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DYNAMICS OF WORK IN THE RURAL PERIPHERIES OF MEGA-CITIES: AN EXPLORATORY ENQUIRY

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The peripheries of large cities under the aegis of globalisation have not only undergone an intensified rural–urban interaction but have also experienced unprecedented transformation of the structure of the available work. This paper seeks to explore the extent to which rural workers in the peripheries of mega-cities have been marginalised or integrated within productive work. Further, this has to be seen in the context of changing economic space along the fringes in relation to the interior rural areas and the resultant changes in the structure of available work. The Census data clearly indicates that there has been a clear erosion of the peasantry and its replacement by casual labour in the peripheries relative to the rural interiors, which testifies to the increasing vulnerability of the rural workers along the fringes. Thus, it may be argued that the changes brought in by the economic reforms have proved to be much more critical in the case of the rural population living in the urban fringe areas of the largest cities relative to those inhabiting the rural interior regions.

Keywords: *Workforce, Peri-urban, Urban restructuring, Mega-cities, Peasantry, Economic space*

I. BACKGROUND OF THE STUDY

The peripheries of the mega-cities rather than the mega-city itself have emerged as the hot-spots of contemporary urbanisation and industrialisation. This has partly been a result of over-concentration in the city core, leading to varied in-city dis-economies and partly an overt impact on the post-liberal investment pattern. A considerable share of the post-reform private investments has been found to be located in the rural peripheries of the largest cities in India1 (Chakravorty, 2003). Research unfolding the post-liberalised restructuring of the urban system indicates a boom in real estate activity, thereby changing the economic space of the cities and their immediate surroundings considerably (Shaw and Satish, 2007). At the risk of digression, it may be mentioned that this process is an outcome of the 'local experience of globalisation' (ibid., p. 149), wherein the internal demand for housing among the growing population and domestic private investments in industry (encouraged by industrial deregulation) and financial sector streamlining have emerged as the constituents of a major mechanism of rapid outward spread of the mega-cities. The second mechanism, which is, in fact, limited in contributing to the local economy, of mainstreaming the city periphery in the urbanisation process, emerges from

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the pattern of foreign direct investment (FDI) reaching the mega-city, which eventually prefers locations that have better infrastructure and access to the centrality of the mega-cities. Mainly, therefore, the recent emergence of the urban fringe within the regional development framework has assumed significance owing to the location of 'new' economic activities in these spaces that have been superimposed upon the pre-existing order and constitute an outcome of both internal and external investment. Thus, peri-urban space provides the platform wherein the forces of globalisation and localisation intersect (Webster, 2002). As market forces are instrumental in triggering off the recent processes in the peri-urban areas, this often results in the displacement of the vulnerable sections residing there (Keivani and Mattingly, 2007), along with differentiation and polarisation between capitalists and subsistence producers (Keivani and Mattingly, 2007; Rakodi, 1999, cited in Brook and Davila, 2000). The fact that globalisation in India, has accentuated the dualisms in the labour market, retarded the pace of rural diversification, worsened the conditions of the women workers, and accelerated the phenomenon of casualisation has been well documented by many scholars (Chadha, 2001; Chadha and Sahu, 2002; Bhalla, 1999; Kundu, et al., 2005; Chandrasekhar and Ghosh, 2007). In view of such disturbing rural employment trends at the macro level, it may be argued that in the peri-urban areas, wherein the impact of globalisation is realised relatively more strongly, there would emerge a more critical rural employment scenario. Further, the nature of economic activities emerging in these locales is suggestive of the serious concerns for rural labour. This is primarily because the investments are attracted by the 'new economic industries' consisting of information technology (IT), information technology enabled services (ITES), hotels and recreation services, super-speciality hospitals, garments, and biotechnology and other technology parks, that is, in short all those sectors which demand world class office space with plush infrastructure and highly specialised labour (Shaw and Satish, 2007). In addition to this, Shaw (1999) has also indicated that the dynamic sectors of these large cities are not only unevenly distributed but also stimulate very specific human capital requirements and hence would have limited employment effects (Shaw, 1999). There is, therefore, an obvious asymmetry in the regional structure at the national scale in terms of the creation of new economic activities and subsequent employment choices. The opportunities that such economic activities would offer for the farming/rural communities would effectively consist of job categories like those of janitors and security guards in the new office complexes. A second stream of opportunity may stem from the informal sector whose growth is promised by the trends of sub-contracting and 'flexibility of enterprise' logic of the formal sector and industrial establishments. Paul and Raju (2014) highlight the expansion of the subsidiary status work and a burgeoning home-based sector of work, particularly that which leverages women, albeit accentuating the phenomenon of gendered occupational segregation. The macro scenario suggests that there have indeed been some limited employment opportunities. However, it is relevant to locate the discourse in the peri-urban space and ask whether such leveraging of non-agricultural engagement is improving the lives of the rural workers whose livelihoods were hitherto tagged to land.

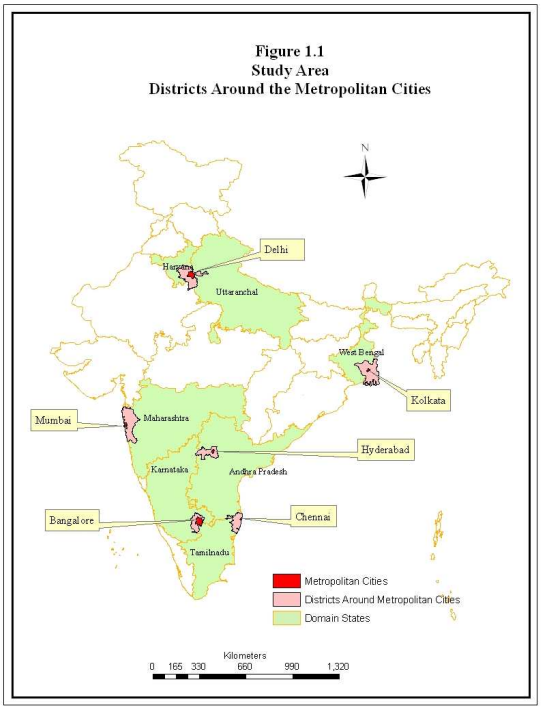
This paper attempts to explore the dynamics of rural work in the peripheries of the six largest metropolitan cities in India, and tries to understand the implications of the changing economic environment along the fringes in relation to the interior rural areas. Specifically, this exploratory analysis seeks to examine the extent to which the rural workers in the peripheries have been marginalised or integrated within productive work in the context of a shrinking natural resource base and the resultant changes in the structure of the available work.

The paper consists of six sections. Section I delivers the background of the study. Section II discusses the issues pertaining to data, methodology and analytical framework. Sections III and IV discuss the employment trends in relation to the status of wok and sectoral trends. Section V briefly reflects upon the regional pattern and Section VI concludes the discussion.

II. DATA, METHODOLOGY AND FRAMEWORK OF ANALYSIS

This paper is based upon the population census available in the Primary Census Abstract. Although the analysis of workforce furnishes better results if age-wise data is used, this study has used the 'all ages' figures of the rural areas due to non-availability of the same in Census 2011 during the preparation of the manuscript. A further limitation of this paper pertains to the dearth of detailed information on employment at the sub-state level as the National Sample Survey Organisation (NSSO) unit level data cannot be satisfactorily interpolated to the

Figure 1
The Study Area



Mumbai	**Thane** **Raigad (Kolaba)**
Kolkata	**Howrah** **Hoogly** **24 Paraganas (N & S)**
Delhi*	**Gurgaon+Mewat** **Sonipat** **Rohtak** **Jhajjar** **Faridabad-Palwal** **Ghaziabad**
Chennai	**Chengalpattu**
Hyderabad	**Rangareddy**
Bangalore	**Bangalore Rural+Ramanagara**

*** Districts in Haryana have been compared with Haryana state and Ghaziabad has been compared with Uttar Pradesh as Delhi shares physical contiguity with both these states.**

Source: Prepared by the author.

district level or a lower unit of study. Hence, in spite of the lack of depth in the workforce data of the Census, it constitutes the sole database for this paper.

The variables have been analysed at two levels, viz., the districts around the metropolitan city (DAM) and the respective state (Figure 1). The districts around the metropolitan cities represent the rural periphery of the city and the respective domain state represents the regional rural interiors. Such a scheme of a two-tier comparative analysis would allow a cursory look into whether the behavior of the districts around the city is similar to the behaviour of the region, that is, i.e. the state. Any departure from the regional trend may be interpreted as the result of the distortions injected by the metropolitan city.

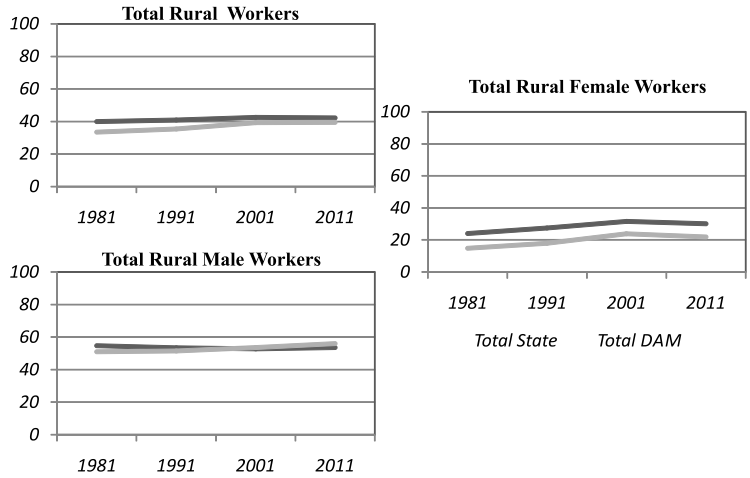
It must be mentioned at this juncture that a multitude of terminologies are used to refer to the areas surrounding the cities. The terms like urban fringe, rural–urban fringe, rurban, rural–urban, peri-urban areas, peri-urban interface, peripheral areas and related terms used to denote the vicinity of cities have been used interchangeably and quite loosely in this paper to refer to the districts around the metropolitan cities.

III. STATUS OF WORK

The work participation rates (WPRs) have been higher in the respective domain states as compared to the DAMs during all the decades studied and registered a marginal increase between 1981 and 2011 (Figure 2). The last decade, however, has been a phase of near-stagnation. Although the share of the male workforce has exhibited a slight increase in the DAMs since 1991, the states have registered a reverse trend. The number of female workers showed a steady increase between 1981 and 2001 and thereafter declined in both the states and DAMs.

Figure 2

Work Participation Rates (All DAMs and Domain States Taken Together)



Source: Prepared the author from Census of India 1981-2011

The growth rates of the total workers has experienced a continuous decline across all the decades in case of both the DAMs as well as the respective domain states for males as well as females, with the most drastic decline being observed between 2001 and 2011 (Table 1). Also noteworthy have been the remarkably higher growth rates for female workers, which stood at more than double that of their male counterparts in both the DAMs and states till the decade 1991-2001, and subsequently not only declined drastically during the decade 2001-2011 but fell well below the male worker growth rates in the states and DAMs. There can be two possible explanations for this. As this pattern conforms to the national level trends suggested by the NSSO data sets for the comparable time periods (post 55th Round, 1999-2000), it may be suggestive of a distress-induced growth of female employment during the decade 1991-2001 when the rural women increasingly joined the workforce in response to increasing economic stress (Chandrasekhar and Ghosh, 2007; Majumdar and Neetha, 2011; Himanshu, 2011). The recent decline in the growth rates of the workforce, in general, and the negative growth of the rural women, in particular, suggests relative stabilisation of the economy and the resultant withdrawal of the reserve labour force (Himanshu, 2011). The fact that a similar dynamics has been operative in the state vis-à-vis DAM framework has been testified further by a marginal recovery of the growth rates of the male workers in the state and its absence in the DAMs during the decade 2001-2011. However, while the recovery of the labour market has been under way in the domain states, it has bypassed the DAMs, indicating that the DAMs have continued to be under economic stress wherein adequate employment is not being created to absorb the rural workers. The second strain of argument converges with the proposition that the new types of jobs created in the liberalised

Table 1
Annual Exponential Growth Rate of Total Workers (1981-2011)

Districts	*1981-1991*			*1991-2001*			*2001-2011*		
	T	*M*	*F*	*T*	*M*	*F*	*T*	*M*	*F*
Maharashtra	2.06	1.44	2.84	1.26	1.60	0.84	1.23	1.57	0.78
DAM Mumbai	1.43	0.56	2.64	1.20	1.88	0.26	0.36	0.97	-0.64
West Bengal	5.75	5.43	7.24	0.16	-1.20	4.45	0.94	1.41	-0.31
DAM Kolkata	2.93	2.57	6.49	2.98	1.99	8.80	0.90	0.83	1.18
Tamil Nadu	1.67	1.10	2.59	-0.18	-0.49	0.27	0.69	0.78	0.56
DAM Chennai	1.79	1.31	2.74	0.08	0.07	0.09	1.25	1.15	1.42
Andhra Pradesh	1.73	1.36	2.28	1.40	1.32	1.51	0.33	0.15	0.57
DAM Hyderabad	0.92	0.67	1.27	1.76	1.93	1.53	-0.20	-0.40	0.06
Karnataka	1.71	0.98	2.98	1.72	1.52	2.02	0.78	0.98	0.47
DAM Bangalore	-	-	-	1.68	1.24	2.45	0.61	0.99	-0.05
Uttar Pradesh	2.65	1.90	6.41	2.36	1.36	5.60	1.52	1.60	1.31
DAM Delhi (UP)	3.07	1.84	16.18	-0.08	-0.45	1.77	1.04	0.62	2.70
Haryana	1.95	1.87	2.35	4.79	2.25	12.15	-0.19	0.99	-2.73
DAM Delhi (Haryana)	1.87	1.82	2.05	4.92	2.39	10.95	-1.83	0.27	-6.42
Total State	2.46	2.00	3.47	1.45	0.89	2.51	0.99	1.19	0.62
Total DAM	2.87	2.46	4.25	2.37	1.69	4.22	0.38	0.74	-0.53

Source: Census of India, 1981-2011.

regime would bypass the vulnerable sections of the populations, especially the rural workers, in general, and the rural women, to a greater extent, owing to human capital constraints2 (Chadha and Sahu, 2002; Chadha, 1999). Further, the growth rates of the workers, both male and female, had been greater in magnitude in the DAMs relative to the domain states till the decade 1991-2001, and the last decade has seen a complete reversal of the trend, viz. rural workers in the DAMs revealing noticeably lower growth rates as compared to the respective state indicating the exposure of the rural workers to adverse labour market conditions in the DAMs during the last decade. The specific trend of employment dynamics observed in the DAMs and the state suggests that though the rural labour market conditions have been adverse, in general, they have been especially critical in the peripheries of the mega-cities relative to the corresponding rural interiors. The DAMs have reflected trends that suggest adversity of the rural workers in addition to the intensified vulnerability of the rural women.

An analysis of the composition of the workforce indicates that though the number of marginal workers had already outnumbered the main workers, the difference further widened after 1991. Between 1991 and 2001, the Casualisation Index3 increased four times in the DAMs and three times in the state, and increased marginally between 2001 and 2011 (Table 2). The incidence of marginal workers has been higher in the DAMs of Mumbai, Chennai and Delhi (Haryana side) as compared to the respective domain states. Following the national level tendency of the Indian workforce wherein casualisation has emerged to

Table 2

Casualisation Index* of the Workforce (1981-2011)

Districts	*1981*			*1991*			*2001*			*2011*		
	T	*M*	*F*	*T*	*M*	*F*	*T*	*M*	*F*	*T*	*M*	*F*
Maharashtra	13.0	2.8	30.5	12.4	2.1	27.5	23.9	12.8	41.6	14.7	9.7	22.3
DAM Mumbai	10.4	2.9	24.6	12.9	2.5	29.6	38.8	22.7	72.7	32.3	22.8	52.8
West Bengal	8.9	3.9	45.0	8.4	1.8	49.5	38.6	18.5	135.0	48.2	30.6	141.3
DAM Kolkata	5.4	3.6	34.3	5.2	1.4	53.3	29.1	17.7	119.2	39.8	28.0	124.2
Tamil Nadu	7.5	1.4	20.1	7.6	0.6	20.5	22.0	13.9	35.8	22.0	16.7	30.6
DAM Chennai	9.4	2.7	27.2	6.7	0.7	19.8	36.4	25.2	63.0	38.1	27.4	62.5
Andhra Pradesh	9.5	1.1	25.4	6.3	0.7	15.1	22.7	12.6	39.8	20.3	13.1	31.4
DAM Hyderabad	8.6	1.3	20.9	3.9	0.5	8.6	17.9	10.7	29.3	20.0	13.6	29.6
Karnataka	11.5	1.4	37.7	11.4	1.3	32.2	27.3	11.6	61.1	23.1	13.2	42.6
DAM Bangalore	-	-	-	17.9	1.1	69.6	26.1	11.0	61.9	18.1	11.2	33.1
Uttar Pradesh	6.0	1.0	53.3	9.6	0.8	68.5	43.2	21.8	166.4	54.6	37.8	131.0
DAM Delhi (UP)	1.0	0.2	22.7	14.9	1.4	353.1	25.4	15.3	106.1	28.7	19.2	81.1
Haryana	13.5	2.0	165.0	10.1	0.6	103.7	42.2	18.6	121.3	34.7	18.3	111.9
DAM Delhi (Haryana)	17.0	3.5	130.4	11.3	0.8	81.6	45.4	21.5	110.2	37.0	23.3	108.7
Total State	9.1	1.7	32.1	9.2	1.1	31.0	31.2	16.6	68.7	32.2	23.0	53.6
Total DAM	8.4	3.0	34.0	8.4	1.3	38.4	32.3	18.5	83.3	34.8	24.5	73.9

Notes: # Data for Bangalore Rural was not available for 1981 as it was combined with the urban part.

