

# Growth and Structure of Workforce in India and analysis

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**Abstract**— The Census 2011 brings new dimension to ongoing debate on the decline in the growth of employment from the last two decade in India. The census 2011 result gives a better picture when compared with NSSO estimation of workforce. It is observed that there is a fast decelerating rate of growth in overall workforce, particularly in that of females, between 2001 and 2011. But the work participation rate has not declined, if not increased, as the rate of growth in workforce is not less than that of population. Secondly, incremental workforce especially of males is getting reduced to marginal workers category whereas the high concentration of females in the category of marginal workers is slightly reduced. Occupational distribution of workforce shows that cultivators are declining. Such decline in agriculture is replaced by increasing agricultural labor. Growth of workforce in non-agriculture is higher than that of agriculture. Growth of female workers engaged in non-agriculture is higher than their male counterparts.

**Keywords**—*Census 2011, NSSO, incremental workforce, marginal workers.*

## I. INTRODUCTION

Slow growth of employment has been a remarkable feature of economic change in India during the post-liberalization period. Economic growth over this period has been highly uneven across different sectors and regions. The rate of growth of agriculture and manufacturing sectors has been sluggish for most parts of the post liberalization period. Growth, even in periods during which it increased, was driven primarily by the service sector. It has been primarily located in urban, particularly metropolitan, areas. Trade and foreign investment have played only a marginal role as drivers of economic expansion. Benefits of economic growth have accrued differently across classes, resulting in a sharp increase in economic inequalities.

Not only has the average employment growth over this period has been low, but also the uneven pattern of growth has resulted in considerable changes in the structure of employment. There has been a considerable contraction in generation of employment in agriculture since the second half of 2000s. The Mahatma Gandhi National Rural Employment Guarantee Act Program (MGNREGA) was introduced in the mid-2000s with a promise of providing a guarantee of 100 days of employment to each rural household. Although that promise has never been met, the program has resulted in some increase in availability of employment in rural areas particularly in the initial years of its implementation. On the other hand, an increase in schooling attendance rates among children, albeit slow, is also said to have resulted in withdrawal of a section of younger people from the labor force.

Several recent scholarly studies have analyzed the changes in levels of employment [4] provided a broad overview of

changes in employment since 1993–2004. They examined employment trends in the Indian economy as a whole and showed that employment in agriculture decreased while employment in non-agricultural activities increased. They have argued that the decline in work participation rates of women was primarily a result of their increased participation in schooling. Rangarajan, [1] also explained the decline in work participation rates of women after 2004–05 based on the rise in school enrolment. [4] claimed that withdrawal of adult women from the labor force was also a result of higher school attendance rates among girls and increased out-migration of adult men, which made housework more time-demanding for adult women. [2] has maintained that, while agrarian distress forced more women into work between 1999–2000 and 2004–05, better economic conditions in a patriarchal society created social pressures that withdrew them from the labor force and confined them to doing housework. [3] have argued that the long-term decline in women's workforce participation rate was a result of contraction of employment in agriculture and lack of corresponding rise in employment opportunities in rural non-farm sector. They contend that more concentrated land coupled with labor displacing machines led to the drop in labor absorption in agriculture. On the other hand, lack of access to basic amenities and serious problems of safety for women impede their physical mobility, limiting migration of rural women to the urban labor markets.

This paper presents an analysis of overall trends in the structure of employment, differentiating these trends between men and women, between rural and urban workers, and across different sectors. The emphasis of this paper is on using age cohort analysis to elucidate the dynamics of change in the employment structure. 1 An age-cohort-wise analysis of employment is limited by the fact that data related to age in NSSO surveys and censuses, particularly for older people, are not accurate. This limits the possibility of using age-cohort analysis to examine long-term dynamics of changes in employment structure. In view of this limitation, the focus of the age-cohort analyses in this paper is on the 61st and 68th rounds of NSS Employment Unemployment Surveys (hereinafter, EUS), which are combined with age-cohort population data from the 2001 and 2011 Censuses. In addition, because of better reliability of age data, the analysis primarily focuses on the changes in levels of educational attainment and the structure of employment among the youth. Section 1 of this paper presents an overview of the changes in the overall size of the labor force and in work participation rates between 1993–94 and 2011–12. Section 2 explains the changes in employment structure across different industries. Section 3 presents the results of age cohort analyses. Section 4 presents discussion of the impact of improvement in educational attainment on employment conditions of young workers. The paper concludes with a summary of the main findings.

