kind social transfers, each of the bottom and top two fractile classes should have 5% of the population and each of the middle 8 fractile classes should contain 10% of the population. However, inclusion of imputed values of the in-kind social transfers increases the MPCE values of the households and this results in an upward movement of the beneficiaries of the lower fractile classes towards higher fractile classes, both in rural and urban areas. In rural India, due to improvement in the level of living, there has been a notable upward movement of the population from the first eight fractile classes to the higher classes whereas in urban India, such an upward movement has been observed for the first seven fractile classes.

Further, upward movement, in a lesser magnitude is also noticed among the remaining higher fractile classes in rural as well as urban India.

Lateral movement of the population to the immediate next higher fractile class in rural India has varied from 4% to 33%, the lowest being for the second highest fractile class and the highest from the fractile class '05-10'. Movement of the population to the immediate next higher fractile class in the urban sector has varied from about 1% to 22%, the highest being noticed for the second fractile class. Besides, in both rural and urban India, maximum upward movement of the population is observed in bottom three fractile classes. Such lateral movement of the population resonates with the progressive nature of the social transfers, i.e., these are intended for the poor, not the rich.

However, there are social welfare schemes through which non-food items like bicycles, laptops, mobiles, school uniforms etc. are distributed to the beneficiaries irrespective of their economic status and this might have contributed to an increase in the imputed MPCE for a segment of the population belonging to the higher fractile classes resulting in lateral movements in these classes also.

It is also worthwhile to note that imputation of the value of free medical services availed by the households through PM Jan Aarogya Yojna (PMJAY) and the value of free education services has not been made in this exercise. Needless to say, consideration of the benefits of free health and education services in imputation would have resulted in further improvements in the level of living of the households specifically, belonging to the lower fractile classes.

Figure 1: Percentage Change of Estimated Population across Fractile Classes for major states



A similar analysis for the 18 major states also reveals scenarios almost identical to the situation prevailing at All-India level. Out of these major states, maximum improvement in the level of living has been observed for the population belonging to lowest fractile classes for 12 states in rural areas and 15 states in urban areas. The transition matrices for the 18 major states are given in the Appendix.

Using the unit level data of HCES:2022-23, we have estimated the percentage of population across all the states and union territories for whom there have been an improvement in the level of living as a consequence of lateral movement from a lower fractile class of MPCE to a higher one. The estimated percentage of population for the 18 major states with an improvement in the living standard is given in Table 3 below.

Table 3: Estimated percentage of population in major states with an improvement in the level of living

State	% in total population		
	Rural	Urban	Total
Andhra Pradesh	21.2	13.4	18.8
Assam	31.2	11.0	29.0
Bihar	19.0	10.5	18.2
Chhattisgarh	33.0	13.6	29.2
Gujarat	5.4	1.1	3.7
Haryana	8.9	4.0	7.1
Jharkhand	9.9	3.9	8.8
Karnataka	36.9	13.5	28.4
Kerala	6.0	3.0	4.6
Madhya Pradesh	13.2	4.7	11.1
Maharashtra	13.5	3.3	9.2
Odisha	14.0	6.5	12.9
Punjab	8.8	4.8	7.4
Rajasthan	17.3	9.6	15.5
Tamil Nadu	23.7	12.6	18.7
Telangana	30.2	12.0	22.2
Uttar Pradesh	25.4	12.1	22.7
West Bengal	46.5	24.9	40.5
All India	18.8	8.4	15.8

4. Impact on Consumption Inequality and Welfare

With a view to assess the distributive impact of public transfers on consumption inequality and welfare, we made a comparison of the Gini Coefficient and Gini Welfare Function using the MPCE figures ‘without and with imputation’ (see Table 4).

Table 4: Comparison of consumption inequality and welfare indicators

Sector	2011-12 (NSS 68 th round)		HCES:2022-23			
	Gini Coefficient	GWF	without imputation		with imputation	
			Gini Coefficient	GWF	Gini Coefficient	GWF
Rural	0.283	1025	0.266	1474	0.261	1518
Urban	0.363	1675	0.314	2408	0.309	2448
GWF is defined as: $W = y(1 - G)$, where y represents the MPCE at 2011-12 prices, and G is the Gini Coefficient.						

The results show a consistent decline in consumption inequality between 2011-12 and 2022-23 in both rural and urban sectors. Further, a comparison of the estimates of with and without imputation highlights the role of social transfers. In rural areas, the Gini Coefficient declines from 0.266 to 0.261 when in-kind transfers are included in the MPCE. A similar pattern is observed in urban areas, where the Gini falls from 0.314 to 0.309 after imputation.

Although the magnitude of the change in the Gini Coefficient is modest, it indicates that public transfers exert an equalising effect on the distribution of consumption. This effect is further reflected in the GWF, which increases from 1474 to 1518 in rural areas, and from 2408 to 2448 in urban areas once imputed benefits are incorporated. This increase in GWF suggests that social transfers not only reduce inequality but also augment effective consumption levels, particularly among the lower fractile classes in the consumption distribution.

5. Summary and Conclusions

Our analysis clearly demonstrates that the in-kind transfer of food and other items through different social welfare schemes of the governments have positively impacted the level of living of the beneficiary households. In all the states, a significant percentage of population has moved from a lower consumption class to a higher one as a consequence of receipt of social transfer in kind. Among the major states, the highest level of improvement has been observed in West Bengal followed by Chattisgarh, Assam and Karnataka. At all-India level, about 18.8% of rural population and 8.4% of urban population, attributing to approximately 22 crores people, have experienced an improvement in their level of living after receiving in-kind transfers. Although, the impact of such schemes varies widely among the states and also between the rural and urban sectors, the importance of in-kind social transfer as a catalyst in improvement of level of living by making additional resources available to the households for satisfying their other needs is evident from our analysis.

The transition of the population across fractile classes, computed based on MPCE without imputation, resulting from the receipt of in-kind transfers for each State/UT, is provided in the Appendix. The State/UT-wise transition matrices presented in the Appendix further demonstrate the effect of the imputed value of in-kind social transfers on the distribution of the population across MPCE fractile classes. Across States/UTs, the inclusion of the imputed value of in-kind transfers is associated with an upward movement of a section of the population from

lower MPCE fractile classes to higher classes, although the magnitude of such movement varies across States/UTs and between rural and urban sectors.

The upward movement is generally more pronounced among the lower MPCE fractile classes, particularly in rural areas, indicating the progressive nature of in-kind social transfers. Thus, the State/UT-wise findings presented in the Appendix reinforce the overall conclusion that the in-kind social transfers have a positive impact in the level of living of beneficiary households.

Several researchers across the world have demonstrated the effectiveness of in-kind social transfer in improvement of level of living. Sen and Himanshu (2013) through imputation of in-kind value of food transfers through PDS and Mid-day meal scheme has observed significant increase in contribution of in-kind transfers to both poverty reduction and nutrition. Our analysis emphatically shows the positive impact of in-kind social transfers in the level of living of the population belonging to the lower fractile classes, i.e., the population who deserves the in-kind transfers the most. Such an improvement will definitely have its influence in reduction of incidence of poverty in the country and would be visible whenever official poverty estimates are made.

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Appendix

Transition matrices showing percentage distribution of estimated population across fractile classes of MPCE (computed based on MPCE - without imputation value) for different states/UTs in rural and urban sectors:

(i) Jammu and Kashmir

Fractile class	Rural											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	2.99	1.86	0.00									
05-10		3.13	1.98	0.00								
10-20			8.34	1.67	0.00							
20-30				8.16	1.81	0.00	0.00					
30-40					7.51	2.48	0.00	0.00				
40-50						8.38	1.66	0.00				
50-60							8.95	1.08	0.00			
60-70								8.95	1.03	0.00		
70-80									9.42	0.61		
80-90										9.73	0.26	
90-95											4.92	0.06
95-100												5.00

Fractile class	Urban											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	4.78	0.21	0.00									
05-10		3.95	1.02	0.00								
10-20			9.51	0.47	0.00							
20-30				9.54	0.45	0.00	0.00					
30-40					9.81	0.24	0.00	0.00				
40-50						9.61	0.38	0.00				
50-60							9.85	0.15	0.00			
60-70								9.86	0.13	0.00		
70-80									9.80	0.22		
80-90										9.97	0.00	
90-95											5.00	0.00
95-100												5.00

(ii) Himachal Pradesh

Fractile class	Rural											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	4.67	0.29	0.00									
05-10		4.92	0.05	0.00								
10-20			9.42	0.63	0.00							
20-30				9.43	0.58	0.00	0.00					
30-40					9.66	0.32	0.00	0.00				
40-50						9.40	0.60	0.00				
50-60							9.83	0.14	0.00			
60-70								9.89	0.15	0.00		
70-80									9.85	0.12		
80-90										10.02	0.00	
90-95											5.00	0.00
95-100												5.00

Fractile class	Urban											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	4.98	0.00	0.00									
05-10		4.69	0.20	0.00								
10-20			9.94	0.16	0.00							
20-30				9.83	0.00	0.00	0.00					
30-40					10.18	0.00	0.00	0.00				
40-50						9.64	0.38	0.00				
50-60							9.84	0.00	0.00			
60-70								10.05	0.11	0.00		
70-80									9.91	0.09		
80-90										9.99	0.00	
90-95											5.00	0.00
95-100												5.00

(iii) Punjab

Fractile class	Rural											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	4.43	0.47	0.05									
05-10		4.09	0.88	0.03								
10-20			8.71	1.29	0.00							
20-30				8.70	1.28	0.00	0.00					
30-40					8.82	1.17	0.02	0.00				
40-50						8.59	1.39	0.00				
50-60							9.22	0.82	0.00			
60-70								9.25	0.74	0.00		
70-80									9.61	0.39		
80-90										9.80	0.21	
90-95											4.92	0.07
95-100												5.00

Fractile class	Urban											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	4.53	0.45	0.00									
05-10		4.44	0.54	0.00								
10-20			9.01	0.99	0.00							
20-30				9.37	0.66	0.00	0.00					
30-40					9.15	0.78	0.00	0.00				
40-50						9.60	0.45	0.00				
50-60							9.47	0.47	0.00			
60-70								9.84	0.24	0.00		
70-80									9.81	0.15		
80-90										9.98	0.05	
90-95											4.98	0.00
95-100												5.00

(iv) Chandigarh

Fractile class	Rural											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	4.72	0.00	0.00									
05-10		4.92	0.08	0.00								
10-20			10.00	0.00	0.00							
20-30				10.00	0.00	0.00	0.00					
30-40					10.00	0.00	0.00	0.00				
40-50						10.00	0.00	0.00				
50-60							10.00	0.00	0.00			
60-70								10.00	0.00	0.00		
70-80									9.85	0.00		
80-90										10.00	0.00	
90-95											4.85	0.00
95-100												5.00

Fractile class	Urban											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	4.76	0.00	0.00									
05-10		5.00	0.00	0.00								
10-20			9.50	0.35	0.00							
20-30				10.00	0.00	0.00	0.00					
30-40					10.00	0.00	0.00	0.00				
40-50						9.96	0.00	0.00				
50-60							9.39	0.00	0.00			
60-70								10.00	0.00	0.00		
70-80									10.00	0.00		
80-90										9.91	0.00	
90-95											4.97	0.00
95-100												5.00

(v) Uttarakhand

Fractile class	Rural											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	3.75	1.14	0.11									
05-10		4.03	0.96	0.00								
10-20			7.56	1.93	0.46							
20-30				7.56	2.21	0.21	0.06					
30-40					8.32	1.56	0.10	0.02				
40-50						7.88	1.92	0.20				
50-60							8.07	1.78	0.07			
60-70								8.53	1.46	0.00		
70-80									8.68	1.40		
80-90										9.58	0.40	
90-95											4.97	0.00
95-100												5.00

Fractile class	Urban											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	4.86	0.00	0.00									
05-10		5.12	0.00	0.00								
10-20			9.75	0.25	0.00							
20-30				8.73	1.22	0.00	0.00					
30-40					8.41	1.46	0.00	0.00				
40-50						9.85	0.20	0.00				
50-60							10.02	0.11	0.00			
60-70								9.36	0.41	0.00		
70-80									10.23	0.00		
80-90										9.80	0.14	
90-95											5.04	0.00
95-100												5.01

(vi) Haryana

Fractile class	Rural											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	4.68	0.26	0.00									
05-10		4.49	0.55	0.00								
10-20			8.44	1.26	0.21							
20-30				8.41	1.51	0.07	0.03					
30-40					8.81	1.09	0.09	0.04				
40-50						8.65	1.30	0.05				
50-60							8.62	1.22	0.14			
60-70								9.38	0.64	0.00		
70-80									9.73	0.26		
80-90										9.89	0.11	
90-95											4.96	0.06
95-100												5.00

Fractile class	Urban											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	4.49	0.46	0.00									
05-10		4.50	0.52	0.00								
10-20			9.14	0.89	0.00							
20-30				9.10	0.88	0.00	0.00					
30-40					9.62	0.41	0.00	0.00				
40-50						9.50	0.49	0.00				
50-60							9.83	0.16	0.00			
60-70								9.85	0.15	0.00		
70-80									9.93	0.03		
80-90										10.00	0.01	
90-95											5.00	0.00
95-100												5.00

(vii) Delhi

Fractile class	Rural											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	4.58	0.00	0.00									
05-10		5.00	0.00	0.00								
10-20			9.73	0.25	0.00							
20-30				10.00	0.00	0.00	0.00					
30-40					9.55	0.49	0.00	0.00				
40-50						8.28	1.31	0.00				
50-60							9.99	0.00	0.00			
60-70								9.95	0.41	0.00		
70-80									9.84	0.00		
80-90										10.00	0.00	
90-95											4.67	0.21
95-100												5.00

Fractile class	Urban											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	4.30	0.68	0.00									
05-10		4.57	0.39	0.00								
10-20			9.08	0.92	0.00							
20-30				9.36	0.67	0.00	0.00					
30-40					8.88	1.13	0.00	0.00				
40-50						9.41	0.55	0.00				
50-60							9.82	0.22	0.00			
60-70								9.83	0.16	0.00		
70-80									9.92	0.08		
80-90										9.95	0.00	
90-95											5.00	0.00
95-100												5.00

(viii) Rajasthan

Fractile class	Rural											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	3.44	1.54	0.02									
05-10		3.31	1.68	0.00								
10-20			7.56	2.43	0.02							
20-30				7.81	2.18	0.01	0.00					
30-40					7.64	2.35	0.01	0.00				
40-50						7.84	2.16	0.01				
50-60							8.08	1.90	0.00			
60-70								8.37	1.66	0.00		
70-80									9.06	0.93		
80-90										9.72	0.28	
90-95											4.85	0.15
95-100												5.00

Fractile class	Urban											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	4.17	0.69	0.12									
05-10		3.69	1.32	0.00								
10-20			8.07	1.90	0.01							
20-30				8.51	1.50	0.01	0.00					
30-40					7.96	2.04	0.00	0.00				
40-50						9.21	0.80	0.01				
50-60							9.38	0.61	0.00			
60-70								9.67	0.31	0.00		
70-80									9.73	0.27		
80-90										10.00	0.03	
90-95											4.90	0.03
95-100												5.08

(ix) Uttar Pradesh

Fractile class	Rural											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	3.56	1.42	0.02									
05-10		2.37	2.62	0.00								
10-20			6.58	3.39	0.03							
20-30				6.43	3.51	0.06	0.01					
30-40					6.11	3.84	0.05	0.00				
40-50						6.62	3.34	0.04				
50-60							7.19	2.81	0.01			
60-70								8.03	1.96	0.00		
70-80									8.60	1.40		
80-90										9.35	0.64	
90-95											4.72	0.28
95-100												5.00

Fractile class	Urban											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	4.11	0.87	0.02									
05-10		3.22	1.78	0.00								
10-20			8.02	1.98	0.00							
20-30				8.20	1.78	0.01	0.00					
30-40					7.98	2.01	0.00	0.00				
40-50						8.20	1.81	0.00				
50-60							8.95	1.05	0.00			
60-70								9.51	0.50	0.00		
70-80									9.76	0.19		
80-90										9.98	0.06	
90-95											5.00	0.00
95-100												5.00

(x) Bihar

Fractile class	Rural											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	4.36	0.63	0.00									
05-10		3.65	1.35	0.00								
10-20			7.85	2.15	0.00							
20-30				7.52	2.48	0.00	0.00					
30-40					6.82	3.17	0.01	0.00				
40-50						7.31	2.68	0.00				
50-60							7.46	2.53	0.00			
60-70								8.22	1.79	0.01		
70-80									8.73	1.27		
80-90										9.43	0.57	
90-95											4.67	0.33
95-100												5.00

Fractile class	Urban											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	4.42	0.53	0.00									
05-10		4.09	0.94	0.00								
10-20			8.47	1.53	0.00							
20-30				7.71	2.30	0.00	0.00					
30-40					8.25	1.71	0.00	0.00				
40-50						8.62	1.40	0.00				
50-60							8.83	1.18	0.00			
60-70								9.46	0.54	0.00		
70-80									9.71	0.29		
80-90										9.90	0.09	
90-95											4.98	0.03
95-100												5.01

(xi) Sikkim

Fractile class	Rural											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	4.87	0.09	0.00									
05-10		4.76	0.26	0.00								
10-20			9.19	0.78	0.00							
20-30				8.64	1.32	0.00	0.00					
30-40					9.11	0.94	0.00	0.00				
40-50						8.63	1.33	0.00				
50-60							8.49	1.53	0.00			
60-70								8.90	1.10	0.00		
70-80									9.75	0.28		
80-90										9.90	0.12	
90-95											4.91	0.10
95-100												5.00

Fractile class	Urban											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	4.75	0.10	0.00									
05-10		4.63	0.10	0.00								
10-20			10.14	0.27	0.00							
20-30				9.63	0.19	0.00	0.00					
30-40					9.76	0.38	0.00	0.00				
40-50						9.96	0.00	0.00				
50-60							9.85	0.16	0.00			
60-70								9.79	0.26	0.00		
70-80									10.00	0.00		
80-90										9.98	0.00	
90-95											4.99	0.00
95-100												5.00

(xii) Arunachal Pradesh

Fractile class	Rural											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	4.04	0.96	0.00									
05-10		3.87	1.12	0.00								
10-20			9.26	0.74	0.00							
20-30				9.58	0.35	0.00	0.00					
30-40					9.87	0.20	0.00	0.00				
40-50						9.64	0.34	0.00				
50-60							9.66	0.35	0.00			
60-70								9.78	0.25	0.00		
70-80									10.00	0.00		
80-90										10.00	0.00	
90-95											4.94	0.02
95-100												5.00

Fractile class	Urban											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	4.72	0.18	0.00									
05-10		4.63	0.41	0.00								
10-20			9.76	0.24	0.00							
20-30				10.00	0.02	0.00	0.00					
30-40					9.30	0.59	0.00	0.00				
40-50						9.94	0.15	0.00				
50-60							9.94	0.07	0.00			
60-70								9.61	0.36	0.00		
70-80									9.94	0.00		
80-90										10.00	0.00	
90-95											4.98	0.00
95-100												5.00

(xiii) Nagaland

Fractile class	Rural											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	4.25	0.68	0.00									
05-10		4.46	0.59	0.00								
10-20			8.10	1.91	0.00							
20-30				8.33	1.60	0.00	0.00					
30-40					8.74	1.26	0.00	0.00				
40-50						8.13	1.88	0.00				
50-60							8.85	1.17	0.00			
60-70								8.92	1.12	0.00		
70-80									9.31	0.65		
80-90										9.50	0.52	
90-95											4.98	0.03
95-100												5.00

Fractile class	Urban											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	4.78	0.19	0.00									
05-10		4.33	0.63	0.00								
10-20			9.64	0.41	0.00							
20-30				8.85	1.13	0.00	0.00					
30-40					9.44	0.51	0.00	0.00				
40-50						8.59	1.48	0.00				
50-60							8.88	1.11	0.00			
60-70								8.97	1.00	0.06		
70-80									8.96	1.03		
80-90										9.42	0.49	
90-95											4.97	0.10
95-100												5.00

(xiv) Manipur

Fractile class	Rural											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	4.82	0.17	0.00									
05-10		4.80	0.20	0.00								
10-20			9.64	0.36	0.00							
20-30				9.71	0.27	0.00	0.00					
30-40					9.80	0.21	0.00	0.00				
40-50						9.91	0.09	0.00				
50-60							9.81	0.16	0.00			
60-70								9.93	0.09	0.00		
70-80									10.00	0.00		
80-90										9.94	0.06	
90-95											5.00	0.00
95-100												5.00

Fractile class	Urban											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	4.70	0.26	0.00									
05-10		3.97	1.00	0.00								
10-20			9.08	0.96	0.00							
20-30				9.33	0.68	0.00	0.00					
30-40					9.19	0.82	0.00	0.00				
40-50						9.63	0.38	0.00				
50-60							9.75	0.22	0.00			
60-70								9.68	0.30	0.00		
70-80									9.93	0.07		
80-90										10.00	0.00	
90-95											4.98	0.03
95-100												5.00

(xv) Mizoram

Fractile class	Rural											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	4.82	0.16	0.00									
05-10		4.95	0.00	0.00								
10-20			9.31	0.52	0.00							
20-30				9.89	0.30	0.00	0.00					
30-40					9.20	0.82	0.00	0.00				
40-50						9.43	0.59	0.00				
50-60							9.82	0.04	0.00			
60-70								9.99	0.07	0.04		
70-80									9.77	0.25		
80-90										9.90	0.10	
90-95											5.00	0.00
95-100												5.00

Fractile class	Urban											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	4.97	0.00	0.00									
05-10		4.88	0.12	0.00								
10-20			9.67	0.34	0.00							
20-30				9.96	0.05	0.00	0.00					
30-40					9.85	0.16	0.00	0.00				
40-50						9.93	0.08	0.00				
50-60							9.94	0.03	0.00			
60-70								9.89	0.14	0.00		
70-80									9.96	0.05		
80-90										9.89	0.08	
90-95											4.91	0.11
95-100												5.00

(xvi) Tripura

Fractile class	Rural											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	4.02	0.98	0.00									
05-10		3.44	1.52	0.00								
10-20			7.02	3.02	0.00							
20-30				7.27	2.73	0.02	0.00					
30-40					7.51	2.49	0.00	0.00				
40-50						7.80	2.18	0.00				
50-60							7.42	2.59	0.00			
60-70								8.42	1.58	0.00		
70-80									9.02	0.99		
80-90										9.47	0.53	
90-95											4.75	0.27
95-100												5.00

Fractile class	Urban											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	3.78	1.19	0.00									
05-10		3.19	1.82	0.00								
10-20			8.85	1.11	0.00							
20-30				8.13	1.88	0.00	0.00					
30-40					8.12	1.85	0.00	0.00				
40-50						8.81	1.22	0.00				
50-60							8.72	1.29	0.00			
60-70								9.48	0.52	0.00		
70-80									9.77	0.26		
80-90										9.86	0.10	
90-95											4.94	0.00
95-100												5.00

(xvii) Meghalaya

Fractile class	Rural											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	4.74	0.22	0.00									
05-10		4.28	0.76	0.00								
10-20			9.62	0.37	0.00							
20-30				9.26	0.76	0.00	0.00					
30-40					9.65	0.35	0.00	0.00				
40-50						9.57	0.37	0.00				
50-60							9.93	0.12	0.00			
60-70								9.86	0.14	0.00		
70-80									9.64	0.37		
80-90										9.88	0.05	
90-95											4.99	0.07
95-100												5.00

Fractile class	Urban											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	4.97	0.00	0.00									
05-10		4.99	0.00	0.00								
10-20			9.91	0.00	0.00							
20-30				10.00	0.00	0.00	0.00					
30-40					9.79	0.17	0.00	0.00				
40-50						9.70	0.21	0.00				
50-60							9.99	0.16	0.00			
60-70								9.97	0.00	0.00		
70-80									9.74	0.25		
80-90										9.94	0.08	
90-95											4.99	0.00
95-100												5.00

(xviii) Assam

Fractile class	Rural											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	3.43	1.54	0.02									
05-10		2.32	2.66	0.02								
10-20			6.44	3.53	0.04							
20-30				6.01	3.93	0.04	0.00					
30-40					6.08	3.84	0.10	0.00				
40-50						5.29	4.68	0.03				
50-60							6.52	3.45	0.01			
60-70								6.60	3.39	0.00		
70-80									7.74	2.27		
80-90										8.85	1.11	
90-95											4.53	0.48
95-100												5.00

Fractile class	Urban											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	3.82	1.14	0.00									
05-10		3.97	1.07	0.00								
10-20			8.07	1.93	0.00							
20-30				8.33	1.65	0.02	0.00					
30-40					8.53	1.43	0.04	0.00				
40-50						8.28	1.68	0.00				
50-60							8.81	1.20	0.00			
60-70								9.51	0.45	0.00		
70-80									9.72	0.34		
80-90										9.88	0.06	
90-95											5.00	0.00
95-100												5.00

(xix) West Bengal

Fractile class	Rural											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	2.57	2.07	0.33									
05-10		1.07	3.83	0.08								
10-20			3.82	5.53	0.64							
20-30				2.97	6.60	0.41	0.00					
30-40					3.44	5.97	0.54	0.04				
40-50						3.72	6.09	0.18				
50-60							4.75	5.13	0.11			
60-70								5.52	4.45	0.01		
70-80									7.30	2.69		
80-90										8.74	1.26	
90-95											4.58	0.40
95-100												5.00

Fractile class	Urban											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	2.98	1.64	0.29									
05-10		1.89	3.09	0.03								
10-20			5.29	4.52	0.20							
20-30				5.63	4.27	0.08	0.01					
30-40					6.82	3.10	0.09	0.00				
40-50						7.45	2.54	0.01				
50-60							7.55	2.45	0.01			
60-70								8.76	1.23	0.00		
70-80									9.09	0.92		
80-90										9.73	0.24	
90-95											4.91	0.11
95-100												5.00

(xx) Jharkhand

Fractile class	Rural											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	4.31	0.63	0.05									
05-10		4.39	0.61	0.00								
10-20			8.97	1.01	0.02							
20-30				8.43	1.54	0.02	0.00					
30-40					8.35	1.57	0.01	0.00				
40-50						8.78	1.25	0.02				
50-60							8.67	1.31	0.00			
60-70								9.00	1.00	0.00		
70-80									9.52	0.47		
80-90										9.75	0.28	
90-95											4.88	0.12
95-100												5.00

Fractile class	Urban											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	4.86	0.14	0.00									
05-10		4.12	0.86	0.00								
10-20			9.39	0.56	0.00							
20-30				9.11	0.93	0.00	0.00					
30-40					9.24	0.74	0.00	0.00				
40-50						9.63	0.42	0.00				
50-60							9.88	0.12	0.00			
60-70								9.86	0.13	0.00		
70-80									9.98	0.00		
80-90										10.00	0.00	
90-95											4.99	0.00
95-100												5.00

(xxi) Odisha

Fractile class	Rural											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	4.41	0.58	0.00									
05-10		3.95	1.06	0.00								
10-20			8.77	1.23	0.00							
20-30				8.24	1.73	0.03	0.00					
30-40					7.97	2.03	0.00	0.00				
40-50						8.02	1.97	0.00				
50-60							7.82	2.16	0.01			
60-70								8.40	1.62	0.00		
70-80									8.83	1.17		
80-90										9.62	0.38	
90-95											4.92	0.07
95-100												5.00

Fractile class	Urban											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	4.11	0.85	0.00									
05-10		3.98	1.04	0.00								
10-20			8.88	1.11	0.00							
20-30				9.03	0.98	0.00	0.00					
30-40					9.20	0.76	0.00	0.00				
40-50						9.29	0.75	0.00				
50-60							9.51	0.47	0.00			
60-70								9.70	0.31	0.00		
70-80									9.88	0.07		
80-90										9.94	0.12	
90-95											5.02	0.00
95-100												5.00

(xxii) Chhattisgarh

Fractile class	Rural											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	3.14	1.52	0.30									
05-10		2.56	2.28	0.05								
10-20			6.46	3.46	0.08							
20-30				5.66	4.19	0.16	0.01					
30-40					5.59	4.33	0.07	0.01				
40-50						5.07	4.78	0.10				
50-60							6.04	4.01	0.00			
60-70								6.39	3.58	0.02		
70-80									7.42	2.56		
80-90										9.15	0.86	
90-95											4.53	0.50
95-100												5.00