* The Index of Casualisation refers to the number of marginal workers per 100 main workers (adopted from Chadha, 2001).

Source: Census of India, 1981-2011.

be particularly significant, the three DAMs perhaps emphasise the greater relevance of the post-reform labour market adversities for the periphery of the mega-cities. Between the male and female workers, the latter group has registered a preponderance of marginal work, a trend which the existing literature overtly assigns to the preference of the women for jobs that are part-time and flexible, thereby allowing them time to perform the domestic chores (Jatav and Sen, 2013). Nonetheless, the increase in the number of marginal workers at the cost of the main workers can never be considered as a healthy signal and should rather be noted as an indicator of the emergent job types that employ the workforce only temporarily.

Tables 3 and 4 suggest a deceleration in the growth rates of both main and marginal workers in the DAMs as well as in the states. The number of main workers in the states and DAMs registered a sharp decline between the decades 1981-91 and 1991-2001, and picked up slightly during the last decade in the states only. The growth rates of the main workers have been lower in the DAMs as compared to that in the respective states in the case of Mumbai, Kolkata, Hyderabad and Delhi-Haryana side (Table 3). On the other hand, the growth rates of the marginal workers increased sharply between the decades 1981-91 and 1991-2001 in the states as well as in the DAMs, with the rate being greater in the DAMs (Table 4). During the last decade, there has been a general deceleration of growth rates and the growth rates of the marginal workers (in addition to the main workers) was lower as compared to the corresponding rates in the respective states (Table 4). However, the magnitude of growth of the marginal workers has been consistently higher than that of the main workers, suggesting that the growth in workforce is largely contributed by the increase in the number of marginal workers.

Table 3

Exponential Growth Rate of Main Workers (1981-2011)

Districts	*1981-1991*			*1991-2001*			*2001-2011*		
	T	*M*	*F*	*T*	*M*	*F*	*T*	*M*	*F*
Maharashtra	2.11	1.51	3.08	0.29	0.61	-0.21	2.00	1.86	2.24
DAM Mumbai	1.21	0.61	2.25	-0.87	0.07	-2.61	0.84	0.96	0.59
West Bengal	5.80	5.63	6.94	-2.31	-2.72	-0.07	0.28	0.44	-0.57
DAM Kolkata	2.94	2.79	5.16	0.93	0.50	5.22	0.10	-0.01	0.96
Tamil Nadu	1.65	1.19	2.56	-1.44	-1.73	-0.93	0.70	0.54	0.95
DAM Chennai	2.04	1.50	3.33	-2.38	-2.11	-2.99	1.12	0.98	1.45
Andhra Pradesh	2.03	1.39	3.14	-0.04	0.20	-0.43	0.52	0.11	1.19
DAM Hyderabad	1.37	0.75	2.34	0.49	0.96	-0.22	-0.38	-0.65	0.04
Karnataka	1.72	0.99	3.38	0.38	0.55	0.04	1.12	0.84	1.70
DAM Bangalore	-	-	-	1.01	0.30	2.92	1.26	0.97	1.91
Uttar Pradesh	2.31	1.92	5.46	-0.31	-0.53	1.02	0.75	0.37	2.73
DAM Delhi (UP)	1.77	1.72	3.12	-0.95	-1.74	9.65	0.78	0.29	3.99
Haryana	2.26	2.02	4.99	2.24	0.60	11.31	0.35	1.02	-2.30
DAM Delhi (Haryana)	2.37	2.09	4.43	2.25	0.52	9.48	-1.24	0.13	-6.34
Total State	2.44	2.06	3.55	-0.39	-0.53	-0.02	0.92	0.66	1.55
Total DAM	2.87	2.63	3.93	0.38	0.12	1.41	0.20	0.25	0.00

Source: Census of India, 1981-2011.

At a gender disaggregated level, it may be observed that in the case of both the male and female workers taken separately as well as together, the magnitude of growth of the marginal workers has been consistently higher than that of the main workers. While the growth rates of the main male workers in both the states and DAMs have consistently declined during all the decades, the magnitude of growth has remained relatively lower in the DAMs. In the case of women, though the rate of growth has been decelerating, till the decade 1991-2001, it was higher in the DAM and turned to 0.0 per cent during the last decade, which is well below the magnitude in the state (1.55 per cent). On the other hand, the magnitude of growth of the marginal workers, though decelerating, contributes to the growth of the male workers, whereas the women have registered negative growth.

Table 4
Exponential Growth Rate of Marginal Workers (1981-2011)

Districts	*1981-1991*			*1991-2001*			*2001-2011*		
	T	*M*	*F*	*T*	*M*	*F*	*T*	*M*	*F*
Maharashtra	1.63	-1.29	2.02	6.87	18.54	3.93	-2.87	-0.95	-3.97
DAM Mumbai	3.30	-1.22	4.09	10.17	22.35	6.37	-1.02	1.01	-2.61
West Bengal	5.16	-2.12	7.89	12.98	20.70	9.96	2.47	5.47	-0.12
DAM Kolkata	2.63	-6.54	9.58	18.14	25.81	13.27	3.23	4.59	1.37
Tamil Nadu	1.87	-7.30	2.74	9.16	29.39	4.66	0.67	2.38	-0.62
DAM Chennai	-1.34	-11.49	0.18	14.50	33.34	8.58	1.58	1.81	1.36
Andhra Pradesh	-2.11	-2.79	-2.06	12.84	29.15	9.24	-0.56	0.50	-1.18
DAM Hyderabad	-6.67	-8.22	-6.52	15.83	31.27	12.02	0.76	1.73	0.14
Karnataka	1.69	0.12	1.82	9.09	22.77	6.44	-0.57	2.13	-1.92
DAM Bangalore	-	-	-	4.77	23.38	1.74	-2.39	1.15	-4.36
Uttar Pradesh	7.06	-0.30	7.97	14.75	32.34	9.90	3.10	5.87	0.34
DAM Delhi (UP)	28.99	19.79	30.55	4.36	22.45	-2.38	1.99	2.56	1.31
Haryana	-0.62	-10.19	0.34	16.50	34.95	12.89	-1.59	0.82	-3.11
DAM Delhi (Haryana)	-1.72	-13.28	-0.26	16.15	33.93	12.49	-3.27	0.90	-6.49
Total State	2.63	-1.97	3.21	11.80	26.33	7.93	1.22	3.93	-0.92
Total DAM	2.93	-5.71	5.14	13.81	26.57	9.16	0.93	3.03	-1.21

Source: Census of India, 1981-2011.

On the whole, the growth in the workforce accrues more to the growth of the marginal workers, which is generally seen in terms of the deterioration of work conditions. However, Papola and Sharma (1997) have argued that in rural areas, as long as the casualisation of work implies 'a shift from subsistence agriculture or other low-productivity occupations to casual yet substantial employment in the more remunerative sectors or work' (p. 349), casualization does not necessarily imply a deterioration in livelihood. Hence, the dynamics operative in the DAMs of the metro cities must be explored carefully. This level of analysis fails to provide an insight into this issue and demands a micro examination.

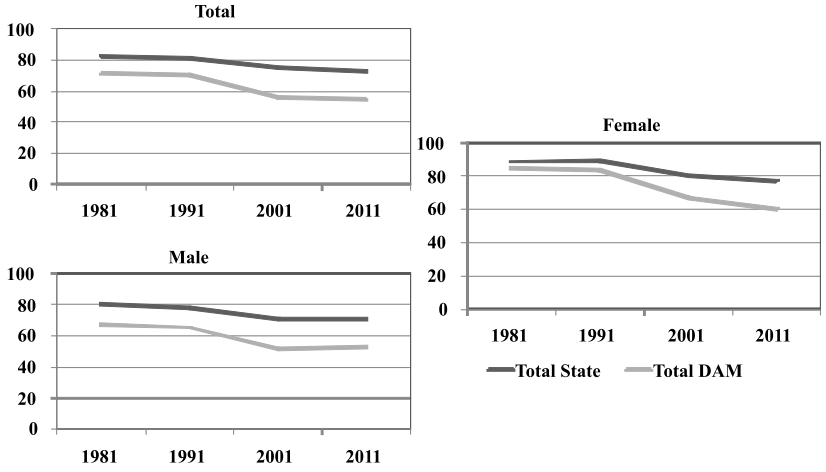
IV. SECTORAL TRENDS

The shares of the workforce engaged in agriculture in the DAMs has been consistently lower than that in the states across all the time periods, which is not unexpected, given the

proximity of the former to the mega-city (Figure 3). The steep decline in the shares between 1991 and 2001, especially in the DAMs has been notable—that is, a momentous decline by 15 percentage points followed by a relatively stable share of the agricultural workers in the DAMs as well as in the states during the last decade. The trend has been similar for both male as well female agricultural workers, with the rate of decline between 1991 and 2001 being steeper for the females in the DAMs. It must be remembered that the locations near the mega-city are marked by land-use change generally disfavouring agriculture which, in turn, squeezes out the workforce from the agricultural sector. It is possible that such a dynamics offers opportunities to at least some sections of the rural workers to opt out of agriculture and helps in the process of transition to non-agricultural livelihoods. However, such type of economic transition is more complex and contingent upon one's access to resources (Mallik and Sen, 2011; Mallik, 2014). Thus, urban expansion, in general, entails the engulfment of the rural forms by commonly marginalising the rural workers.

Figure 3

Shares of Agricultural Workers (1981-2011)



The growth rate of the total agricultural workers decelerated from 2.29 per cent to 1.13 per cent in the state and from 2.71 per cent to 0.05 per cent in the DAMs, with the decline being sharper in the latter between 1981 and 2011 (Table 5). Although the growth rates of the agricultural workers, including both men and women in the DAMs, had been higher than that in the state in 1981, since 1991, it has consistently fallen below the growth rate in the respective state. The trend revealed by the male and female agricultural workers is, however, interesting. Although a majority of the women workers have been engaged in the agricultural sector and their growth rates were higher than those of their male counterparts in both the DAMs and the states till 2001, the female growth rates have rapidly fallen below those of their male counterparts during the last decade in both the DAMs as well as the states. This decline in the growth rates of the female agricultural workers has been significantly high in the DAMs as compared to the states. A recent study based on the analysis of NSSO data has also reported similar findings wherein it has been argued that the decline in the number

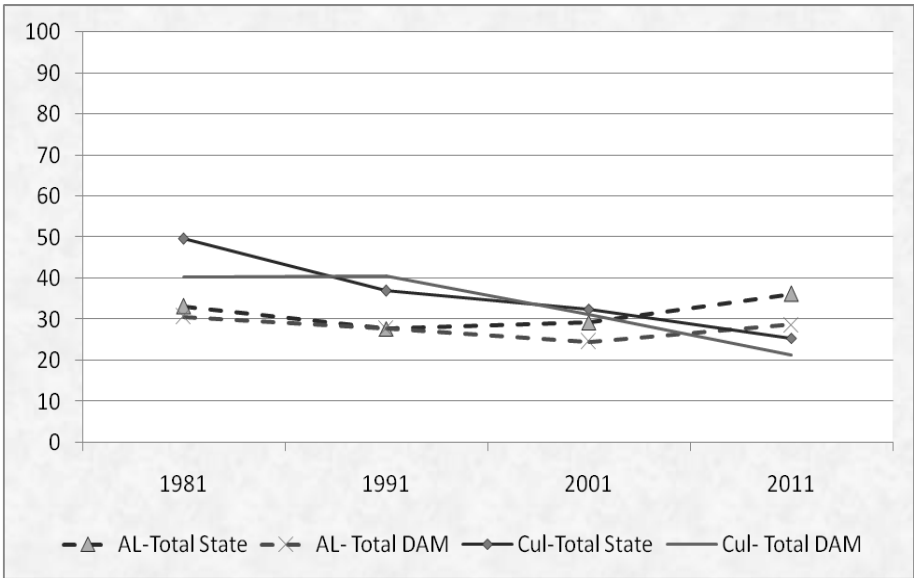
Table 5
Exponential Growth Rate of Total Agricultural Workers

Districts	*1981-1991*			*1991-2001*			*2001-2011*		
	T	*M*	*F*	*T*	*M*	*F*	*T*	*M*	*F*
Maharashtra	2.02	1.20	2.88	0.87	1.30	0.44	1.38	2.04	0.64
DAM Mumbai	1.68	0.69	2.63	-0.60	-0.31	-0.87	-0.18	1.04	-1.46
West Bengal	5.02	4.57	7.18	-1.19	-2.29	2.53	1.41	1.94	-0.18
DAM Kolkata	2.30	1.89	6.56	0.12	-0.66	5.06	1.52	1.56	1.32
Tamil Nadu	1.57	0.92	2.49	-1.27	-1.73	-0.70	0.06	0.03	0.09
DAM Chennai	1.52	0.82	2.60	-1.60	-1.83	-1.28	-1.16	-1.38	-0.88
Andhra Pradesh	1.76	1.32	2.32	0.61	0.41	0.85	0.58	0.46	0.72
DAM Hyderabad	1.55	1.51	1.60	0.53	0.26	0.80	-0.13	-0.09	-0.17
Karnataka	1.68	0.74	3.16	0.74	0.48	1.09	0.42	0.70	0.05
DAM Bangalore	-	-	-	0.52	0.03	1.28	-0.58	-0.27	-1.06
Uttar Pradesh	2.49	1.61	6.56	1.40	0.38	4.39	0.75	1.14	-0.26
DAM Delhi (UP)	3.05	1.82	18.31	-3.27	-3.83	-0.48	0.68	0.64	0.82
Haryana	1.64	1.46	2.38	3.39	0.80	9.78	-0.39	0.86	-2.79
DAM Delhi (Haryana)	1.39	1.15	2.05	3.42	0.71	8.24	-2.52	0.06	-7.02
Total State	2.29	1.69	3.48	0.59	0.01	1.56	0.77	1.13	0.19
Total DAM	2.71	2.18	4.11	0.22	-0.59	1.94	0.05	0.79	-1.49

Source: Census of India, 1981-2011.

of female agriculturalists signifies the withdrawal of female unpaid labour from agriculture, which is indicative of greater domestication and the subsequent subjugation of women workers (Majumdar and Neetha, 2011). However, the disaggregated analysis of agricultural workers reveals a more nuanced scenario, which is presented in the subsequent sections.

Figure 4
Shares of Cultivators and Agricultural Labourers (1981-2011)



Source: Prepared by the author from Census of India, 1981-2011.