## II. CHANGE IN WORKFORCE

Change in Workforce Since the early 1990s, when full-scale economic reforms were introduced, the Indian economy has experienced sweeping changes in the overall composition of employment, with a considerable shift from agricultural to non-agricultural employment. The changes in structure of employment, however, need to be examined separately for rural and urban areas, and for men and women. While agricultural employment has declined in rural areas, the trends in level of non-agricultural employment in rural and urban areas show different patterns. Another reason for investigating the employment structure in rural and urban areas separately is because of mushrooming of census towns, a peculiar feature of Indian urbanization. An increase in sizes of habitation and a shift in composition of workforce towards non-agricultural occupations result in transformation of erstwhile rural habitations into town-like habitations. However, since government notifications recognizing them as urban areas are often delayed, these habitations are classified as census towns even though they are not yet recognized as statutory urban areas for administrative purposes. The increase in number of such census towns, and of the population living in these towns, is a reflection of the increasing shift of rural workforce towards non-agricultural occupations. The importance of separately analyzing trends in employment of men and women barely needs to be highlighted. A great difference exists between men and women not only in terms of levels of work participation but also in the types of employment. Therefore, it is expected that both have different patterns when agricultural employment declines and new employment opportunities emerge, particularly in the construction and other services sectors.

Table 1: Population and labor force in India

Type	Population (Millions)	Workers	Unemployed	Worker population Ratio
Rural Male	1993 - 186	160	2.4	86.4
	2004 - 234	198	3.2	84.6
	2011 - 267	213	3.7	80.0
Rural Female	1993 - 181.5	88.3	0.7	48.7
	2004 - 233.2	113.1	2.1	48.5
		92.8	1.5	35.2

	2011 - 263.5			
Urban Male	1993 - 67.7	52.0	2.2	76.8
	2004 - 91.9	70.1	2.7	76.3
	2011 - 119.6	88.7	2.7	74.1
Urban Female	1993 - 61.5	13.7	0.9	22.3
	2004 - 84.6	19.2	1.4	22.7
	2011 - 112.7	21.9	1.2	19.5

Table 2 presents changes in the industrial distribution of workers during the last two decades. According to the NSS usual and subsidiary activity status definition, workers are classified as (a) self-employed, which includes family helpers and employers, (b) regular wage/salaried employees (hereinafter, regular wage workers), and (c) casual labor. The activity status and industry are combined in Table 2 to show the share of different types of workers in the total work force. It is noteworthy that self-employment and casual labor in agriculture were the major occupations for rural male workers. In 1993–94, 44.8 per cent of rural male workers were self-employed and 27.7 per cent of rural male workers worked as casual labourers in agriculture. The shares of both occupations declined substantially over the following two decades. The share of self-employed among rural male workers fell to 42.2 per cent in 2004–05 and further to 38.9 per cent in 2011–12. The share of casual labourers dropped to 23.2 per cent in 2004–05 and further to 20.0 per cent in 2011–12. Overall, the share of total employment in agriculture (including regular wage workers in agriculture) fell sharply, from 73.7 per cent in 1993–94 to 59.4 per cent in 2011–12. It is also apparent that the proportion of self-employed and regular wage workers in manufacturing, trade and transport rose between 1993–94 and 2004–05 but stagnated or fell thereafter. Employment in other service sectors, either as self-employed, regular wage worker, or casual labor, remained at the level of 1993–94 or flagged slightly. While the share of every other sector either stagnated or declined, it was casual labor in construction that expanded substantially during the period under study. The share of construction labourers rose from 2.6 per cent in 1993–94 to 5.5 per cent in 2004–05 and then sharply to 11.4 per cent in 2011–12. In 2011–12, construction became the second largest industry aside from agriculture to employ rural male labourers. Between 1993–94 and 2004–05, numerous rural male workers lost employment in agriculture but found it in services (trade and transport). Between 2004–05 and 2011–12, they were pushed out of agriculture and ended up finding jobs in construction.