Fractile class	Urban											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	4.22	0.78	0.00									
05-10		3.78	1.20	0.03								
10-20			8.13	1.83	0.02							
20-30				8.09	1.91	0.00	0.00					
30-40					8.08	1.87	0.00	0.00				
40-50						7.10	2.85	0.00				
50-60							8.30	1.74	0.00			
60-70								9.38	0.68	0.00		
70-80									9.29	0.69		
80-90										9.97	0.05	
90-95											4.99	0.00
95-100												5.00

(xxiii) Madhya Pradesh

Fractile class	Rural											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	4.52	0.47	0.00									
05-10		4.17	0.84	0.00								
10-20			8.54	1.45	0.01							
20-30				8.00	1.97	0.02	0.00					
30-40					8.19	1.79	0.03	0.00				
40-50						7.88	2.10	0.02				
50-60							8.38	1.62	0.00			
60-70								8.59	1.41	0.00		
70-80									8.96	1.05		
80-90										9.66	0.34	
90-95											4.93	0.07
95-100												5.00

Fractile class	Urban											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	4.55	0.43	0.00									
05-10		4.28	0.73	0.01								
10-20			9.15	0.84	0.00							
20-30				9.23	0.76	0.01	0.00					
30-40					9.15	0.86	0.00	0.00				
40-50						9.44	0.55	0.00				
50-60							9.70	0.26	0.00			
60-70								9.87	0.17	0.00		
70-80									9.89	0.11		
80-90										9.99	0.00	
90-95											5.00	0.00
95-100												5.00

(xxiv) Gujarat

Fractile class	Rural											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	4.48	0.50	0.00									
05-10		4.54	0.46	0.00								
10-20			9.23	0.78	0.00							
20-30				9.13	0.84	0.01	0.00					
30-40					9.25	0.78	0.00	0.00				
40-50						9.45	0.54	0.00				
50-60							9.46	0.54	0.00			
60-70								9.52	0.48	0.00		
70-80									9.62	0.38		
80-90										9.92	0.08	
90-95											4.98	0.03
95-100												5.00

Fractile class	Urban											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	4.84	0.16	0.00									
05-10		4.88	0.12	0.00								
10-20			9.88	0.11	0.00							
20-30				9.83	0.17	0.00	0.00					
30-40					9.77	0.23	0.00	0.00				
40-50						9.94	0.06	0.00				
50-60							9.90	0.11	0.00			
60-70								9.87	0.11	0.01		
70-80									9.98	0.00		
80-90										9.99	0.00	
90-95											5.00	0.02
95-100												5.00

(xxv) Dadar and Nagar Haveli and Daman and Diu

Fractile class	Rural											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	3.46	1.09	0.00									
05-10		4.59	0.53	0.00								
10-20			9.35	0.75	0.00							
20-30				8.02	2.17	0.00	0.00					
30-40					7.80	2.12	0.00	0.00				
40-50						9.50	0.53	0.00				
50-60							8.81	1.10	0.00			
60-70								9.18	1.00	0.00		
70-80									9.36	0.49		
80-90										10.00	0.00	
90-95											5.00	0.00
95-100												5.00

Fractile class	Urban											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	4.64	0.00	0.00									
05-10		5.00	0.00	0.00								
10-20			10.04	0.00	0.00							
20-30				7.66	2.28	0.00	0.00					
30-40					10.00	0.15	0.00	0.00				
40-50						9.44	0.00	0.00				
50-60							10.00	0.00	0.00			
60-70								9.82	0.18	0.00		
70-80									9.97	0.00		
80-90										10.00	0.00	
90-95											5.00	0.00
95-100												5.00

(xxvi) Maharashtra

Fractile class	Rural											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	4.34	0.66	0.00									
05-10		4.00	1.00	0.00								
10-20			7.92	2.08	0.00							
20-30				7.97	2.02	0.01	0.01					
30-40					7.90	2.07	0.03	0.00				
40-50						8.22	1.77	0.00				
50-60							8.36	1.64	0.00			
60-70								8.89	1.12	0.00		
70-80									9.19	0.81		
80-90										9.77	0.22	
90-95											4.93	0.09
95-100												5.00

Fractile class	Urban											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	4.70	0.27	0.00									
05-10		4.49	0.53	0.00								
10-20			9.40	0.59	0.00							
20-30				9.66	0.34	0.00	0.00					
30-40					9.41	0.58	0.00	0.00				
40-50						9.70	0.31	0.00				
50-60							9.77	0.22	0.00			
60-70								9.83	0.18	0.00		
70-80									9.93	0.06		
80-90										9.81	0.21	
90-95											4.97	0.03
95-100												5.00

(xxvii) Andhra Pradesh

Fractile class	Rural											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	3.79	1.20	0.00									
05-10		3.15	1.79	0.06								
10-20			7.20	2.65	0.05							
20-30				7.17	2.73	0.04	0.03					
30-40					7.09	2.81	0.05	0.08				
40-50						6.94	2.99	0.03				
50-60							7.47	2.47	0.05			
60-70								8.39	1.55	0.06		
70-80									8.43	1.57		
80-90										9.29	0.71	
90-95											4.83	0.16
95-100												5.00

Fractile class	Urban											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	3.34	1.61	0.00									
05-10		3.37	1.64	0.00								
10-20			7.80	2.18	0.03							
20-30				8.19	1.81	0.01	0.01					
30-40					8.19	1.75	0.07	0.00				
40-50						8.43	1.56	0.00				
50-60							8.47	1.53	0.00			
60-70								9.23	0.77	0.00		
70-80									9.67	0.31		
80-90										9.91	0.07	
90-95											5.00	0.01
95-100												5.00

(xxviii) Karnataka

Fractile class	Rural											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	3.41	1.50	0.02									
05-10		2.81	2.22	0.00								
10-20			5.78	4.13	0.10							
20-30				4.31	5.62	0.08	0.00					
30-40					4.58	5.39	0.02	0.00				
40-50						5.60	4.41	0.00				
50-60							5.12	4.89	0.00			
60-70								6.01	3.96	0.03		
70-80									7.20	2.80		
80-90										8.81	1.19	
90-95											4.47	0.52
95-100												5.00

Fractile class	Urban											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	3.79	1.21	0.00									
05-10		3.09	1.90	0.00								
10-20			7.44	2.54	0.00							
20-30				7.99	2.01	0.00	0.00					
30-40					8.13	1.86	0.00	0.00				
40-50						8.35	1.66	0.00				
50-60							8.74	1.22	0.00			
60-70								9.28	0.75	0.00		
70-80									9.74	0.28		
80-90										9.84	0.04	
90-95											5.00	0.01
95-100												5.00

(xxix) Goa

Fractile class	Rural											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	4.41	0.39	0.00									
05-10		4.65	0.08	0.00								
10-20			9.99	0.00	0.00							
20-30				10.00	0.06	0.15	0.00					
30-40					8.79	1.00	0.00	0.00				
40-50						9.48	0.69	0.00				
50-60							9.22	0.70	0.00			
60-70								9.76	0.31	0.00		
70-80									9.94	0.00		
80-90										10.00	0.00	
90-95											5.00	0.00
95-100												5.00

Fractile class	Urban											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	4.51	0.48	0.00									
05-10		4.34	0.52	0.00								
10-20			9.16	0.59	0.00							
20-30				8.65	1.42	0.00	0.00					
30-40					10.00	0.00	0.00	0.00				
40-50						9.20	0.77	0.00				
50-60							9.07	0.84	0.00			
60-70								9.58	0.43	0.00		
70-80									10.00	0.00		
80-90										10.00	0.00	
90-95											5.00	0.00
95-100												5.00

(xxx) Lakshadweep

Fractile class	Rural											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	1.94	1.76	0.00									
05-10		3.52	2.66	0.00								
10-20			8.83	0.86	0.00							
20-30				7.11	3.19	0.00	0.00					
30-40					7.27	2.61	0.00	0.00				
40-50						8.39	1.49	0.00				
50-60							9.66	0.43	0.00			
60-70								9.45	0.71	0.00		
70-80									8.15	1.87		
80-90										9.65	0.39	
90-95											5.00	0.00
95-100												5.00

Fractile class	Urban											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	2.50	2.11	0.00									
05-10		4.58	0.59	0.00								
10-20			7.73	2.28	0.00							
20-30				8.38	1.57	0.00	0.00					
30-40					8.96	1.29	0.00	0.00				
40-50						9.06	0.82	0.00				
50-60							9.83	0.14	0.00			
60-70								9.75	0.17	0.00		
70-80									9.61	0.57		
80-90										9.99	0.00	
90-95											5.00	0.00
95-100												5.00

(xxxii) Kerala

Fractile class	Rural											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	4.50	0.49	0.00									
05-10		4.37	0.62	0.00								
10-20			9.33	0.67	0.00							
20-30				8.74	1.21	0.02	0.00					
30-40					8.96	1.04	0.01	0.00				
40-50						9.32	0.69	0.00				
50-60							9.38	0.58	0.00			
60-70								9.71	0.32	0.00		
70-80									9.72	0.26		
80-90										9.97	0.05	
90-95											4.99	0.02
95-100												5.00

Fractile class	Urban											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	4.71	0.23	0.04									
05-10		4.64	0.36	0.00								
10-20			9.46	0.54	0.00							
20-30				9.63	0.35	0.00	0.00					
30-40					9.55	0.48	0.00	0.00				
40-50						9.65	0.33	0.00				
50-60							9.73	0.30	0.00			
60-70								9.61	0.31	0.00		
70-80									9.99	0.06		
80-90										10.00	0.03	
90-95											5.00	0.01
95-100												5.00

(xxxiii) Tamil Nadu

Fractile class	Rural											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	3.76	1.20	0.04									
05-10		3.12	1.84	0.02								
10-20			6.94	2.91	0.12							
20-30				6.34	3.53	0.10	0.01					
30-40					6.48	3.47	0.03	0.03				
40-50						6.54	3.39	0.05				
50-60							7.22	2.73	0.04			
60-70								8.03	1.96	0.03		
70-80									8.68	1.32		
80-90										9.37	0.63	
90-95											4.78	0.23
95-100												5.00

Fractile class	Urban											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	3.95	1.03	0.00									
05-10		3.51	1.46	0.02								
10-20			8.14	1.87	0.01							
20-30				8.12	1.83	0.04	0.00					
30-40					8.27	1.71	0.02	0.00				
40-50						8.52	1.49	0.00				
50-60							8.76	1.25	0.00			
60-70								9.15	0.82	0.01		
70-80									9.39	0.63		
80-90										9.71	0.28	
90-95											4.89	0.10
95-100												5.00

(xxxiii) Puducherry

Fractile class	Rural											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	4.28	0.71	0.00									
05-10		3.65	1.32	0.00								
10-20			8.84	1.19	0.00							
20-30				8.66	1.31	0.00	0.00					
30-40					9.03	0.67	0.00	0.00				
40-50						9.02	1.12	0.00				
50-60							9.29	0.59	0.00			
60-70								9.66	0.49	0.00		
70-80									9.82	0.13		
80-90										9.52	0.56	
90-95											5.00	0.00
95-100												5.00

Fractile class	Urban											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	4.41	0.44	0.00									
05-10		4.92	0.08	0.00								
10-20			9.17	0.68	0.00							
20-30				10.00	0.00	0.00	0.00					
30-40					9.07	0.74	0.00	0.23				
40-50						9.24	0.55	0.23				
50-60							9.98	0.00	0.00			
60-70								9.39	0.61	0.00		
70-80									9.99	0.00		
80-90										10.00	0.00	
90-95											4.90	0.00
95-100												5.00

(xxxiv) Andaman and Nicobar Islands

Fractile class	Rural											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	4.74	0.00	0.00									
05-10		5.17	0.00	0.00								
10-20			10.00	0.00	0.00							
20-30				9.83	0.00	0.00	0.00					
30-40					10.00	0.00	0.00	0.00				
40-50						9.97	0.03	0.00				
50-60							10.00	0.00	0.00			
60-70								10.00	0.00	0.00		
70-80									10.00	0.00		
80-90										10.00	0.00	
90-95											5.00	0.00
95-100												5.00

Fractile class	Urban											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	4.77	0.00	0.00									
05-10		4.97	0.00	0.00								
10-20			9.80	0.00	0.00							
20-30				10.00	0.30	0.00	0.00					
30-40					10.00	0.05	0.00	0.00				
40-50						9.85	0.00	0.00				
50-60							9.92	0.00	0.00			
60-70								9.97	0.00	0.00		
70-80									10.00	0.17		
80-90										10.00	0.11	
90-95											4.99	0.01
95-100												5.00

(xxxv) Telangana

Fractile class	Rural											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	3.53	1.37	0.09									
05-10		2.45	2.52	0.03								
10-20			6.21	3.61	0.16							
20-30				5.77	4.17	0.06	0.00					
30-40					6.09	3.80	0.11	0.00				
40-50						5.72	4.13	0.17				
50-60							6.51	3.48	0.00			
60-70								6.97	3.03	0.00		
70-80									7.94	2.07		
80-90										8.92	1.04	
90-95											4.73	0.31
95-100												5.00

Fractile class	Urban											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	3.74	1.25	0.00									
05-10		3.56	1.41	0.00								
10-20			6.75	3.09	0.00							
20-30				8.65	1.55	0.00	0.00					
30-40					8.18	1.62	0.00	0.00				
40-50						9.17	1.00	0.00				
50-60							9.02	1.01	0.00			
60-70								9.53	0.46	0.00		
70-80									9.46	0.56		
80-90										9.90	0.10	
90-95											4.99	0.02
95-100												5.00

(xxxvi) Ladakh

Fractile class	Rural											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	4.72	0.28	0.00									
05-10		3.91	0.92	0.00								
10-20			9.79	0.00	0.00							
20-30				9.43	0.88	0.00	0.00					
30-40					9.89	0.00	0.00	0.00				
40-50						8.47	1.52	0.00				
50-60							9.28	0.83	0.00			
60-70								8.62	1.28	0.00		
70-80									9.42	0.49		
80-90										10.00	0.14	
90-95											4.58	0.42
95-100												5.00

Fractile class	Urban											
	00-05	05-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-95	95-100
00-05	4.33	0.41	0.00									
05-10		4.72	0.27	0.00								
10-20			9.92	0.27	0.00							
20-30				9.78	0.00	0.00	0.00					
30-40					9.82	0.24	0.00	0.00				
40-50						9.84	0.00	0.00				
50-60							10.00	0.02	0.00			
60-70								10.00	0.15	0.00		
70-80									10.00	0.13		
80-90										10.00	0.03	
90-95											5.00	0.06
95-100												5.00

Note: All values are approximated at second place of decimal point.

Role of the size of the factories in efficiency – A study based on data from Annual Survey of Industries (ASI) 2022-23

Anindita Sinharay¹
Rahul Kumar Gupta²

Abstract:

The paper analyses the micro-data of Annual Survey of Industries (ASI) 2022-23 to study whether the size of the factory in terms of number of workers has any role in (i) its efficiency in use of labour and establishment in production, (ii) generation of employment, (iii) having scope for innovation and capacity development, (iv) higher utilisation of the productivity power of women, (v) having measures to control pollution to save the nature, (vi) efficient utilisation of formal credit, etc. It is expected that the analysis will provide a data-driven perspective on role of sizes of factories in efficiency so that optimal resources could be allocated for most productive establishments in the industry to ensure the growth of manufacturing sector in India.

Key words: ASI, factories, productivity, size, research & development, training

JEL codes: L25, L60, J24

Receipt of Final version of paper from Author: 26th May 2025

Date of Acceptance: 9th February 2026

¹ Deputy Director General, Research and Analysis Division, MoSPI

² Deputy Director, Research and Analysis Division, MoSPI

Introduction

‘World Development Report 2024: The Middle-Income Trap’ by the World Bank Group has observed that “Policy makers will have to stop relying on superficial measures of structural efficiency such as firm size, income inequality, and energy sources. The imperative for today’s middle-income economies is “efficiency”—in the use of capital, labor,” ” Policy makers will need to heed the value added of firms, social mobility,...” “They are more reliable and more realistic metrics for policy making”. As India is targeting towards becoming a developed economy by 2047, it is imperative that policy makers are data-informed about the state of Indian factories in the line with the observations of the World Development Report 2024 published by the World Bank.

Manufacturing sector plays an important role in the Indian economy. It contributed 14% of the total gross value added (GVA) at nominal prices in the Indian economy in 2024-25 as per the National Statistics Office (NSO), Ministry of Statistics and Programme Implementation (MoSPI). The GVA at real price of this sector has observed a growth rate of 5.3% in FY 2024-25 over the previous year. In 2023-24, the sector provided employment to 11.4% of the workers[^] of India as per Periodic Labour Force Survey (PLFS) of the NSO. To have higher growth rate in the sector, it is necessary to identify the factors which are facilitating higher productivity in the Indian factories and replicate those factors across the industry.

This paper examines the performance of manufacturing sector in India in comparison with China, Germany and United States of America (USA) which are having higher GVA from manufacturing sector. In addition to make the policy makers data-informed about Indian factories in line with the observations of the report of the World Bank, an attempt has been made to study whether the size of the factory in terms of number of workers has any role in its efficiency in India, based on the analysis of micro data from Annual Survey of Industries (ASI) 2022-23. The Annual Survey of Industries broadly covers the following:

- i. Factories registered under Sections 2m(i) and 2m(ii) of the Factories Act, 1948
- ii. Bidi and cigar manufacturing establishments registered under the Bidi & Cigar Workers (Conditions of Employment) Act, 1966
- iii. Electricity undertakings engaged in generation, transmission and distribution of electricity, not registered with the Central Electricity Authority (CEA)
- iv. Units with 100 or more employees registered in the Business Register of Establishments (BRE) prepared and maintained by the State Governments as and when such lists are shared by the respective State Governments.

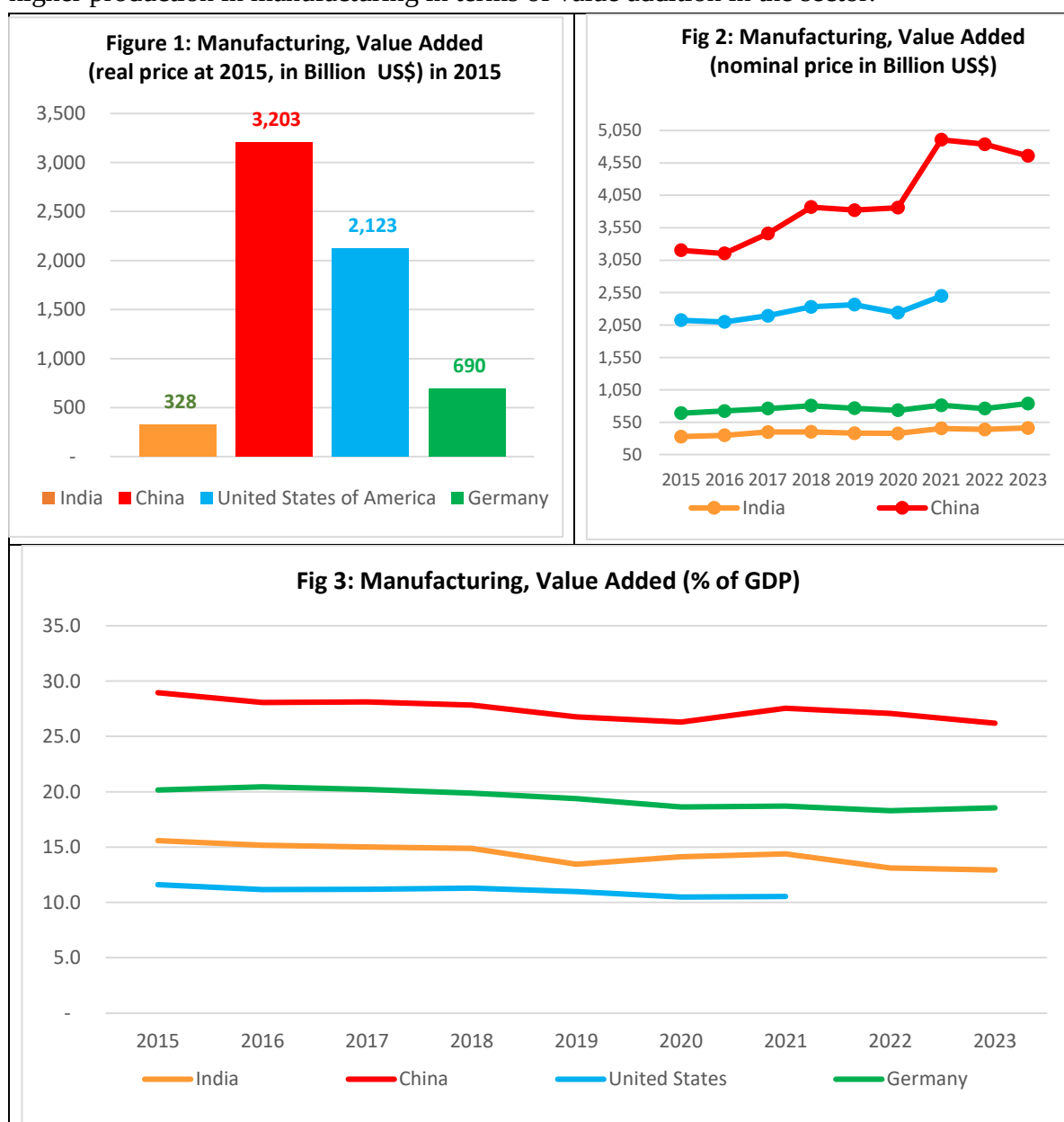
The measures of efficiency for various parameters discussed in the report have been assessed using the following data from ASI:

- (i) Productivity - GVA per factory and GVA per worker
- (ii) Generation of employment - estimated number of workers
- (iii) Scope for innovation - percentage of factories having research & development (R & D) unit
- (iv) Scope for capacity development - percentage of factories providing formal training[@] to its workers

- (v) Utilisation of the productivity power of women - percentage of women workers
- (vi) Measures to control pollution to save the nature - percentage of factories with fixed assets in terms of pollution control equipment and
- (vii) utilisation of formal credit - closing amount of formal loan as percentage of GVA.

2. International comparison in performance of manufacturing

The following graphs show the comparative position of India and three other countries having higher production in manufacturing in terms of value addition in the sector.



Source: World Bank

It may be observed from Fig 1 that in 2015, the value added in manufacturing at 2015 price level, in USA, China and Germany was about 10 times, 6.5 times and twice higher than that of India. Fig 2 shows that, at nominal prices, the value added in manufacturing in these 3 countries are much higher than India even in recent years. Further, Fig 3 shows that China and Germany were having higher percentage contribution of manufacturing to total GDP than India whereas

USA had the least percentage contribution of manufacturing to total GDP out of the four countries being considered here. Thus, India has to improve its manufacturing production to a great extent to reach the level of the developed countries who have a better performance in the sector.

3. Classification of Indian factories by size

As per the ASI 2022-23 report, the selected manufacturing sector accounts for a GVA of ₹20.91 lakh crore, which is 95.16% of the total GVA of ₹21.97 lakh crore generated by all factories covered under the survey. This paper therefore analyses all factories covered under ASI. Based on the micro data of ASI 2022-23, these factories have been classified into four size categories according to the number of workers employed, as follows:

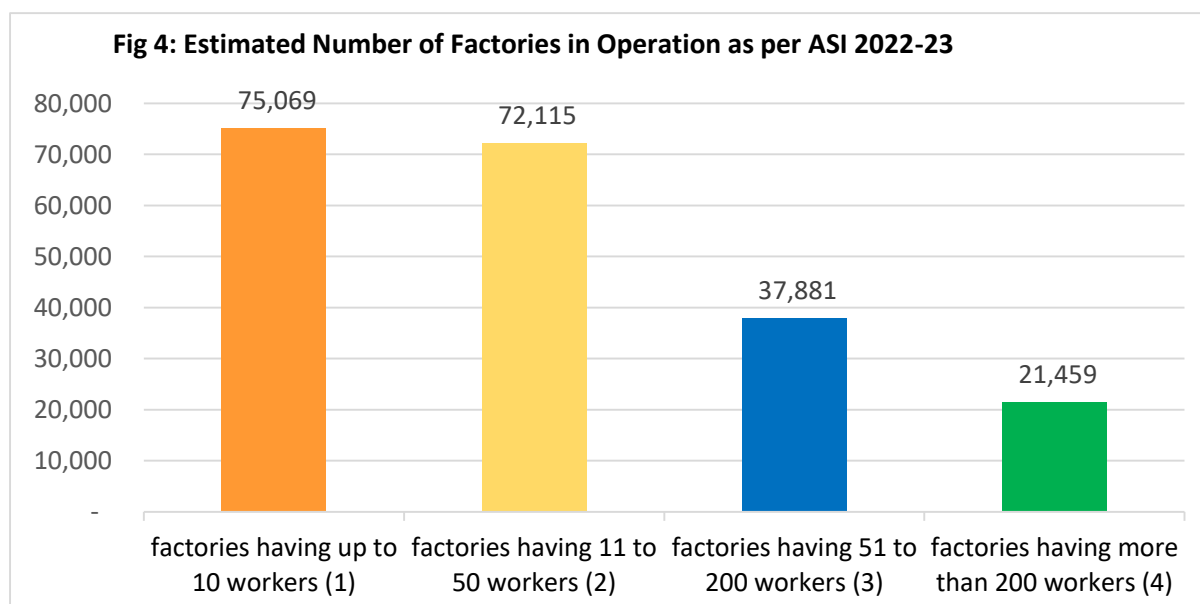
The First category (1) includes factories employing up to 10 workers, the second category (2) comprises factories with 11 to 50 workers, the third category (3) covers factories employing between 51 to 200 workers and finally fourth category (4) is factories employing more than 200 workers.

Following paragraphs present the analysis of performance of the factories by different classifications based on number of workers.

4. Analysis of role of factory size in efficiency

4.1 Number of factories in different classes based on number of workers

The following graph shows the distribution of estimated number of factories in operation, in different classes according to number of workers.



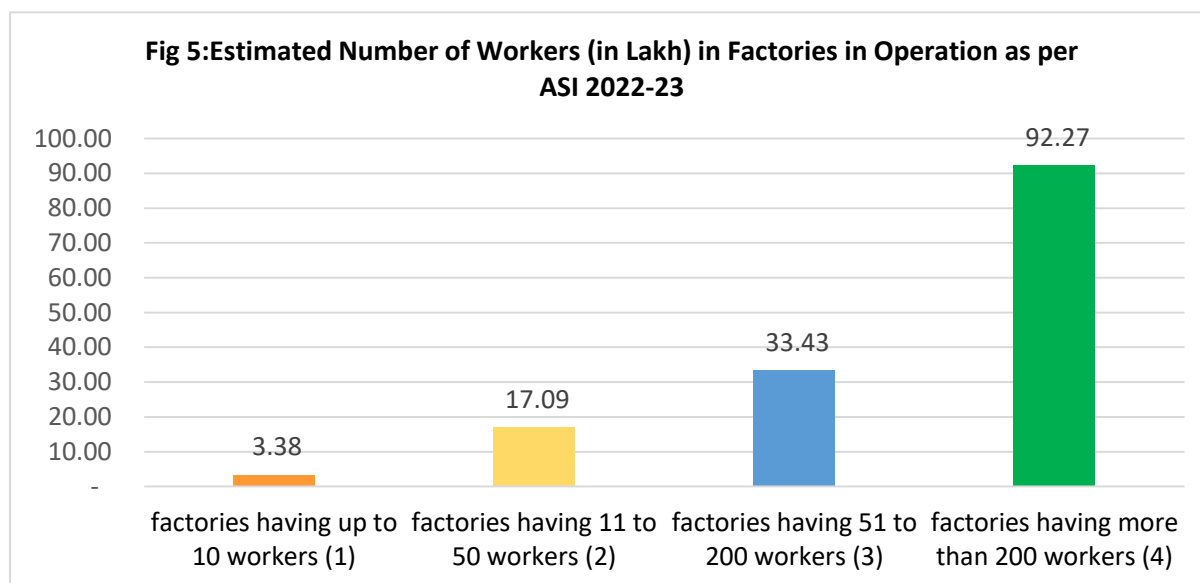
Source: Micro data of ASI 2022-23

It may be observed from Fig 4 that out of the total estimated number of 2.06 lakh factories in operation in India covered under ASI 2022-23, 75,069 factories (36.3%) were having upto 10 workers, 72,115 factories (34.9%) were having 11 to 50 workers, 37,881 factories (18.3%)

were having 51 to 200 workers, and 21,459 factories (10.4%) were having more than 200 workers.