Within the category of agricultural workers, the dynamics between the cultivators and the agricultural labourers have manifested interesting trends. The number of cultivators has declined consistently after 1991 in both the states as well as the DAMs, with the decline being steeper in the latter (Figure 4). The number of agricultural labourers also declined marginally after 1991 but gained in share following 2001. The growth rates of the total cultivators declined from 2.36 per cent in 1981-1991 to -0.55 per cent in 1991-2001, and further to -1.83 per cent in 2001-2011 in the DAMs, while the decline was slightly moderate in the respective domain states (Table 6). On the other hand, the growth rates of the agricultural labourers declined slightly during the first decade, but subsequently recovered and increased during the next two decades in both the DAMs and the states (Table 7). It is, therefore, possible that some of the cultivators, that is, the rural workers have been alienated from land and have joined the army of landless rural labourers. Such a phenomenon of the erosion of the peasantry and its replacement by agricultural labourers (Figure 4), a process commonly referred to as 'pauperisation of the peasantry' (Jha, 1997) may have been underway in this study area, with the intensity being greater in the DAMs. The phenomenon of generation-wise land-holding fragmentation rendering land-holdings uneconomical partly explains the prevalence of widespread landlessness (Himanshu, 2011). However, the processes of urban expansion and associated land use changes must also be accepted as contributory factors that are persistently dispossessing the peasants of their lands (Bryceson, 1999; Mallik, 2014), and creating wage labour. This may take the form of planned land acquisition for urbanisation and industrialisation (Mallik, 2014), or may also result from a structural adjustment programme or other policy changes that pervasively impinge upon the sustainability of the peasantry (Bryceson, 1999). And, the urban fringe is the hotspot for the private investors in South Asia, especially during the last two decades, wherein land grabs through both economic as well as 'extra-economic means' have been rampant. Thus, the waning away of the cultivators and the replacement of their work by other types of jobs including the agricultural labouring type of work in the peripheries of the mega-cities must be accepted as a consequence of complex interaction between socio-political and economic forces wherein the nexus between state and private capital is especially significant. Given the nature of economic transformation under way in the peripheries of the mega-cities under the aegis of increased private investments in these locales, which is actively creating an environment wherein agriculture is becoming unviable (Mallik, 2014), the increase in the number of agricultural labourers at the cost of the cultivators must be accepted as a critical outcome of the present economic policy.

The gender dynamics operating within the agricultural workers has presented a rather confusing scenario. The growth rate of the female cultivators has been higher than that of their male counterparts during the decades of 1981-1991 as well as 1991-2001, which reversed in the next decade. The period 1991-2001 may be taken as a marker of replacement of the male cultivators by their female counterparts, a phenomenon that is commonly referred to as the 'feminisation of agriculture'. However, the last decade revealed a completely different scenario. During this period, though the growth rates of both the male as well as female cultivators turned negative, the rate of decline of the female cultivators was sharper than that of the male

Table 6
Exponential Growth Rate of Total Cultivators

Districts	*1981-1991*			*1991-2001*			*2001-2011*		
	T	*M*	*F*	*T*	*M*	*F*	*T*	*M*	*F*
Maharashtra	1.81	0.80	3.23	0.47	0.72	0.15	0.67	1.26	-0.16
DAM Mumbai	1.06	0.21	1.93	-2.24	-1.97	-2.50	-1.88	-0.32	-3.71
West Bengal	4.89	4.31	9.53	-3.15	-3.74	-0.12	-1.31	-0.54	-5.59
DAM Kolkata	2.36	1.88	12.14	-1.99	-2.59	3.56	-0.74	-0.43	-3.12
Tamil Nadu	0.34	-0.39	2.21	-1.88	-2.83	0.01	-2.00	-1.95	-2.10
DAM Chennai	-0.52	-1.32	2.48	-2.97	-3.54	-1.40	-3.35	-3.45	-3.10
Andhra Pradesh	0.48	-0.10	1.86	-0.47	-0.84	0.30	-2.17	-2.05	-2.42
DAM Hyderabad	0.65	0.58	0.77	0.75	0.26	1.58	-1.06	-0.84	-1.42
Karnataka	1.01	0.03	3.69	0.42	0.47	0.31	-0.50	-0.21	-1.23
DAM Bangalore	-	-	-	0.11	-0.07	0.48	-1.02	-0.72	-1.65
Uttar Pradesh	1.84	1.07	6.54	-0.02	-0.78	2.93	-1.51	-1.23	-2.47
DAM Delhi (UP)	2.13	0.93	19.78	-2.72	-3.03	-0.94	-0.94	-0.79	-1.81
Haryana	0.83	0.57	1.88	3.76	1.43	9.61	-1.48	-0.26	-3.96
DAM Delhi (Haryana)	0.71	0.49	1.36	3.75	1.29	8.47	-3.74	-1.19	-8.71
Total State	1.66	0.97	3.92	-0.27	-0.86	1.22	-1.06	-0.74	-1.81
Total DAM	2.36	1.86	3.98	-0.55	-1.45	1.64	-1.83	-0.81	-4.40

Source: Census of India, 1981-2011.

Table 7
Exponential Growth Rate of Total Agricultural Labourers

Districts	*1981-1991*			*1991-2001*			*2001-2011*		
	T	*M*	*F*	*T*	*M*	*F*	*T*	*M*	*F*
Maharashtra	2.28	1.90	2.56	1.34	2.18	0.70	2.12	3.03	1.29
DAM Mumbai	3.09	1.90	4.08	2.10	2.75	1.58	1.70	2.74	0.74
West Bengal	5.16	4.94	5.87	0.74	-0.60	3.97	3.16	3.91	1.52
DAM Kolkata	2.24	1.91	4.61	1.77	0.97	5.74	2.75	2.76	2.68
Tamil Nadu	2.57	2.53	2.61	-0.86	-0.69	-1.01	1.20	1.46	0.95
DAM Chennai	2.63	2.64	2.63	-1.02	-0.79	-1.26	-0.43	-0.43	-0.44
Andhra Pradesh	2.74	3.02	2.51	1.28	1.55	1.06	1.87	2.12	1.65
DAM Hyderabad	2.47	3.11	2.07	0.31	0.26	0.35	0.69	0.95	0.52
Karnataka	2.55	2.20	2.83	1.11	0.50	1.57	1.35	2.19	0.71
DAM Bangalore	-	-	-	1.45	0.36	2.35	0.26	1.07	-0.38
Uttar Pradesh	4.55	3.69	6.60	4.53	3.56	6.25	3.81	4.97	1.67
DAM Delhi (UP)	5.20	3.99	16.23	-4.49	-5.74	0.26	3.77	3.76	3.80
Haryana	3.51	3.51	3.52	2.61	-0.60	10.12	1.70	3.16	-0.79
DAM Delhi (Haryana)	3.37	3.19	3.78	2.52	-1.07	7.70	0.35	3.48	-3.87
Total State	3.16	3.13	3.18	1.60	1.41	1.80	2.41	3.33	1.33
Total DAM	3.15	2.63	4.24	1.10	0.47	2.22	1.69	2.33	0.53

Source: Census of India, 1981-2011.

workers, more so in the DAMs. The agricultural labourers also present a similar condition of greater decline in the growth rate of the female workers during the last decade while the male workers maintained higher growth rates in both the states as well as the DAMs. In fact, the growth rates of the male agricultural labourers increased from those prevalent during the previous decade in all the domain states and DAMs. It is not very likely that agriculture, being mechanised and thereby gender non-inclusive, expels the women workers out of the sector (except for the Delhi periphery, which includes Haryana). This may be argued on two principal grounds: firstly, the DAMs are locales that are dominated by small and marginal holdings, which discourages mechanisation; and secondly, exposure to competition for non-agricultural land use and widespread speculation generally deters allocation of land to agriculture. Thus, the prospect of agriculture along the peripheries being highly capital-intensive and potentially alienating for the women agriculturalists may be a remote possibility. Rather, it is more likely that home-based work which offers flexibility of enterprise appears more attractive to women who voluntarily opt out of unpaid work on the family farms. The in-situ work offered by the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) may also be another avenue for the women farmers to engage themselves into paid non-farm work. The significantly higher growth rates of the female non-agricultural workers as compared to their male counterparts in both the state and the DAMs partly supports this argument (Table 8). However, it requires further scrutiny to establish this strain of argument. The growth of male agricultural labourers may have been a case of shift in the status of the agriculturalists as the casual wages have risen remarkably higher owing to the reservation wage offered by MGNREGS. So, it is possible that the men are now more into agricultural labour possibly because it offers better returns than the uneconomic land-holding.

Table 8

Exponential Growth Rate of Total Non-agricultural Workers

Districts	*1981-1991*			*1991-2001*			*2001-2011*		
	T	*M*	*F*	*T*	*M*	*F*	*T*	*M*	*F*
Maharashtra	2.27	2.27	2.28	3.22	2.55	6.02	0.54	0.06	2.06
DAM Mumbai	0.78	0.38	2.68	4.86	4.52	6.18	1.14	0.90	1.96
West Bengal	7.77	7.87	7.39	2.80	1.06	7.81	0.14	0.43	-0.49
DAM Kolkata	4.15	3.91	6.37	6.62	5.44	13.07	0.29	0.07	1.07
Tamil Nadu	2.01	1.64	3.21	3.06	2.35	4.89	2.07	2.05	2.12
DAM Chennai	2.65	2.42	3.77	3.83	3.16	6.51	4.37	3.65	6.50
Andhra Pradesh	1.62	1.50	1.97	4.27	3.81	5.45	-0.48	-0.60	-0.19
DAM Hyderabad	-1.17	-1.15	-1.22	5.41	5.15	6.30	-0.37	-0.88	1.17
Karnataka	1.85	1.86	1.84	5.04	4.38	6.69	1.69	1.58	1.94
DAM Bangalore	-	-	-	5.92	4.88	8.81	3.35	3.48	3.03
Uttar Pradesh	3.62	3.53	4.51	6.73	5.29	14.90	3.81	2.92	6.50
DAM Delhi (UP)	3.11	1.87	13.51	4.09	3.99	4.55	1.35	0.60	4.23
Haryana	3.10	3.16	2.10	8.45	5.54	24.54	0.22	1.21	-2.59
DAM Delhi (Haryana)	3.11	3.19	1.96	7.80	4.89	24.05	-0.85	0.52	-5.13
Total State	3.23	3.19	3.36	4.52	3.49	7.91	1.61	1.36	2.26
Total DAM	3.26	3.02	4.96	6.07	4.94	11.31	0.79	0.68	1.13

Source: Census of India, 1981-2011.

The growth rates of the non-agricultural workers have been higher in the DAMs relative to the states during the first two decades, whereas this trend has been reversed during the last decade (Table 8), though the shares of non-agricultural workers continue to remain higher in the DAMs. It is interesting to note the significantly higher growth rates of the female non-agricultural workers as compared to those of their male counterparts in both the states and the DAMs. The analysis of the 66th Round of NSSO (2009-10) has revealed that there has been an unprecedented increase in the levels of participation of the rural females in non-agricultural work, especially in the construction, transport and trade, and household industries, and that the growth rates have matched that of the males (Jatav and Sen, 2013). Thus, it is possible that part of the increase in the female non-agricultural work is related to the MGNREGS, which appears particularly attractive to the rural women owing to the availability of in-situ work for this group (Majumdar and Neetha, 2011; Jatav and Sen, 2013). Also, given the increasing predominance of the construction sector in the peri-urban locale driven by the post-liberalisation investment pattern, it may be argued that a major section of non-farm employment accrues to construction work. The contractor-based circulatory migrant regime of the recent times has been observed to be centring round a movement from agriculture to construction temporarily to manage rural/agrarian distress (Mazumdar and Neetha, 2011). However, some concern persists in relation to the growth of home-based non-agricultural engagements as Paul and Raju (2014) note a confinement of the women workers in specific sectors and their absorption in activities entailing low levels of education and skills.

V. REGIONAL PATTERN

The six mega-cities are located in diverse agro-climatic as well as economic regions. Their integration with the regional as well as global economies varies considerably allowing for a complex scenario that often makes generalisation quite problematic. There has been a crude regional pattern, which conforms to the general understanding of the interaction of post-liberal economic space centring around the mega-city periphery and the nature of rural labour. The critical trend and the regional pattern may be summarised as follows (Table 9):

The growth rate of the total workers is lower in the DAM as compared to the respective state. This implies that the rural workforce in the peripheries is increasingly being marginalised from productive work opportunities. This has been observed in the peripheries of all the mega-cities except that of Chennai.

The growth rate of female workers is lower than that of their male counterparts in the DAM. This indicates greater deprivation of the women from paid employment.4 This has been the trend in three of the DAMs, that is, Mumbai, Hyderabad and Delhi (Haryana side) among the six mega-cities studied.

There is a preponderance of marginal workers relative to the main workers in the DAM. This is indicated by the Casualization Index as revealed by the DAMs of Mumbai and Delhi (Haryana side), and to a certain extent, Chennai. It implies that the increase in the workforce in these DAMs is largely contributed by the marginal worker.

The growth rate of marginal workers is higher than that of the main workers in the DAMs, that is, the growth of the workforce is contributed by the growth of the marginal worker. This has been the case with the DAMs of Kolkata, Chennai, Hyderabad and Delhi (UP side).

The total number of cultivators is declining along with an increase in the number of agricultural labourers in the DAM. This suggests signs of pauperisation of the peasantry. This phenomenon has been registered by all the DAMs.

Table 9
Regional Pattern of the Critical Trends in the DAMs

Criteria	Mumbai	Kolkata	Chennai	Hyderabad	Bangalore	Delhi (UP)	Delhi (Haryana)
Rural workers more marginalised in the DAM	√	√	x	√	√	√	√
Women workers more deprived in the DAM	√	x	x	X	√	x	√
Preponderance of marginal workers relative to main workers in the DAM	√	x	√	X	x	x	√
Growth of workforce contributed by growth of the marginal worker	x	√	√	√	x	√	x
Pauperisation of the peasantry	√	√	√	√	√	√	√

Note: "√": applicable; "x": not applicable.

Source: Compiled by the author.

It is clear that out of the five disturbing trends, four are clearly visible in Mumbai and Delhi (Haryana side). Women workers have been especially marginalised in these two DAMs in addition to Bangalore. These mega-cities are those wherein the impact of globalisation has been relatively more prominent. This analysis reveals a correspondence between the greater integration of the mega-city with the liberalised economic space and greater adversity for the rural workers, in general, and rural women workers, in particular, in the peripheral areas of the mega-cities.

VI. CONCLUSION

The processes of urban restructuring and its inevitable spatial expression upon the surrounding of the cityscape have affected both the composition of the workforce and organisation of the labour market. This paper attempts to validate some of the presumptions about the reconfiguration of the labour market in the urban fringe of the largest mega-cities in India in relation to the observed transformation of the economic space in the post-liberalised regime wherein both the tertiarisation of industry and flexibility of production have come to dominate. The paper highlights two major issues. The first is the increased vulnerability of the rural workers, especially women at the peri-urban interface. There is a trend of replacement

of main workers by marginal workers suggesting the proliferation of temporary types of employment, which unmistakably belong to the 'hire and fire' category and imbue negative indications. A greater degree of pauperisation of the peasantry and greater deprivation of the rural women from productive work is another indication of the adverse livelihood context in the peri-urban areas. In the context of recent scholarship, it is evident that while the rural women have been deprived of their traditional economic niche, that is agriculture, they have encountered several novel avenues of engagement with the non-agricultural activities (predominantly home-based work) and hence the unprecedented growth of female non-farm workers in the peri-urban interface of the mega-cities. However, the questions of the quality of work available, the nature of work to be done, the diversity of de facto options available, the rates of returns and the larger livelihood implications of the newer engagements should be legitimately interrogated through micro level studies. The second issue underlined in this paper emphasises a prominent interface between the marginalisation of rural workers in the peripheries and the greater attractiveness of the mega-city to corporate investments. Mumbai, Delhi and Bangalore are the mega-cities wherein urban restructuring and new economic spaces have proliferated with the subsequent peripheralisation of industrial development, and this paper shows that the marginalisation of the rural workforce has been most profound in the peripheries of these three mega-cities. Thus, the unevenness of integration of the rural workforce within the emergent economic spaces is deeply rooted within the interface between the dynamism of the economic space and the relative human capital stagnation/drawback of the rural workers. Further, the peripheral rural areas have registered trends that are more drastic as compared to the respective rural interiors proposing that the changes injected by the economic reforms have proved to be much more critical for the transitional areas than for either the urban or rural areas. This study, in spite of having severe data limitations, has presented an overview of the crucial rural labour market markers that call for a closer look. Thus, the paper highlights the criticality of addressing the vulnerability of the rural workers in the urban fringes of the largest mega-cities in India and rightfully urges both socially sensitive corporatisation and State or non-State intervention.