Table 2: Percentage distribution of workers by employment status and industry (per cent)

Employment status	Industry	Rural male			Rural female			Urban male			Urban female		
		1993-94	2004-05	2011-12	1993-94	2004-05	2011-12	1993-94	2004-05	2011-12	1993-94	2004-05	2011-12
Self-employed	Agriculture	44.8	42.2	38.9	50.3	53.8	48.1	5.4	4.3	3.9	14.4	11.5	6.4
	Mining	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.0
	Manufacturing	3.5	4.1	3.6	4.6	6.3	7.4	7.3	7.7	7.5	13.3	18.7	19.8
	Electricity	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.2
	Construction	0.5	1.2	1.3	0.0	0.0	0.0	1.7	2.4	2.1	0.1	0.1	0.1
	Trade	4.9	6.6	6.4	2.0	2.4	2.5	16.3	19.7	17.7	8.7	10.0	9.9
	Transport	0.8	1.7	1.8	0.0	0.1	0.0	3.2	5.0	4.4	0.2	0.5	0.1
	Other Services	2.7	2.1	2.4	1.3	1.0	1.0	7.5	5.6	6.1	7.8	6.3	6.1
Regular wage workers	Agriculture	1.2	0.9	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3
	Mining	0.2	0.1	0.1	0.0	0.0	0.0	1.0	0.7	0.6	0.2	0.1	0.1
	Manufacturing	1.6	1.8	2.5	0.6	0.7	0.9	12.5	11.6	12.0	4.0	5.1	5.4
	Electricity	0.2	0.2	0.2	0.0	0.0	0.0	1.4	0.9	1.2	0.8	0.3	0.7
	Construction	0.1	0.2	0.3	0.0	0.0	0.0	0.8	0.6	1.4	0.1	0.2	0.5
	Trade	0.5	1.1	1.1	0.0	0.1	0.3	4.4	6.7	6.8	0.8	1.6	2.3
	Transport	1.0	1.4	1.7	0.0	0.1	0.1	5.2	5.4	6.5	0.9	1.1	2.5
	Other Services	3.8	3.3	3.6	1.5	2.4	3.9	16.8	14.5	14.7	22.1	27.2	31.1
Casual labourers	Agriculture	27.7	23.2	20.0	35.6	29.2	26.4	3.2	1.5	1.5	10.3	6.4	4.2
	Mining	0.5	0.5	0.4	0.3	0.2	0.2	0.2	0.1	0.2	0.3	0.1	0.2
	Manufacturing	1.8	1.9	2.0	1.7	1.2	1.4	3.4	3.2	2.7	6.1	3.3	3.3
	Electricity	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.2	0.0	0.1
	Construction	2.6	5.5	11.4	0.8	1.4	6.6	4.5	6.2	7.2	4.0	3.5	3.4
	Trade	0.2	0.6	0.5	0.0	0.0	0.1	1.2	1.6	1.5	0.6	0.8	0.6
	Transport	0.5	0.8	0.8	0.0	0.0	0.1	1.9	1.2	1.0	0.3	0.1	0.1
	Other Services	0.7	0.4	0.4	0.5	0.4	0.4	1.6	0.6	0.7	4.3	2.5	2.5
Total		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	

The percentage distribution of workers sometimes conceals changes in the actual magnitude of each category because of fluctuations in the total number of workers. Estimation of the numbers of workers in different age cohorts allows for an examination of the shift of the workforce across different sectors. Let us first explain the method of age-cohort analysis and its limitations. A change in employment structure takes place through the following:

- Entry of young workers into different sectors
- Changes in occupations of existing workers
- Exit or retirement of workers from the labor force

Dividing the workers into age cohorts and making comparisons across two rounds of NSSO EUS provides some clues that elucidate the impact of these three processes on changes in the employment structure. Considering the 7-year gap separating the 61st and 68th Rounds of NSSO EUS, we divide the sample into seven year age groups starting from 15

years of age (that is, 15–21 years, 22–28 years, and so on). Then, the employment structure of an age group (say, 15–21 years) in 2004–05 is compared with the employment structure of the next age group (22–28 years) from the 2011–12 survey. Since people who were in the 15–21 years age group at the time of 2004–05 would have been in the 22–28 years age group at the time of 2011–12 survey, a comparison of the employment structure of these two age groups enables us to examine how employment conditions of this age group changed during this period. In principle, one should be able to compare the employment structure of each age cohort in 2004–05 with the employment structure of the next age cohort in 2011–12.