4.2 Employment generation in factories of different classes based on number of workers

The estimated number of workers working in the different group of factories in operation, based on number of workers, has been shown in Fig 5.

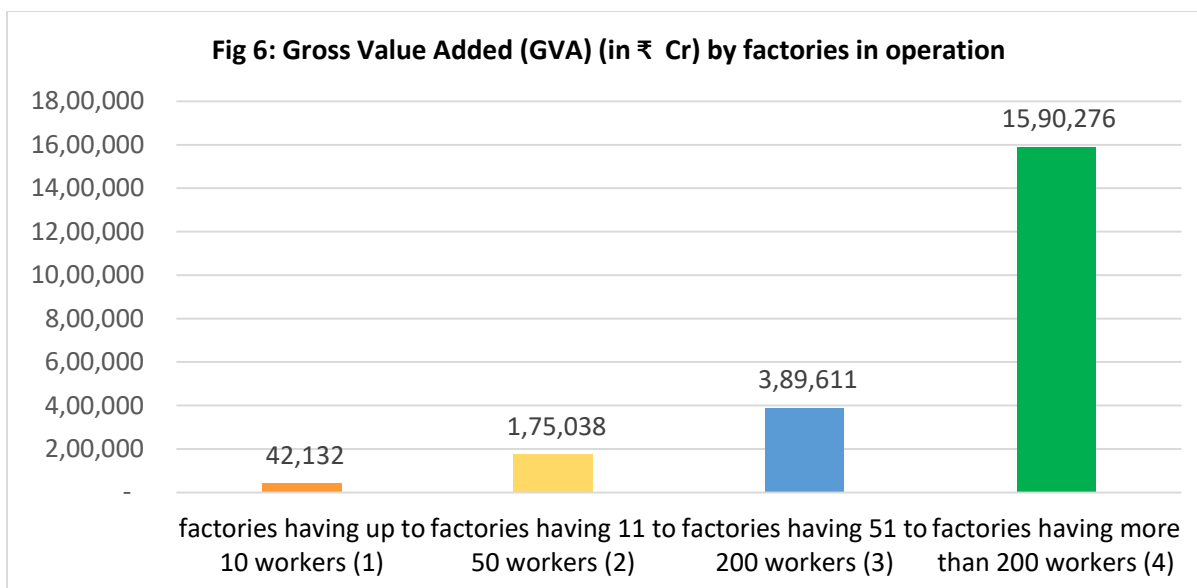


Source: Micro data of ASI 2022-23

Fig 5 shows that out of the estimated number of 1.46 crore total workers working in the factories in operation, **92.27 lakh (63.1%) were working in factories with more than 200 workers**, 33.43 lakh (22.9%) were in factories with 51 to 200 workers, 17.09 lakh (11.7%) were working in factories with 11 to 50 workers and 3.38 lakh (2.31%) were working in factories having up to 10 workers. **Thus, as far as employment generation is concerned, large-sized factories having more than 200 workers could provide maximum employment (63.1%).**

4.3 Contribution in Gross Value Addition (GVA) by factories of different classes based on number of workers

Now, it is of interest to examine the contribution of GVA by different group of factories covered under ASI. Following figure shows the contribution of different groups of factories in the GVA as per ASI 2022-23.

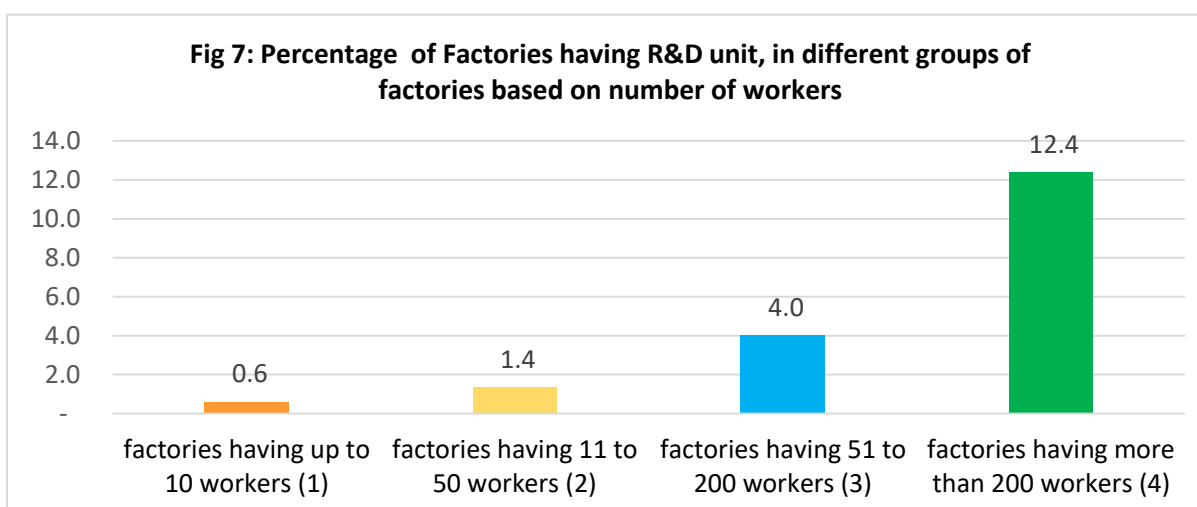


Source: Micro data of ASI 2022-23

From Fig 6, it can be observed that as per ASI 2022-23, out of the estimated ₹ 21.97 lakh crore of total GVA generated by the factories, ₹ 15.90 lakh crore (72.4%) of GVA was generated by the factories having more than 200 workers, ₹ 3.90 lakh crore (17.7%) of GVA was generated by the factories having 51 to 200 workers, ₹ 1.75 lakh crore (8%) of GVA was generated by the factories having 11 to 50 workers and ₹ 0.42 lakh crore (1.9%) of GVA was generated by the factories having up to 10 workers. **Thus, larger-sized factories having more than 200 workers, contributed 72.4% of the total GVA generated by all the factories as per ASI 2022-23.**

4.4 Impact of presence of R&D unit in efficiency of productivity in factories by different classes based on number of workers

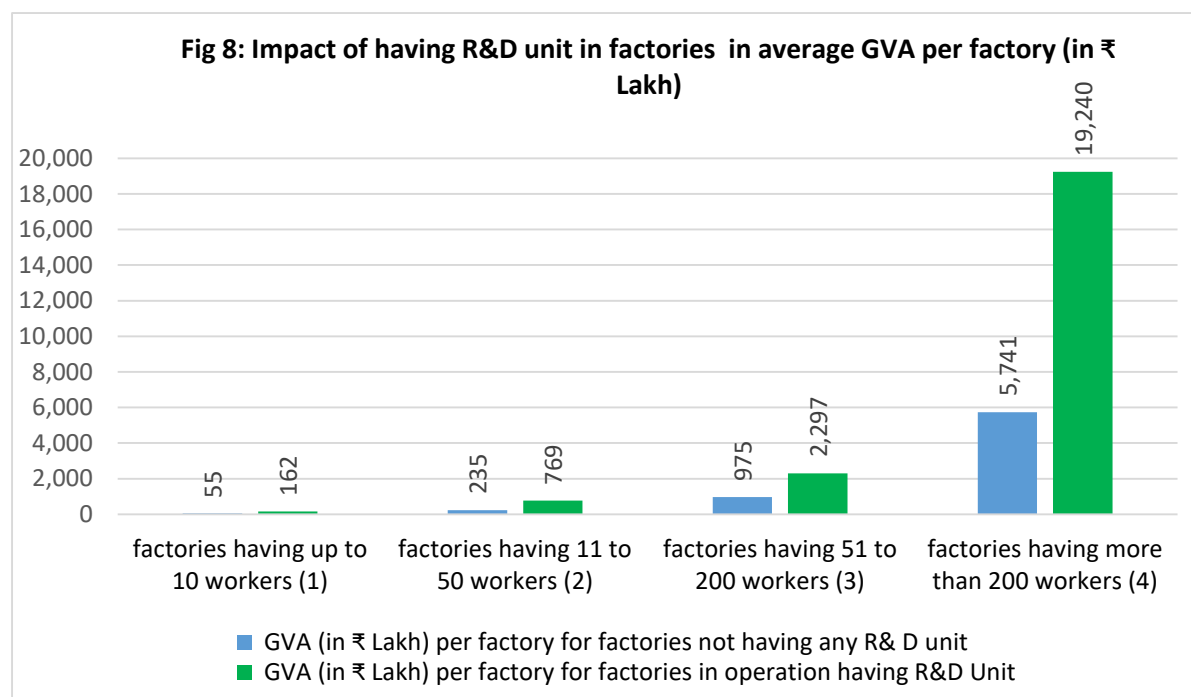
For growth, it is imperative to have innovation in the manufacturing process. Factories having research & development (R&D) unit are expected to have higher probability to embrace innovation. Following graph shows the percentage of factories having R&D unit in different groups of factories in operation, based on number of workers as per ASI 2022-23.



Source: Micro data of ASI 2022-23

It may be observed that only 2.7% of the factories in operation covered under ASI 2022-23 had R&D unit. The percentage was **12.4% for the factories having more than 200 workers**, 4% for the factories having 51 to 200 workers, 1.4% for the factories having 11 to 50 workers and 0.6% for the factories having up to 10 workers. Thus, larger factories having more than 200 workers had higher percentage (12.4%) of factories with R&D unit.

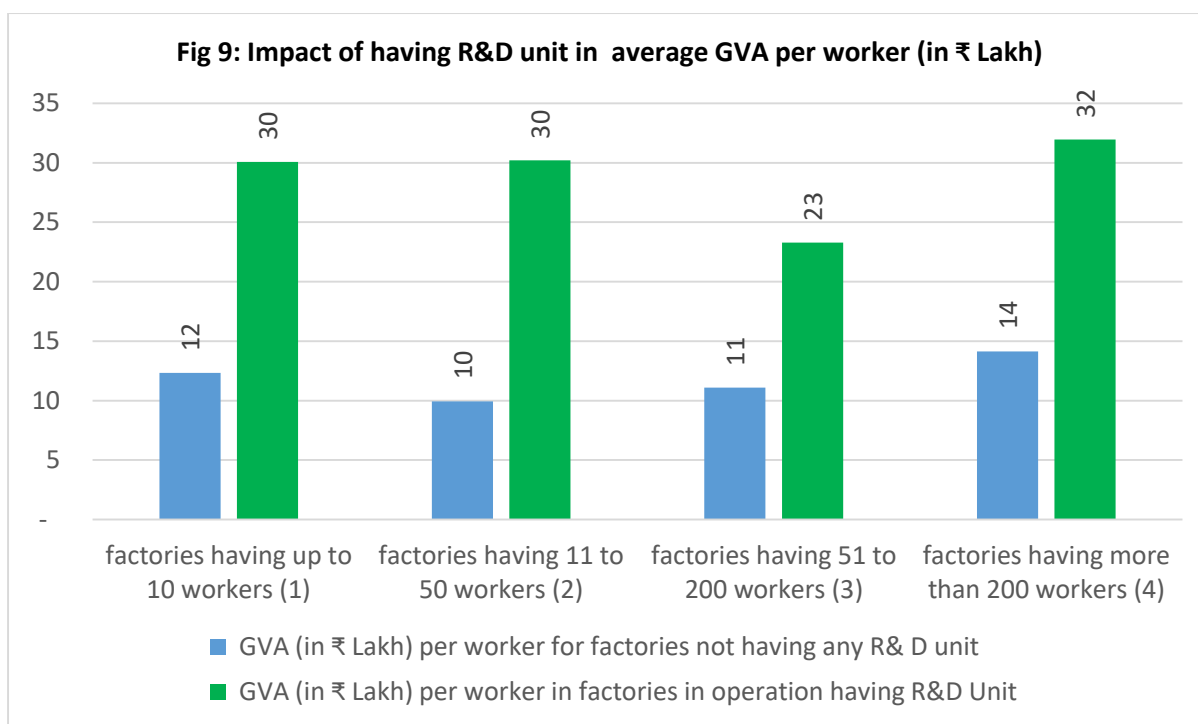
Let us now examine, how having R&D unit in factories impacted the efficiency in productivity of the factories. Following graph shows the comparative status of average GVA per factory in ₹ Lakh for the factories not having R & D unit and for factories having R&D unit in the respective groups according to number of workers.



Source: Micro data of ASI 2022-23

It can be observed from Fig 8 that **factories having R&D unit had higher productivity in terms of GVA per factory in all the four groups of factories based on number of workers**. The average GVA per factory for factories having R&D unit was 2.9 times, 3.3 times, 2.4 times and 3.4 times higher than the average GVA per factory for factories not having the R & D unit in the group of the factories with up to 10 workers, 11 to 50 workers, 51 to 200 workers and more than 200 workers, respectively. **Thus, the average GVA per factory was 2.4 to 3.4 times higher in those factories who were having R&D unit in comparison with those factories who were not having the R & D unit.**

Let us now examine how having R&D unit impacted the productivity of the workers. Following graphic shows the comparative status of average GVA per worker in ₹ Lakh for factories not having R&D unit and for factories having R&D unit in the respective groups according to number of workers.

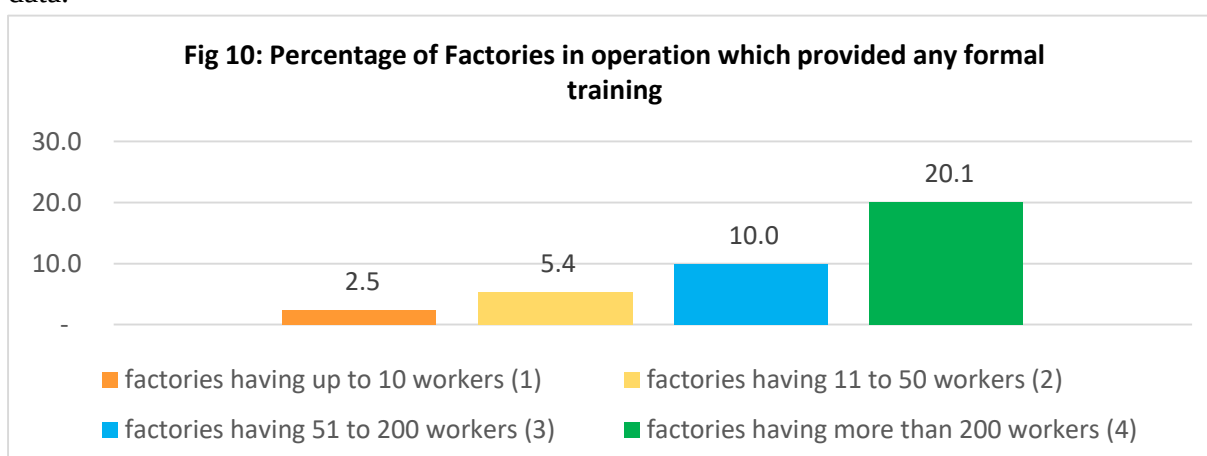


Source: Micro data of ASI 2022-23

Fig 9 shows that **factories having R&D unit had higher productivity of labour in terms of average GVA per worker than the factories not having R & D unit in all the four groups of factories based on number of workers.** The average GVA per worker for factories having R&D unit was 2.4 times, 3.0 times, 2.1 times and 2.3 times higher than the average GVA per worker in the factories not having R & D unit in the respective group of the factories with up to 10 workers, 11 to 50 workers, 51 to 200 workers and more than 200 workers. **Thus, having R&D unit was shown to have 2 to 3 times higher GVA per worker in the factories.**

4.5 Impact of access to formal training facilities in productivity in different group of factories based on number of workers

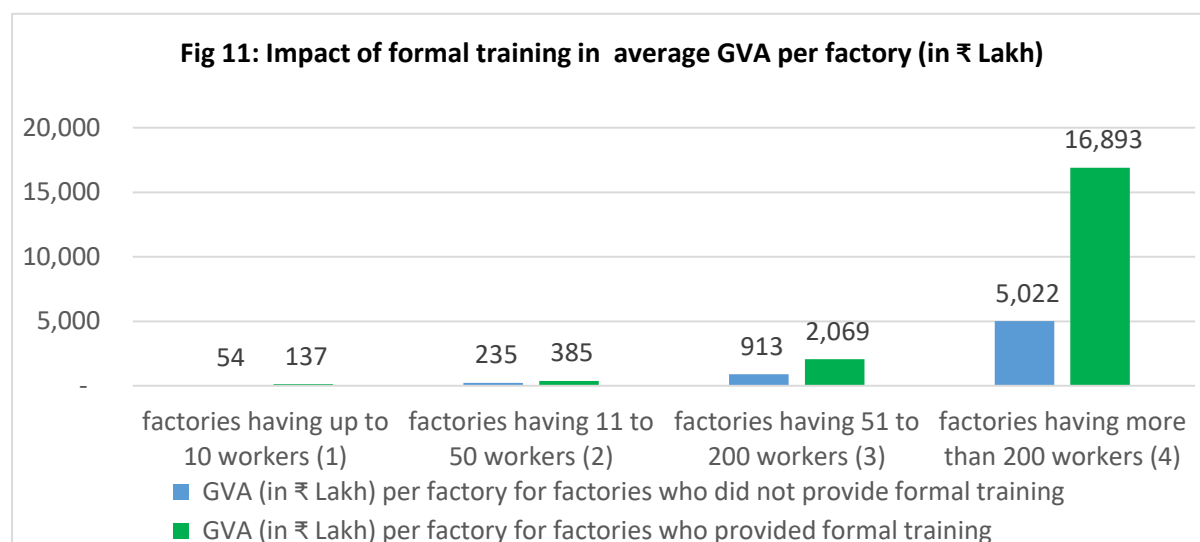
Capacity development of the workers in terms of providing formal training plays a crucial role in improving the productivity of the factories and the workers. Following figure shows the percentage of factories in operation which provided any formal training as per ASI 2022-23 data.



Source: Micro data of ASI 2022-23

It is seen that **only 6.7% factories in operation provided any formal training in 2022-23**. Of these, **20.1% of the factories having more than 200 workers**, 10% of the factories having 51 to 200 workers, 5.4% of the factories having 11 to 50 workers and 2.5% of the factories having up to 10 workers were found to have provided any formal training as per ASI 2022-23. Thus, larger factories with more than 200 workers had higher percentage of factories who provided formal training to its workers.

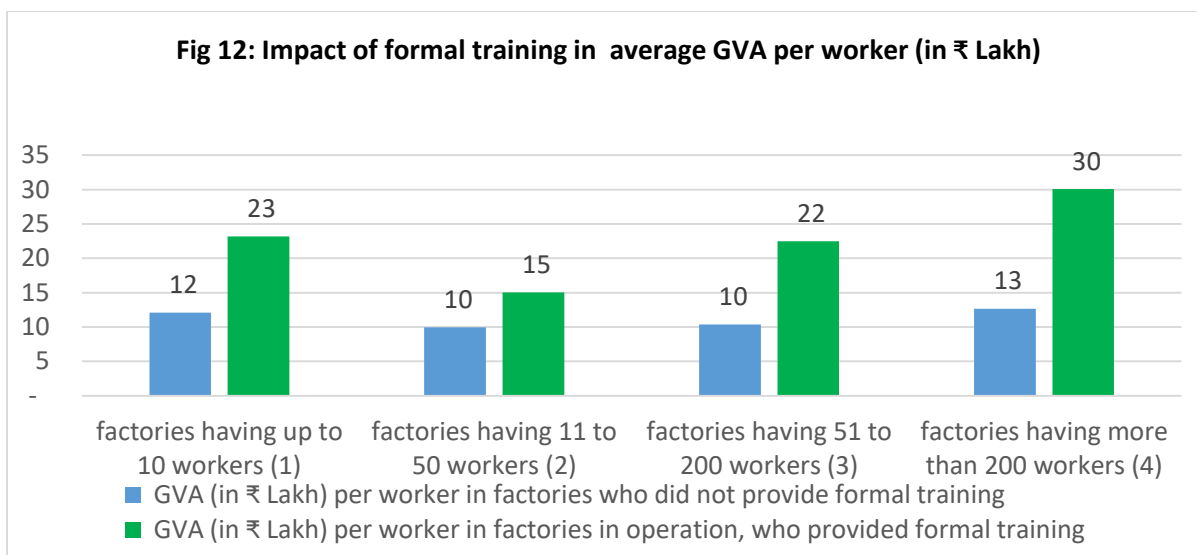
Let us now examine, how having formal training in factories impacted the efficiency in productivity of them in terms of average GVA per factory in 2022-23.



Source: Micro data of ASI 2022-23

Fig 11 shows that factories having access to formal training had higher productivity in terms of average GVA per factory in all the four groups of factories based on number of workers. The average GVA per factory in factories having access to formal training was 2.5 times, 1.6 times, 2.3 times and 3.4 times higher than the average GVA per factory in the respective group of the factories with up to 10 workers, 11 to 50 workers, 51 to 200 workers and more than 200 workers. **Thus, factories who provided formal training to its workers were found to have about 2 to 3.4 times higher GVA per factory.**

The following graph shows the comparative status of average GVA per worker in ₹ Lakh for factories who did not provide formal training and for factories who provided formal training in the respective groups according to number of workers.

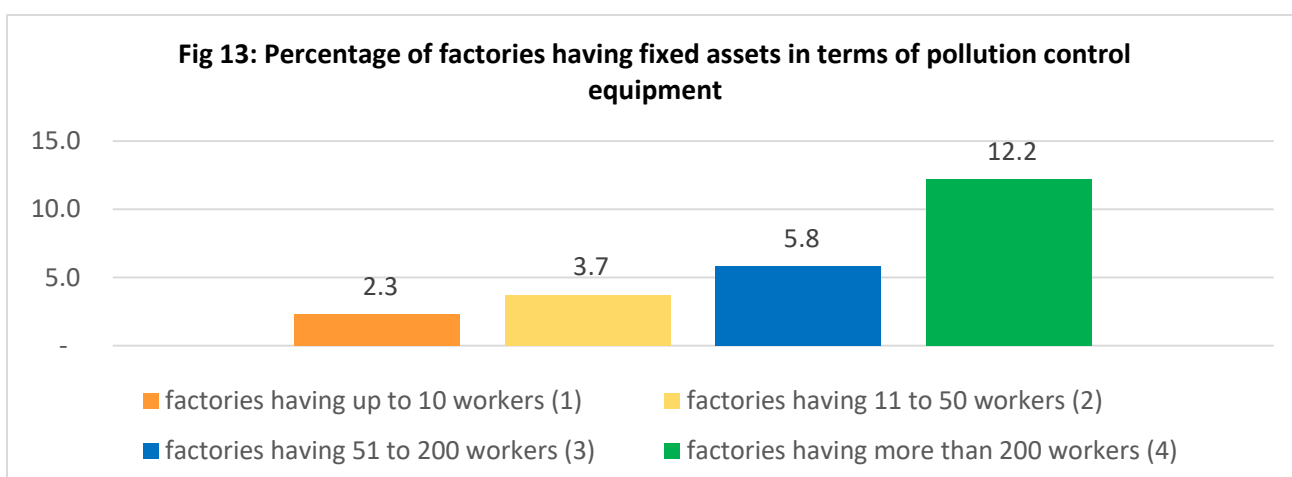


Source: Micro data of ASI 2022-23

It is seen that **factories who provided formal training had higher productivity in terms of GVA per worker than the factories who did not provide formal training in all the four groups of factories based on number of workers.** The average GVA per worker for factories having access to formal training was 1.9 times, 1.5 times, 2.2 times and 2.4 times higher than the average GVA per worker in the respective group of the factories with up to 10 workers, 11 to 50 workers, 51 to 200 workers and more than 200 workers. **Thus, having access to formal training was shown to have about two-times higher GVA per worker in each group.**

4.6 Availability of Pollution control equipment in the different groups of factories based on number of workers

Considering the increasing pollution level in the environment, the factories need to be encouraged to adapt pollution control equipment. The following graph shows the percentage of factories having fixed asset in terms of pollution control equipment as per ASI 2022-23.



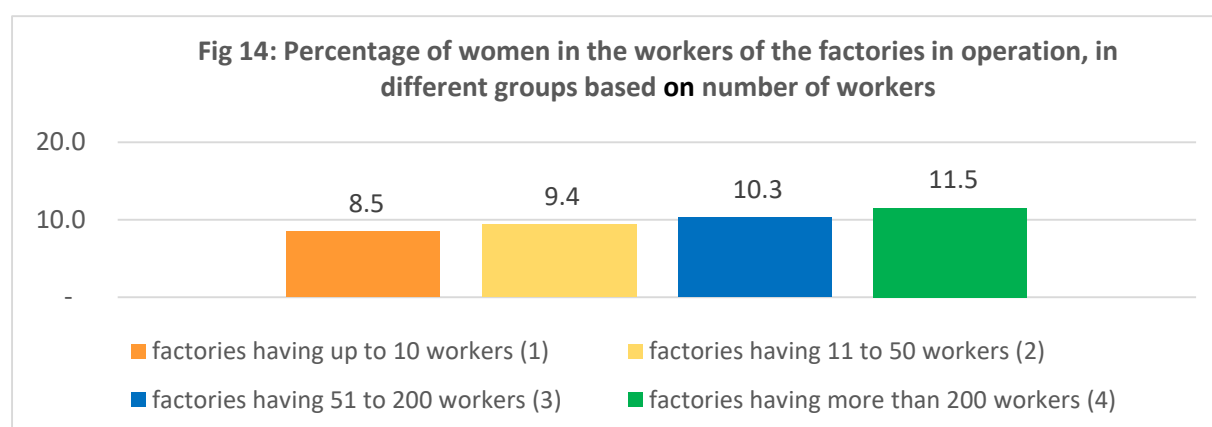
Source: Micro data of ASI 2022-23

It may be observed that **at total level only 4.5% of the factories were found to have fixed assets on pollution control equipment. 12.2% of the factories having more than 200 workers, 5.8% of the factories having 51 to 200 workers, 3.7% of the factories having 11 to**

50 workers and 2.3% of the factories having up to 10 workers were found to have fixed assets in terms of pollution control as per ASI 2022-23. Thus, larger factories having more than 200 workers had a higher percentage of factories with pollution control equipment.

4.7 Representativeness of women in the workforce of the factories in different groups based on number of workers

To utilise the women's productivity power in the manufacturing sector, factories need to be encouraged to provide equal opportunity to all the genders to join the workforce. The following graph shows, the percentage of women in the workers of the factories in operation as per ASI 2022-23.

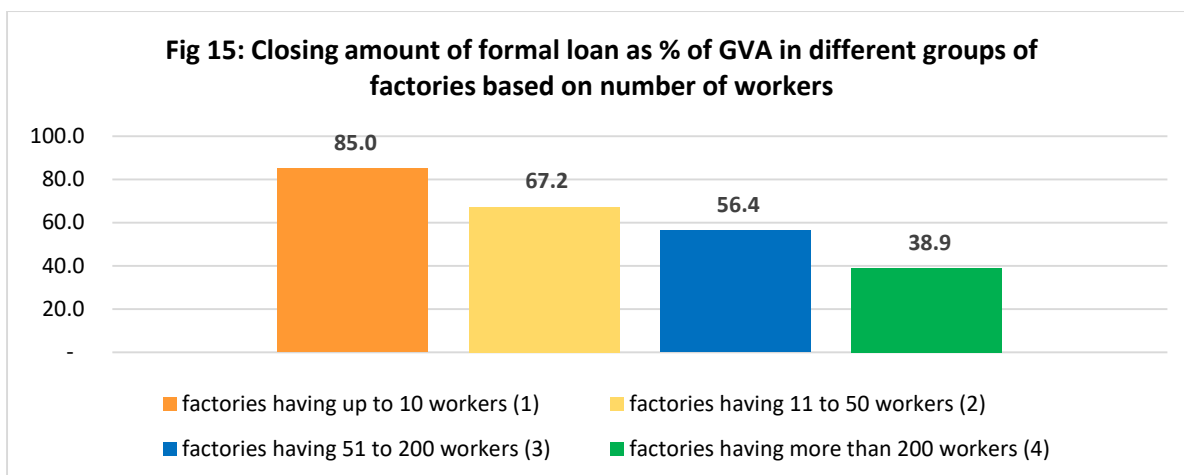


Source: Micro data of ASI 2022-23

It may be observed that percentages of women workers were **11.5 %**, 10.3%, 9.4% and 8.5% in the **factories having more than 200 workers**, having 51 to 200 workers, having 11 to 50 workers and having up to 10 workers, respectively, as per ASI 2022-23. **Thus, presence of women in the workforce was marginally higher in the larger size factories based on number of workers.**

4.8 Formal credit to GVA ratio of the factories in different groups based on number of workers

Let us now examine the formal loan to GVA ratio of the different group of factories based on number of workers. The following figure shows the closing amount of formal loan as percentage of GVA in different group of factories based on number of workers.