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Notes

1. This shift in the focus of growth of economic activities to the peripheries of the mega-cities from the mega-city itself is facilitated by the emergence of environmental lobbies in the big cities (Kundu, 2003), which regulate the location of manufacturing units within the city coupled with the shortage of land for expansion within the city (Keivani and Mattingly, 2007). It is also associated with the easy availability of land and access to an unorganised rural labour market (Kundu, 2003; Keivani and Mattingly, 2007) besides lesser awareness and less care being accorded to implementation of environmental regulations in the rural settlements in the urban periphery (Kundu, 2003).

2 During preparation of the manuscript, the education level disaggregated data at the district level was not available in the Census 2011. Hence, this analysis could not be undertaken.

3 The Index of Casualisation index refers to the number of marginal workers per 100 main workers (adopted from Chadha, 2001).

4 Himanshu (2011), while analysing the 66th Round (2009-10), NSS, has, however, proposed that the lower growth of the female workforce accrues partly to the 'return to normality' of the work participation of the women workers after the spurt in 2004-05 due to drought and global recession. The second argument explaining the recent withdrawal of women workers pertains to an increase in the attendance of the rural females in the educational institutions. However, this paper has revealed that such clear trend of withdrawal of women workers and 'normal' increase in the work-participation of the rural men in the DAMs has been unclear suggesting the continued persistence of labour market adversities. To argue this more substantively, it calls for further deliberation which has not been possible due to data constraints.

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EFFECT OF NON-MARKET SOURCES OF CONSUMPTION ON NUTRITIONAL INTAKE OF RURAL LABOURERS IN INDIA

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The study attempts to observe the impact of reduction in non-market sources of consumption on calorie intake among rural labourers. Non-market sources comprise consumption out of home-grown stock and out of subsidised grain transfers such as the Public Distribution System (PDS). Using NSSO data on Consumption Expenditure (1993, 2004, 2009 and 2011), the study finds that the calorie intake of rural labourers has been statistically lower than that of other households in all the four Rounds, that is, the 50th, 61st, 66th and 68th Rounds. It has been observed that economic indicators including access to non-market sources of consumption or the value of transfers from PDS, which have showed a positive impact on the calorie intake of the overall population, either show a negative impact or become insignificant over time for rural labourers. This implies that decreased access to non-market sources over time has adversely affected the calorie intake of rural labour households. Regressing the same variables on the shares of rice-/wheat-based food and coarse cereal-based food only within labour households, it has been observed that even within the labour households, the share of rice-/wheat-based food is negatively elastic to consumption from home-grown stock and transfer from PDS, and positively elastic to the monthly per capita expenditure and vice versa, showing that lesser access to non-market sources pushes the household away from nutritious coarse cereals, and in turn, reduces the calorie intake. The result emphasises the importance of providing coarse foodgrains through PDS since a lower calorie intake among rural labourers can be attributed more to push-driven factors like reduced availability of nutritious grains from PDS or a lower share of home consumption than any change in preference or need.

Keywords: *Rural labourers, Calorie intake, Public Distribution System, Non-market sources of consumption*

I. INTRODUCTION

Despite the growth of income, consumption expenditure and other such indicators of economic development over the past two decades, indicators of individual well-being which are less conventional in nature such as nutrient intake have shown odd declining trends and adverse nutritional outcomes. This paradoxical nature of human development

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in India has triggered a sustained debate on the reason for the decline in the calorie and nutrient intake with scholars arguing that the demand for calories has probably declined because of the advent of better health situations and more mechanised working conditions (Deaton and Dreze, 2009) or a shift in nutritional preferences (Sen, 2005; Mittal, 2007), which has lowered the requirements of calories. Patnaik (2010), and Gaiha, *et al*. (2012), on the other hand, have criticised this view, stating that the demand for calories has declined due to changes in food prices and worsening welfare conditions of the household in an open market economy, which has reduced the access of households to nutritional food and pushed them towards the consumption of high-value low-calorie food. Another aspect of the calorie-nutrition debate has been the effectiveness of subsidised sources of food consumption, the most prominent of which is the Public Distribution System (PDS). Behrman and Deolalikar (1989)[1] and in recent times Khera (2011) have observed that the shift in the nature of food grain transfer programmes has also pushed dietary preferences towards low-calorie rich food. The debate opens an interesting aspect in this regard. Calorie deficiency is largely a problem of the labour class. This is because it is the labour class that is affected by low productivity resulting in low wages and it is largely rural labour households that are pushed into a poverty-nutrition trap[2] because of the low intake of calories or nutrients. Even the argument that mechanisation of workforce has led to a reduction of demand for calories is significant only for the population that is involved in such tasks. As a result of earning low wages, these households remain impoverished and require a larger part of the benefits accruing from transfer schemes like the PDS or employment schemes like the National Rural Employment Guarantee Act (NREGA).

The studies that have been undertaken so far have either looked at the overall calorie intake of the population, the calorie intake of different MPCE-classes and social groups or at the effect of calorie intake on wages or productivity or the poverty-nutrition trap. However, rural labour households have constantly been calorie-deficient as compared to other households and the reason as to why their nutritional intake is lower than that of others or why this deficiency has persisted over time has not been addressed. Nutritional intake can be measured by calorie, protein, fat and micro-nutrient intake but this paper focuses only on calorie intake. An interesting objective is not just to determine whether being a rural labourer puts a household at the risk of low calorie intake but also whether access to in-kind transfer schemes or non-market sources of consumption[3] shows any effect on changes in the levels of nutritional intake of these households. The study attempts to assess the impact of non-market sources of consumption on calorie intake. The effects of non-market sources, that is, in-kind transfers and home-grown stock, are manifested through the value of the subsidy that these provide and also through the nature of the foodgrains that are transferred through them. This question is particularly relevant in the present policy context, especially due to the passage of the Food Security Bill, 2013, on one hand, and the massive debate that has been raging regarding the benefit of in-kind versus cash transfer, on the other hand. Some scholars have also been arguing that PDS is ineffective in benefiting the poor and should be replaced with cash transfers. Similarly the content of grain transfer programmes has also

been criticised for ignoring nutritious foodgrains and providing only rice and wheat to poor households, thereby affecting their calorie intake.

After reviewing the current literature and general trends from data, Section II outlines the pertinent questions more clearly. The methodology and indicators of the study are discussed in Section III whereas Section IV highlights the results of the analysis and Section V concludes the discussion.

II. EXISTING LITERATURE AND THE TRENDS

The debates on the relation between consumption and nutrition, and what determines them have been far from conclusive. Behrman and Deolalikar (1987) compared elasticity of nutrition to equations on the food expenditure system where in the expenditure on aggregate food groups multiplied by the constant nutrient equivalent is used as a dependent variable, with direct nutrient demand equations to observe whether nutrient intake responses to expenditure are substantial and differ from food expenditure responses. Using ICRISAT data on a south Indian village for two time periods, they find that the use of food expenditure leads to over-stating of calorie intake elasticity to income, which is near or close to zero when the nutrient intake is used. They also observe that the average cost of the nutrients from the same food group increases monotonically with the expenditure indicating a preference for high-value food rather than high-calorie food in the upper quintiles of income. In another paper, Behrman and Deolalikar (1989) show that as the budget on food increases, instead of consuming high-calorie food, households move towards high-value food.

Empirical studies in recent times have corroborated the same debate. Scholars like Surabhi Mittal (2007) have argued that the decline in the cereal intake is due to a diversification of diet towards high-value food, which has actually made poorer households better off nutritionally. Pronab Sen (2005) has also argued that there has been a switch of preferences to low-calorie food.

The trends of indicators of calorie intake and nutritional outcome, when compared with the trends pertaining to consumption expenditure or real income and poverty show contradictory results, as pointed out by Radha Krishna and Ravi (2004), and Deaton and Dreze (2009), among others. Deaton and Dreze (2009) show that there is a *positive correlation* between the log of calorie intake and the log of consumption expenditure, which is, however, contradictory to theory. They also observe that the curve has shifted downwards for all MPCE classes, even for the poor, especially in rural areas. Therefore, though there is clear evidence of an increase in real income, the per capita calorie consumption has declined and overall malnourishment is still very high and has remained virtually unchanged during the past decade. They try to interpret the facts and find the results to be inconclusive as none of the theories on the determinants of calorie intake in India is able to comprehensively explain the contrasting trend. They contrast Patnaik's stand that impoverishment is a cause of low calorie intake with Pronab Sen's (2005) theory of switch of preferences and point out that calorie needs may have declined due to both improvements in the health condition of people over time, and increased mechanisation of activity. Basu and Basole (2012) recently

analysed the calorie intake data till 2009-10 and highlighted the continuing paradoxical trend of calorie intake and income while analysing the determinants of calorie intake in India. They take several indicators like rural impoverishment, relative price changes, decline in calorie needs, diversification of diets, squeeze on the food budget due to rising expenditures on non-food essentials, and reduction in subsistence consumption or home-grown consumption as explanatory variables. They contrast Patnaik's stand that impoverishment leads to low calorie intake on the grounds that the agricultural wage rate has increased from 1983 to 2004-05, while the calorie intake has increased in the bottom decile during the same time period and consumption expenditure has also shown positive growth for the bottom decile. Moreover, there is no clear trend of an increase in food prices during the period 1983-2010. However, the authors have also refuted the conclusions arrived at by Deaton and Dreze (2009) of non-coercive factors as being suggestive. They conclude that it is a combination of a few coercive factors, that is, a squeeze in the food budget (the share of non-food to the total budget), decline in home-grown consumption and diversification of diets, which explain the low calorie intake in India. They also refute the argument that a decline in calorie needs has a significant role to play in reducing calorie intake.

Literature focusing on the nutritional intake of rural labourers is sparser than literatures on the overall nutrition debate. Older papers by authors like Bliss and Stern (1978) argue that low productivity of labour causes low consumption. Recently Raghav Gaiha *et. al*. (2009) observed that the poverty-nutrition trap is pervasive in rural India and continues to have an impact on labour productivity, particularly among female agricultural workers. Gaiha *et al*. (2012) observe that the decline in the calorie intake slowed down during the period 2004-09 and also that the change in food prices was affecting the calorie intakes of different social groups.

The non-market sources of calories include mainly home-grown stock, which also incorporates in-kind wages or wages in the form of foodgrains, which is why landless households also show a home-grown consumption (Ansari, 1958) and the transfer of grains at subsidised rates such as in the PDS. Some earlier scholars doubted the functionality of PDS since overall elasticity of calorie intake was observed to be low during universal PDS (Jha, 1992; Parikh, 1994), and after targeting elasticity of calorie was observed to have declined (Kochar, 2005). However, on the other hand, were scholars who have been arguing that with proper functioning and universal access, PDS will be a much beneficial scheme for poor households as it has been in the States that implemented PDS efficiently (Khera, 2011; Himanshu and Sen, 2013).Commenting on the debate of whether the PDS has lost relevance for providing nutrition, Swaminathan (2001; 2002) has pointed out that the PDS itself is not responsible for low demand, rather it is inefficient targeting that has resulted in the low demand from PDS. A similar importance of non-market sources in changing consumption levels was reflected in Suryanarayana's (2000) paper, wherein he opined that monetisation of the wage rate has impacted rural poverty and decreased consumption. Recently Kirit Parikh (2013) pleaded for a cash transfer instead of a kind transfer, though he argued for a near-universal approach on the grounds that targeting is in itself problematic.

Table 1

Changes in Levels of Calorie Intake [Kcal] of Rural Labourers in India

State	*1993*	*2004*	*2009*	*2011*
Andhra Pradesh	1895	1904	2003	1966
Assam	1779	1996	1876	1770
Bihar	1949	1906	1812	1871
Goa	1559	1606	1811	1598
Gujarat	1806	1806	1909	1729
Haryana	2001	1905	1933	1978
Himachal Pradesh	2066	2139	2334	2247
Jammu & Kashmir	2327	2161	2333	2231
Karnataka	1868	1734	1821	1690
Kerala	1655	1823	1822	1539
Madhya Pradesh	1980	1721	1824	1846
Maharashtra	1803	1784	2004	1859
Orissa	2055	1868	2043	1935
Punjab	2055	1943	1983	1970
Rajasthan	2183	1991	2015	1990
Tamil Nadu	1668	1731	1851	1647
Uttar Pradesh	2024	1950	1913	1907
West Bengal	1993	1930	1858	1863
Chhattisgarh	1788	1758	1791	1822
Jharkhand	1876	1856	1874	1734
Uttaranchal	2011	1954	2061	2186
All India	1906	1857	1905	1864

Note: Rural labourers constitute NCO categories that are engaged in labour activities.

Source: Calculated from NSS CES unit level data from 1993, 2004, 2009 and 2011 by the author.

Table 2

Difference in Average Calorie Intake per capita per day [kcal] of Rural Labourers

State	*Difference in Average Calorie Intake*			
	1993	*2004*	*2009*	*2011*
Andhra Pradesh	157	91	44	41
Assam	204	71	98	134
Bihar	182	143	119	82
Goa	293	157	48	70
Gujarat	188	117	73	74
Haryana	490	321	247	202
Himachal Pradesh	258	187	73	98
Jammu & Kashmir	180	205	1	44
Karnataka	205	111	82	68
Kerala	310	191	142	105
Madhya Pradesh	315	208	115	103
Maharashtra	136	149	47	57
Orissa	144	155	83	42
Punjab	363	297	240	226
Rajasthan	287	189	176	154
Tamil Nadu	216	111	74	62

Uttar Pradesh	158	250	151	105
West Bengal	218	140	69	73
Chhattisgarh	293	184	135	41
Jharkhand	133	105	26	140
Uttaranchal	238	206	118	61
All India	247	190	115	88

Note: Rural labourers constitute NCO categories that are engaged in labour activities.

Source: Calculated from NSS CES unit level data from 1993, 2004, 2009 and 2011 by the author.

The average calorie intake of rural labourers has always been lower than that of members of other households. Table 1 shows the average Kcal per capita per day of rural labour. In order to compare the levels of nutritional intakes of rural labour households with other types of households, a two tailed pair-wise t-test of mean calorie intake between rural labourers and other occupations (Table 3 reports the values of t stat)has been done for the NSS years 1993, 2004, 2009 and 2011.

Table 3

T test between Labour and Other households

Years	*t stat between*		
	Labour and Non-Labour	*Landless and Other HHs*	*Calorie from Home Landless and Other HHs*
1993	43.06	26.7	69.73
Pr(|T| > |t|)	(0.000)	(0.000)	(0.000)
2004	23.06	14.83	99.94
Pr(|T| > |t|)	(0.000)	(0.000)	(0.000)
2009	26.61	12.94	77.72
Pr(|T| > |t|)	(0.000)	(0.000)	(0.000)
2011	18.83	20.44	77.07
Pr(|T| > |t|)	(0.000)	(0.000)	(0.000)

Source: Computed from NSS CES, 1993, 2004, 2009 and 2011 by the author.

The results show that during all the years, the mean calorie intake of rural labour households has been statistically lower than that of households whose members are engaged in other occupations, though the gap between the two groups of households reduced in 2009. In 1993, the average calorie intake of rural labourers was 1906 Kcal per capita per day as compared to a corresponding figure of 2153 per capita per day for the all-India rural category with the gap between the two categories being 247 Kcal. In 2004, the gap was lower at 190 Kcal per capita per day but this was not due to an increase in the calorie intake of rural labour households—rather it was the outcome of a greater reduction in the calorie intake of other households. However, the average calorie intake of rural labourers showed an increase in 2009, whereas for the all-India rural category, it showed a decrease, thereby reducing the gap between the average intake of rural labour households and the all-India rural category to 115 Kcal per capita per day. In 2011, the calorie intake of labour households decreased from to 2009 Kcal per day to an all-time low of 1864 Kcal per day, while other households were consuming 1952 Kcal per capita per day, with a gap of 88 Kcal.

These results show that rural labourers are systematically at the lower end of the nutritional intake in India and that the situation with regard to their calorie intake has not improved. From a welfare perspective, this is important since it is the labour households that perform most of the manual activities for livelihood, thereby putting them at greater need of calories, and consequently a low calorie intake may result in low productivity, low income and the resultant low consumption, pushing them into vicious circle of poverty and malnourishment. The study tries to estimate the marginal effect of access to non-market sources of consumption on calorie intake, and whether the transfer of foodgrains through different sources can explain the low levels of calorie intake for labour households.