However, NSS data pose two limitations in doing so. First, NSSO surveys underestimate the population. Because of this, estimates from the NSSO surveys must be adjusted using population data from population censuses. Doing so requires data on population of age cohorts from the population censuses. Secondly, because many respondents do not know their exact age, information related to age is an approximation. This approximation leads to a problem of age heaping, with a

disproportionately high number of people reporting their age in numbers with terminal digits '5' or '0', and among other numbers, smaller preference for number ending with '1' and '9'. For comparing data of the two NSSO EUS rounds, seven-year age cohorts are necessary to address the seven-year gaps separating the two survey rounds. For that reason, the age heaps (at 5s, 0s, and other minor heaps) are not evenly distributed across these cohorts. Given improvements in the recording of age over time, the extent of heaping is not so severe for the youngest age groups (15–21 years and 22–28 years). Therefore, it least affects comparisons of data for these groups.

Given that the problem of age-heaping is not severe in the youngest two age cohorts, one can start by comparing data for the 15–21 years age cohort in 2004–05 with data for the 22–28 years age cohort in 2011–12. Of those who had been working in 2004–05, some would have continued working in the same industry, and some would have moved into a different industry, although some would have exited, retired or migrated (from rural to urban or vice versa) by the time the 2011–12 survey took place. In 2004–05, persons in the 15–21 years age group who were non-workers included students, unemployed persons, and other non-workers. Some students would have completed education and entered the labor market (as workers or unemployed persons) by the time the 2011–12 survey took place (and they were in the 22–28 years age group), although others would have gone on to further studies. Some persons who were unemployed or were a part of the category of other non-workers in 2004–05 might have found work by 2011–12. Those who gained employment constitute fresh entrants into the labor market. Combined with educational attainment, employment patterns of young fresh entrants are apparent. The employment structure changed during the seven years. Table 3a shows the number of rural male workers by age cohort, employment status and industry. The total number of rural male workers increased by 14.8 million during the seven years: from 213 million in 2004–05 to 227.8 million in 2011–12. The number of self-employed people in agriculture (that is, cultivators) decreased by 1.6 million, although the number of agricultural labourers decreased by 4.9 million. Construction was the largest employer of the increased labor force, accounting for 15.1 million persons, followed by the service sector (4.3 million persons). The rise in the number of workers in manufacturing was less than 2 million. Cohort data show that there were 31.8 million workers in the 15–21 years age group in 2004–05. Persons in this age cohort moved to the 22–28 years age group by 2011–12; the number of workers increased to 44.9 million. The increase by 13.1 million in the number of workers among this group consists mainly of ex-students who completed education and who entered the labor market during the seven years. There were also some unemployed and other non-workers who found jobs as they moved to the 22–28 years age group. Sector data show that the number of workers in manufacturing increased by 2.5 million, the number of workers in construction increased by 1.8 million, the number of workers in services increased by 4.5 million, and the number of self-employed persons in agriculture increased by 4.1 million. We examine the employment patterns of fresh entrants more closely with consideration of their educational attainment in the next section. For the next age cohort, persons of the 22–28 years age group in 2004–05, it is apparent that only a small increase (0.8 million) in the number of workers occurred

among them as they moved into the 29–35 year age group in 2011–12. Two factors are likely to have been responsible for the fact that the increase in work participation rates for rural men in this age group was small: first, the increase in the number of students in higher education was limited (estimated as 1.1 million students in 2004–05); second, migration of workers from this age cohort to urban areas increased. In this age cohort, the number of workers engaged in self-employment in agriculture and agricultural labor diminished by 1.3 million and 1.2 respectively, during the period.

### III. CONCLUDING REMARKS

A severe contraction of employment took place in India between 2004–05 and 2011–12. NSSO surveys show a fall in work participation rates in rural and urban areas, and for men and women. Sectoral data show a considerable decline in employment in agriculture. After 2004–05, employment in manufacturing and services sectors stagnated or declined. Between 1993–94 and 2004–05, numerous rural male workers lost employment in agriculture but found employment in services (mainly, trade and transport). Between 2004–05 and 2011–12, rural male workers who lost employment in agriculture had to move to construction. In 2011–12, construction became the second largest industry next to agriculture to employ the rural labor force. Construction accounted for employment of 11 per cent of rural male workers, 6.6 per cent of rural women workers, 7.2 per cent of urban male workers, and 3.7 per cent of urban women workers. Although data also show an expansion of employment in construction for rural women, much of this was attributable to employment under public works programs, mainly reflecting the impact of MGNREGA

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