Source: Micro data of ASI 2022-23

It is seen that **the closing amount of formal loan as percentage of GVA** were **38.9 %**, 56.4%, 67.2% and 85.0% in the **factories having more than 200 workers**, having 51 to 200 workers, having 11 to 50 workers and having up to 10 workers, respectively, as per ASI 2022-23. Thus, the percentage was **highest in the smaller factories, i.e. factories having up to 10 workers and lowest in the larger factories, i.e. factories having more than 200 workers.**

5. Major findings

It is observed that 10.4% of the factories were large-sized, having more than 200 workers. However, they provided employment to 63.1% of the total estimated workers in the factories and contributed 72.4% of the total GVA of the factories as per ASI 2022-23. Only 2.7% factories had R&D unit. The percentage of factories with R & D unit was the highest at 12.4% in the large-sized factories having more than 200 workers. It is observed that having R&D unit in the factory resulted into 2.4 to 3 times higher average GVA per factory and 2 to 3 times higher average GVA per worker. Only 6.7% factories provided formal training to their workers. The percentage of factories having provided formal training was the highest at 20.1% in the large-sized factories having more than 200 workers. It is observed that providing formal training to the workers of the factories resulted into 1.6 to 3.4 times higher average GVA per factory and 1.5 to 2.4 times higher average GVA per worker.

Only 4.5% of the factories were found to have fixed assets on pollution control equipment. The percentage was the highest at 12.2% in case of large-sized factories having more than 200 workers. The percentage of women workers were 10.9% in the factories. The percentage was the highest at 11.5% in case of large-sized factories having more than 200 workers. Formal loan to the factories was 45.1% of the GVA. For smaller factories having up to 10 workers, the percentage was the highest at 85% and for large-sized factories having more than 200 workers, the percentage was the lowest at 38.9%. Summarised findings of the analysis are presented at Annexure II.

Thus, the class of the larger factories having more than 200 workers has significantly large contribution in employment generation and GVA although their numbers are much lower. They were also found to be more efficient than the other classes of factories in terms of (i) productivity measured by GVA per factory and GVA per worker, (ii) having higher percentage

of factories with research & development (R & D) unit, (iii) having higher percentage of factories providing formal training to its workers, (iv) having higher percentage of women workers, and (v) lower formal loan to GVA ratio etc. Further, having R&D unit and providing formal training to the workers were found to improve the productivity of the factories in terms of average GVA per factory and average GVA per worker.

6. Recommendations:

It is observed that large-size factories, though fewer in number, contributed more to employment and GVA generation, and had a lower loan-to-GVA ratio than smaller factories. To ensure faster growth in manufacturing, policy-makers may encourage the scaling up of factories through targeted credit access, technology upgradation support, regulatory simplification, and cluster-based/ancillary linkages between smaller and larger units.

As explained in para 4.4, presence of an R&D unit positively impacts productivity (GVA per factory and per worker) irrespective of factory size, with large factories showing higher R&D presence. It is recommended that factories invest in setting up R&D centres to encourage R&D adoption among smaller factories.

As explained in para 4.5, access to formal training similarly boosts productivity across factory sizes, with large factories showing greater training access. It is recommended that factories invest in formal training for the workers of the factory, supported by government-industry partnerships (e.g., ITIs, skill missions) to extend this benefit to smaller factories.

In addition, smaller factories should get easier access to loans, larger factories should be encouraged to export more and build stronger supply chains with smaller factories, and future ASI surveys should be used to regularly check whether these steps are actually improving factory performance over time.

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***Coverage of ASI:** ASI covers the factories registered under the Section 2m (i) and 2m (ii) of the Factories Act, 1948. Further, the units with 100 or more employees, not registered under Section 2m (i) and 2m (ii) of the Factories Act, 1948, but registered under any of the seven Acts / Board / Authority viz., Companies Act. 1956, Factories Act. 1948, Shops and Commercial Establishment Act, Societies Registration Act, Cooperative Societies Act, Khadi and Village Industries Board, Directorate of Industries (District Industries Centre) in the Business Register of Establishments (BRE) as prepared by the State Governments and verified by Field Operations Division (FOD) of National Statistics Office (NSO) are also considered for selection as and when such lists are shared by the State Governments.

Although the scope of ASI extends to all registered manufacturing establishments in the country, defence establishments, oil storage and distribution depots, restaurants, hotels, café and computer services, departmental units such as railway workshops, RTC workshops, Government Mints, sanitary, water supply, gas storage units etc. are excluded from the purview of the Survey.

Fixed Capital: Fixed Capital represents the depreciated value of fixed assets owned by the factory as on the closing day of the accounting year. Fixed assets are those, which have normal productive life of more than one year. Fixed capital covers all type of assets, new or used or own constructed, deployed for productions, transportation, living or recreational facilities, hospitals, schools, etc. for factory personnel. It would include land, building, plant and machinery, transport equipment etc. It includes the fixed assets of the head office allocable to the factory and also the full value of assets taken on hire-purchase basis (Whether fully paid or not) excluding interest element. It excludes intangible assets and assets solely used for post-manufacturing activities such as, sale, storage, distribution, etc.

@Formal training: As per the instruction manual of ASI 2022-23, any structured vocational or technical training of at least 200 hours being provided to permanent or contractual employees/staff is construed as ‘formal training’ at the workplace.

^Worker: Worker includes all persons employed directly, informally or formally or through contractor on payment of wages or salaries and engaged in any manufacturing process or its ancillary activities like cleaning any part of the machinery or any premises used for manufacturing or storing materials or any kind of work incidental to or connected with the manufacturing process.

Summarised findings in the different classes of factories based on number of workers

Sl. No.	Parameter	Factories having up to 10 workers (1)	Factories having 11-50 workers (2)	Factories having 51-200 workers (3)	Factories having more than 200 workers (4)	Total
i	Estimated number of factories	75,069	72,115	37,881	21,459	2,06,523
ii	Percentage (%) share of each group in total estimated number of factories	36.3	34.9	18.3	10.4	100.0
iii	Estimated number of workers (in Lakh)	3.38	17.09	33.43	92.27	146.17
iv	Percentage (%) share of each group in total estimated number of workers	2.3	11.7	22.9	63.1	100.0
v	Estimated GVA (in ₹ Cr)	42,132	1,75,038	3,89,611	15,90,276	21,97,056
vi	Percentage (%) share of each group in total estimated GVA	1.9	8.0	17.7	72.4	100.0
vii	Percentage (%) of Factories having R&D unit	0.6	1.4	4.0	12.4	2.7
viii	Average GVA per factory for those factories not having R & D unit (₹ Lakh)	55	235	975	5,741	818
ix	Average GVA per factory for those factories having R & D unit (₹ Lakh)	162	769	2,297	19,240	9,858
	(ix)/(viii)	2.9	3.3	2.4	3.4	12.1
x	Average GVA per worker for those factories not having R & D unit (₹ Lakh)	12	10	11	14	13
xi	Average GVA per worker for those factories having R & D unit (₹ Lakh)	30	30	23	32	31
	(xi)/(x)	2.4	3.0	2.1	2.3	2.4

Sl. No.	Parameter	Factories having up to 10 workers (1)	Factories having 11-50 workers (2)	Factories having 51-200 workers (3)	Factories having more than 200 workers (4)	Total
xii	Percentage (%) of Factories having provided formal training	2.5	5.4	10.0	20.1	6.7
xiii	Average GVA per factory for those factories who did not provide formal training (₹ Lakh)	54	235	913	5,022	712
xiv	Average GVA per factory for those having provided formal training (₹ Lakh)	137	385	2,069	16,893	5,955
	(xiv)/(xiii)	2.5	1.6	2.3	3.4	8.6
xv	Average GVA per worker for those factories who did not provide formal training (₹ Lakh)	12	10	10	13	12
xvi	Average GVA per worker for those having provided formal training (₹ Lakh)	23	15	22	30	29
	(xvi)/(xv)	1.9	1.5	2.2	2.4	2.4
xvii	Percentage (%) of factories having fixed assets in terms of pollution control equipment	2.3	3.7	5.8	12.2	4.5
xviii	Percentage (%) of women in the workers of the factories in operation	8.5	9.4	10.3	11.5	10.9
xix	Closing amount of formal loan as percentage (%) of GVA	85.0	67.2	56.4	38.9	45.1

Effect of adopting PPS circular systematic sampling in Annual Survey of Industries: A Simulation Study

Sandipan Sarkar¹

Abstract

The Annual Survey of Industries (ASI) is the principal source of industrial statistics in the country. The performance of the industrial sector plays a seminal role in the progress of a country's economic status. The ASI is conducted annually to measure and assess the growth of the industrial sector. Information on multifarious items—such as assets, liabilities, employment and labour costs, receipts, expenses, indigenous and imported input items, and products and by-products—of industrial units involved in the manufacturing process and repair services in the organized manufacturing sector is collected through the ASI. These data are essential for estimating key indicators of economic growth, thereby assisting planners and policymakers in framing new industrial policies.

Currently, equal probability circular systematic sampling is used for the ASI. In this study, we have attempted to use PPS circular systematic sampling, using the number of workers in the frame as the size variable to select units in the sample. A distribution-based simulation model was identified to simulate data within the frame. The Horvitz-Thompson estimator was used to estimate the parameters in the PPS sampling scheme. For a comparative study between the two sampling designs, bias, relative bias, mean squared error, and relative standard error were calculated. The simulation study clearly indicates that for certain key indicators, the PPS circular systematic sampling scheme provides more precise and efficient estimators than equal probability circular systematic sampling.

Keywords: Circular systematic sampling, Comparative study, Horvitz-Thompson estimator, Probability proportional to size sampling, Simulation.

JEL Classification Code: C83, C15, L60

Receipt of Final version of paper from Author: 16th May 2025

Date of Acceptance: 7th September 2026

¹ Deputy Director, Enterprise Survey Division (NSO), MoSPI

1. Introduction

The Annual Survey of Industries (ASI) provides key characteristics of industrial statistics in India. It offers key indicators to assess the health of the Indian economy. To evaluate changes in the growth, composition, and structure of the organized manufacturing sector—consisting of manufacturing, repair services, gas and water supply, and cold storage—ASI data is widely used throughout the country. From ASI 2010-11 onwards, the survey has been conducted annually under the statutory provisions of the Collection of Statistics (COS) Act, 2008, and the rules framed thereunder in 2011, except in the State of Jammu & Kashmir, where it is conducted under the J&K Collection of Statistics Act, 2010, and the rules framed thereunder in 2012.

The ASI schedule is the basic tool used to collect data from the selected units. The comprehensive schedule of the ASI is composed of two parts. Part-I is processed at the EnSD (IS Wing), Kolkata, and contains information about assets and liabilities, employment and labour costs, receipts, expenses, indigenous and imported inputs, and products and by-products. Meanwhile, Part-II is processed by the Labour Bureau and contains different aspects of labour statistics, such as mandays worked, labour turnover, and man-hours worked. This survey is conducted across India.

The ASI covers factories registered under Sections 2(m)(i) and 2(m)(ii) of the Factories Act, 1948, establishments under the Bidi and Cigar Workers (Conditions of Employment) Act, 1966, and all electricity undertakings engaged in the generation, transmission, and distribution of electricity that are not registered with the Central Electricity Authority (CEA).

Starting from ASI 2014-15, the coverage of the ASI has been extended beyond Sections 2(m)(i) and 2(m)(ii) of the Factories Act, 1948. To start with, additions to the sampling frame include units with 100 or more employees that are not registered under Sections 2(m)(i) and 2(m)(ii) of the Factories Act, 1948, but are registered under any of the seven Acts/Boards/Authorities, namely:

- Companies Act. 1956,
- Factories Act. 1948,
- Shops and Commercial Establishment Act,
- Societies Registration Act,
- Cooperative Societies Act,
- Khadi and Village Industries Board,
- Directorate of Industries (District Industries Centre)

The additional units mentioned above have been identified as per the Business Register of Establishments (BRE) prepared by the State Governments. The ASI frame of all eligible units is revised and updated annually before the selection of units by the IS Wing (NSO).

2. About the Study

The present study consists of examining the relative efficiency of an alternative sampling scheme for the selection of units. The study evaluates the suitability of a PPS sampling scheme as compared to the equal probability circular systematic sampling scheme adopted at present. For this purpose, an experimental population was first simulated to closely mimic the actual population in respect of a few key variables. The objective being comparison between two sampling schemes, only a few basic simulation techniques were employed to create the experimental population. Next, the study examines the effect of adopting a PPS selection scheme on the estimates of these key variables within the experimental population. The methodologies for both steps are discussed in further detail later.

The sampling design of the ASI has undergone considerable changes over time, taking into consideration technical and operational requirements. From ASI 2015-16 onwards, a stratified equal-probability circular systematic sampling scheme has been adopted, as recommended by the Sub-Group of the SCIS. A brief description of the current sampling design is provided in Annexure I.

Currently, "Stratified Equal Probability Circular Systematic Sampling" (EPCSS) is used in the Annual Survey of Industries to estimate the key variables of organized sector units involved in manufacturing, electricity generation, salt extraction, and other activities. In the ASI frame, for any given year, besides the names of the factories and their corresponding addresses, the data on an additional characteristic is provided: the number of workers for each factory. There has been a long-standing debate regarding whether this additional information can be used as an auxiliary variable to select the factories in the sample. As there was no definitive answer to this problem in the past, we have attempted to provide an answer to this debatable question through comparison of relative efficiencies of estimates under the present and an alternative scheme applied on an experimental population created for this purpose.

The present study is an attempt to assess the effect of adopting a "Probability Proportional to Size" (PPS) sampling scheme on the efficiency of estimates—such as the number of workers, GVA, and GVA per worker—in terms of relative bias (RB) and relative standard errors (RSEs). The size variable proposed for this purpose is the number of workers in the ASI 2017-18 frame.

3. Survey Design and Methodology adopted for the study

In this study, we have used the sampling frame and unit-level data of ASI 2017-18. For simplicity, we considered only the manufacturing sectors (NIC-2008 2-digit codes within the range of 10–33) of Uttar Pradesh, a large state in India, excluding bidi-making units (NIC code 1200) and those engaged in electricity generation and distribution. As an empirical study with a limited scope, it is confined to the examination of estimates for only two key parameters: the number of employees and Gross Value Added (GVA) per employee.

The study consists of two broad components:

- Creation of an experimental population.

- Estimation of RBs and RSEs for the estimates under the current and proposed sampling schemes.

The stratification adopted for this study is identical to the one currently followed. For all states, strata are formed at the "*State x District x Sector x 2-digit NIC-2008*" level. The units in each stratum are arranged in descending order based on the number of employees. Following this arrangement, samples are drawn using the Probability Proportional to Size without replacement (PPSWOR) sampling technique. An even number of units, with a minimum of four units, is selected from each stratum and distributed into four sub-samples. It should be noted that the four sub-samples from a particular stratum may not necessarily contain an equal number of units.

3.1. Creation of experimental population:

The experimental population created for the study consists of the following variables: number of workers and GVA. Of these, only the variables ‘actual number of workers’ and ‘GVA’ are simulated while the rest are the same as those in the frame. Following are the steps followed for this purpose:

Step 1: Fitting an appropriate probability distribution to

- ✓ Number of workers from sampling frame
- ✓ Actual number of workers from unit level data
- ✓ Actual GVA of units from unit level data

We assume that 2-parameter log-normal distribution function, $\Lambda(x|\mu, \sigma)$, seems to fit fairly well to all the three variables.

Step 2: Obtaining simulated values of observed number of workers and GVA

Let, the obtained frequency distribution functions of number of workers in frame and actual number of workers in unit level data be, $\Lambda_1(x_1)$ and $\Lambda_2(x_2)$ respectively. Also, the distribution function of GVA be, $\Lambda_3(x_3)$.

For simulation purpose, we have obtained the actual number of workers and actual GVA as follows:

For a given value x_1 of the frame number of workers, the actual number of workers is obtained as $x_2 = \Lambda_2^{-1}[\Lambda_1(x_1)] \times u$ and the actual GVA as $x_3 = \Lambda_3^{-1}[\Lambda_1(x_1)] \times v$ where, u and v are the random fluctuation, introduced in the simulation.

In real life, these variables being not associated according to any exact mathematical one-to-one relationship, there will be some departure from reality, which is inherent to any simulated data. To get the experimental population behave as a real-life population, we have introduced the multiplicative random fluctuation u and v in above equations, and assumed that they follow log-normal distribution with non-zero mean and variances σ_u^2 and σ_v^2 respectively are calculated by taking ratio of averages of number of workers in unit level data and number of workers in the frame and taking logarithmic function in it.

6.2. Estimation procedure under the current and proposed sampling schemes:

Notations:

N = total number of factories in the sampling frame.

n = total number of factories in the sample.

s = subscript of the s -th stratum.

m = subscript of sub-sample ($m = 1, 2, 3, 4$) [$m = 1$ and 3 for central and 2 and 4 for state]

E = total number of factories in the sample sector in a stratum.

e = number of factories surveyed out of total number of factories in the sample sector in a stratum.

X = value of auxiliary characteristic.

Y = value of a study characteristic.

y_{smk} = observed value of characteristic Y for the k -th unit belonging to m -th sub-sample for the s -th stratum.

π_i = The probability that unit i is included in the sample (First-order inclusion probability).

π_{ij} = The probability that both unit i and unit j are included in the sample (Second-order or Joint inclusion probability).

The steps to be followed for estimating RBs and RSEs of the estimates are outlined below,

Step 1:

Now, we have to group the data into “District X NIC-2008 2-digit code”.

Step 2:

We have removed census-sector units i.e., units having no. of employees ≥ 100 and stratum having less or equal to 4 units. From the remaining data, we have removed joint return units i.e., “no. of units” > 1 . Thus, we are left with strata coming under the Sample Scheme as per the existing definition. After that we have arranged all the units in each stratum in descending order of no. of employees.

Step 3:

For sample allocation purpose, we have used proportional allocation in each stratum according to the number of units in that stratum.

In Proportional allocation, $n_s = n \times \frac{N_s}{N}$ (1)

After allocating sample size in all strata, we did adjustment n_s in following manner so that it would be the multiple of 2:

✓ If $n_s \leq 4$, then we take $n_s = 4$

✓ If $n_s > 4$, then value of n_s will nearest integer multiple of 2

For example, if $n_s = 4.3$ then $n_s = 4$ and $n_s = 5.6$ then $n_s = 6$.

After stratification and allocation of samples, sampling units are being selected using “Equal probability circular systematic sampling without replacement” and “Varying probability circular systematic sampling without replacement” by taking number of employees as auxiliary variable. Likewise, census units are also selected with probability 1.

Step 4:

Now we have to calculate the Multipliers for each selected unit to get the desired parameter estimates.

In case of “Equal probability circular systematic sampling”,

Formula for sub-sample wise multiplier,

$$w_{sm} = \frac{E_s}{e_{sm}}, m = 1, 2, 3, 4 \quad (2)$$

For combined sample multiplier,

$$e_s = \sum_{m=1}^4 w_{sm} \quad (3)$$

On the other hand, for “Varying probability circular systematic sampling without replacement”,

In circular systematic sampling of n units with PPS scheme, the cumulative Total $\{T_i\}; i = 1, 2, \dots, N$, are determined and the units corresponding to the numbers, $\{r + jk\}, j = 0, 1, 2, \dots, (n - 1)$, are selected, where

$$k = X/n = \sum_{i=1}^n X_i/n \quad (4)$$

and r is a random number from 1 to k . The inclusion probability of each unit will be,

$$\pi_i = \frac{nX_i}{X} \quad (5)$$

And the multiplier will be,

$$W_i = \frac{1}{\pi_i} = \frac{X}{nX_i} \quad (6)$$

Step 5:

Auxiliary variable is referred as additional information which is available prior to data collection and this information is known for all the units in the population. In sample survey an auxiliary variable can assist in various such as, stratification, selection of sample units, estimation. In the PPS sample auxiliary information such as size of units is used to select sampling units. In this study we have used number of workers in the frame as the size variable for selection factories out of the frame.

Circular systematic sampling scheme is used to select samples from each stratum. For “Equal probability circular systematic sampling”, let N_s be the total number of units in s-th stratum and n_s be the sample size corresponding to s-th stratum.

Then, sampling interval, $= \frac{N_s}{n_s}$, rounded to the nearest integer.

We choose units in the following manner-

Let us choose random start ‘ r ’, such that $1 \leq r \leq N_s$.

We choose units with index, $r + jk$, when $r + jk \leq N_s$

and $r + jk - N_s$, when $r + jk > N_s$,

where, $j = 0, 1, 2, \dots, (n - 1)$.

This process is also used to select the sample under “Varying probability circular systematic sampling” without replacement scheme with replacing the value of k with equation (3) for each stratum.

Step 6:

Parameter estimation

Under *Equal probability circular systematic sampling*:

For the m^{th} sub-sample, an unbiased estimate of the parameter ‘population total’ of the s^{th} stratum,

$Y_s = \sum_{i=1}^{N_s} Y_{si}$, is given by

$$\hat{Y}_{sm} = \frac{N_s}{n_{sm}} \sum_{k=1}^{n_{sm}} y_{smk} \quad (7)$$

The estimate for the ‘population total’ of the entire domain (Uttar Pradesh), $Y = \sum_s Y_s$ is,

$$\hat{Y} = \sum_s \hat{Y}_s \quad (8)$$

The sampling variance of $\hat{Y}$ is,

$$V(\hat{Y}) = \sum_s V(\hat{Y}_s) = \sum_s \frac{1}{N_s} \sum_{\alpha} (\hat{Y}_{s\alpha} - Y)^2 \quad (9)$$

where $\hat{Y}_{s\alpha}$ represents the estimate from the circular systematic sample obtained with random start α . Under *Varying probability circular systematic sampling without replacement*,

Horvitz-Thompson estimator of the population total for a stratum is,

$$\hat{Y}_{VPCSS} = \sum_{i=1}^n \frac{y_i}{\pi_i} \quad (10)$$

Where π_i is given in the equation 5.

and its sampling variance would be,

$$V(\hat{Y}_{VPCSS}) = \frac{1}{K} \sum_{\alpha} (\hat{Y}_{\alpha} - Y)^2 \quad (11)$$

Where, $\hat{Y}_{\alpha}$ represents the estimate from PPS circular systematic sample obtained with random start α and K is the total number of possible systematic samples.

For ratio estimation,

Let, $\hat{Y}$ and $\hat{X}$ be the estimates of Y and X for two characteristics y and x respectively. Then the ratio estimate will be,

$$\hat{R} = \frac{\hat{Y}}{\hat{X}} \quad (12)$$

Step 7:

Variance and Bias Estimation

The variance and bias of the estimators are estimated numerically by selecting 1000 independent samples under the respective schemes.

For one of the selected population parameters, say θ , the estimates under respective sampling schemes $\hat{\theta}_r$ are obtained for the replicates $r = 1, 2, \dots, 1000$.

The Relative Bias of an estimator is obtained as,

$$RB(\hat{\theta}) = \frac{(\hat{\theta} - \theta)}{\theta} \times 100 \quad (13)$$

And MSE will be calculated by,

$$\widehat{MSE}(\hat{\theta}) = \frac{1}{n-1} \sum_{i=1}^n (\hat{\theta}_i - \theta)^2 \quad (14)$$

Relative standard error (RSE) for a given characteristic under a specified sampling design would be,

$$R\widehat{SE}(\hat{\theta}) = \frac{\sqrt{\widehat{MSE}(\hat{\theta})}}{\hat{\theta}} \times 100 \quad (15)$$

4. Results and Discussion

4.1. Data Description

To compare the survey effects, we utilized the ASI 2017-18 sampling frame and unit-level data for the state of Uttar Pradesh. In this frame, Uttar Pradesh corresponds to state code 09 and consists of 75 districts. For this study, we considered only the Manufacturing sector (NIC 2-digit codes 10 to 33). Additionally, factories with negative GVA were removed from the unit-level data, as they are classified under "status codes" 3 to 8. Consequently, the final sampling frame comprises 14,390 factories distributed across 775 strata. For stratification purposes, we utilized District codes (1–75) and NIC 2-digit codes for the manufacturing sector (10–33). The factories were stratified such that the first two digits denote the district code and the last two

digits denote the NIC 2-digit code. For example, "0110" represents district code 01 and NIC code 10, while "7530" represents district code 75 and NIC code 30.

As the methodology discussed in the step 2 of creation of experimental population, the obtained log normal distributions are,

$$x_1 \sim \Lambda_1(3.458, 1.819)$$

$$x_2 \sim \Lambda_2(3.404, 1.511)$$

$$x_3 \sim \Lambda_3(16.169, 2.951)$$

Using these parametric relationships, for number of workers of each factory in the frame, we have calculated the fitted values using the method illustrated in step 2 of creation of experimental population. Curve of fitted versus actual values is shown in the figures below.

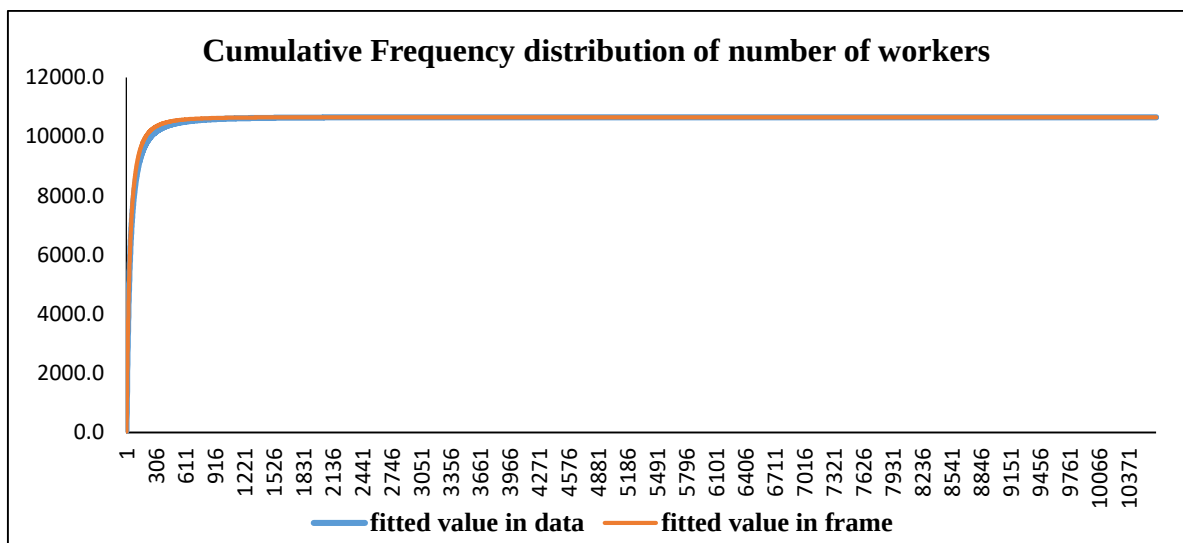


Figure 1: Frequency distribution of number of workers in unit level data vs. frame

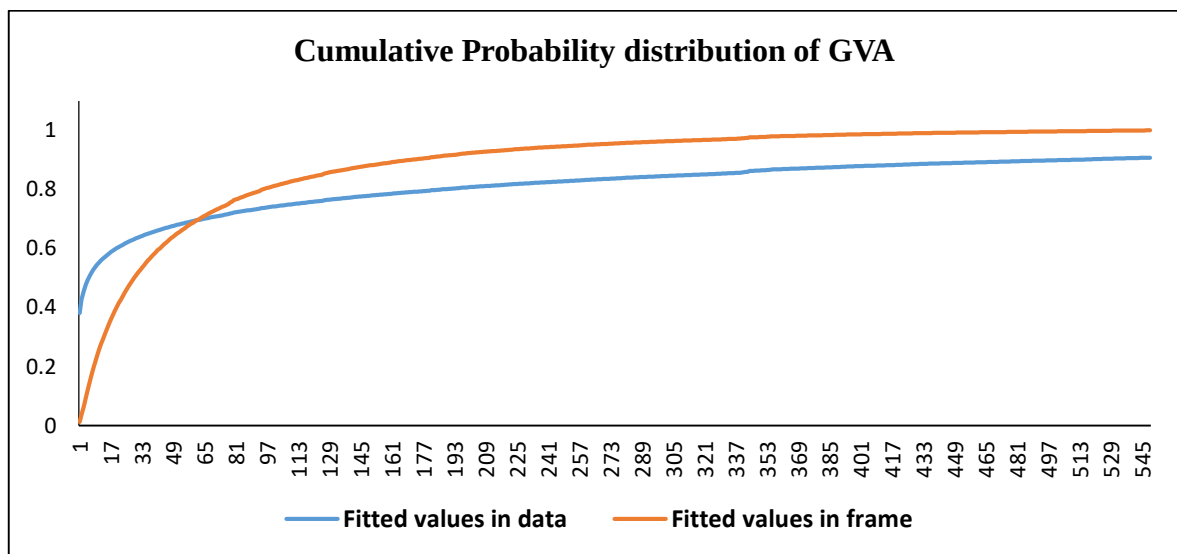


Figure 2: Frequency distribution of number of workers in unit level data vs. frame

As this generated values obtained from one-to-one relationship, this does not contain any error component in it. So that, we have obtained random fluctuation u and v following log-normal distribution as,

$$u \sim \Lambda_u(-0.27, 0.15)$$

$$v \sim \Lambda_v(-0.21, 0.10)$$

The values -0.27 and -0.21 are calculated by taking ratio of averages of number of workers in unit level data and number of workers in the frame and taking logarithmic function in it.