There is another aspect to the debate on the sources of calorie intake, which pertains to the changes in the nature of foodgrains supplied through non-market sources and the effect of the nature of these foodgrains on calorie intake. Khera (2011) has pointed towards the changed nature of PDS and the discontinuation of coarse cereals in the diet as one of the factors leading to low nutritional intake among the poor. Similarly, growing monetisation and the reduced consumption out of home-grown stock also shifts the consumption basket towards rice and wheat, which supply lesser calories than coarse cereals. The changing effect of non-market sources of consumption on the calorie intake manifests itself at two levels—one is a decline in the demand for these sources because of targeting, lower subsidies and leakages in transfer schemes or the growing dependence on the market rather than on in-kind wages or home-grown stock; the other is the resultant shift of foodgrain consumption towards rice and wheat, and away from coarse cereals. The discontinuation of the supply of coarse cereals in the PDS and decreased consumption from the market rather than from home-grown stock, changes almost simultaneously with a decline in the consumption of coarse cereals (Figure 1). The share of coarse cereals as a source of calorie intake has declined parallel to the decline in home consumption and the discontinuation of coarse cereals in the PDS, which, in turn, has been paralleled by the constant decline in the calorie intake of rural labourers, thereby pointing to the importance of these sources in the calorie intake of the labour class. This also points to the link between the type of foodgrains supplied through these sources and their effectiveness in providing the right optimal amount of calories.

The trend of calorie intake of rural labourers[4] confirms the decline of consumption from non-market sources, that is, out of home grown stock and PDS (Table 4).

The share of the calorie intake from coarse cereals has also reduced over the same time for rural labourers (Table 5).

It has also been observed that though the average calorie intake of rural labourers is lower than that of their counterparts from other households, their dependency on PDS for calories increased from 2004 to 2011, whereas the same showed a decline with respect to home-grown consumption (Figure 1). Meanwhile, Figure 2 shows the item-wise shares of the intake of calories from the PDS and non-PDS sources for 1993, indicating that rural labourers were largely benefiting in terms of the share of calories obtained from the PDS in items like pulses and edible oil, which were dropped during the later rounds. It seems paradoxical that the overall share of the intake from the PDS as a source of calories has increased for the rural labour households whereas the average calorie intake has not improved.

Table 4

Shares of Calorie Intake from Various Sources of Supply of Rural Labourers

State	*Calorie Intake from Home*				*Calorie from PDS*			
	1993	*2004*	*2009*	*2011*	*1993*	*2004*	*2009*	*2011*
Andhra Pradesh	6.16	3.26	3.38	3.87	20.6	19.8	22.6	23.74
Assam	11.76	7.62	8.77	7.81	8.4	7.1	18.4	22.81
Bihar	8.45	7.54	7.05	8.47	1.4	0.8	6.5	21.93
Goa	3.92	0.74	6.95	0.59	35.5	21.5	32.8	22.93
Gujarat	9.96	8.52	11.01	6.31	12.4	9.7	11.6	10.65
Haryana	14.33	7.95	8.46	6.27	2.0	4.1	14.1	15.08
Himachal Pradesh	24.52	22.27	14.21	14.96	15.0	23.6	25.6	31.49
Jammu & Kashmir	27.91	25.14	20.40	16.39	3.2	21.9	33.3	37.59
Karnataka	10.88	9.60	6.30	6.42	9.4	25.9	24.3	27.44
Kerala	5.84	5.75	1.68	2.14	38.4	19.0	23.4	31.90
Madhya Pradesh	15.53	11.14	15.88	16.72	4.3	15.3	20.9	20.29
Maharashtra	13.67	10.13	5.59	3.52	7.4	13.7	21.2	24.27
Orissa	11.90	14.28	6.62	9.10	1.8	8.6	24.8	33.06
Punjab	12.64	6.77	5.32	4.64	2.7	0.4	12.3	13.31
Rajasthan	22.70	15.28	15.52	17.76	5.2	7.3	6.7	13.28
Sikkim	12.92	10.61	6.81	10.3	43.5	29.3	32.9	28.4
Tamil Nadu	7.49	1.89	0.84	1.40	17.6	33.7	37.8	42.29
Tripura	8.41	5.11	4.49	4.22	20.8	34.2	31.9	42.66
Uttar Pradesh	22.84	13.24	13.31	15.27	1.4	4.3	13.4	15.78
West Bengal	12.67	9.26	5.46	5.65	3.1	4.2	9.2	13.14
Chhattisgarh	27.09	11.93	4.80	8.42	6.1	3.4	11.3	14.13
Jharkhand	15.16	18.36	10.94	17.76	2.7	14.9	39.9	32.50
Uttaranchal	15.32	15.44	16.24	10.58	23.4	5.3	18.1	24.73
All India	12.92	9.29	8.14	9.07	18.5	11.9	17.8	21.24

Source: Calculated from NSS CES data, 1993, 2004 2009 and 2011 by the author.

Table 5

Shares of Calorie Intake from Coarse Grains to the Total of Rural Labourers

State	*% of Calorie from Coarse Cereals*			
	1993	*2004*	*2009*	*2011*
Andhra Pradesh	5.08	6.45	7.46	6.76
Assam	10.55	3.14	7.85	3.69
Bihar	38.35	6.82	11.29	5.28
Goa	16.93	4.56	5.56	7.41
Gujarat	31.93	35.24	21.93	23.03
Haryana	58.02	4.76	10.34	4.96
Himachal Pradesh	40.65	12.48	11.08	10.58
Jammu & Kashmir	36.81	4.26	13.49	7.96
Karnataka	6.65	21.64	17.40	21.38
Kerala	3.19	1.64	8.19	7.14
Madhya Pradesh	42.57	16.63	11.27	9.19
Maharashtra	14.36	34.57	20.28	17.62
Orissa	2.44	1.82	4.37	3.35
Punjab	56.50	3.63	12.85	5.30

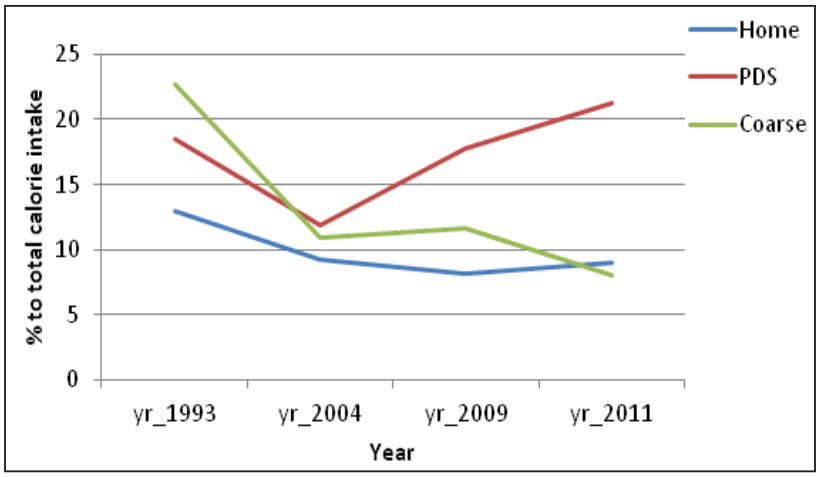
Rajasthan	49.75	16.29	20.67	15.35
Sikkim	12.36	5.17	11.29	3.8
Tamil Nadu	5.15	3.91	6.78	7.42
Tripura	4.33	2.20	7.34	2.34
Uttar Pradesh	53.02	4.41	9.61	5.11
West Bengal	7.28	1.87	9.45	2.60
Chhattisgarh	5.08	4.72	10.01	4.06
Jharkhand	17.22	3.90	4.53	5.22
Uttaranchal	42.69	3.71	10.72	6.24
All India	22.69	10.91	11.62	8.06

Source: Calculated from NSS CES data 1993, 2004 2009 and 2011 by the author.

One reason for this situation could be the increase in purchasing power due to the advent of the National Rural Employment Guarantee Scheme (NREGS) from 2004 to 2009, and the resultant revival of the PDS. However, it is also possible that the decline in consumption out of non-market sources, that is, out of home, is a larger reason for the decline in the calorie intake of rural labourers. The reduced calorie intake could also be due to a shift in the consumption basket of rural labourers towards high-value food due to the unavailability of coarse cereals and oil from either the PDS or home-grown stock, which resulted in their increased dependence on rice and wheat from PDS transfers. This has probably resulted in a reduction in the overall intake of calories despite the consumption of a higher share of foodgrains from the PDS.

Figure 1

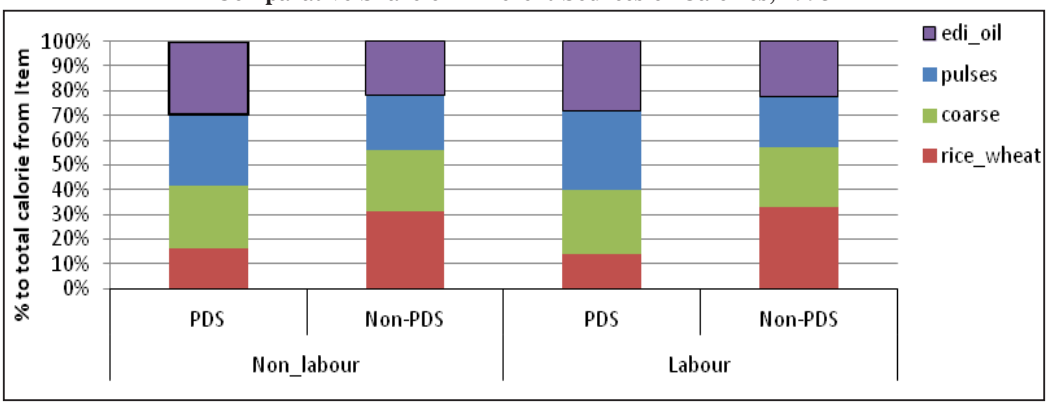
Changes in the Proportion of Calorie Intake of Rural Labourers from Different Sources



Source: Calculated from NSS CES data, 1993, 2004, 2009 and 2011 by the author.

Given the literatures on the decline of calorie intake, on the one hand, and reduction of access to the government transfer of foodgrains or home-grown consumption, on the other hand, it would be an interesting task to combine the two debates with respect to rural labourers. This shows a convergence of the two aspects of non-market sources of consumption—firstly the reduction in access to the PDS and other non-market sources like home-grown

Figure 2
Comparative Share of Different Sources of Calories, 1993



Source: Calculated from NSS CES data, 1993, by the author.

consumption or in-kind wages, and secondly the resultant shift away from coarse foodgrains towards rice and wheat. In this context, one needs to consider the following questions: Is it inaccessibility to home-grown stock or the PDS that causes low calorie intake even for labour households? Has the changed nature of the transfer resulted in a switch to rice-and wheat-based consumption and consequently a reduced calorie intake?

III. DATA AND METHODOLOGY

A number of factors can affect the intake of calories. Income (proxy by consumption expenditure) is such an indicator. However, the purpose is to compare the effect of the indicators of the socio-economic condition of households with the indicators that show the access of the households to non-market sources of consumption and transfer. The most relevant indicators with respect to the labour household in rural India can be the possession of land, access to non-market sources of consumption, that is, consumption out of home-grown stock, and the household's access to subsidies or transfers, of which the largest is the PDS, and some indicators of the household's demographic profile, which reflects its socio-economic situation, such as the educational level of the household head and the household size. An analysis of the t-test of the mean between the average calorie consumption of landless households and other households shows that landless households systematically consume fewer calories than households owning land (see the t stat in Table 1). One could argue that households without land are engaged in non-farm works that do not require as much calorie intake as agriculture-based labour but the difference in the calorie intake even within landless households shows that the landless labourers consume less than their counterparts belonging to the landless non-labour households, which thus clearly negates 'the declining needs' argument (see the t stat in Table 2).

As regards the importance of consumption from home-grown stock, some early studies like the Ansari Report (1958-59) have emphasised the importance of this indicator in household consumption. Suryanarayana (2000) has noted a decline in consumption from home-grown stock and a shift towards the market for consumption in rural areas. However, whether this

has adversely affected the nutritional intake, especially in the labour households, has not yet been estimated. The pair-wise t-test of the mean calorie consumption out of home-grown stock between the landless and other households (Table 1 reports the t stat) confirm that consumption out of home existed for both types and has declined over the years, but the decline is higher for landless households, which means that the in-kind payment of wages has been replaced by cash payment (Ansari, 1958). Therefore, this indicator is not just an indicator of ownership of land or other productive resources but it also reflects access to common property resources and its decline implies the increased monetisation of wages and privatisation of common properties.

Meanwhile, extensive debates have been raging on the importance of subsidised foodgrains and scholars have time and again argued that a reduction in transfer and changes in the nature and content of the foodgrains supplied by the PDS has adversely affected nutritional intake. The nature of PDS post-targeting is also believed to have proved detrimental to nutritional well-being as nutritious foodgrains were dropped, and only rice and wheat were distributed through the PDS, which made it less demanding for the poor labour households and lowered the levels of calorie intake of the beneficiaries (Kochar, 2005). An important way of showing the effectiveness of the PDS is to measure the value of the implicit transfer from the PDS, which is the average of (quantity consumed from the PDS * [price of the commodities from the market- price of commodities from the PDS]. In their paper, Himanshu and A. Sen (2013) showed that the value of the implicit transfer from cereals and sugar has a very high positive impact on the calorie intake and that the percentage of the value of the food transfer has also constantly increased since 1993. This variable has been incorporated in the equation for analysing the effect of the in-kind transfer of foodgrains on the calorie intake of labour households. Apart from these indicators, the equation also has two demographic indicators reflecting the household's level of socio-economic well-being—these include household size and the level of education of the household head.

The equation takes the following form:

$$N = \beta_0 + \beta_1 M + \beta_2 I + \beta_3 P + \beta_4 L_d + \beta_5 D_D + \beta_6 H + \beta_7 E + \mu \quad (1)$$

N: vector in which each element of the calorie intake directly estimated from quantities

$N = q_i * n_i$

q_i = quantity consumed per capita per day of item i

n_i = Calorie per unit per day of item i

M: log of monthly per capita expenditure [MPCE]

I: log of Share of intake from home

P: Implicit value of subsidy from PDS

$P = (v_m - v_p) * Q_p$

V_m = price of item from the market

V_p = price of item from the PDS

Q_p = quantity of item from the PDS

**this is only for food items therefore kerosene is not taken to calculate the implicit value of the transfer here.

L: Dummy for landless [1 if landless, 0 otherwise]

D: Dummy for rural labour [1 if labour, 0 otherwise]

H: Household size

E: Education of Household Head [years completed]

Since the objective is to observe the marginal effect of being a rural labour household combined with the precise effect of the indicators of non-market consumption and PDS transfer in increasing nutritional intake, the dummies of landlessness and rural labour are interacted with the other indicators. The regression is cross-sectional and has been done for four separate years, that is, 1993, 2004, 2009 and 2011, for facilitating a comparison of the changes in coefficients—whether any of the indicators has lost or gained importance in explaining the calorie intake—focusing on whether the marginal effect of being a rural labourer on the intake has changed over time.

Putting the budget shares for the high-value items and low-value yet high-calorie items as the dependent variable helps answer the question as to whether the switch to rice and wheat is determined by the calorie intake[5]from the PDS and home-grown stock.

$$\omega_i = \beta_0 + \beta_1 M + \beta_2 I + \beta_3 P + \beta_4 L_d + \beta_5 H + \beta_6 E + \mu \quad (2)$$

ω_i: Budget share of the relevant items (high-value or high-calorie) only in the rural labour households

A regression of the same indicators on the budget share shows whether the shift to rice- and wheat-based food is a function of the value of the subsidy from transfers and consumption out of home-grown stock. If the shares are elastic to the transfer and home consumption, then we can conclude that the changes in foodgrain type provided through transfers have impacted the effect of these transfers and of non-market sources on the calorie intake of labour households.

IV. RESULTS

Since the calorie intake and per capita household expenditure are influenced by a number of possibly common factors, the MPCE can be endogenous to the model. In order to avoid the problem of endogeneity, the MPCE has been instrumented by caste dummies in the equation. Caste has been chosen as an instrument since the family in which an individual will be born cannot be determined by socio-economic factors but expenditure or income or the possession of assets is influenced by an individual's caste in India. A 2SLS Hausman test confirms the existence of endogeneity and validates the use of caste dummies as instruments (Table 6). The F test of the joint significance of coefficients of instruments shows that it is not only significant but also has a value that is much higher than 10, and therefore, the instrument is strong.

Table 6
Results of the Hausman Test

	Coefficient of Log of MPCE	*Hausman Test (chi_sq)*	*F test of Joint Significance*
1993	0.94	145.47*	64.62
2004	0.53	63.7*	39.31
2009	0.4	45.3**	159.92
2011	0.4	66.45*	217.62

Note: * = prob>chi2 0.000 **= prob>chi2 0.0010

Source: Computed by the author using NSSO data (1993-2011).

In order to observe the changes of the effects of these indicators, the regression has been done separately for three years. The coefficients are reported in Table 5.

Table 7
Results on Estimation of Instrumental Variable Equations on log of per capita Calorie Intake per Day

Explanatory Variables	*B Coefficient*			
	1993	*2004*	*2009*	*2011*
Log_MPCE	0.46*	0.37*	0.40*	0.40*
Log_home	0.05*	0.03*	0.02*	0.03*
Dummy for labour household	0.25*	0.17*	0.11*	0.11*
Interaction labour dummy and log consumption from home	-0.02*	-0.01*	-0.01*	-0.01*
Dummy for landless	0.15	0.16	0.09	-0.01
Interaction landless dummy and log consumption from home	-0.02*	-0.02*	-0.01*	-0.01*
Interaction landless and labour dummy	-0.06	-0.09	-0.16	0.12
Interaction landless and labour dummy and log consumption from home	0.01	0.02	0.00	0.00
Log of implicit value of transfer from PDS	0.00*	0.02*	0.02*	0.02*
Interaction labour dummy and log transfer from PDS	-0.02*	-0.03*	-0.01	0.00
Interaction landless dummy and log transfer from PDS	-0.01	0.00	0.00	0.02
Interaction landless and labour dummy and log transfer from PDS	0.02	-0.02	0.02	-0.02
Education of HH head	-0.01*	-0.05*	-0.01*	-0.01*
Interaction labour dummy and education of head	0.00	0.01	0.00	0.00
Interaction landless and education of head	0.00	0.00	0.00	-0.01
Interaction landless and labour dummy and education head	0.00	0.05	0.00	0.00
HH size	-0.01	-0.02*	-0.01*	-0.01*
Interaction labour dummy and HH size	-0.01*	0.00	0.00	0.00
Interaction landless and HH size	0.00	-0.01	-0.01	0.01
Interaction landless and labour dummy and HH size	0.00	0.00	0.01	-0.02
constant	4.76	5.15	4.80	4.63
R2	48%	44%	40%	31%
Wald chi 2(20)	5749.33**	2455.9**	3933.4**	6032.9**

Note: * = significant at the 5% confidence level or less **= prob> chi^2= 0

Source: Computed by the author using NSSO data (1993-2011).

The result for 1993 shows that the expenditure of households has a positive impact on the calorie intake. This finding is similar to Khera's (2011) study using field level data from

Rajasthan, wherein she found that the predicted MPCE positively affects cereal consumption whereas education has a negative impact. Although the value of the coefficient decreases over time (0.9 to 0.5 then 0.4), it remains significant. In order to find out why the calorie intake of labour households is lower than that of other households, labour household dummies are interacted with the other indicators. The log of consumption out of home-grown stock is also significant in all the three rounds but when interacted with the dummy for rural labour households, the coefficient becomes negative. This shows that for rural labour households, access to home-grown food or wages and transfers in the form of foodgrains have declined, which has adversely affected the nutritional intake of rural labourers. Another indicator of the access to the non-market source of consumption is the log of implicit value of transfer from PDS. This indicator shows that the calorie intake was inelastic to consumption from the PDS in 1993, whereas later in 2004, 2009 and 2011, the elasticity was positive. Zero elasticity in 1993 for the overall population can be explained by the lowering of subsidies by the Government on transfer schemes during the post-1991 reforms, resulting in a lowering of demand of the PDS foodgrains, and a reduction in its impact on calorie intake. In his paper, Abhijit Sen (1996) also noted the lowering of government transfers post reforms and the resultant rise in rural poverty in 1993.However, when interacted with the labour household dummy, the coefficient is negative. This points to a very interesting aspect as it shows that the PDS has not benefited rural labour households in terms of nutritional intake. In 2004, the overall calorie intake showed positive elasticity to the PDS but the interaction term with labour households was negative which hints to a possible leakage as it shows that labour households have not been the beneficiaries of the PDS in terms of the nutritional intake when they should have been the major target group. In 2009 and 2011, the coefficient was insignificant though in 2011, it was positive. In this equation, landlessness does not emerge as a significant factor in determining calorie intake. As expected, education shows a negative impact on calorie intake since it is possible that educated households shift to a diversified high-value yet low-calorie basket. Interestingly, when interacted with labour household dummies, the coefficients are insignificant during all the three years, which means that even with access to education, labour households have not significantly shifted towards the consumption of low-calorie food. This means that the shift to low-calorie food is not a preference switch. Similar results have been obtained with regard to the household size—in 1993, the indicator was insignificant, which could be due to the prevalence of poorer labour households, which are usually bigger in size and choose more coarse cereals and less high-value items, but even this indicator proved to be insignificant in the latest round, hinting towards a diversification of the diet within rural labour households. In short, the rural labour households show a shift away from calorie-rich food not because of an increase in their income but because of reduced access to non-market sources of consumption and to the transfer of nutritious foodgrains from the PDS.

In order to comment more precisely on whether a switch to rice- and wheat-based food and away from coarse cereals has occurred even within labour households as a result of the changed composition of grain transfers and lower access to home-grown consumption, an

equation similar to the conditional Engel curves is used only for the sample of rural labourers. The indicators which determine the changes in calorie intake have been regressed on the shares of intake of rice- and wheat-based food and shares of the calorie intake from low-value yet high-calorie, that is, coarse cereal-based food to observe the nature of the coefficients. Here, mainly the signs of the coefficients are observed as it is a very basic regression.

Table 8

Conditional Engel Curves

Year	*Independent Variables*	*Dependent Variables*			
		share_coarse	*share_main*	*share_spl*	*share_oiletc*
1993	log_home	**0.77**	**-2.05**	**0.81**	**0.49**
	log_subsidyn	-0.09	**4.95**	**-2.89**	**-2.03**
	log_MPCE	**-2.17**	**-13.07**	**10.48**	**4.72**
	Dummy_landless	0.72	**-8.17**	**3.56**	**3.96**
	head_edu	**-0.16**	0.22	-0.10	0.04
	HH size	0.08	-0.03	0.10	-0.14
2004	log_home	**1.10**	**-1.61**	**0.24**	**0.29**
	log_subsidyn	**-2.70**	**4.71**	**-0.93**	**-1.10**
	log_MPCE	1.55	**-16.26**	**9.41**	**5.03**
	Dummy_landless	**4.30**	**-6.84**	0.49	**2.17**
	head_edu	-1.23	1.09	**0.80**	**-0.62**
	HH size	0.51	**-0.71**	0.19	0.01
2009	log_home	**0.47**	**-0.50**	-0.05	**0.09**
	log_subsidy	**-3.06**	**6.15**	**-1.89**	**-1.21**
	log_MPCE	**3.10**	**-16.32**	**8.15**	**5.05**
	Dummy_landless	1.14	**-4.56**	**2.13**	**1.28**
	head_edu	**-0.33**	**0.31**	0.06	-0.03
	HH size	0.18	**-0.57**	**0.56**	**-0.17**
2011	log_home	**0.38**	**-0.6**	**0.39**	0.07
	log_subsidyn	**0.59**	-0.11	0.06	**0.35**
	log_MPCE	**1.59**	**-17.05**	**4.54**	**2.27**
	Dummy_landless	**2.07**	**-4.62**	**1.27**	**2.15**
	head_edu	-0.13	0.04	0.04	0.03
	HH size	**0.33**	**-1.3**	0.03	-0.11

Note: Bold numbers= significant at 5% or less.

Source: Computed by the author using NSSO data (1993-2011).

The results (Table 8) imply that with decreasing consumption out of home-grown stock, labour households shifted away from calorie-rich coarse cereals. As the resultant consumption is more from market sources, the households shift to rice- and wheat-based food. The sign of coefficient of home-grown consumption is negative and significant from 1993 to 2011 for the share of calorie-rich food, showing the lowering of home-grown sources of consumption within labour households. Landlessness also shows positive signs for the share of high-calorie food and negative signs for the share of rice- and wheat-based food, implying that the poorer households among the rural labourers do not switch to low-calorie food. Within the labour households, the share of coarse cereals food is not elastic to consumption from the PDS and positively elastic to the MPCE, showing that the decision regarding the consumption

of calories is not need-driven as the need for calories among all labour households should be similar due to the similar nature of the activity performed by their members. The value of the coefficient of the implicit value of the subsidy from the PDS shows a negative sign in high-calorie shares but it was insignificant in 1993 before the advent of the TPDS. This hints to the fact that since the discontinuation of coarse cereals after 1993, rural labour households have not benefited in terms of nutritional intake from in-kind transfers. In 1993, the PDS was not pushing households to rice and wheat consumption but after targeting it has been clearly doing that even for labour households. Thus, changing the nature of the foodgrains consumed through non-market sources like home-grown stock or the PDS affects the calorie intake of labour households.

V. CONCLUSION

The paper observes that as compared to other households, rural labour households have always been deprived in terms of nutritional intake and over time, their average intake has not improved. However, the low nutritional intake is not a result of low demand but rather of a decrease in the access to non-market sources of consumption and changes in the foodgrain type from the erstwhile in-kind transfer of foodgrains that earlier used to provide for a significant calorie intake. The prevalent trends show that over time, consumption from home-grown stock has reduced while sources of calories like edible oil and pulses, which were earlier bought by the labour households from the PDS, are no longer available from the PDS, leading to a decreasing impact on the calorie intake of the labour households. This is also implied by the fact that the elasticity of calorie intake for the entire population to the implicit value of the transfer from the PDS was zero in 1993 and became positive and significant later, whereas when interacted with labour dummies, it is negative first and later insignificant. This implies that the calorie intake of rural labourers has been lower than that of others since they do not receive the benefit of non-market or subsidised sources of consumption. As regards the shares of calorie-rich food, that is, coarse cereals of rural labour households, the implicit value of the transfer from the PDS shows an insignificant impact in 1993 before targeting started, but during all the three years after targeting, the transfers show a negative impact, which means that the PDS after targeting has shifted the consumption basket away from coarse cereals. Since income (MPCE) has a positive impact on the calorie intake, the results imply that it is due to the unavailability of the non-market sources of consumption like home-grown stock or in-kind wages and transfers from the PDS that the rural labour households have shifted to high-value and low-calorie food. This means that the shifting away from high-calorie food is more due to push factors or lack of choice than preference. This would not have been a matter of concern for other occupational categories but it is so for rural labourers since the nature of their activity is still largely manual with increasing casualisation of the workforce in rural India, and, therefore, the low calorie intake would mean an adverse nutritional outcome for the labour class, further lowering their productivity and leading to a poverty-nutrition trap.

From a policy perspective, the study emphasises the importance of PDS and subsidised food transfers and also the provision of more nutritious foodgrains as well as edible oil through the PDS as other non-market sources for the same have become scarce or unavailable over time for the rural labour households. Policy cannot increase the consumption out of home-grown stock but it surely can provide the necessary foodgrains through the PDS or other kinds of food transfers to the labour households.

Notes

1. In their essay, "Is Variety the Spice of Life? Implications for Calorie Intake", Behrman and Deolalikar (1989) argue that as income increases, the reason as to why calorie intake does not increase is because households switch to more valuable and low-calorie rich food. Thus, the relations between food expenditure and calorie intake are also weak. Behrman and Deolalikar also argue against cash transfer, claiming that the extra income gained would be spent on variety not quality.
2. The poverty-nutrition trap (Gaiha, et al., 2009) is a vicious cycle of low nutritional intake due to low productivity resulting in low wages and low nutritional intake.
3. The term 'non-market sources' in this paper refers to the consumption out of home-grown stock and also out of PDS transfers.
4. The term 'rural labour' in this paper refers to households that are engaged in labour activities other than cultivation or services of a regular nature. This includes agricultural labourers, labourers in industries, unskilled construction workers, transport workers such as rickshaw pullers, and sanitation workers. Instead of the use of the household type of NSS, NCO codes of occupation have been clubbed together to create a labour household dummy.
5. A similar method of conditional Engel's Curve was used in Pal, 2013.Although this paper is not strictly relevant here, the methodology used is helpful as a measure of budget share elasticity to non-market sources for calorie intake.

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WORKFORCE PARTICIPATION AMONG THE ELDERLY IN INDIA: STRUGGLING FOR ECONOMIC SECURITY

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In India, ageing is rapidly becoming a major socio-economic concern. The rapidly increasing dependency ratios impose an economic burden on the family. Simultaneously, the State has failed to create an adequate social security network for the vulnerable elderly. In this situation, the labour market remains the only possible means of ensuring security for the elderly. The extent to which the labour market in India has succeeded on this front has been analysed in this study. The main source of data for the article is the National Sample Survey Office (NSSO) unit level data for the 55th (1999-2000) and 66th (2009-10) Rounds. In addition, data from the 60th Round (2004) survey on "Morbidity and Health Care" has also been used.

The study reveals a decline in the workforce participation rate among the elderly over the study period, particularly among the urban and rural males. This is accompanied by a high level of informalisation of the aged workforce. The decline in the workforce participation rate appears more as a deliberate withdrawal from the labour force, caused by rural prosperity and the expansion of employment opportunities in the manufacturing sector between 2004 and 2009, rather than due to forced unemployment. An examination of the occupational profile shows that in rural areas, the elderly workers are concentrated in the primary sector, whereas in urban areas, on the other hand, they are mainly engaged in services. An analysis of the occupational structure and earnings, however, reveals that the aged who continue to work are generally employed in the low-wage sectors. Further, their own wages are lower than the (low) average earnings in these occupational categories. This remains an area of concern that needs to be addressed by policy-makers.

Keywords: *Ageing, Employment, Informal sector, Occupational pattern, India*

I. INTRODUCTION

Ageing of the population is a phenomenon that occurs when the proportion of the aged in the total population increases to over 7 per cent owing to a reduction in fertility and mortality (Prakash, 1999). The United Nations projection indicates that the population aged 60 years and above would grow from an estimated 737 million older persons in 2009 to 2 billion in 2050 (UN, 2009). In particular, the oldest-old group (those aged above 80 years) would grow faster than the other age groups, and would comprise about one-fifth of the total elderly

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population by 2050. Although ageing has emerged as an important issue in European and American countries (Anderson and Hussey, 2000), in recent years, it has also become an important socio-demographic issue in Asia (UN, 2002). India is no exception to this trend, with the total number of elderly persons expected to increase from 70.6 million in 2001 (6.9 per cent of the total population) to 173 million by 2026 (12.4 per cent of the total population) (Subaiya and Bansod, 2011). Estimates by the Planning Commission (2011) indicate that, by 2050, one out of every five persons in India would be aged above 60 years. The increasing 'greying' of the population imposes a greater burden on social security, health services, housing and urban planning, and necessitates fundamental changes in consumption and saving patterns. Increasing feminisation of ageing is another major cause of concern in India (Alam, 2009; Subaiya and Bansod 2011), as they often lack financial security and are dependent to a greater extent on other family members.

In India, the family has traditionally taken care of the elderly; the Maintenance and Welfare of Parents and Senior Citizens Act in 2007 also laid an emphasis on familial care of the aged. The old-dependency ratio (the number of aged as a ratio of the total working population), however, is expected to rise in India (Subaiya and Bansod, 2011). This is likely to increase the pressure on the working population, particularly as more than half of the elderly people are fully dependent on others (Purohit, 2008). Moreover, other factors including the housing shortage, an increasing trend towards nuclear families, the shift from altruistic family-centric values to consumerism and individualism, greater mobility of workers, increasing work pressure and greater participation of women in economic activities has been threatening inter-generational family bonds and reducing the support provided to aged relatives (Prakash, 2005; Husain and Ghosh, 2010; Raju, 2011). While the Government has taken some measures to improve the socio-economic conditions of the economically vulnerable elderly in India—in the form of policies like Annapoorna and the National Old Age Pension Scheme—these policies fall far short of what is required (Purohit, 2008). Given the need to control fiscal deficit, one cannot be sure of the extent to which the Government can scale up expenditure on social security in order to meet the needs of a population with an increasing share of ageing persons. Inadequate social security leads to financial distress, which increases the economic dependence of the elderly and leads to a deterioration in their health status (Alam and Karan, 2011). The incidence of financial insecurity has been found to be greater among the rural elderly, female elderly (particularly widows), the aged residing in nuclear families or alone, and the aged afflicted with health problems (Rajan, et al., 2003).