Table 1: Parameter comparison of Unit level data and simulated data

Parameters	Unit level data		Simulated Data	
	No. of Workers	Total GVA (Rs.)	No. of Workers	Total GVA (Rs.)
Total	12,59,207	11,12,542.12	13,07,298	11,22,099.73
Mean	87.51	67.17	90.85	78.04
Standard Deviation	557.77	328.83	368.18	531.62

Descriptive statistics of the data is given in Table 2. From the Table 1 and 2, it is evident that our simulated data series viz. No. of workers and total GVA closely mimics the actual scenario of the unit level data of ASI 2017-18.

Table 2. Descriptive statistics of the simulated data

Parameters	No. workers in frame	Simulated no. workers	Simulated total GVA (Rs.)
Minimum	1	1	55,160
Q1	12	9	24,73,000
Mean	87.51	90.85	7,79,77,744.21
Q3	57	52	2,15,50,000
Maximum	10,811	16,952	28,26,00,00,000
Standard Deviation	278.31	368.18	53,16,23,661.73
CV	3.18	4.05	6.81

4.2. Parameter Estimation

The Census Sector comprises factories that satisfy two conditions:

- (i) All units belonging to strata having 4 or fewer units.
- (ii) Units having 100 or more employees.

In this manner, 3,031 factories are identified as "Census Sector units" and are included in the sample with a probability of one. The Sample Sector contains the remaining factories that do not satisfy conditions (i) and (ii). The number of factories in the Sample Sector is 11,450, distributed across 312 strata. After dividing the whole population into Census and Sample

sectors, sample allocation for each stratum is performed using proportional allocation. Let N_s be the number of units in the s^{th} stratum, from which we need to select n_s units. If the total number of units to be selected for the sample is n , then each stratum will receive:

$$n_s = n \times \frac{N_s}{N}$$

In the case of the ASI, there is a restriction: if the calculated $n_s < 4$, we allocate minimum 4 sample units to that particular stratum. Consequently, the minimum allocated sample size in each stratum is 4. Following this method, we have allocated 2,396 units across 312 strata proportional to their respective sizes. Out of these 2,396 units, 1,198 units are allocated to the Central sample and 1,198 to the State sample. Thus, our effective sample size (Central Sample) is 4,229 (comprising 3,031 Census units + 1,198 Sample units) out of the total factories. In our study, we examined 8 types of parameters for both sampling designs, viz. "Equal Probability Circular Systematic Sampling (EPCSS)" and "Varying Probability Circular Systematic Sampling (VPCSS)" without replacement (WOR) schemes. These parameters are:

- i. Number of factories
- ii. Total workers
- iii. Total GVA
- iv. Number of workers per factory
- v. GVA per factory
- vi. GVA per worker
- vii. Percentage of factories having number of workers ≤ 50
- viii. Percentage of factories having number of workers ≤ 5

These estimates were obtained by taking the average of **1,000 independent sample estimates**. The average estimates of the **1,000 independent samples**, along with their actual parameter values from the population, are presented in Table 3.

Table 3. Parameter estimates for both designs

Sampling design	Name of the parameters	Estimate	Parameter
Equal probability circular systematic sampling design	No. of factories	14,390	14,390
	Total workers	13,07,169	13,07,298
	Number of workers per factory	90.83	90.84
	Total GVA (Rs. Crore)	1,12,205	1,12,210
	GVA per factory (Rs.)	7,79,74,541	7,79,77,744
	GVA per worker (Rs.)	8,58,387	8,58,335.08
	% factory having workers ≤ 50	74.14	74.13
	% factory having workers ≤ 5	9.31	9.31
Varying probability circular	No. of factories	14,406.04	14,390
	Total workers	13,07,286	13,07,298
	Number of workers per factory	90.77	90.84

systematic sampling design	Total GVA (Rs. Crore)	1,12,206	1,12,210
	GVA per factory (Rs.)	7,79,09,171	7,79,77,744
	GVA per worker (Rs.)	8,58,318	8,58,335
	% factory having workers ≤ 50	74.16	74.13
	% of factory having workers ≤ 5	9.315	9.31

From Table 3, it can be observed that under Equal Probability Sampling, the estimate of the total number of factories is exactly equal to the actual population parameter. Consequently, the bias is exactly zero. The primary reason for this is that the sum of the multipliers (Equation 3) is mathematically equal to the total number of factories in the population.

Conversely, the estimate of the number of factories obtained from VPCSS does not match the actual parameter and is subject to bias. This arises because the sum of multipliers in VPCSS (Equation 6) does not necessarily equal the total number of factories in the population. This is a known limitation of the Probability Proportional to Size (PPS) sampling design. The theoretical proof for this is provided in Annexure II.

To evaluate the efficiency of the estimates under the two sampling designs, we calculated Bias, Relative Bias (RB), Mean Squared Error (MSE), and Relative Standard Error (RSE), as described in Section 6.3. The resulting values are presented in the table below.

Table 4. Estimates of RB and RSE for different parameters

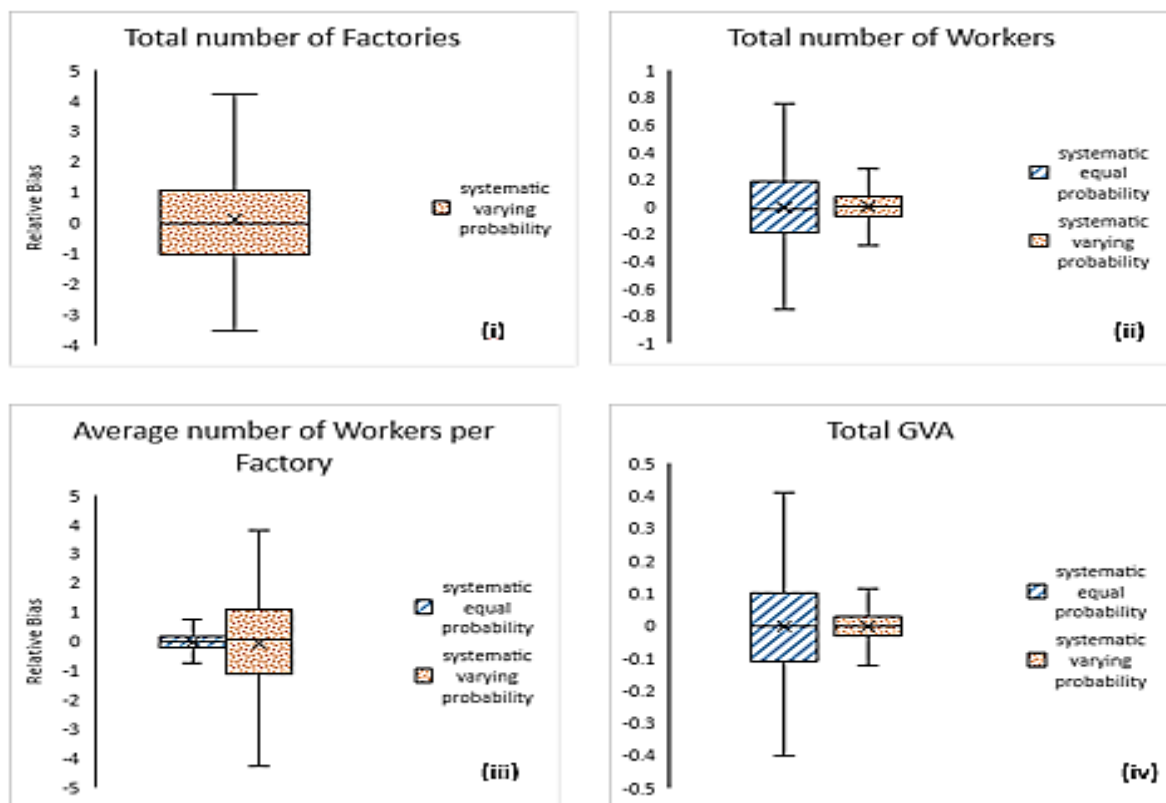
Sampling design	Name of the parameters	RB (%)	RSE (%)
Equal probability circular systematic sampling design	No. of factories	0.0000	0.0000
	Total workers	0.0098	0.2820
	Number of workers per factory	0.0098	0.2820
	Total GVA (Rs.)	0.0041	0.1562
	GVA per factory (Rs.)	0.0041	0.1562
	GVA per worker (Rs.)	0.0061	0.1709
	% factory having workers ≤ 50	0.0079	0.7242
	% of factory having workers ≤ 5	-0.0117	5.3021
Varying probability circular systematic sampling design	No. of factories	0.1114	1.6216
	Total workers	0.0009	0.1056
	Number of workers per factory	0.0859	1.6256
	Total GVA (Rs.)	0.0030	0.0442
	GVA per factory (Rs.)	0.0879	1.6295
	GVA per worker (Rs.)	0.0019	0.1065
	% factory having workers ≤ 50	0.0418	0.7902
	% of factory having workers ≤ 5	0.1132	6.9702

From **Table 4**, it is evident that the estimates for **total workers, total GVA, and GVA per worker** are more efficient under **VPCSS**, exhibiting lower Relative Bias (RB) and Relative Standard Error (RSE). Conversely, for the remaining five estimates, the **EPCSS** scheme yields more efficient results than VPCSS.

To visually represent the deviation of estimates from the actual parameters, Box-and-Whisker plots for the two sampling designs are presented in **Figure 3**. In each subplot of Figure 3 (i to viii), the **middle line** represents the actual parameter, while the ‘×’ symbol denotes the mean of the 1,000 independent sample estimates.

Visual inspection of **Figures 3(ii), 3(iv), and 3(vi)** indicates that the VPCSS scheme provides more consistent results than EPCSS. However, for the remaining estimates, EPCSS performs better. Notably, in **Figure 3(vii)**, it is observed that the VPCSS estimates **do not vary significantly** in terms of relative bias, making this estimate nearly as consistent as the EPCSS estimate.

Figure 3: Box-Whisker plots of different estimates





It is pertinent to note that sampling multipliers (weights) play a decisive role in the precision of estimates. While these multipliers are intended to enhance the efficiency of estimators across various sampling designs, high variability in weights can sometimes be detrimental. Equal Probability Circular Systematic Sampling (EPCSS) possesses a distinct structural advantage regarding these multipliers, as detailed in Annexure II. Specifically, EPCSS provides an unbiased estimate of the total number of factories, as evidenced in Table 4. Consequently, when this unbiased estimate is utilized in ratio estimates (for the four parameters analyzed), EPCSS is expected to yield more efficient and accurate results compared to Varying Probability Circular Systematic Sampling (VPCSS).

5. Conclusion

From the above illustration we have observed that for some estimates, viz. total workers, total GVA and GVA per worker VPCSS scheme outperforms EPCSS scheme. And for the other 5 estimates EPCSS scheme gives more efficient result than VPCSS scheme. But as far as the number of factories are concerned we do not need to estimate it from any kind of sampling design. Because we already have the sampling frame, which has exact number of factories. So, it would be very convenient, if we calculate the number of factories from the sampling frame itself. Thus, we can say that “Varying probability circular systematic sampling” can give better estimates of the key variables, such as number of workers, average GVA per worker and total GVA, in Annual Survey of Industries as compared to presently used sampling design, “equal

probability circular systematic sampling”. However, for the parameters involving the number of factories, such as GVA per factory or number of worker per factory, the equal probability sampling scheme yields much better estimates.

Acknowledgement:

This research was conducted by the author in personal capacity. The views, thoughts, and opinions expressed in this text belongs solely to the author and not necessarily to the authors' employer, organization, committee, or other group or individual. I would like to express my sincere gratitude to Shri Alope Kar, Visiting Scientist, ISI, Kolkata (Ex-DDG, CSO, MOSPI), who despite having a very tough schedule took keen interest in this work and provide necessary guidance till its completion. I am thankful to him for his encouragement, advice and kind support.

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The Sample Design – in brief

For selection of central sample units, all the factories in the frame are divided into two categories, viz., Census Sector and Sample Sector.

Census Sector: Census Sector consists of the following units:

- a) All industrial units belonging to the seven less industrially developed states/ UT's viz. Arunachal Pradesh, Manipur, Mizoram, Meghalaya, Nagaland, Sikkim, Tripura and Andaman & Nicobar Islands.
- b) All industrial units with Frame NIC = 0893 (Salt Extraction).
- c) For the States/ UTs other than those mentioned in (a),
 - (i) units having 75 or more employees from six States, namely, Jammu & Kashmir, Himachal Pradesh, Rajasthan, Bihar, Chhattisgarh and Kerala;
 - (ii) units having 50 or more employees from three States/UTs, namely, Chandigarh, Delhi and Puducherry;
 - (iii) units having 100 or more employees for rest of the States/UTs, not mentioned in (i) and (ii) above and;
 - (iv) all units covered under 'Joint Return' (JR), where JR should be allowed when the two or more units located in the same State/UT belonging to the same industry (3-digit level of NIC) under the same management. It may be noted that the principle of JR is applicable only before the selection of units before the survey and unit(s) belonging to the "Census Sector" will not be joint with unit(s) of "Sample Sector" at the field stage or all units belonging to the "Sample Sector" should not be joint among themselves at the field stage even if the conditions of JR are satisfied.
- d) After excluding the Census Sector units as defined in paragraphs a) and b) above, the strata will be formed at State × District × Sector × 3-digit of NIC-2008 level. Here, 'sector' is very broad economic activity group consisting of manufacturing, electricity generation activity and bidi producing activity. Thus, in short, sectors are (i) Bidi making, (ii) Manufacturing and (iii) Electricity. All units belonging to the strata (i.e., formed on the basis of units in State by District by Sector by 3-digit of NIC-08) having less than or equal to 4 units are completely enumerated and are thus considered as 'census sector' units.

Sample Sector: All the units not listed under census sector are covered in Sample sector.

- a) The factories, in each stratum, are arranged in order of their number of employees. The sample will be drawn circular systematically in the form of four independent sub-samples considering an overall sampling fraction, say, about 16% to 20%, depending upon the availability of resources of FOD and State DES in each State. An even number of units, with a minimum of four (4) units, are selected and evenly distributed in four

sub-samples. It may be noted that in the formation of stratum, the sectors are taken as (i) Bidi, (ii) Manufacturing and (iii) Electricity. Moreover, each of the four (4) sub-samples from a particular stratum may not have equal number of units.

- b) Out of these four sub-samples, two, preferably the odd ones, will be given to FOD of NSO and the remaining two will be given to State/UT for data collection. Thus, if four sub-samples SS1, SS2, SS3 and SS4 are formed in each stratum, the sub-samples SS1 and SS3 will be surveyed by NSO, FOD, and the sub-samples SS2 and SS4 will be surveyed by State/ UT.
- c) The entire units under the Census scheme plus all the units belonging to the two subsamples meant for FOD (i.e., sub-samples SS1 and SS3 in this case) are treated as the Central sample.
- d) All the units belonging to the two sub-samples meant for State/UT (i.e., sub-samples SS2 and SS4) may be treated as the State sample. However, State/UT will have to use Census units, surveyed by central agency, along with their State sample while deriving the estimates at different levels for their State/UT.
- e) So, there will not be any provision of drawing state sample separately in the new sampling design for ASI. In fact, in the new design, the stratification will be “State $\times$ District $\times$ Sector $\times$ 3-digit of NIC”, and the samples will be drawn from the sample sector in the form of four (4) independent sub-samples.

Multiplier Estimation Procedure:

Let, there are N units in the population, out of which n number of units to be selected in the sample. For all 1 to N units and the auxiliary variable, i.e. size of units $X_1, X_2, \dots, X_N$. A fixed sample size n_h is to be selected from the total number of frame units N in stratum h . Consequently, every unit in stratum h has an identical inclusion probability:

$$\pi_{hi} = \frac{n_h}{N_h} \quad \forall i = 1 \text{ to } n_h \text{ and } h = 1 \text{ to } L$$

The sampling weight (or multiplier) applied to each selected unit is the inverse of this inclusion probability: $w_{hi} = \frac{1}{\pi_{hi}} = \frac{N_h}{n_h}$

Thus, the estimated total number of factories in the sample sector $\hat{N}_{sample}$ becomes:

$$\hat{N}_{sample} = \sum_{h=1}^L \sum_{i \in S_h} w_{hi} = \sum_{h=1}^L \sum_{i=1}^{n_h} \left(\frac{N_h}{n_h} \right) = \sum_{h=1}^L n_h \times \left(\frac{N_h}{n_h} \right) = \sum_{h=1}^L N_h = N$$

Now, for varying probability sampling scheme [Horvitz-Thompson estimator], the survey weight or multiplier of i^{th} unit would become inverse of inclusion probability,

$$W_{hi} = \frac{1}{\pi_{hi}} = \frac{X_h}{n_h \times x_{hi}}$$

Where, $\pi_{hi} = \frac{n_h \times x_{hi}}{X_h}$ is the inclusion probability of i^{th} unit in the h^{th} stratum, X_h is the total workers in the h^{th} stratum and x is the workers in the i^{th} factory.

Now, if we take summation of W_i over 1 to n , then it would be,

$$\hat{N}_{sample} = \sum_{h=1}^L \sum_{i \in S_h} w_{hi} = \sum_{h=1}^L \sum_{i \in S_h} \frac{X_h}{n_h \times x_{hi}} \neq N$$

For Horvitz-Thompson estimator with equal probability scheme, every unit has the equal probability of selection, the sampling weight (multiplier) is a constant $w_i = \frac{N_i}{n_i}$ for all selected units. This results in an exact match of number of factories with zero sampling variance. Whereas, for Horvitz-Thompson estimator with varying probability scheme (PPS), applied weights depend entirely on which specific factories happen to be randomly selected in a given sample, their sum is a random variable. Consequently, while the estimator remains unbiased on average, the sum of these weights $W_i = \frac{X_h}{n_h \times x_{hi}}$ for any single drawn sample will almost certainly not equal the exact population size N .

PART – II

Highlights of Report Released by National Statistics Office (NSO)

**(The highlights are Reproduced from Related Report prepared by NSO. For details,
the reader may refer to the related main report)**

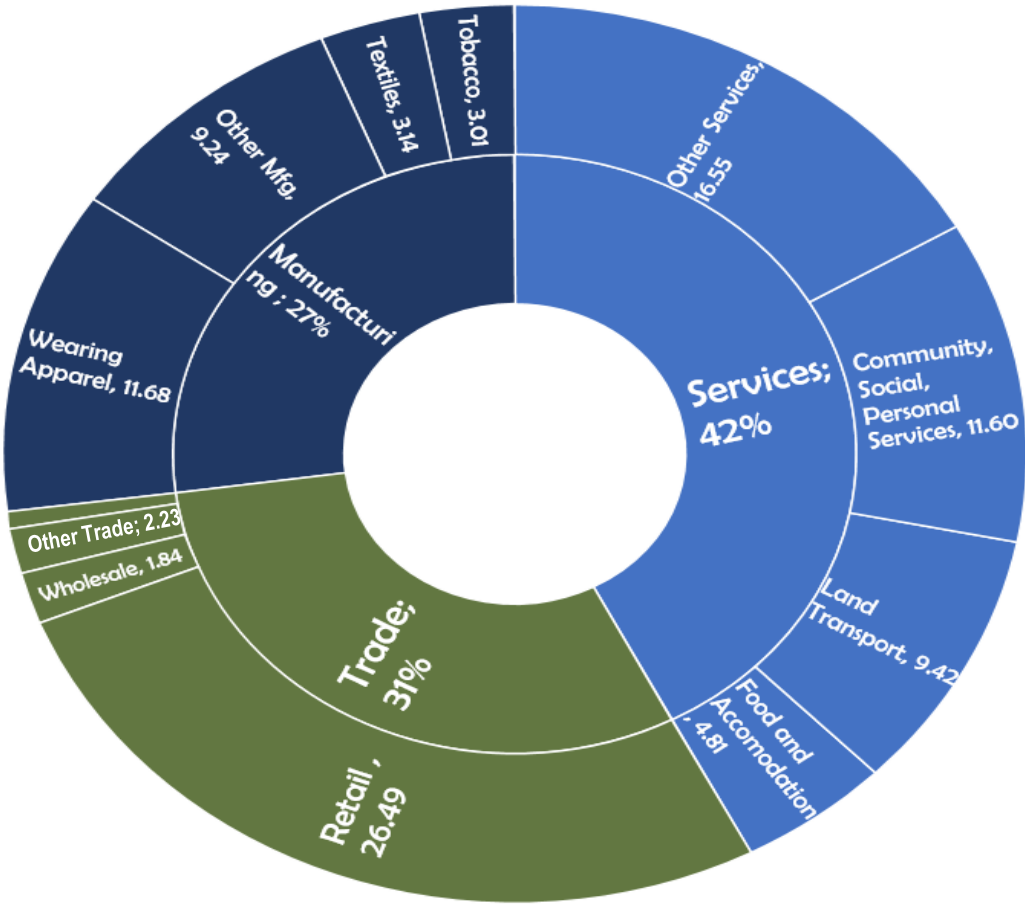
ESTABLISHMENTS

Number of estimated establishments belonging to unincorporated ‘manufacturing’, ‘trade’, and ‘other services’ sector grew from **7.34 crore** during October, 2023- September,2024 to **7.92 crore** during the survey period of ASUSE 2025, which is, January, 2025-December,2025

Rural: 4.24 Crore Establishment
Urban: 3.68 Crore Establishment

Estimated Own Account Establishment:
6.86 Crore
Estimated Hired Worker Establishments:
1.06 Crore

Percentage share of various industries in estimated establishments



States with highest share of Unincorporated Establishments

Uttar Pradesh: 13.80%	West Bengal: 13.10%	Maharashtra: 8.29%
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OWNERSHIP



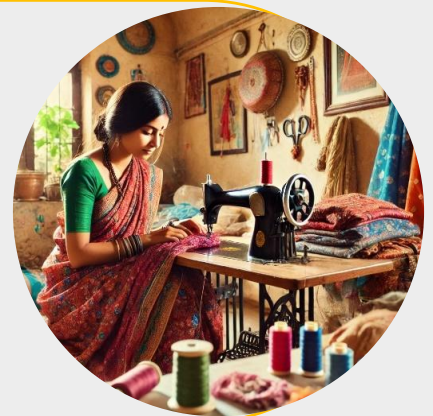
95% of the establishments were estimated to be proprietary establishment



Majority of the States have more than 90% of the establishment owned by sole proprietors. Among major states, Uttar Pradesh recorded the highest percentage (**99.2%**) of proprietary establishment

27% of the unincorporated establishments were headed by female proprietors while in manufacturing, this share was slightly more than **60%**.

Highest percentage of female headed establishments have been observed in Telangana (**38.55%**)



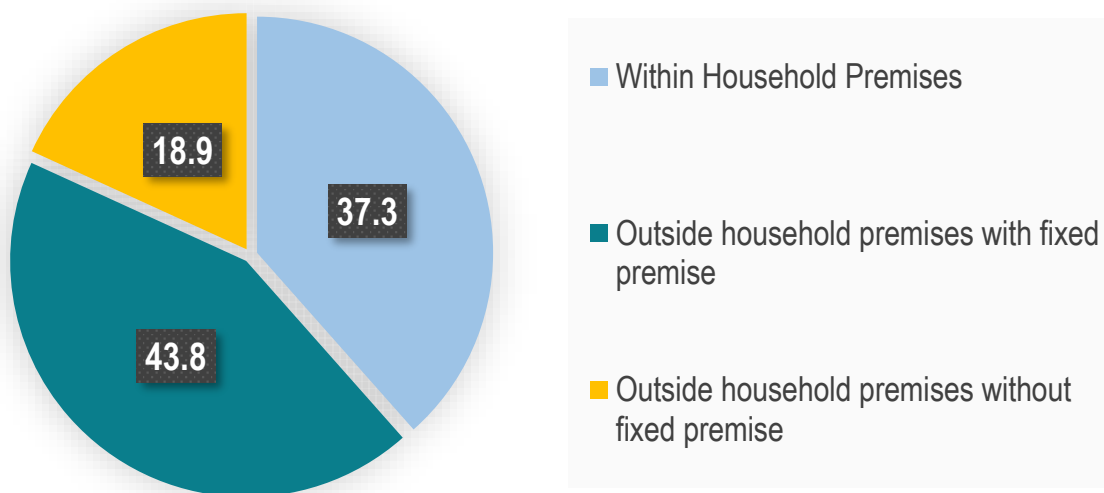
PERCENTAGE SHARE OF ESTABLISHMENTS BY SOCIAL GROUP OF OWNER/MAJOR PARTNER

■ Scheduled Tribe ■ Scheduled Caste ■ Other Backward Classes ■ Others



LOCATION OF ESTABLISHMENT

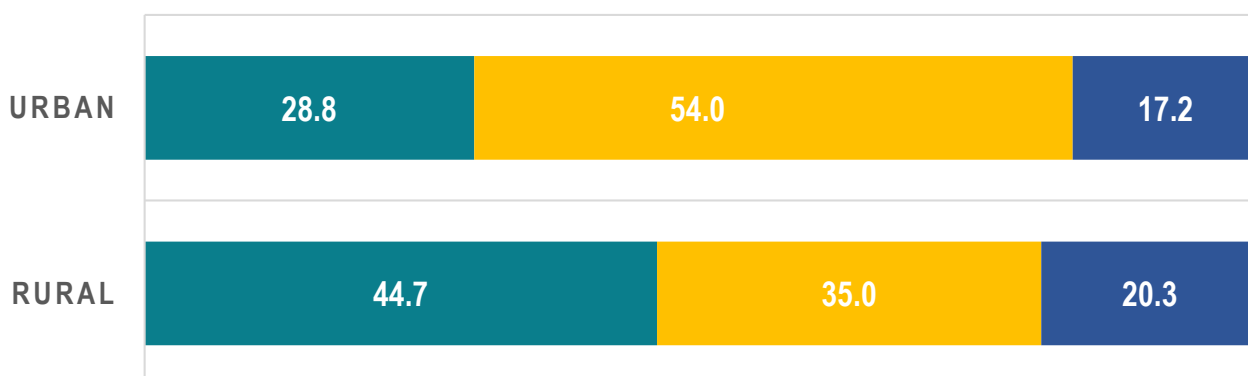
Distribution of Establishment by Location



84.4% of the HWEs were located outside household premises with permanent structure while the same percentage for **OAEs** was **31.0%**

LOCATION OF ESTABLISHMENT BY SECTOR

- Within household premises
- Outside household premises with fixed premise
- Outside household premises without fixed premise

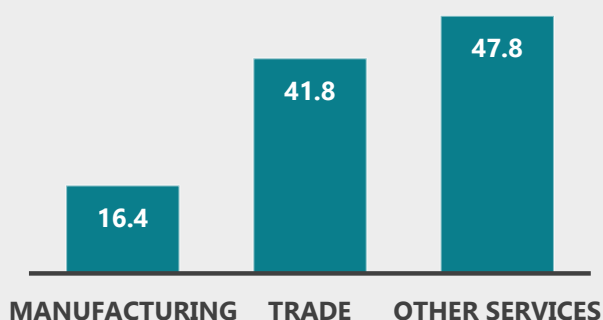


REGISTRATION AND ICT

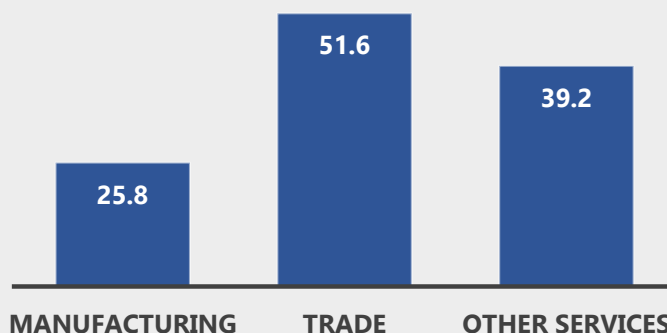


37.5% of the unincorporated establishments were found to be registered under some act/authority.