Given the inability of both the society and the State to ensure the phenomenon of healthy ageing in India, the feasibility of market-based solutions has to be explored. In the long run, for instance, the incentive to increase savings during the working period is a possible instrument for safeguarding the health of the aged. In the short run, however, the participation of the elderly in the workforce may enable them to be economically independent (Vodopivec and Arunatilake, 2011), besides generating non-economic externalities. For instance, participation in economic activities has been observed to improve the self-reported health status of the elderly (Husain and Ghosh, 2010), and to improve satisfaction among the elderly (Chang

and Yen, 2011). Simultaneously, complete retirement leads to an increase in the number of episodes of illness and a decline in mental health of the elderly (Dave, et al., 2008), thereby adversely affecting their well-being (Stutzer, 2004). Given the inadequacy of social security, therefore, the participation of the elderly in the labour force should receive more importance in order for us to understand their economic dependence (Rajan, et al., 2003). The issue of increasing the participation of the aged in the labour market, however, has not received its due attention as governments use retirement as an instrument to provide more employment opportunities to the young (Salem, et al., 2008), even at the cost of increasing the proportion of the elderly who are financially dependent on the State (Walker, 1981).

Most of the research on the elderly in India has tended to focus largely on issues related to health, residential arrangement, social security and ill-treatment (Husain and Ghosh, 2011; Alam and Karan, 2011; Rajan and Mishra, 2011). The few studies that concentrate on the workforce participation of the elderly in India have been essentially descriptive, as they describe trends in employment and wages (Rajan, et al., 2003; Selvaraj, et al., 2011). Analytical works are rare; so far I have been able to trace only works by Alam and Mitra (2012), Pandey (2009), and Singh and Das (2012).

This paper examines the changes in the workforce participation rates (WPRs) and the nature of employment (reflected in the extent of participation in the informal sector and occupational pattern) between the years 1999-2000 and 2009-2010. Data for these two years are available in the 55th and 66th Rounds of the National Sample Survey Office (NSSO) survey on Employment and Unemployment. The choice of these two rounds enables us to examine the impact of changes that have occurred since the sweeping liberalisation of the Indian economy between 1985 and 2000, culminating in the integration of the Indian economy with world markets. This is also the period when India was 'shining' economically and was resilent enough to weather even the petro shocks and the sub-prime crisis. Using bivariate and econometric analysis, we have tried to examine whether growth was inclusive and resulted in a decline of economic vulnerability of aged workers over the decade studied.

II. WORKFORCE PARTICIPATION AMONG THE ELDERLY IN INDIA

On the basis of the Census data, Rajan, et al. (2003) have shown that the workforce participation (WFP) of the elderly in India decreased from 1961 to 1991, with the rural WFP rate being higher than the WFP in urban areas. Disaggregating by gender, they have found that the elderly male participated more in economic activities than the elderly female. Further, elderly workers were increasingly involved in the agricultural sector, with almost 80 per cent of the aged workers being engaged in this sector in 1991.

Selvaraj, et al. (2011) have also analysed the WFP trend in India on the basis of the usual activity status (usual principal status1 and usual subsidiary status2) using NSSO data from 1983 to 2004-05. The total number of elderly workers in India was approximately 7 per cent of the total workforce (Selvaraj, et al., 2011). They have also shown that the WFP rate for the elderly decreased marginally from 42 per cent in 1983 to 39 per cent in 2004-05, mainly due to the growing number of elderly in the higher age group who are less

likely to participate in the workforce. The WFP of the elderly is higher in rural areas as compared to urban areas.

Selvaraj, et al. (2011) also report that the educational attainments of elderly workers is low—more than 70 per cent of the elderly are illiterate, or have not acquired any primary education. This implies that it is economic vulnerabilities which 'force' the aged to work in India. Most of the elderly workers are self-employed, with the proportion of self-employed elderly workers further increasing with age. The incidence of casual employment is higher among the elderly females. In urban areas, significant proportions of the elderly female workers are engaged in regular employment. On the basis of current weekly status3 data of the NSSO, Selvaraj, et al. (2011) have also shown that the real wages of regular and casual workers increased by 60 per cent from 1983 to 2005. Although the elderly are receiving lower income than the non-aged workers, their (aged workers') contribution to the total household income is substantial, amounting to about 4 to 5 per cent, on an average.

Singh and Das (2012) have analysed the determinants of old age wage labour participation and supply in India from 1993-94 to 2009-10 on the basis of the current weekly status data generated by the NSSO. The descriptive analysis shows that the wage labour participation of the elderly from 1993-94 to 2009-10 decreased in urban areas (from 7.45 per cent to 6.01 per cent) but increased in rural areas (from 9.66 per cent to 11.35 per cent). However, the average number of weekly days of work supplied by the working elders decreased in rural areas (from 6.22 per cent to 5.80 per cent) but remained the same in urban areas (6.42 per cent) (Singh and Das, 2012). Econometric analysis undertaken by using the probit regression model indicates that in urban areas, there is a negative relation between the probability of wage labour participation and the age of the elderly. In rural areas, they showed the same result only for the year 1993-94, but for the year 2009-10, they exhibited an insignificant relation. In rural areas, the Scheduled Castes (SCs) and Scheduled Tribes (STs), and in urban areas, the SCs were observed to be participating more than the others in 2009-10. In both the NSS Rounds, females are seen to be participating less than the males in both rural as well as urban areas. They have observed that in both rural and urban areas, the elderly from poorer households exhibit a higher probability of wage labour participation in both the Rounds. They report that education does not play any systematic role in wage labour participation, as the pattern of participation of those having acquired secondary level education and that of a higher educated person is significantly different from that of the illiterate. On the basis of descriptive analysis within econometric analysis, they have found that the elders from smaller families are more likely to participate in the workforce. Using the Heckman sample selection regression, they have found that in 2009-10, in both rural and urban areas, the number of weekly days of work supply by the working population of the elderly does not have any significant relation with their age.

Rajan, et al. (2003) have analysed the elderly WFP only during the pre-globalisation period. Although Selvaraj, et al. (2011) have studied the WFP trend from 1983 to 2004-05, their study is limited to the description of trends and does not involve any analytical work. Only the study of Singh and Das (2012) is analytical. However, it suffers from some

limitations, as delineated below.

1. For instance, they have used data on current weekly status which is not as reliable as (say) principal status, because the reference period is very small (the week preceding the data of survey). The use of the current weekly status increases the probability of unemployment.
2. Another limitation is that Singh and Das (2012) have considered only wage labour. However, unpaid family labour is also important for aged workers. For instance, in the context of rural China, Pang, et al. (2004) report that the elderly tend to participate in the informal sector after withdrawing from the formal labour market. They report that about 62 per cent of the elderly and near-elderly people in rural China are participating in the informal sector, by undertaking activities like household chores and taking care of the grandchildren.

The present study aims to address these deficiencies. Using data on principal status, this study focuses on the changing levels and patterns of the WFP of the elderly in India in recent years as compared to the period just after globalisation. The analysis has been undertaken after disaggregating by place of residence and gender. In addition, an attempt has also been made to examine the nature of employment of the elderly workforce, captured by the extent of informalisation and occupational pattern. The analysis facilitates an assessment of the extent to which the elderly have succeeded in their struggle to secure economic independence through participation in the labour market.

III. DATABASE AND METHODOLOGY

1. Database

The two most important sources of data on the Workforce Participation Rate (WFPR) in India are the Economic Tables of the decadal Census, and the Employment and Unemployment schedule of the NSSO quinquennial survey. The last Census undertaken was in 2011, but as data on employment is yet to be released, the latest Census data on employment is available only for 2001. Further, the Census does not provide data on informal sector. In contrast, NSSO provides unit level data, and the availability of socio-economic information in the NSSO data allows for richer bivariate and multivariate analysis over socio-economic and demographic correlates. Moreover, NSSO provides information on the informal sector. So, we use NSSO data even though it is based on a sample survey. This study uses data from the 55th Round (1990-2000) and the 66th Round (2009-10) surveys of NSSO on the "Employment and Unemployment situation in India". The selection of these two rounds enables us to analyse changes in the WFP of elderly people following the second round of liberalisation in the 1990s.

The sampling design adopted for the two surveys was essentially a stratified multi-stage one for both rural and urban areas. The surveys used the interview method of data collection from a sample of randomly selected households. The first stage units (FSUs) were villages (panchayat wards for Kerala) for rural areas and NSSO Urban Frame Survey (UFS) blocks for urban areas. The ultimate stage units (USUs) were households. In the 55th Round, data

was collected for 7,00,934 individuals. Within this sample, 48,223 persons were aged 60 years and above. In the 66th Round, data was collected for 4,59,784 individuals, among which there were 36,774 individuals aged 60 years or above. Table 1 shows the percentage distribution of the elderly population by sex and place of residence in the 55th and 66th Rounds. The table reveals that the proportion of rural and urban elderly people increased marginally by 0.9 and 1.5 percentage points, respectively, over the study period. If we disaggregate the rural and urban population by gender, a similar marginal increase is observed.

Table 1
Percentage of Elderly Persons in the Population by Place of Residence and Sex

Group	*1999-2000*	*2009-10*
Rural male	7.24	7.87
Rural female	6.95	8.13
Rural	7.10	8.00
Urban male	6.01	7.51
Urban female	7.10	8.52
Urban	6.50	8.00

Source: Calculated from the NSS 55th and 66th Rounds.

2. Some Methodological Issues

Two important macro measures of the decision to work are the Labour Force Participation Rate (LFPR) and the WFPR. The LFPR of elderly people shows the percentage of the elderly population that is in the labour force,4 while the WFPR of elderly people indicates the percentage of the elderly population that is in the workforce.5 Now, a person may be willing to work, but may not be able to find work (unemployed). In that case, the person is deemed to be part of the labour force, but not part of the workforce. This creates a gap between the two measures. In both the Rounds, we have found that the number of unemployed elderly workers are minimal—only 12 (comprising 0.06 per cent of the labour force) and only 35 (comprising 0.30 per cent of the labour force) in the 55th and 66th Rounds, respectively. The low rates of unemployment among the elderly is in keeping with studies reporting that if the aged do not secure work, they tend to withdraw from the workforce (Vodopivec and Arunatilake, 2011)—referred to as hidden unemployment (OECD 2006). The marginal difference between the LFPR and WFPR implies that it does not make much difference whether we look at the LFPR, or the WFPR. Given the trivial nature of the choice, we focus on the WFPR.

In the 55th and 66th Rounds, the persons surveyed were classified into various activity categories on the basis of the activities pursued by them during certain specified reference periods. There were three reference periods for this survey. These are: (i) one year, (ii) one week, and (iii) each day of the reference week. Based on these three periods, three different measures of activity status are arrived at—usual status, current weekly status and current daily status.6 Usual status is determined on the basis of the usual principal activity and usual subsidiary economic activity of a person taken together. Usual status data is a better indicator regarding the presence in the labour market as it looks at the status of the

person over a longer reference period. In the 55th round and 66th round on the basis of usual subsidiary status data we have found only 3.4 per cent and 5.6 per cent elderly people are employed. Such a small percentage is not helpful for meaningful analysis. So, we have taken only the usual principal status data for our analysis.

3. Econometric Models

In this paper, in order to determine the influence of predictor variables on the WFPR of elderly by sex and place of residence, we have used the following model:

$$\begin{aligned} \text{WFORCE} = {} & \alpha + \beta 1\ \text{AGE} + \beta 2\ \text{LPCME} + \beta 3\ \text{LPCME2} + \beta 4\ \text{ILLITERATE} + \\ & \beta 5\ \text{BPRIMARY} + \beta 6\ \text{MIDDLE} + \beta 7\ \text{SECONDARY} + \beta 8\ \text{HIGHER} + \\ & \beta 9\ \text{MUSLIM} + \beta 10\ \text{HSC} + \beta 11\ \text{HST} + \beta 12\ \text{OTHERS} + \beta 13\ \text{UNEMP} \end{aligned} \quad (1)$$

where

WFORCE = 1 if the respondent is a worker, = 0 otherwise
AGE = Age of the respondent
LPCME = Log of monthly per capita expenditure
ILLITERATE = 1 if the respondent is illiterate, = 0 otherwise
BPRIMARY = 1 if the respondent is below primary educated, = 0 otherwise
MIDDLE = 1 if the respondent is middle educated, = 0 otherwise
SECONDARY = 1 if the respondent is secondary educated, = 0 otherwise
HIGHER = 1 if the respondent is higher educated, = 0 otherwise
(PRIMARY, i.e. respondent has primary education, is taken as reference category)
MUSLIM = 1 if the respondent is a Muslim, = 0 otherwise
HSC = 1 if the respondent is a Hindu schedule caste, = 0 otherwise
HST = 1 if the respondent is a Hindu schedule tribes, = 0 otherwise
OTHERS = 1 if the respondent belongs to all others socio-religious identity, = 0 otherwise
(H-OTHERS, i.e. Hindu OBCs and forward castes, is the reference category)
UNEMP = State level unemployment
Region-specific fixed effect are also included, taking CENTRAL as the reference category.

Here the dependent variable—whether the respondent is working or not—is binary. In case of a binary choice model, we use either the logit or probit model.7 Now, one possible problem with model (1) is reverse causality. We know that monthly per capita expenditure level influences the individual's decision to work. On the other hand, if a person participates in economic activities, his/her participation in the workforce increases household income, and hence expenditure. In order to check the endogeneity between the above-mentioned variables, we have used two tests of endogeneity, namely, the Hayashi test8 and the Wu-Hausman9 test (results are reported in the Appendix). Both the statistics are significant at a 1 per cent level of significance (Table A1), so that we can reject the null hypothesis of exogeneity. Given that there is a two-way relation between monthly per capita expenditure level and work participation of the elderly, estimating logit or probit models may lead to biased estimates (endogeneity). To solve this endogeneity problem caused by reverse causality, Arellano (2008) suggests a control function approach using a two step probit model.

Let the initial model be as follows:

$$Y = 1\ (\alpha + \beta X + U \geq 0)$$

$$X = \pi Z + \sigma v V$$

Here $\begin{pmatrix} U \\ V \end{pmatrix} | Z \quad N\left[0, \begin{pmatrix} 1 & \rho \\ \rho & 1 \end{pmatrix}\right]$

In this model, X is an endogenous explanatory variable if $\rho \neq 0$ and exogenous if $\rho = 0$. U is an error term which is correlated with X but not with the instrument Z. Further, E(U) = 0 and E(ZU) = 0. The two step estimation of the model is given below:

Step 1: We have to obtain the Ordinary Least Square (OLS) estimates ($\hat{\pi}$, $\hat{\sigma}_v$) of the first stage equation and then form standardized residual $\hat{v}_i$ = (xi - $\hat{\pi}$ zi)/ $\hat{\sigma}_v$, i= 1,2,.....N.

Step 2: Run an ordinary probit of y on constant, x, and i to obtain consistent estimates of the parameter.[10]

In our study, the functional forms of LPCME and WFPR are hypothesised as follows:

LPCME = f (WFPR, other explanatory variables)

WFPR = g (LPCME, LPCME2, other explanatory variables)

Following the Arellano's control function approach we have to identify an instrumental variable (IV) that affects the LPCME but not the WFPR of elderly. In our model, the instrumental variables are the number of non-aged working members of the family and percentage of elderly members co-residing with their children in the state. We first regress LPCME on the instrument and other variables. Based on this model, we estimate predicted residual and form standardized residual (SRES). As WFPR is the function of LPCME and LPCME2, we have calculated SRES and square of SRES (SRES2). We then estimate WFPR on SRES, SRES2 (in place of LPCME and LPCME2) and other variables to obtain unbiased consistent estimates. This model is estimated for only the aged sample.

One problem with the above model is that it does not incorporate information on the physical ability of the aged respondent and residential arrangements—even though such factors affect the ability of the aged to particpate in the labour market and the economic pressure to work, respectively. As such information is available only in the NSSO Morbidity and Health Care round (60th Round data), undertaken in 2004, we have also estimated a revised model of WFP using this data.