Percentage of Establishments
Registered under Act/Authority



Percentage of Establishments using
Internet



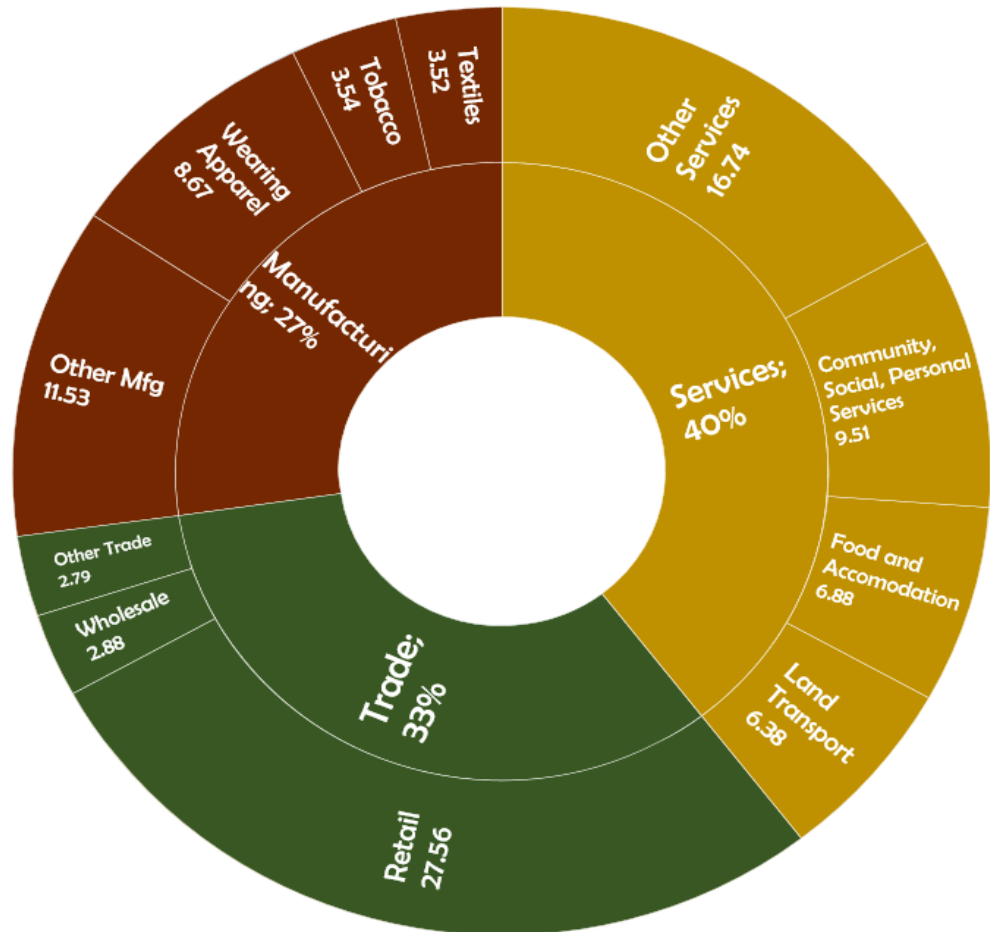
Use of internet, for entrepreneurial purpose, has increased from **18%** in 2023-2024 to **31%** in 2025 in rural and from **37%** to **49%** in urban sector.

Overall, it increased from **27%** to **39%** during ASUSE 2025 as compared to ASUSE 2023-2024.

WORKERS AND EMOLUMENT

Unincorporated non-agricultural economy has employed about **12.81 crore workers** as per ASUSE 2025, in comparison to about 12.06 crore workers as estimated from ASUSE 2023-2024.

Percentage share of various industries in estimated workers



States with Highest Share of workers engaged in unincorporated establishments

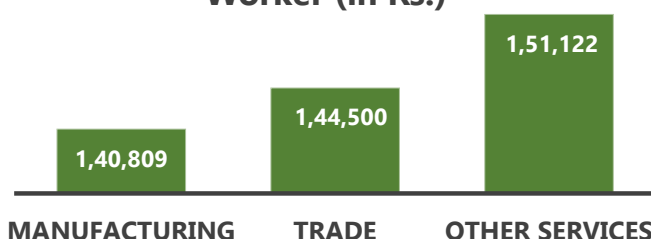
Uttar Pradesh: **14.50%**

West Bengal: **10.38%**

Maharashtra: **9.14%**



Annual Emolument per Hired Worker (in Rs.)

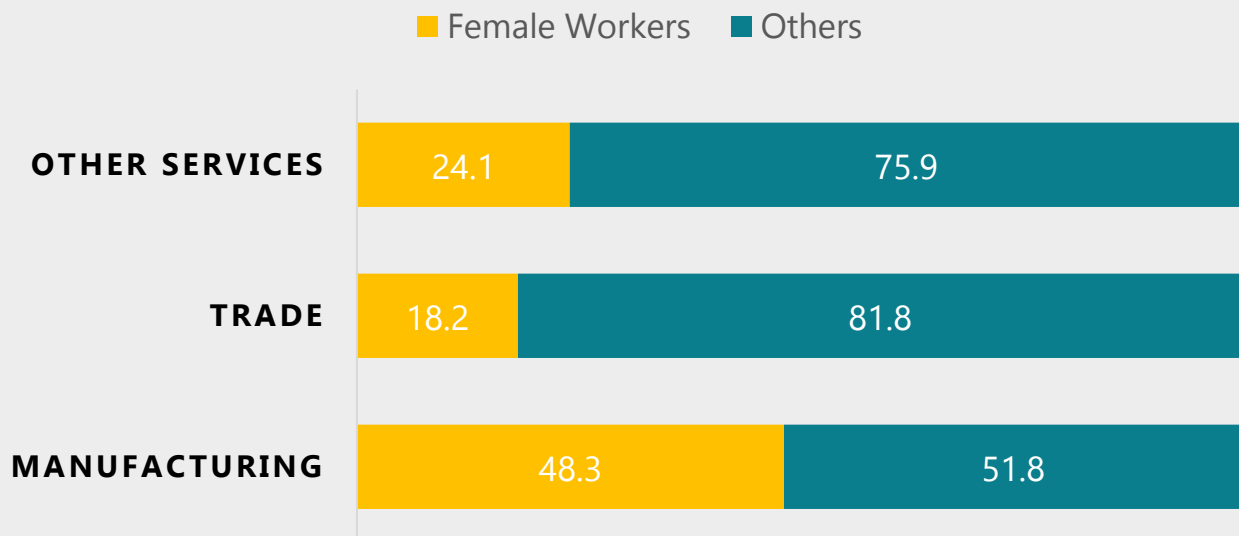


Uttarakhand recorded the highest average **emoluments per hired worker** among major states during **ASUSE 2025**, amounting to **₹2,14,237**.

FEMALE WORKERS

Overall, about **29%** of the total workers of unincorporated non-agricultural sector, during the period January 2025 to December 2025, were female.

PERCENTAGE OF FEMALE WORKERS



Female-led hired-worker establishments demonstrate a strong tendency to employ women as nearly **72 %** of such establishments engaged at least one female hired worker.

States with highest share of female workers engaged in unincorporated establishments

West Bengal: 12.18%

Uttar Pradesh: 11.28%

Maharashtra: 9.53%



PRODUCTIVITY (Market Establishments)

PERCENTAGE SHARE OF GVA

■ Manufacturing ■ Trade ■ Other Services



States with highest share of GVA in unincorporated establishments

Uttar Pradesh: 11.7%

Maharashtra: 11.2%

Tamil Nadu: 8.2%



GVA per Establishment during survey period of ASUSE 2025 has been observed to be **Rs. 2.5 lakh.**

The same for OAE was **Rs. 1.4 lakh** and for HWE was **Rs. 10 lakh.**

GVA per Worker during survey period of ASUSE 2025 has been observed to be **Rs. 1.6 lakh.**

The same for OAE was **Rs. 1.2 lakh** and for HWE was **Rs. 2.3 lakh.**

FIXED ASSETS AND OUTSTANDING LOAN



ASUSE 2025 has shown **better capital investment** in the unincorporated sector, as fixed assets (owned) by an unincorporated non-agricultural establishment, on average, has risen to **Rs. 3.4 lakh** from Rs. 3.2 lakh in ASUSE 2023-24.

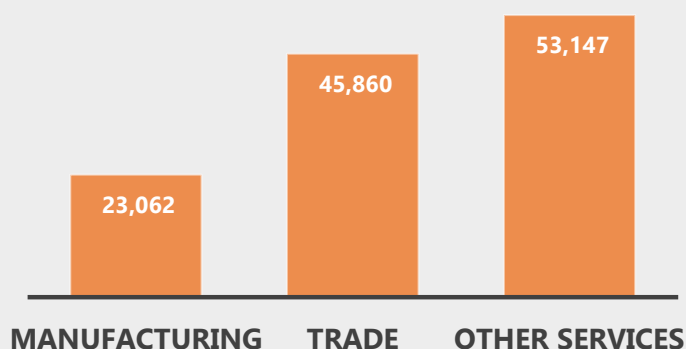


At all-India level, **'Warehousing'** recorded the highest fixed assets per establishment.

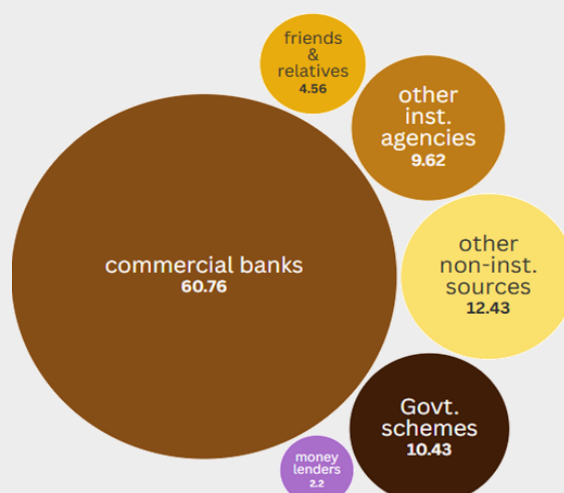
Outstanding loan per unincorporated non-agricultural establishment, on average, has been estimated to be **Rs. 42,776** at all-India level during the survey period of ASUSE 2025. **Around 80%** of the outstanding loan has been routed through different institutional sources.



Outstanding Loan per Establishment (in Rs.)



Percentage share of outstanding loan by source



HIGHLIGHTS - II: Periodic Labour Force Survey (PLFS) 2025



Survey Period

January 2025 to December 2025



Survey Coverage

Surveyed

22,594 First Stage Units (FSUs)	Rural: 12,441 villages Urban: 10,153 urban blocks
2,70,472 Households	1,48,718 in rural areas 1,21,754 in urban areas
11,48,634 Persons	6,56,160 in rural areas 4,92,474 in urban areas

The survey covered the whole of the Indian Union *except* the villages in Andaman and Nicobar Islands which remained extremely difficult to access throughout the year.

Approaches for presenting Labour Force Indicators

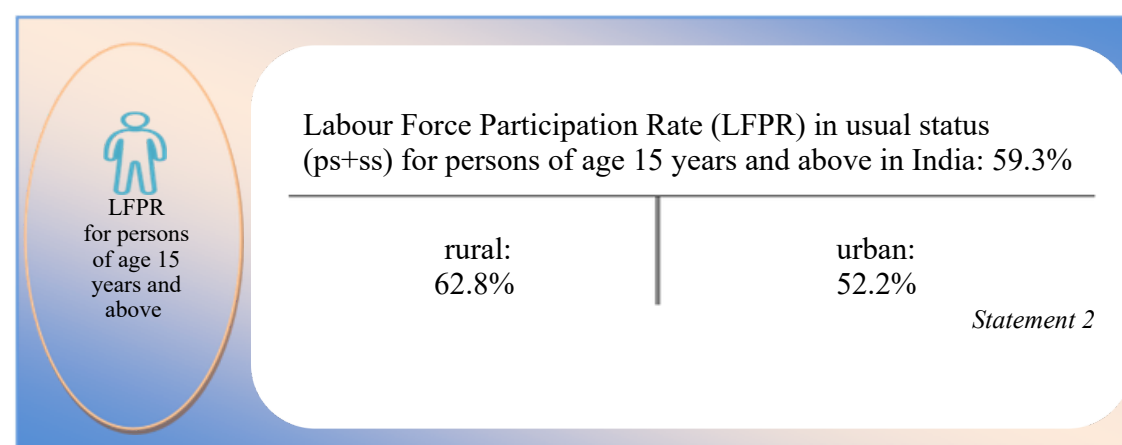
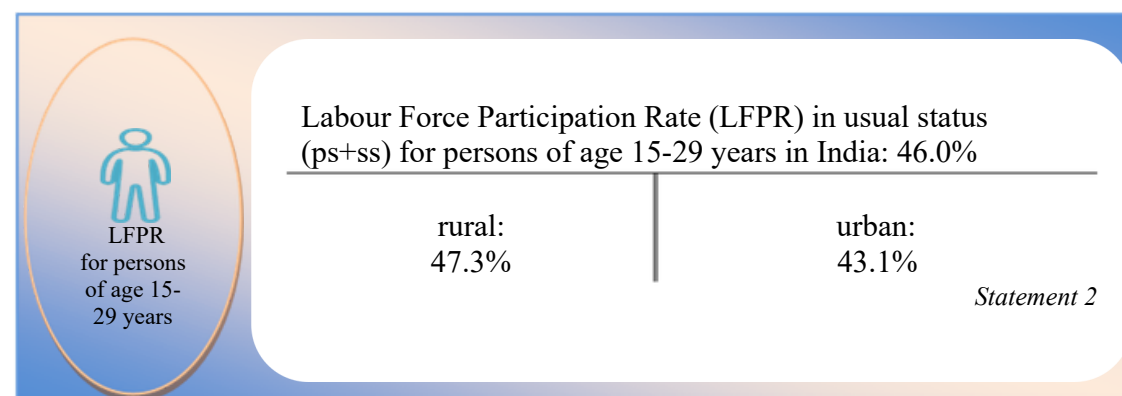
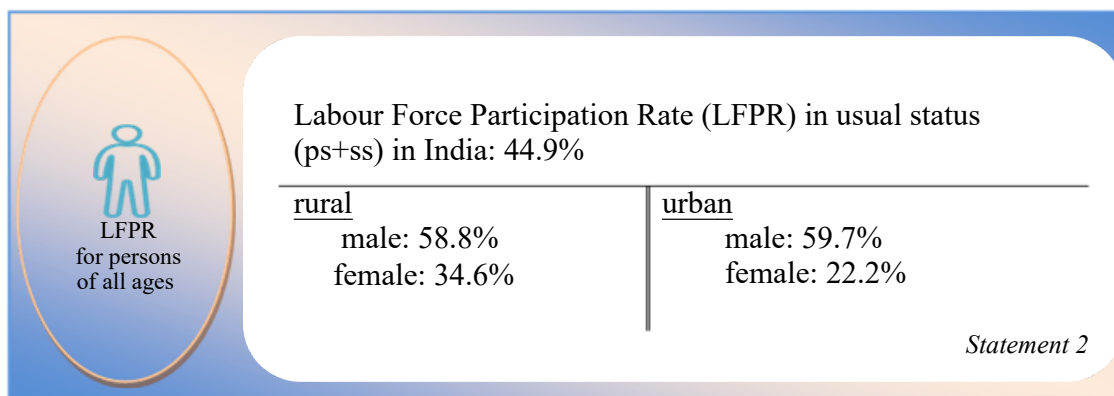
July 2018 to June 2019

Approaches followed for presenting Labour Force Indicators

usual status (ps+ss) Reference period: 1 year	current weekly status (CWS) Reference period: 1 week
--	---

Some of the key results at the all-India level for the period January 2025 - December 2025 emerging from PLFS are highlighted below.

A. Labour Force in usual status (ps+ss)



B. Workforce



WPR
in usual
status for
persons of
all ages

Worker Population Ratio (WPR) in usual status (ps+ss) in India: 43.5%

rural

male: 57.2%
female: 33.8%

urban

male: 57.2%
female: 20.7%

Statement 5



WPR
in usual
status for
persons of
age 15-29
years

Worker Population Ratio (WPR) in usual status (ps+ss) for persons of age 15-29 years in India: 41.4%

rural:
43.4%

urban:
37.2%

Statement 5



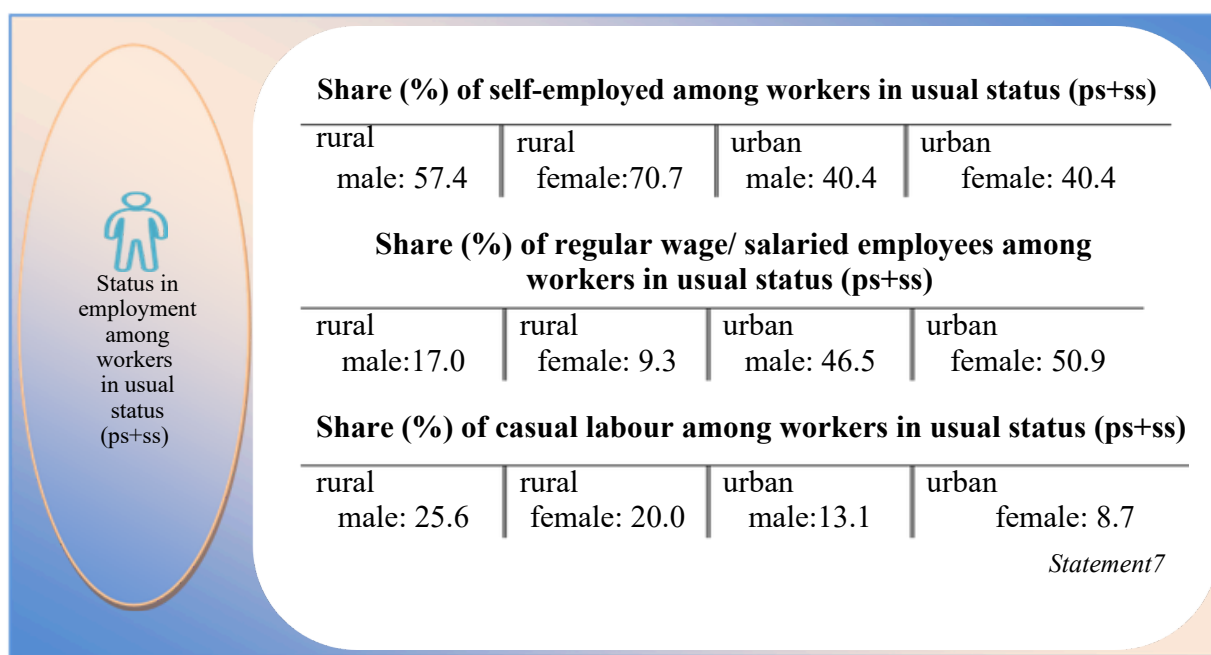
WPR
in usual
status for
persons of
age 15
years and
above

Worker Population Ratio (WPR) in usual status (ps+ss) for persons of age 15 years and above in India: 57.4%

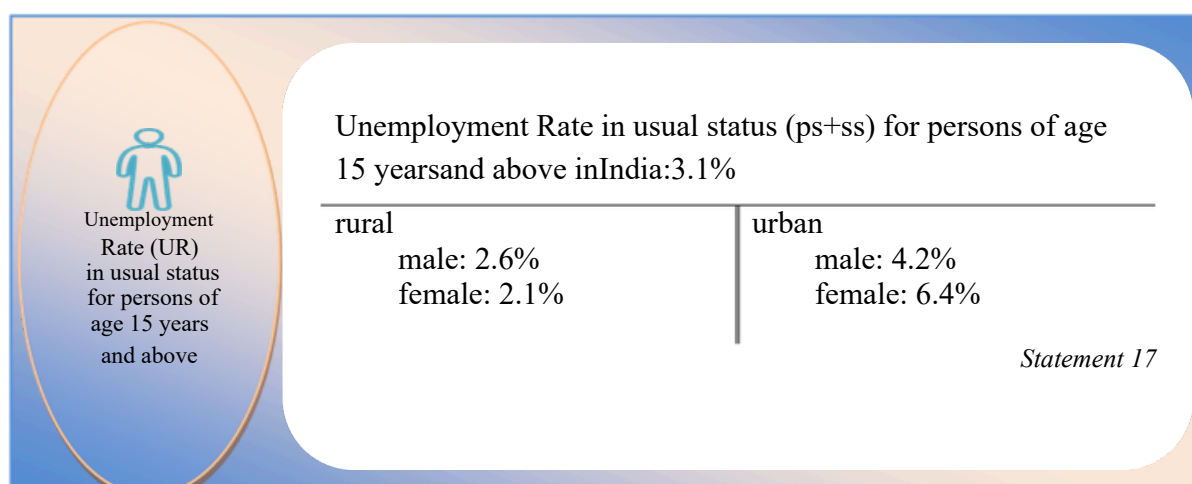
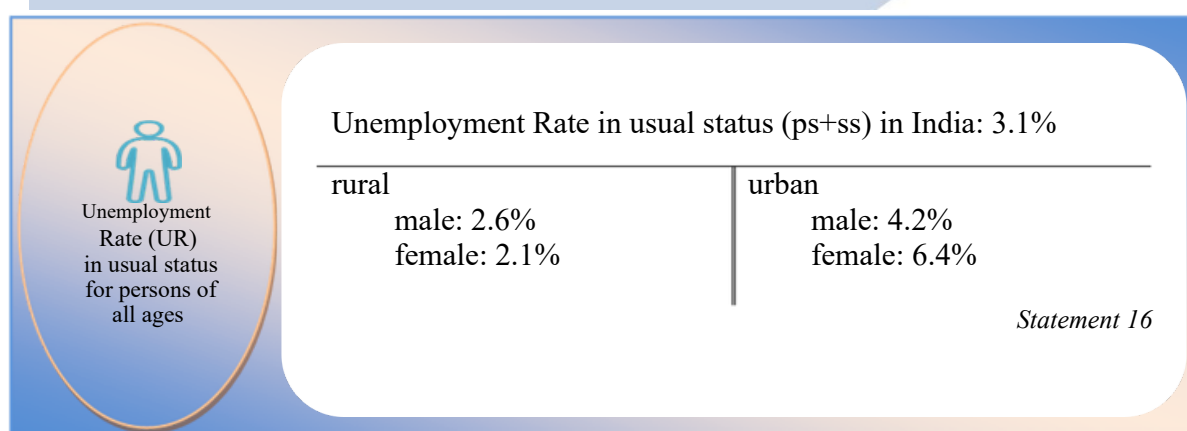
rural:
61.2%

urban:
49.7%

Statement 5



C. Unemployment Rate in usual status (ps+ss)





Unemployment
Rate (UR)
in usual status
for educated
persons
of all age 15
years and
above

Unemployment Rate in usual status (ps+ss) for educated (*highest level of education secondary and above*) persons of age 15 years and above in India: 6.5%

rural	urban
6.0%	7.2%

Statement 17



Unemployment
Rate (UR)
in usual status
for persons of
age 15 -29
years

Unemployment Rate in usual status (ps+ss) for youth persons of age 15 -29 years in India: 9.9%

rural	urban
male: 8.2%	male: 11.8%
female: 8.6%	female: 18.9%

Statement 18

D. Time Series of Key Labour Force indicators in usual status (ps+ss) obtained from PLFS

Table 1: Labour Force Participation Rate (in per cent) in usual status (ps+ss) estimated from PLFS 2022, PLFS 2023, PLFS 2024 and PLFS 2025 for persons of age 15 years and above and persons of all ages									
all-India									
age group	rural			urban			rural+urban		
	male	female	person	male	female	person	male	female	person
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
PLFS 2025									
15 years and above	80.5	45.9	62.8	76.2	27.7	52.2	79.1	40.0	59.3
all ages	58.8	34.6	46.6	59.7	22.2	41.3	59.1	30.7	44.9
PLFS 2024									
15 years and above	80.6	45.8	62.9	76.2	27.6	52.2	79.2	40.3	59.6
all ages	58.2	34.2	46.2	59.4	22.0	41.1	58.6	30.7	44.7
PLFS 2023									
15 years and above	79.8	47.3	63.4	74.9	27.2	51.4	78.3	41.3	59.8
all ages	57.6	35.3	46.6	58.7	21.7	40.6	57.9	31.5	44.9
PLFS 2022									
15 years and above	79.5	37.5	58.5	74.3	24.7	50.0	78.0	33.9	56.1
all ages	55.3	27.5	41.8	58.1	19.6	39.4	56.0	25.4	41.1
2025 refers to the period January 2025 – December 2025 and likewise for 2024, 2023 and 2022									

Table 2: Worker Population Ratio (in per cent) in usual status (ps+ss) estimated from PLFS 2022, PLFS 2023, PLFS 2024 and PLFS 2025 for persons of age 15 years and above and persons of all ages									
all-India									
age group	rural			urban			rural+urban		
	male	female	person	male	female	person	male	female	person
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	PLFS 2025								
15 years and above	78.4	44.9	61.2	73.0	25.9	49.7	76.6	38.8	57.4
all ages	57.2	33.8	45.4	57.2	20.7	39.3	57.2	29.8	43.5
	PLFS 2024								
15 years and above	78.4	44.8	61.4	72.8	25.8	49.6	76.6	39.0	57.7
all ages	56.6	33.5	45.1	56.7	20.5	39.0	56.6	29.7	43.3
	PLFS 2023								
15 years and above	77.7	46.4	61.9	71.6	25.2	48.8	75.8	40.1	58.0
all ages	56.1	34.7	45.5	56.1	20.0	38.5	56.1	30.5	43.5
	PLFS 2022								
15 years and above	77.1	36.7	56.9	70.4	22.8	47.0	75.1	32.8	54.1
all ages	53.6	26.9	40.6	55.0	18.1	37.0	53.9	24.6	39.7
<i>2025 refers to the period January 2025 – December 2025 and likewise for 2024, 2023 and 2022</i>									

Table 3: Unemployment Rate (in per cent) in usual status (ps+ss) estimated from PLFS 2022, PLFS 2023, PLFS 2024 and PLFS 2025 for persons of age 15 years and above and persons of all ages									
all-India									
age group	rural			urban			rural+urban		
	male	female	person	male	female	person	male	female	person
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	PLFS 2025								
15 years and above	2.6	2.1	2.4	4.2	6.4	4.8	3.1	3.1	3.1
all ages	2.6	2.1	2.4	4.2	6.4	4.8	3.1	3.1	3.1
	PLFS 2024								
15 years and above	2.8	2.1	2.5	4.4	6.7	5.0	3.3	3.1	3.2
all ages	2.8	2.1	2.5	4.4	6.7	5.0	3.3	3.1	3.2
	PLFS 2023								
15 years and above	2.7	1.9	2.4	4.4	7.5	5.2	3.2	3.0	3.1
all ages	2.7	1.9	2.4	4.4	7.5	5.2	3.2	3.0	3.1
	PLFS 2022								
15 years and above	3.1	2.1	2.8	5.3	7.7	5.9	3.7	3.3	3.6
all ages	3.1	2.1	2.8	5.3	7.7	5.9	3.7	3.3	3.6
2025 refers to the period January 2025 – December 2025 and likewise for 2024, 2023 and 2022									

E. Time Series of Key Labour Force indicators in Current Weekly Status (CWS) obtained from PLFS

Table 4: Labour Force Participation Rate (in per cent) in current weekly status estimated from PLFS 2022, PLFS 2023, PLFS 2024 and PLFS 2025 for persons of age 15 years and above and persons of all ages
all-India

age group	rural			urban			rural+urban		
	male	female	person	male	female	person	male	female	person
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	PLFS 2025								
15 years and above	78.9	38.3	58.1	75.3	25.9	50.8	77.7	34.3	55.7
all ages	57.6	28.9	43.1	59.0	20.7	40.2	58.0	26.3	42.2
	PLFS 2024								
15 years and above	79.2	38.6	58.6	75.6	25.8	51.0	78.1	34.7	56.2
all ages	57.1	28.8	43.0	58.9	20.5	40.1	57.7	26.4	42.2
	PLFS 2023								
15 years and above	78.3	39.6	58.8	74.3	25.5	50.3	77.0	35.4	56.2
all ages	56.5	29.5	43.1	58.2	20.3	39.7	57.0	26.9	42.2
	PLFS 2022								
15 years and above	78.0	30.7	54.4	73.8	23.2	48.9	76.8	28.6	52.8
all ages	54.2	22.5	38.8	57.7	18.4	38.5	55.1	21.4	38.7

2025 refers to the period January 2025 – December 2025 and likewise for 2024, 2023 and 2022

Table 5: Worker Population Ratio (in per cent) in current weekly status estimated from PLFS 2022, PLFS 2023, PLFS 2024 and PLS 2025 for persons of age 15 years and above and persons of all ages									
all-India									
age group	rural			urban			rural+urban		
	male	female	person	male	female	person	male	female	person
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	PLFS 2025								
15 years and above	75.0	36.8	55.4	70.7	23.6	47.4	73.6	32.5	52.8
all ages	54.7	27.7	41.1	55.4	18.9	37.5	55.0	25.0	40.0
	PLFS 2024								
15 years and above	75.7	37.1	56.1	71.0	23.7	47.6	74.2	33.0	53.5
all ages	54.7	27.7	41.2	55.3	18.8	37.5	54.8	25.1	40.1
	PLFS 2023								
15 years and above	74.6	38.0	56.2	69.9	23.2	47.0	73.2	33.7	53.4
all ages	53.9	28.4	41.3	54.7	18.5	37.1	54.1	25.6	40.1
	PLFS 2022								
15 years and above	74.0	29.3	51.7	68.6	21.0	45.2	72.4	27.0	49.8
	all ages		51.4	21.5	36.9	53.6	16.7	35.6	
52.0	20.2	36.5 2025 refers to the period January 2025 – December 2025 and likewise for 2024, 2023							

Table 6: Unemployment Rate (in per cent) in current weekly status estimated from PLFS 2022, PLFS 2023, PLFS 2024 and PLFS 2025 for persons of age 15 years and above and persons of all ages									
all-India									
age group	rural			urban			rural+urban		
	male	female	person	male	female	person	male	female	person
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	PLFS 2025								
15 years and above	4.9	4.0	4.6	6.1	8.9	6.8	5.3	5.2	5.3
all ages	4.9	4.0	4.6	6.1	8.9	6.8	5.3	5.2	5.3
	PLFS 2024								
15 years and above	4.3	3.9	4.2	6.1	8.2	6.7	4.9	4.9	4.9
all ages	4.3	3.9	4.2	6.1	8.2	6.7	4.9	4.9	4.9
	PLFS 2023								
15 years and above	4.6	3.8	4.3	6.0	8.9	6.7	5.0	4.9	5.0
all ages	4.6	3.8	4.3	6.0	8.9	6.7	5.0	4.9	5.0
	PLFS 2022								
15 years and above	5.2	4.4	5.0	7.0	9.4	7.6	5.7	5.6	5.7
all ages	5.2	4.5	5.0	7.0	9.4	7.6	5.7	5.6	5.7
<i>2025 refers to the period January 2025 – December 2025 and likewise for 2024, 2023 and 2022</i>									

खण्ड-III हिन्दी

सर्वेक्षण

राष्ट्रीय सांख्यिकी कार्यालय की पत्रिका

भाग सं० 121 PDOS-57-XLII सितम्बर 2026 (3-4)

अंक संख्या 121

सितम्बर 2026



राष्ट्रीय सांख्यिकी कार्यालय
सांख्यिकी और कार्यक्रम कार्यान्वयन मंत्रालय
भारत सरकार
नई दिल्ली

संपादकीय सलाहकार बोर्ड

1. डॉ. जी. सी. मन्ना, अध्यक्ष, पूर्व महानिदेशक, एनएसओ, नई दिल्ली
2. श्री एस. एल. मेनारिया, पूर्व महानिदेशक, एनएसओ, नई दिल्ली
3. डॉ. तथागत बंद्योपाध्याय, पूर्व प्रोफेसर, आईआईएम अहमदाबाद
4. डॉ. मौसमी बोस, आईएसआई कोलकाता
5. श्रीमती बी. पी. वाणी, एसोसिएट प्रोफेसर, सामाजिक एवं आर्थिक परिवर्तन संस्थान, बेंगलुरु
6. श्री आलोक कर, पूर्व उप महानिदेशक, एनएसओ, कोलकाता
7. प्रो. टी. जे. राव, प्रोफेसर (सेवानिवृत्त), भारतीय सांख्यिकी संस्थान, कोलकाता
8. अपर महानिदेशक, एनएसओ (एसपीडी), सांख्यिकी और कार्यक्रम कार्यान्वयन मंत्रालय, नई दिल्ली
9. अपर महानिदेशक, एनएसओ (एसडी), सांख्यिकी और कार्यक्रम कार्यान्वयन मंत्रालय, कोलकाता
10. अपर महानिदेशक, एनएसओ (ईएनएसडी), सांख्यिकी और कार्यक्रम कार्यान्वयन मंत्रालय, कोलकाता
11. अपर महानिदेशक, एनएसओ (ईएसडी), सांख्यिकी और कार्यक्रम कार्यान्वयन मंत्रालय, प्रबंध संपादक, नई दिल्ली
12. अपर महानिदेशक, (सीडीडी), सांख्यिकी और कार्यक्रम कार्यान्वयन मंत्रालय, नई दिल्ली
13. उप महानिदेशक/सलाहकार, (आरएडी), सांख्यिकी और कार्यक्रम कार्यान्वयन मंत्रालय, नई दिल्ली
14. ओआरजीआई, नई दिल्ली के प्रतिनिधि
15. उप महानिदेशक, (एनएसएसटीए), सांख्यिकी और कार्यक्रम कार्यान्वयन मंत्रालय
16. निदेशक/संयुक्त निदेशक, (एनएसएसटीए), सांख्यिकी और कार्यक्रम कार्यान्वयन मंत्रालय, नई दिल्ली

संपादकीय सचिवालय - राष्ट्रीय सांख्यिकी प्रणाली प्रशिक्षण अकादमी, सांख्यिकी और कार्यक्रम कार्यान्वयन मंत्रालय, ग्रेटर नोएडा - 201310

1. श्री आर.राजेश, अतिरिक्त महानिदेशक, सीडीडी, सांख्यिकी एवं कार्यक्रम कार्यान्वयन मंत्रालय, नई दिल्ली
2. श्री संतोष कुमार गुप्ता, निदेशक, एनएसएसटीए
3. श्री सूरज कुमार शुक्ला, उप निदेशक, एनएसएसटीए

राष्ट्रीय सांख्यिकी कार्यालय (एनएसओ) द्वारा जारी रिपोर्ट के मुख्य अंश
(ये मुख्य अंश एनएसओ द्वारा तैयार की गई संबंधित रिपोर्ट से
पुनरुत्पादित किये गए हैं। अधिक जानकारी के लिए, पाठक संबंधित मुख्य
रिपोर्ट देख सकते हैं।)

**मुख्य बिंदु 1: अनिगमित सेक्टरों के उद्यमों (ए. एस, यू. एस. ई) का वार्षिक सर्वेक्षण
(जनवरी २०२५ – दिसम्बर २०२५)**

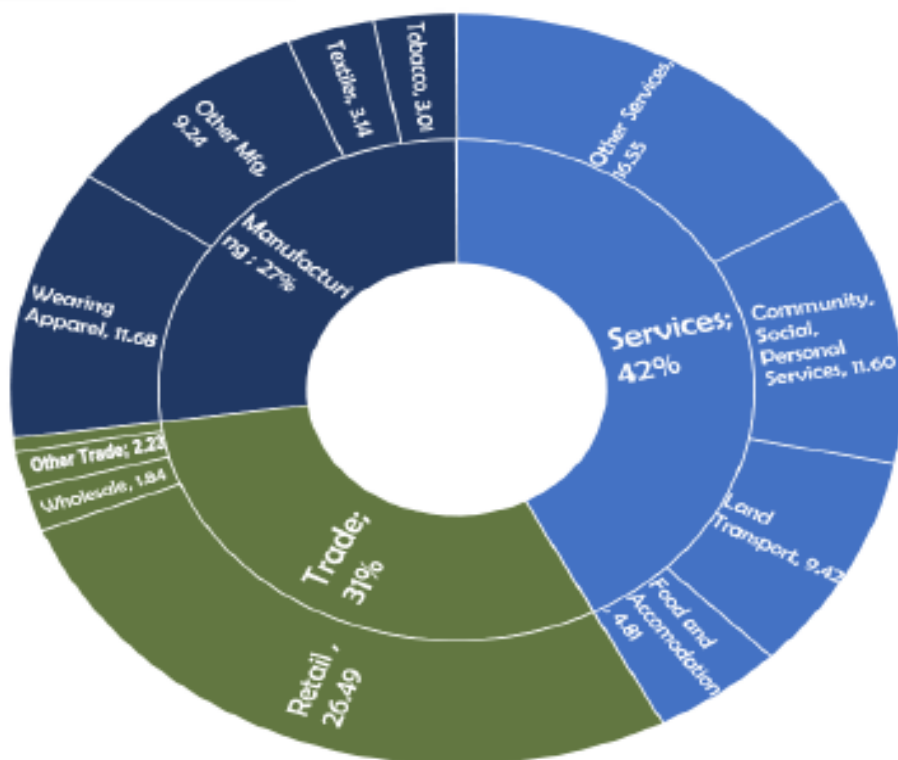
स्थापना

अनिगमित 'विनिर्माण', 'व्यापार' और 'अन्य सेवाओं' के क्षेत्रों से संबंधित अनुमानित स्थापनाओं की संख्या अक्टूबर, 2023 से सितंबर, 2024 के दौरान 7.34 करोड़ से बढ़कर ए.एस.यू.एस.ई. 2025 की सर्वेक्षण अवधि (अर्थात् जनवरी, 2025 से दिसंबर, 2025) के दौरान 7.92 करोड़ हो गई।

ग्रामीण : 4.24 करोड़ स्थापना
शहरी : 3.68 करोड़ स्थापना

अनुमानित स्वयं खाता स्थापना:
6.86 करोड़
अनुमानित भाड़े के कामगार स्थापना :
1.06 करोड़

अनुमानित स्थापनाओं में विभिन्न उद्योगों का प्रतिशत हिस्सा



अनिगमित स्थापनाओं में सर्वाधिक हिस्सेदारी वाले राज्य

उत्तर प्रदेश: 13.80%

पश्चिम बंगाल: 13.10%

महाराष्ट्र: 8.29%



स्वामित्व



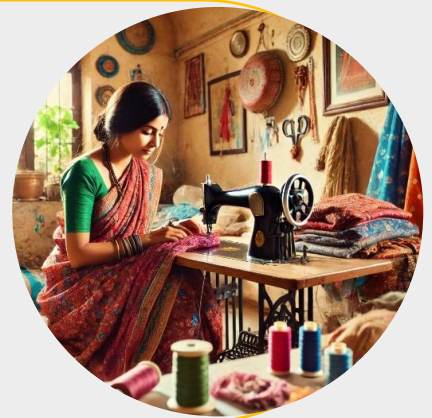
अनुमान है कि 95% स्थापना स्वामित्व वाले स्थापनाओं थे।



अधिकांश राज्यों में 90% से अधिक स्थापना एकल स्वामित्व वाले हैं। प्रमुख राज्यों में से उत्तर प्रदेश में एकल स्वामित्व वाले स्थापनाओं का प्रतिशत सर्वाधिक (99.2%) दर्ज किया गया।

अनिगमित स्थापनाओं में से 27% स्थापनाओं का नेतृत्व महिला मालिकों द्वारा किया जाता था, जबकि विनिर्माण क्षेत्र में यह हिस्सा 60% से थोड़ा अधिक था।

महिला-प्रधान स्थापनाओं का सर्वाधिक प्रतिशत तेलंगाना (38.55%) में देखा गया है।



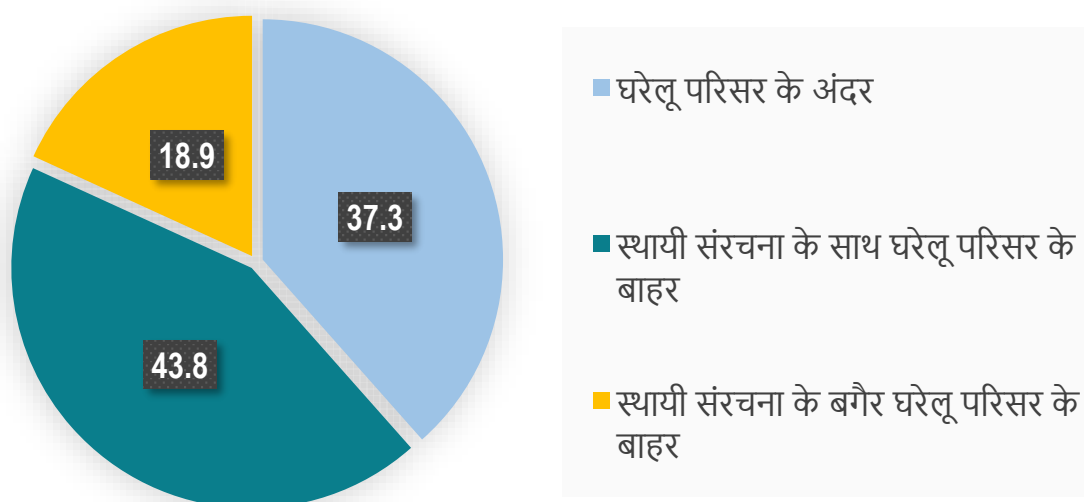
मालिक/मुख्य साझेदार के सामाजिक समूह के अनुसार स्थापनाओं की प्रतिशत हिस्सेदारी

■ अनुसूचित जनजाति ■ अनुसूचित जाति ■ अन्य पिछड़ा वर्ग ■ अन्य



स्थापना का स्थान

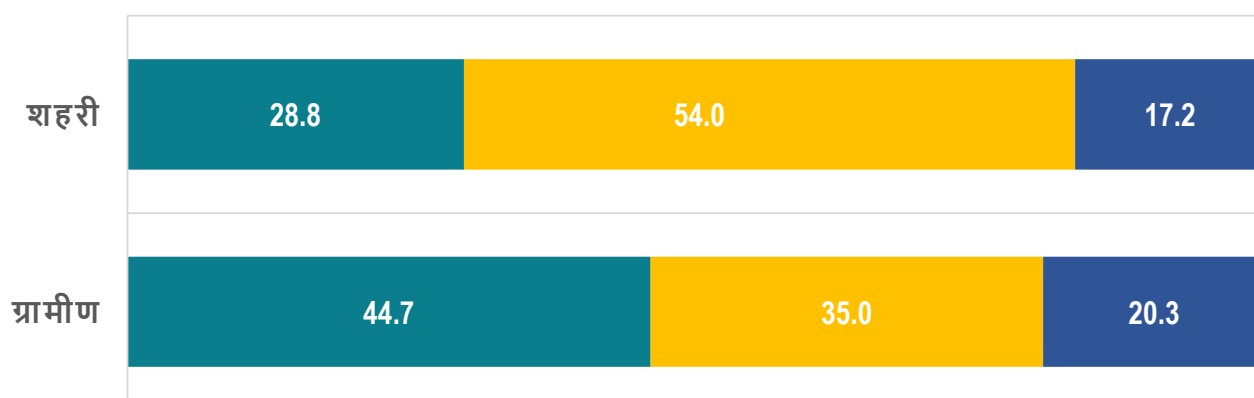
स्थान के अनुसार स्थापनाओं का वितरण



84.4% एच.डब्ल्यू.ई. स्थायी संरचना वाले घरेलू परिसर के बाहर स्थित थे, जबकि ओ.ए.ई. के लिए यही प्रतिशतता 31.0% थी ।

क्षेत्र के अनुसार स्थापना का स्थान

- घरेलू परिसर के अंदर
- स्थायी संरचना के साथ घरेलू परिसर के बाहर
- स्थायी संरचना के बगैर घरेलू परिसर के बाहर

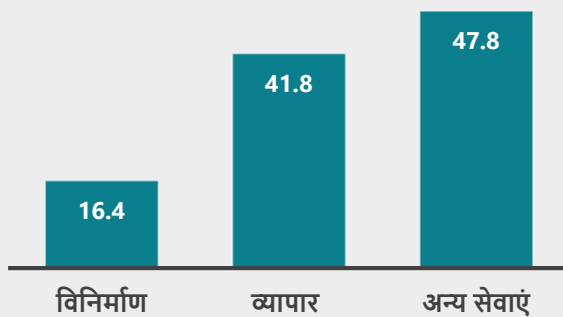


पंजीकरण और आई.सी.टी.

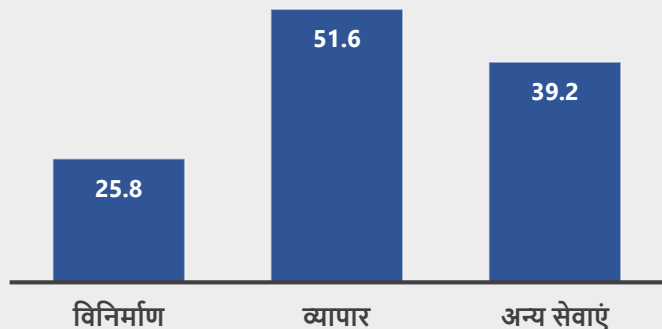


37.5% अनिगमित स्थापना किसी अधिनियम/प्राधिकरण के अंतर्गत पंजीकृत पाए गए।

अधिनियम/प्राधिकरण के अंतर्गत पंजीकृत
स्थापनाओं का प्रतिशत



इंटरनेट का उपयोग करने वाले स्थापनाओं का
प्रतिशत



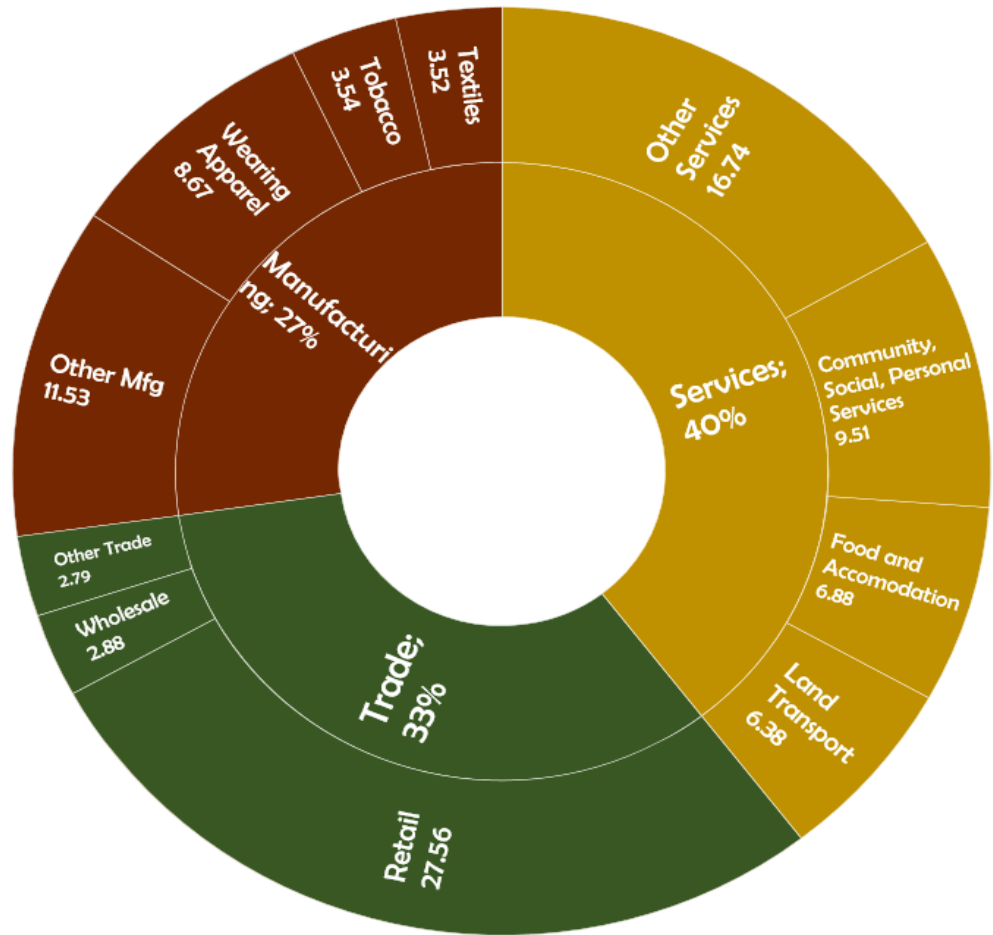
उद्यमशीलता के उद्देश्य के लिए इंटरनेट का उपयोग ग्रामीण क्षेत्रों में 2023-2024 के 18% से बढ़कर 2025 में 31% हो गया है, जबकि शहरी क्षेत्रों में यह 37% से बढ़कर 49% हो गया है।

कुल मिलाकर, यह ए.एस.यू.एस.ई. 2023-2024 की तुलना में ए.एस.यू.एस.ई. 2025 के दौरान 27% से बढ़कर 39% हो गया।

कामगार और पारिश्रमिक

ए.एस.यू.एस.ई. 2025 के दौरान, अनिगमित गैर-कृषि अर्थव्यवस्था ने 12.81 करोड़ लगभग कामगारों को रोज़गार दिया है, जबकि ए.एस.यू.एस.ई. 2023-2024 के दौरान यह संख्या लगभग 12.06 करोड़ थी।

अनुमानित कामगारों में विभिन्न उद्योगों की प्रतिशत हिस्सेदारी



अनिगमित स्थापनाओं में कार्यरत कामगारों की सर्वाधिक हिस्सेदारी वाले राज्य

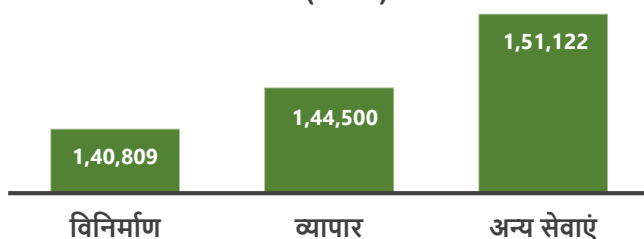
उत्तर प्रदेश: **14.50%**

पश्चिम बंगाल: **10.38%**

महाराष्ट्र: **9.14%**



प्रति कार्यरत कामगार वार्षिक पारिश्रमिक (रु. में)



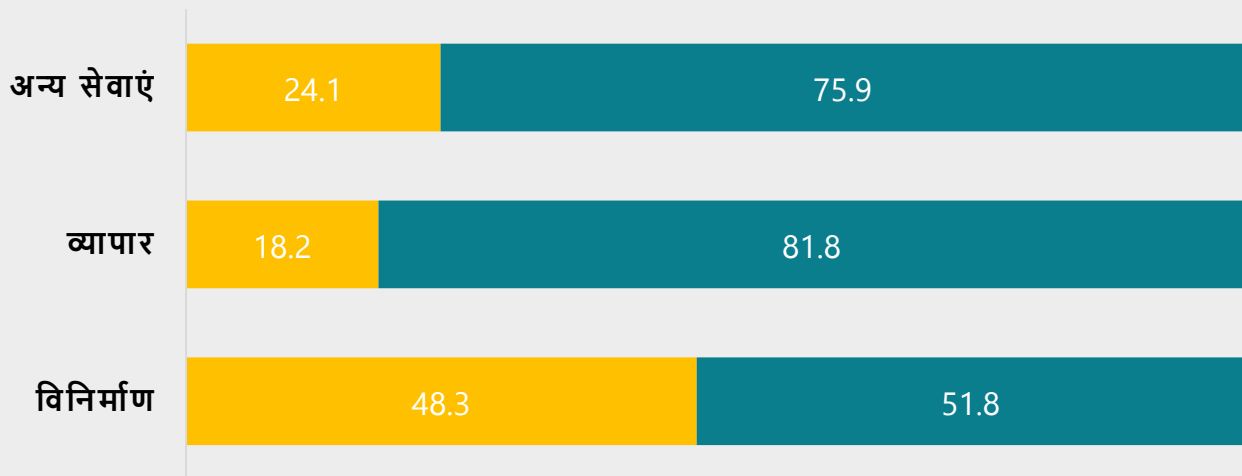
ए.एस.यू.एस.ई. 2025 के दौरान, प्रमुख राज्यों में **उत्तराखंड** में प्रति कार्यरत कामगार औसत पारिश्रमिक सबसे अधिक दर्ज किया गया, जो **₹2,14,237** था।

महिला कामगार

कुल मिलाकर, जनवरी, 2025 से दिसम्बर, 2025 की अवधि के दौरान अनिगमित गैर-कृषि क्षेत्र में कार्यरत कामगारों में से **29%** महिलाएँ थीं।

महिला कामगारों का प्रतिशत

■ महिला कामगार ■ अन्य



महिलाओं के नेतृत्व वाले, वेतनभोगी कर्मचारियों वाली स्थापनाओं में महिलाओं को रोज़गार देने की प्रबल प्रवृत्ति देखी जाती है, क्योंकि ऐसी लगभग **72%** स्थापनाओं में कम-से-कम एक महिला कामगार कार्यरत थी।

अनिगमित स्थापनाओं में कार्यरत महिला कामगारों का सर्वाधिक हिस्सा रखने वाले राज्य

पश्चिम बंगाल: 12.18%

उत्तर प्रदेश: 11.28%

महाराष्ट्र: 9.53%



उत्पादकता (बाज़ार स्थापना)

जी.वी.ए. का प्रतिशत हिस्सा

■ विनिर्माण ■ व्यापार ■ अन्य सेवाएं



अनिगमित स्थापनाओं में जी.वी.ए. का सर्वाधिक हिस्सा रखने वाले राज्य

उत्तर प्रदेश: 11.7%

महाराष्ट्र: 11.2%

तमिलनाडु: 8.2%



ए.एस.यू.एस.ई. 2025 की सर्वेक्षण अवधि के दौरान, प्रति स्थापना जी.वी.ए. **2.5 लाख रुपये** पाया गया है।

ओ.ए.ई. के लिए यह राशि **1.4 लाख रुपये** और एच.डब्ल्यू.ई. के लिए **10 लाख रुपये** थी।

ए.एस.यू.एस.ई. 2025 की सर्वेक्षण अवधि के दौरान प्रति कामगार जी.वी.ए. **1.6 लाख रुपये** पाया गया है।

ओ.ए.ई. के लिए यह राशि **1.2 लाख रुपये** और एच.डब्ल्यू.ई. के लिए **2.3 लाख रुपये** थी।

अचल परिसंपत्तियाँ और बकाया ऋण



ए.एस.यू.एस.ई. 2025 ने अनिगमित क्षेत्र में बेहतर पूंजी निवेश दिखाया है, क्योंकि अनिगमित गैर-कृषि स्थापना के स्वामित्व वाली अचल परिसंपत्तियाँ (fixed assets) औसतन, ए.एस.यू.एस.ई. 2023-24 के **3.2 लाख रुपये** से बढ़कर **3.4 लाख रुपये** हो गई हैं।

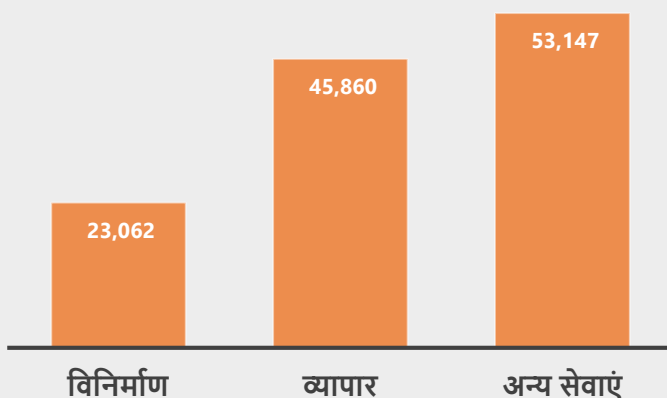


अखिल भारतीय स्तर पर, यह अनुमान लगाया गया है कि 'भंडारण (वेयरहाउसिंग)' गतिविधि में प्रति स्थापना सर्वाधिक अचल परिसंपत्तियाँ हैं।

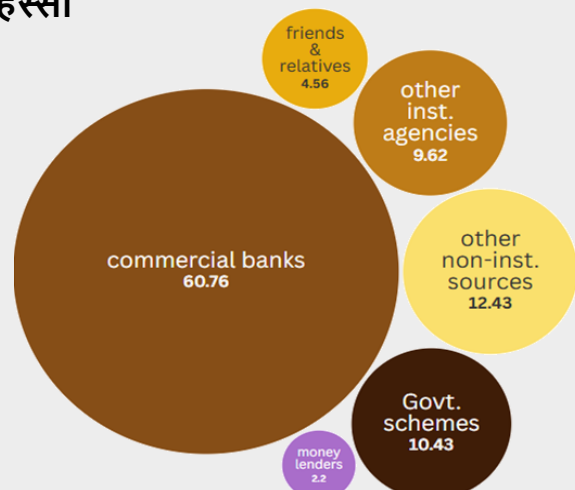
ए.एस.यू.एस.ई. 2025 की सर्वेक्षण अवधि के दौरान, अखिल भारतीय स्तर पर, प्रत्येक अनिगमित गैर-कृषि स्थापना पर बकाया ऋण का औसत अनुमान **42,776 रुपये** लगाया गया है। बकाया ऋण का लगभग **80%** हिस्सा विभिन्न संस्थागत स्रोतों के माध्यम से प्राप्त किया गया है।



प्रति स्थापना बकाया ऋण (रु. में)



स्रोत के अनुसार बकाया ऋण का प्रतिशत हिस्सा



मुख्य बिंदु – II: आवधिक श्रमबल सर्वेक्षण (पी एल एफ एस) २०२५

सर्वेक्षण
अवधि



जनवरी 2025 से दिसंबर 2025

सर्वेक्षण
कवरेज

सर्वेक्षण किया गया

22,594 फर्स्ट स्टेज उनिट्स
(एफएसयू)

ग्रामीण: 12,441 गांवों
नगरीय: 10,153 नगरीय खंडों



2,70,472 परिवारों

1,48,718 ग्रामीण क्षेत्रों में
1,21,754 नगरीय क्षेत्रों में



11,48,634 व्यक्तियों

6,56,160 ग्रामीण क्षेत्रों में
4,92,474 नगरीय क्षेत्रों में

इस सर्वेक्षण में पूरे भारतीय संघ को शामिल किया गया अंडमान और निकोबार द्वीप समूह के उन गाँवों को छोड़कर जिन तक पहुँच पाना पूरे वर्ष तक बेहद कठिन था।

श्रम बल
संकेतक पेश
करने के
आधार

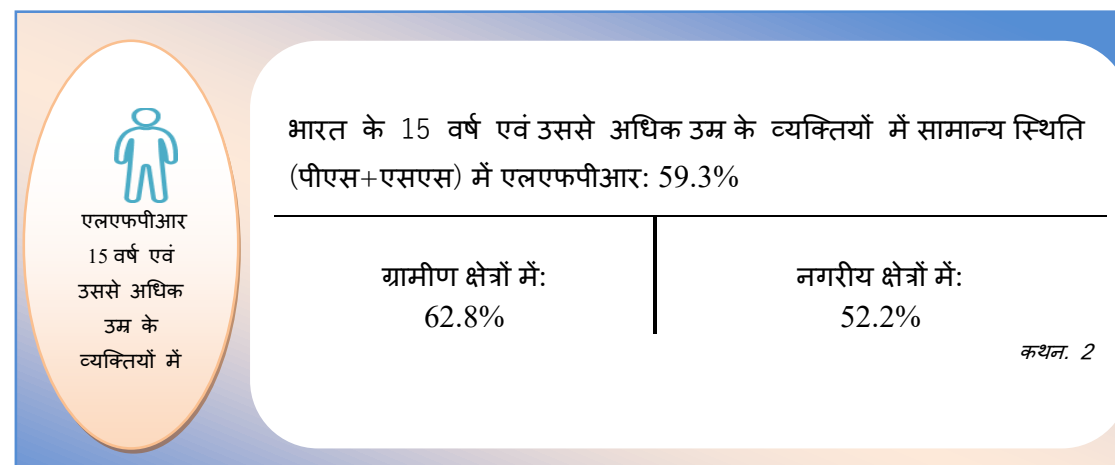
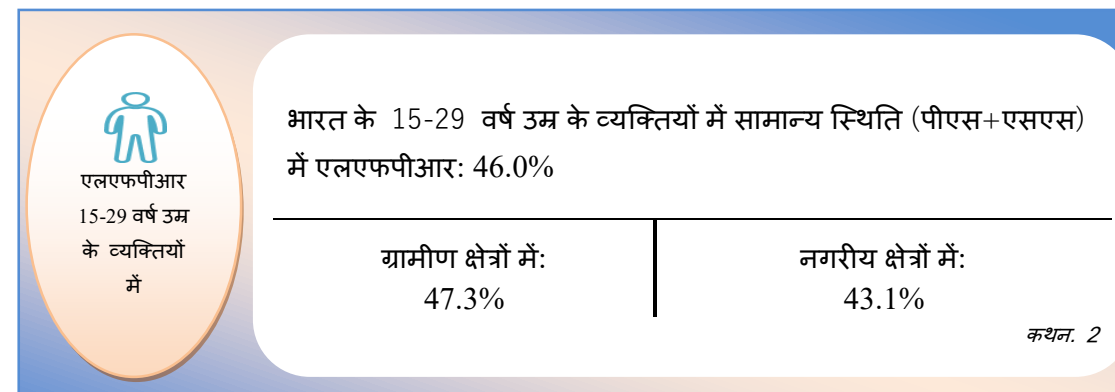
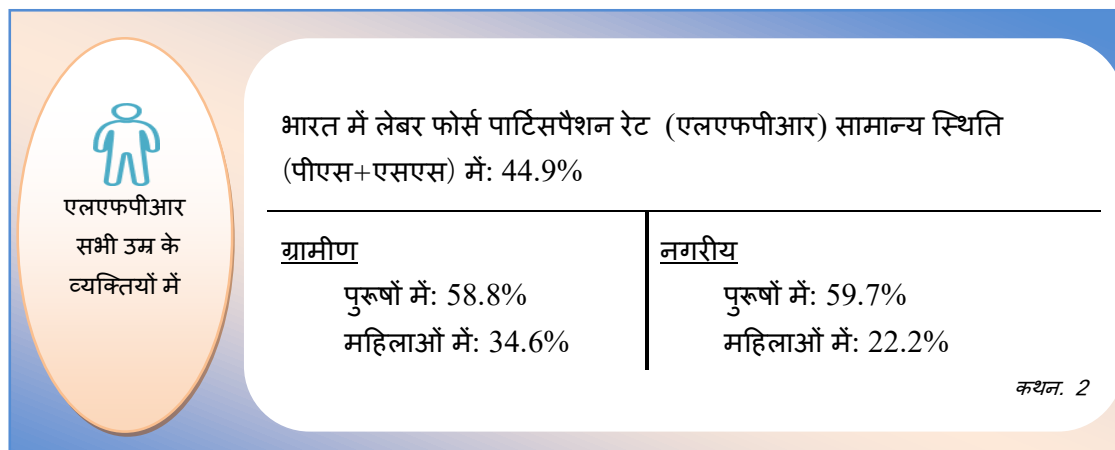
श्रम बल संकेतक पेश करने के लिए अपनाया गया आधार

सामान्य स्थिति
(पीएस+एसएस)
सन्दर्भ अबधि: 1 वर्ष

वर्तमान साप्ताहिक
स्थिति(सीडब्ल्यूएस)
सन्दर्भ अबधि: 1 सप्ताह

अखिल भारतीय स्तर पर जनवरी 2025 - दिसंबर 2025 की अबधि के लिए पीएलएफएस से प्राप्त कुछ मुख्य परिणाम निम्नलिखित हैं।

(क) श्रमबल सामान्य स्थिति (पीएस+एसएस) में



(ख) कार्यबल



डब्ल्यूपीआर
सभी उम्र के
व्यक्तियों में

कामगार जनसंख्या अनुपात (डब्ल्यूपीआर) सामान्य स्थिति में
(पीएस+एसएस) में: 43.5%

ग्रामीण

पुरुषों में: 57.2%
महिलाओं में: 33.8%

नगरीय

पुरुषों में: 57.2%
महिलाओं में: 20.7%

कथन. 5



डब्ल्यूपीआर
15-29 वर्ष उम्र
के व्यक्तियों
में

15-29 वर्ष उम्र के व्यक्तियों में भारत में डब्ल्यूपीआर सामान्य स्थिति
(पीएस+एसएस) में: 41.4%

ग्रामीण क्षेत्रों में:
43.4%

नगरीय क्षेत्रों में:
37.2%

कथन. 5



डब्ल्यूपीआर
15 वर्ष एवं
उससे अधिक
उम्र के
व्यक्तियों में

15 वर्ष एवं उससे अधिक उम्र के व्यक्तियों में भारत में डब्ल्यूपीआर सामान्य
स्थिति (पीएस+एसएस) में: 57.4%

ग्रामीण क्षेत्रों में:
61.2%

नगरीय क्षेत्रों में:
49.7%

कथन. 5



सामान्य
स्थिति
(पीएस+ए
एसएस) में
कामगारों के
बीच
रोजगार
स्थिति

सामान्य स्थिति (पीएस+एसएस) में कामगारों के बीच स्व-रोजगार का शेयर(%)

ग्रामीण	ग्रामीण	नगरीय	नगरीय
पुरुषों में: 57.4	महिलाओं में: 70.7	पुरुषों में: 40.4	महिलाओं में: 40.4

सामान्य स्थिति (पीएस+एसएस) में कामगारों के बीच नियमित मजदूर/वेतनभोगी कर्मचारियों का शेयर(%)

ग्रामीण	ग्रामीण	नगरीय	नगरीय
पुरुषों में: 17.0	महिलाओं में: 9.3	पुरुषों में: 46.5	महिलाओं में: 50.9

सामान्य स्थिति (पीएस+एसएस) में कामगारों के बीच आकस्मिक मजदूरों का शेयर(%)

ग्रामीण	ग्रामीण	नगरीय	नगरीय
पुरुषों में: 25.6	महिलाओं में: 20.0	पुरुषों में: 13.1	महिलाओं में: 8.7

कथन. 7

(ग) बेरोजगार दर सामान्य स्थिति (पीएस+एसएस) में



बरोजगार दर
सभी उम्र के
व्यक्तियों पर

भारत में सामान्य स्थिति (पीएस+एसएस) में बरोजगार दर: 3.1%

ग्रामीण	नगरीय
पुरुषों में: 2.6%	पुरुषों में: 4.2%
महिलाओं में: 2.1%	महिलाओं में: 6.4%

कथन. 16



बरोजगार दर 15
वर्ष एवं उससे
अधिक उम्र के
व्यक्तियों पर

भारत में सामान्य स्थिति (पीएस+एसएस) में बरोजगार दर 15 वर्ष एवं उससे अधिक उम्र के व्यक्तियों में: 3.1%

ग्रामीण	नगरीय
पुरुषों में: 2.6%	पुरुषों में: 4.2%
महिलाओं में: 2.1%	महिलाओं में: 6.4%

कथन. 17



बरोजगार दर
15 वर्षों और
उससे उपर के
उम्र के शिक्षित
व्यक्तियों में

भारत में 15 वर्षों और उससे उपर के उम्र के शिक्षित (माध्यमिक एवं उसके उच्चतर का अधिकतम शिक्षा का स्तर) व्यक्तियों में सामान्य स्थिति (पीएस+एसएस) में बरोजगार दर: 6.5%

ग्रामीण क्षेत्रों में
6.0%

नगरीय क्षेत्रों में
7.2%

कथन. 17



बरोजगार दर
युवा (15-29 वर्ष
उम्र के)
व्यक्तियों में

भारत में बरोजगार दर युवा (15-29 वर्ष उम्र के) व्यक्तियों में: 9.9%

ग्रामीण

पुरुषों में: 8.2%
महिलाओं में: 8.6%

नगरीय

पुरुषों में: 11.8%
महिलाओं में: 18.9%

कथन. 18

(घ). प्रमुख श्रम बल संकेतक की टाइम-सीरीज सामान्य स्थिति (पीएस+एसएस) में
पीएलएफएस से प्राक्कलित

टेबल 1: लेबर फोर्स पार्टिसिपेशन रेट (एलएफपीआर) (प्रतिशत में) सामान्य स्थिति (पीएस+एसएस) में पीएलएफएस 2022, पीएलएफएस 2023, पीएलएफएस 2024 एवं पीएलएफएस 2025 से प्राक्कलित									
आल-इंडिया									
आयु वर्ग	ग्रामीण			नगरीय			ग्रामीण + नगरीय		
	पुरुषों में	महिलाओं में	व्यक्तियों में	पुरुषों में	महिलाओं में	व्यक्तियों में	पुरुषों में	महिलाओं में	व्यक्तियों में
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
पीएलएफएस 2025									
15 वर्ष और उससे अधिक उम्र के व्यक्तियों के लिए	80.5	45.9	62.8	76.2	27.7	52.2	79.1	40.0	59.3
सभी उम्र के व्यक्तियों के लिए	58.8	34.6	46.6	59.7	22.2	41.3	59.1	30.7	44.9
पीएलएफएस 2024									
15 वर्ष और उससे अधिक उम्र के व्यक्तियों के लिए	80.6	45.8	62.9	76.2	27.6	52.2	79.2	40.3	59.6
सभी उम्र के व्यक्तियों के लिए	58.2	34.2	46.2	59.4	22.0	41.1	58.6	30.7	44.7
पीएलएफएस 2023									
15 वर्ष और उससे अधिक उम्र के व्यक्तियों के लिए	79.8	47.3	63.4	74.9	27.2	51.4	78.3	41.3	59.8
सभी उम्र के व्यक्तियों के लिए	57.6	35.3	46.6	58.7	21.7	40.6	57.9	31.5	44.9
पीएलएफएस 2022									
15 वर्ष और उससे अधिक उम्र के व्यक्तियों के लिए	79.5	37.5	58.5	74.3	24.7	50.0	78.0	33.9	56.1
सभी उम्र के व्यक्तियों के लिए	55.3	27.5	41.8	58.1	19.6	39.4	56.0	25.4	41.1
2025 जनवरी 2025- दिसंबर 2025 की अवधि को संदर्भित करता है और इसी तरह 2024, 2023 और 2022 के लिए									

टेबल 2: कामगार जनसंख्या अनुपात (डब्ल्यूपीआर) (प्रतिशत में) सामान्य स्थिति (पीएस+एसएस) में पीएलएफएस 2022, पीएलएफएस 2023, पीएलएफएस 2024 एवं पीएलएफएस 2025 से प्राक्कलित									
आल-इंडिया									
आयु वर्ग	ग्रामीण			नगरीय			ग्रामीण + नगरीय		
	पुरुषों में	महिलाओं में	व्यक्तियों में	पुरुषों में	महिलाओं में	व्यक्तियों में	पुरुषों में	महिलाओं में	व्यक्तियों में
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
पीएलएफएस 2025									
15 वर्ष और उससे अधिक उम्र के व्यक्तियों के लिए	78.4	44.9	61.2	73.0	25.9	49.7	76.6	38.8	57.4
सभी उम्र के व्यक्तियों के लिए	57.2	33.8	45.4	57.2	20.7	39.3	57.2	29.8	43.5
पीएलएफएस 2024									
15 वर्ष और उससे अधिक उम्र के व्यक्तियों के लिए	78.4	44.8	61.4	72.8	25.8	49.6	76.6	39.0	57.7
सभी उम्र के व्यक्तियों के लिए	56.6	33.5	45.1	56.7	20.5	39.0	56.6	29.7	43.3
पीएलएफएस 2023									
15 वर्ष और उससे अधिक उम्र के व्यक्तियों के लिए	77.7	46.4	61.9	71.6	25.2	48.8	75.8	40.1	58.0
सभी उम्र के व्यक्तियों के लिए	56.1	34.7	45.5	56.1	20.0	38.5	56.1	30.5	43.5
पीएलएफएस 2022									
15 वर्ष और उससे अधिक उम्र के व्यक्तियों के लिए	77.1	36.7	56.9	70.4	22.8	47.0	75.1	32.8	54.1
सभी उम्र के व्यक्तियों के लिए	53.6	26.9	40.6	55.0	18.1	37.0	53.9	24.6	39.7
2025 जनवरी 2025- दिसंबर 2025 की अवधि को संदर्भित करता है और इसी तरह 2024, 2023 और 2022 के लिए									

टेबल 3: बरोजगार दर (प्रतिशत में) सामान्य स्थिति (पीएस+एसएस) में पीएलएफएस 2022, पीएलएफएस 2023, पीएलएफएस 2024 एवं पीएलएफएस 2025 से प्राक्कलित									
आल-इंडिया									
आयु वर्ग	ग्रामीण			नगरीय			ग्रामीण + नगरीय		
	पुरुषों में	महिलाओं में	व्यक्तियों में	पुरुषों में	महिलाओं में	व्यक्तियों में	पुरुषों में	महिलाओं में	व्यक्तियों में
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
पीएलएफएस 2025									
15 वर्ष और उससे अधिक उम्र के व्यक्तियों के लिए	2.6	2.1	2.4	4.2	6.4	4.8	3.1	3.1	3.1
सभी उम्र के व्यक्तियों के लिए	2.6	2.1	2.4	4.2	6.4	4.8	3.1	3.1	3.1
पीएलएफएस 2024									
15 वर्ष और उससे अधिक उम्र के व्यक्तियों के लिए	2.8	2.1	2.5	4.4	6.7	5.0	3.3	3.1	3.2
सभी उम्र के व्यक्तियों के लिए	2.8	2.1	2.5	4.4	6.7	5.0	3.3	3.1	3.2
पीएलएफएस 2023									
15 वर्ष और उससे अधिक उम्र के व्यक्तियों के लिए	2.7	1.9	2.4	4.4	7.5	5.2	3.2	3.0	3.1
सभी उम्र के व्यक्तियों के लिए	2.7	1.9	2.4	4.4	7.5	5.2	3.2	3.0	3.1
पीएलएफएस 2022									
15 वर्ष और उससे अधिक उम्र के व्यक्तियों के लिए	3.1	2.1	2.8	5.3	7.7	5.9	3.7	3.3	3.6
सभी उम्र के व्यक्तियों के लिए	3.1	2.1	2.8	5.3	7.7	5.9	3.7	3.3	3.6
2025 जनवरी 2025- दिसंबर 2025 की अवधि को संदर्भित करता है और इसी तरह 2024, 2023 और 2022 के लिए									

(ड). प्रमुख श्रम बल संकेतक की टाइम-सीरीज साप्ताहिक स्थिति (सीडब्ल्यूएस) में पीएलएफएस से प्राक्कलित

टेबल 4: लेबर फोर्स पार्टिसिपेशन रेट (एलएफपीआर) (प्रतिशत में) वर्तमान साप्ताहिक स्थिति (सीडब्ल्यूएस) में पीएलएफएस 2022, पीएलएफएस 2023, पीएलएफएस 2024 एवं पीएलएफएस 2025 से प्राक्कलित									
आल-इंडिया									
आयु वर्ग	ग्रामीण			नगरीय			ग्रामीण + नगरीय		
	पुरुषों में	महिलाओं में	व्यक्तियों में	पुरुषों में	महिलाओं में	व्यक्तियों में	पुरुषों में	महिलाओं में	व्यक्तियों में
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
पीएलएफएस 2025									
15 वर्ष और उससे अधिक उम्र के व्यक्तियों के लिए	78.9	38.3	58.1	75.3	25.9	50.8	77.7	34.3	55.7
सभी उम्र के व्यक्तियों के लिए	57.6	28.9	43.1	59.0	20.7	40.2	58.0	26.3	42.2
पीएलएफएस 2024									
15 वर्ष और उससे अधिक उम्र के व्यक्तियों के लिए	79.2	38.6	58.6	75.6	25.8	51.0	78.1	34.7	56.2
सभी उम्र के व्यक्तियों के लिए	57.1	28.8	43.0	58.9	20.5	40.1	57.7	26.4	42.2
पीएलएफएस 2023									
15 वर्ष और उससे अधिक उम्र के व्यक्तियों के लिए	78.3	39.6	58.8	74.3	25.5	50.3	77.0	35.4	56.2
सभी उम्र के व्यक्तियों के लिए	56.5	29.5	43.1	58.2	20.3	39.7	57.0	26.9	42.2
पीएलएफएस 2022									
15 वर्ष और उससे अधिक उम्र के व्यक्तियों के लिए	78.0	30.7	54.4	73.8	23.2	48.9	76.8	28.6	52.8
सभी उम्र के व्यक्तियों के लिए	54.2	22.5	38.8	57.7	18.4	38.5	55.1	21.4	38.7
2025 जनवरी 2025- दिसंबर 2025 की अवधि को संदर्भित करता है और इसी तरह 2024, 2023 और 2022 के लिए									

टेबल 5: कामगार जनसंख्या अनुपात (डब्ल्यूपीआर) (प्रतिशत में) साप्ताहिक स्थिति (सीडब्ल्यूएस) में पीएलएफएस 2022, पीएलएफएस 2023, पीएलएफएस 2024 एवं पीएलएफएस 2025 से प्राक्कलित आल-इंडिया									
आयु वर्ग	ग्रामीण			नगरीय			ग्रामीण + नगरीय		
	पुरुषों में	महिलाओं में	व्यक्तियों में	पुरुषों में	महिलाओं में	व्यक्तियों में	पुरुषों में	महिलाओं में	व्यक्तियों में
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
पीएलएफएस 2025									
15 वर्ष और उससे अधिक उम्र के व्यक्तियों के लिए	75.0	36.8	55.4	70.7	23.6	47.4	73.6	32.5	52.8
सभी उम्र के व्यक्तियों के लिए	54.7	27.7	41.1	55.4	18.9	37.5	55.0	25.0	40.0
पीएलएफएस 2024									
15 वर्ष और उससे अधिक उम्र के व्यक्तियों के लिए	75.7	37.1	56.1	71.0	23.7	47.6	74.2	33.0	53.5
सभी उम्र के व्यक्तियों के लिए	54.7	27.7	41.2	55.3	18.8	37.5	54.8	25.1	40.1
पीएलएफएस 2023									
15 वर्ष और उससे अधिक उम्र के व्यक्तियों के लिए	74.6	38.0	56.2	69.9	23.2	47.0	73.2	33.7	53.4
सभी उम्र के व्यक्तियों के लिए	53.9	28.4	41.3	54.7	18.5	37.1	54.1	25.6	40.1
पीएलएफएस 2022									
15 वर्ष और उससे अधिक उम्र के व्यक्तियों के लिए	74.0	29.3	51.7	68.6	21.0	45.2	72.4	27.0	49.8
सभी उम्र के व्यक्तियों के लिए	51.4	21.5	36.9	53.6	16.7	35.6	52.0	20.2	36.5
2025 जनवरी 2025- दिसंबर 2025 की अवधि को संदर्भित करता है और इसी तरह 2024, 2023 और 2022 के लिए									

टेबल 6: बरोजगार दर (प्रतिशत में) साप्ताहिक स्थिति (सीडब्ल्यूएस) में पीएलएफएस 2022, पीएलएफएस 2023, पीएलएफएस 2024 एवं पीएलएफएस 2025 से प्राक्कलित									
आल-इंडिया									
आयु वर्ग	ग्रामीण			नगरीय			ग्रामीण + नगरीय		
	पुरुषों में	महिलाओं में	व्यक्तियों में	पुरुषों में	महिलाओं में	व्यक्तियों में	पुरुषों में	महिलाओं में	व्यक्तियों में
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
पीएलएफएस 2025									
15 वर्ष और उससे अधिक उम्र के व्यक्तियों के लिए	4.9	4.0	4.6	6.1	8.9	6.8	5.3	5.2	5.3
सभी उम्र के व्यक्तियों के लिए	4.9	4.0	4.6	6.1	8.9	6.8	5.3	5.2	5.3
पीएलएफएस 2024									
15 वर्ष और उससे अधिक उम्र के व्यक्तियों के लिए	4.3	3.9	4.2	6.1	8.2	6.7	4.9	4.9	4.9
सभी उम्र के व्यक्तियों के लिए	4.3	3.9	4.2	6.1	8.2	6.7	4.9	4.9	4.9
पीएलएफएस 2023									
15 वर्ष और उससे अधिक उम्र के व्यक्तियों के लिए	4.6	3.8	4.3	6.0	8.9	6.7	5.0	4.9	5.0
सभी उम्र के व्यक्तियों के लिए	4.6	3.8	4.3	6.0	8.9	6.7	5.0	4.9	5.0
पीएलएफएस 2022									
15 वर्ष और उससे अधिक उम्र के व्यक्तियों के लिए	5.2	4.4	5.0	7.0	9.4	7.6	5.7	5.6	5.7
सभी उम्र के व्यक्तियों के लिए	5.2	4.5	5.0	7.0	9.4	7.6	5.7	5.6	5.7
2025 जनवरी 2025- दिसंबर 2025 की अवधि को संदर्भित करता है और इसी तरह 2024, 2023 और 2022 के लिए									

BROAD CONTENTS OF THE LAST FOUR ISSUES OF ‘SARVEKSHANA’

(A) 117th ISSUE

PART –I: TECHNICAL PAPERS

1. An alternative imputation technique for treatment of ‘Temporarily Missing’ food item prices for compilation of Consumer Price Index (CPI)
Rajeswari Kasturi
2. District Level Estimates of Agricultural Household Income in India Using Small Area Models
B. B. Singh
3. Females in the Job Market: An Understanding of Its Socio-Economic Correlates
Atanu Sengupta, Priyanka Das & Shenaz Hussain

PART-II: HIGHLIGHTS OF THE REPORT RELEASED BY NSSO:

4. Highlights: Annual Report of Periodic Labour Force Survey (PLFS) (2023-2024)

PART-III: HINDI SECTION

5. Highlights: Hindi

(C) Combined (118th & 119th) ISSUE

PART –I: TECHNICAL PAPERS

1. A Reflection of Inequality in Attainment of ICT Skills across Social Groups in India and Uttar Pradesh: Evidences from Multiple Indicator Survey (MIS)
Nagendra Kumar Maurya & Puneet Kumar Shrivastav
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Binod Bihari Jena & Rabinarayan Patra
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Sonakhya Samaddar & Ujjaval Srivastava

PART –II: INVITED PAPERS

4. Water and Sanitation Services in India: Emerging State-Level Patterns and Differentiated Service Quality
Amitabh Kundu, Meheubub Rahaman & Varghese Kunjappu
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Household Survey Division (HSD), MoS&PI
6. Evolution of Survey Tools and Techniques Used by NSS in Data Collection and Processing
Enterprise Survey Division (EnSD), MoS&PI

PART-III: HIGHLIGHTS OF THE REPORT RELEASED BY NSSO:

7. Highlights I: Annual Survey of Unincorporated Sector Enterprises (ASUSE) 2023-2024, October 2023 – September 2024
8. Highlights II: Time Use in India, 2024, Time Use Survey, January - December, 2024

PART-III: HINDI SECTION

9. Highlights: Hindi

(D) SUPPLEMENT to Combined (118th & 119th) ISSUE

PART –I: INVITED PAPERS

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A. C. Kulshreshtha
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Aloke Kar, G. C. Manna and T. J. Rao

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3. Glimpses of the 75th Year Celebration of the National Sample Survey (NSS) – From a Glorious Past to a Promising Future for a Viksit Bharat

(E) 120th ISSUE

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1. Understanding changes in access to inpatient care in India between 1995-96 and 2017-18 - Evidence from the national sample survey by
Abhishek Anand and T.R. Dilip
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Rajeswari Kasturi and Ashish Yadav
3. Measuring Time Poverty: Establishing a threshold and Analyzing its Determinants for the Indian Population
Shreya Aggarwal
4. Consumption of food by Indian households and ICMR-recommended quantity – An analysis based on HCES 2022-23 data
Anindita Sinharay and Rahul Kumar Gupta

PART-II: HIGHLIGHTS OF THE REPORT RELEASED BY NSSO

5. Highlights I: Survey on Household Consumption Expenditure: 2023-24 (August 2023 – July 2024)
6. Highlights II: Nutritional Intake in India:2022-23 & 2023-24 (August, 2022 – July, 2024)

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7. Highlights: Hindi

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