In order to determine the influence of predictor variables on the informal sector participation of the people, we have used the model:

$$\begin{aligned} IFS = \alpha + \beta 1\ LPCME + \beta 2\ LPCME2 + \beta 3\ UNEMP + \beta 4\ ILLITERATE + \\ \beta 5\ BPRIMARY + \beta 6\ MIDDLE + \beta 7\ SECONDARY + \beta 8\ HIGHER + \\ \beta 9\ MUSLIM + \beta 10\ HSC + \beta 11\ HST + \beta 12\ OTHERS \end{aligned} \quad (2)$$

where,

IFS = 1 if the respondent participating in the informal sector, = 0 otherwise

Other variables are same as (1).

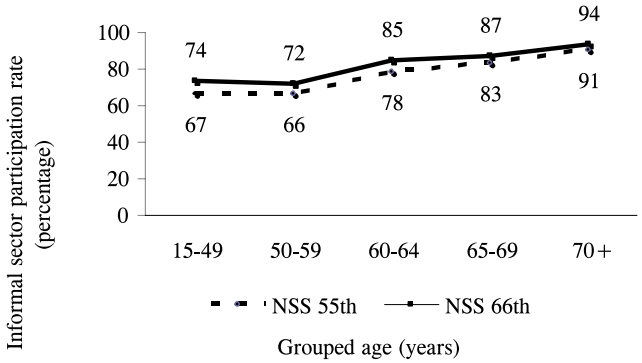
IV. RECENT CHANGES IN THE WFPR IN INDIA

In India, the WFPR of elderly people decreased from 39 per cent (1999-2000) to 32 per cent (2009-10)—a decline of seven percentage points over the study period. Selvaraj, et al. (2011) had argued that the declining trend in the WFPR of the elderly in India is due to a decrease in the WFPR among the urban elderly, who are less likely to participate in the workforce. However, Figure 1 shows that the WFPR decreased for all the groups (rural male, rural female, urban male, urban female) over the study period. The greatest fall in the WFPR is observed among the urban elderly males (a decline of nine percentage points), followed by that among the rural male elderly (a decline of eight percentage points). The least decline is observed among the urban females (a decline of two percentage points). The pooled regression results (taking the NSS 55th and 66th Rounds together, and incorporating a TIME dummy to capture between-round changes in the work participation) also confirms that the WFPR decreased in the 66th Round, compared to the 55th Round, for all groups (Appendix Table A2). [11]

The moot question is whether this decline is the result of a deliberate withdrawal from the labour force, or whether it can be attributed to factors like declining job opportunities, poor health, lack of skills commensurate with modern production techniques, and inconvenient public transport, among other things (Pandey, 2009). In times of distress, both the work participation rates of females, children and elderly people, and unemployment increase as the demand for jobs increases at a higher rate than the creation of job opportunities (Himangshu, 2011). Given that the unemployment rate of the elderly population was marginal in both the Rounds, the declining WFPR is likely to be a result of a withdrawal of the aged from the workforce.

Figure 1

WFPR of the Elderly in the 55th and 66th Rounds of NSS



Source: NSS 55th and 66th Rounds.

The reduction in the supply of labour with regard to the elderly may be a response to a change in real earnings or it may be due to general prosperity, particularly in rural areas. Abraham (2009) found that the WFPR of the rural elderly population increased between 1999-2000 and 2004-05 due to a decline in the earning capacity of normal income-earners. Over a longer time period (1999-2000 and 2009-10), however, the daily average real earnings

of non-elderly people (in both rural and urban India) has increased.12 This may be one of the reasons for the declining participation of the elderly in the workforce in rural and urban India. In particular, populist Government policies before the 2009 General Elections (like waiver schemes) and the success of various programmes including the Mid Day Meal Scheme (MDMS), the Mahatma Gandhi National Rural Employment Guarantee Scheme (MNREGS) and the Public Distribution System (PDS) buffered the Indian economy from the adverse effects of the global economic crisis on the Indian economy and the drought of 2009 (Himangshu, 2011; Khera, 2006; 2011).

1. Changes in the WFPR across Socio-economic Strata

Obviously the socio-economic implications of a decreasing WFPR would depend upon which socio-economic stratum has experienced the greatest decline in WFPR over the two rounds. In this section, we analyse changes in the WFPR across expenditure groups. In order to analyse the work participation of the elderly belonging to different expenditure groups, we have taken quintile divisions of the monthly per capita expenditure. The five groups are labelled as follows: Poorest, Poor, Middle, Rich and Richest. Table 2 shows that the WFPR of rural males increases over quintile groups, while that of the remaining gender-residence groups (rural female, urban male and urban female) decreases. The results also reveal marginal changes in the WFPR over the two rounds for most of the quintile groups. Only among rural males (top 20 per cent) and urban males (top 40 per cent) has the decline in the WFPR been greater than four percentage points.

Table 2
WFPR of the Elderly by Expenditure Group, Sex and Location of Residence in the 55th and 66th Rounds of the NSS (Percentage)

Gender and Place of Residence	*Round*	*Expenditure Group*				
		Poorest	*Poor*	*Middle*	*Rich*	*Richest*
Rural Male	NSS 55th	56.9	59.8	63.5	64.9	65.8
	NSS 66th	57.6	60.7	61.4	63.6	58.6
	Difference	0.8	1.0	-2.0	-1.4	-7.2
Rural Female	NSS 55th	17.1	16.1	15.8	15.3	13.4
	NSS 66th	15.0	15.3	15.4	17.8	14.4
	Difference	-2.1	-0.9	-0.4	2.5	1.1
Urban Male	NSS 55th	45.0	44.0	40.1	39.0	32.3
	NSS 66th	43.0	44.0	38.8	33.3	28.3
	Difference	-2.0	-0.1	-1.2	-5.7	-4.1
Urban Female	NSS 55th	13.1	10.0	8.0	5.0	3.2
	NSS 66th	10.2	10.7	8.4	5.1	3.1
	Difference	-2.9	0.7	0.4	0.1	-0.1

Source: Calculated from the NSS 55th and 66th Rounds.

2. Econometric Analysis

One limitation of the bivariate analysis is the failure to control for variables like socio-religious identity, geographical zone of residence, and other determinants of the WFP.

In order to remedy this deficiency, we have estimated the multivariate regression model, using the methodology described in Section III, to identify determinants of the WFP. Table 3 presents results of the regression model for determinants of the WFP of the rural male, rural female, urban male and urban female elderly. In all eight models, the LR 2 statistic is significant, indicating that the overall models are significant.13 The pseudo R2 values show that all the independent variables explain 13 to 16 per cent of the variations in the dependent variables. These are acceptable given that we are using cross-sectional data.

The results reveal, predictably, that the WFP declines with age. In rural areas, the WFP increases with the household expenditure levels, but at a decreasing rate. In contrast, in urban areas, elderly persons from affluent families are less willing to re-enter the labour market, possibly because they enjoy economic security. Larger families have more potential working members, in general; this reduces pressure on the elderly persons to work. The impact of education varies, depending upon the gender of the respondent. Among aged male workers, the WFP initially rises, but subsequently declines with education—an inverse U-shaped curve is observed; in the case of female aged workers, we observe a negative relationship between the WFP and education. In urban areas, however, aged women with more than 12 years of education are more likely to be found to be working, in both the Rounds. In general, Hindu upper castes tend to have a higher WFP than aged members from other socio-religious groups. There are, however, several exceptions—urban female Muslims (55th Round), female SCs

Table 3
Determinants of WFP of the Elderly in the 55th and 66th Rounds—All-India, by Place of Residence and Gender

Variable	*Rural Male*		*Rural Female*		*Urban Male*		*Urban Female*	
	NSS 55th	*NSS 66th*	*NSS 55th*	*NSS 66th*	*NSS 55th*	*NSS 66th*	*NSS 55th*	*NSS 66th*
AGE	-0.03*	-0.03*	-0.01*	-0.02*	-0.02*	-0.03*	-0.005*	-0.004*
LPCME	0.03*	0.03*	-0.02*	0.004*	-0.004*	-0.01*	-0.03*	-0.01*
LPCME2	-0.01*	-0.02*	-0.001*	-0.01*	-0.001*	0.01*	-0.001*	-0.001*
HHSIZE	-0.01*	-0.01*	-0.02*	-0.02*	-0.005*	0.001*	-0.01*	-0.01*
UNEMP	0.10*	-0.01*	-0.39*	-0.003*	1.04*	0.01*	0.02*	-0.0002*
Education Level (Ref. Cat. Primary)								
ILLITERATE	-0.07*	-0.12*	0.03*	0.02*	-0.02*	-0.01*	0.02*	0.01*
PRIMARY	-0.03*	-0.08*	0.03*	-0.01*	-0.01*	-0.04*	-0.004*	0.01*
MIDDLE	-0.05*	-0.05*	0.02*	-0.03*	-0.04*	-0.03*	-0.004*	-0.01*
SECONDARY	-0.22*	-0.18*	-0.04*	-0.08*	-0.16*	-0.16*	-0.02*	-0.03*
HIGHER	-0.16*	-0.31*	-0.07*	-0.10*	-0.22*	-0.24*	0.08*	0.01*
Socio-religious Identity (Ref. Cat. HINDU OTHERS)								
MUSLIM	-0.03*	-0.01*	-0.03*	-0.06*	-0.0003*	-0.02*	0.01*	-0.005*
HSC	-0.06*	-0.04*	0.02*	0.01*	0.03*	-0.34*	0.06*	0.03*
HST	0.04*	-0.02*	0.09*	0.06*	-0.003*	-0.12*	0.06*	0.05*
OTHERS	-0.01*	0.003*	-0.01*	-0.03*	-0.02*	-0.01*	0.0001*	0.001*
Region-specific Fixed Effect (Ref. Cat. CENTRAL): Included in All Models, but not reported								
PSEUDO R2	0.14	0.16	0.15	0.15	0.10	0.13	0.16	0.16

Note: * denotes significance at 1%.

Source: Calculated from the NSS 55th and 66th Rounds.

(in both rural and urban areas, and in both Rounds), rural male STs (55th Round), female STs (in both rural and urban areas, and in both Rounds), and other minorities (rural males in the 66th Round, and urban females in both Rounds).

In the next step we extend the above model by incorporating:

1. Physical health of the aged respondents, determining their ability to particpate in the labour market. This is captured by the mobility of the respondents and freedom from chronic ailments; and,
2. Economic pressure on the aged to rejoin the workforce after retirement captured through economic independence and residential arrangements.

We have, therefore, run a revised model of the WFP by using the NSSO Morbidity and Health Care (60th Round, 2004), which has all this information. The only instrument taken is the number of non-elderly workers, while additional variables in the form of residential arrangements, mobility of the respondent, whether the respondent suffers from chronic ailments, and the economic independence of the respondent are incorporated in the second stage model. The results are reported in Table 4.

Table 4
Determinants of WFP of the elderly in the 60th Round—
All-India by Place of Residence and Gender

Variable	*Rural Male*	*Rural Female*	*Urban Male*	*Urban Female*
Mobility of respondent: Ref. Cat. Immobile				
Mobile	0.29*	0.06*	0.21*	0.02*
Freedom from chronic ailment: Ref. Cat. No ailment				
Chronic	-0.05*	-0.02*	-0.05*	-0.01*
Economic independence of the respondent: Ref. Cat. Economically dependent				
Economic independence	0.38*	0.16*	0.34*	0.12*
Living arrangement (Ref. Cat. Living with spouse or with spouse and others)				
Living with child but not spouse	-0.07*	-0.04*	-0.05*	-0.02*
Living with others including grandsons	-0.22*	-0.02*	0.05*	-0.01*
Living with others but not grandsons	-0.09*	-0.02*	0.04*	-0.01*
Other control variables	YES	YES	YES	YES
Pseudo R2	0.23	0.10	0.20	0.20

Note: * denotes significance at 1%.

Source: Calculated from the NSS 60th Round.

The results (Table 4) indicate that the physical health of the respondent—captured through mobility and chronic ailments—is an important determinant of the decision to work. In both cases, the expected signs (positive and negative, respectively) are obtained. It is also observed that economically independent aged persons generally withdraw themselves from the labour force. This may be attributed to the economic security enjoyed by such persons, which reduces the economic pressure on them to work. An analysis of the impact of the residential arrangements reveals that elderly persons residing with their spouses (with or without other relatives) are, in general, more likely to work.

The analysis in this section indicates that the elderly belonging to low-income households might not have been adversely affected by changes in the economic conditions or in the labour market. However, before arriving at a firm conclusion, we must also examine the quality of employment. In this study, the quality of employment is captured by the extent of informalisation and the occupational pattern.

V. THE INFORMAL SECTOR AND THE ELDERLY

The quality of employment may be captured throgh different indicators. One of these indicators is the extent of informalisation of the workforce. The concept of the informal sector was first propounded by the social anthropologist Keith Hart (1970), and popularised in the ILO report on employment in Kenya (ILO, 1972). The informal sector primarily comprises the urban self-employed labour force and those engaged in household production enterprises. It is not recognised by the Government, which is why its economic activities are not included within the national income statistics; nor is this sector subject to regulations or provided Government support (De Soto, 1989), despite its substantial coverage. This makes entry or exit easy and imparts flexibility in the operation of informal sector units. Consequently, the informal sector has been viewed as a refuge of reserve labour in urban areas. Further, early studies argued that, given its unregulated nature, employers in the informal sector were able to retain informal labour at low wages, without providing social security and good working conditions.

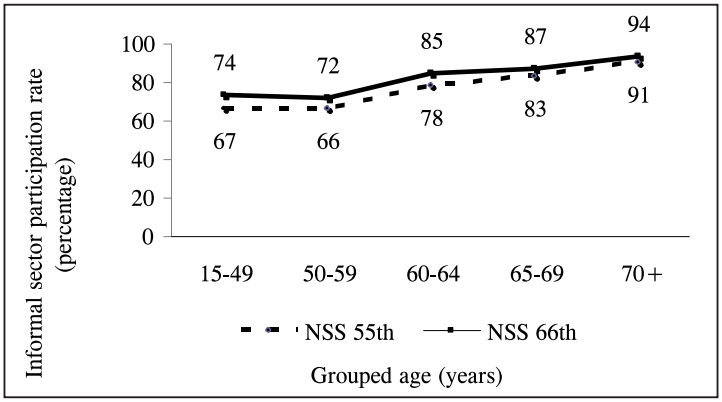
While initial researchers equated the informal sector with traditional and low-end technology, it has now been recognised that certain segments of the informal sector are capable of considerable adaptation. In particular, globalisation has resulted in economic integration of the formal and informal sectors, resulting in the emergence of a dynamic, rapidly growing and profitable segment within the informal sector (Arye, 1981). Thus, mere employment in the informal sector need not imply that the worker is in distress—as the experience of East Asian countries shows (Fields, 1990; Lubell, 1991; Charmes, 1998)—and educated workers may deliberately join the dynamic segment of the informal sector to earn decent wages. Therefore, the occupational distribution—which we will consider in Section VI—is also important.

1. Trends in Informalisation in India

In India, the informal sector is the largest employment-providing sector (Sakthivel and Joddar, 2006). Given that the population and workforce now contain a greater share of aged persons, we would expect the extent of informalisation to increase over time. As expected, we find that the proportion of workers aged 15 years and above who are engaged in the informal sector, grew from 67.59 per cent in 1999-2000 to 74.57 per cent in 2009-10. An analysis of the participation of the workforce14 in the informal sector reveals a positive relation between age and informal sector participation in both the Rounds (Figure 2). This is not surprising, given that full-time employment in the public sector is possible only up to 60, or at most, 65 years of age. More important is the fact that informalisation has increased over the study period for all age groups. The increasing informalisation of the

elderly workforce may simply be due to the increase in the number of workers aged above 65, or even 70, years. As the number of avenues for employment in the formal sector is limited for such workers, the increasing proportion of 'middle-old' (persons aged 70-80 years) in the population and workforce should result in an increase in the proportion of informal sector workers among the elderly. While the data does show an increase in the proportion of workers aged 65 years and above, it also reveals the increasing informalisation of workers in the 60-65 year age bracket by about 6 per cent. While this result may be attributed to jobless growth in the Indian economy, which has been squeezing out the elderly from the formal sector, such an explanation overlooks recent trends in employment in India. Studies report that while the growth rate of organised sector employment declined from 0.4 per cent per annum during the period 1994-2000 to -1.1 per cent in 2004-05, it subsequently increased to 0.7 per cent in 2005-08 (Papola, 2013). Goldar (2011) found the size of the organised manufacturing sector to have increased at the rate of 7.5 per cent per annum between 2003-04 and 2008-09; similar findings have also been reported by Himangshu (2011). What is more likely, therefore, is that the increasing integration of the formal and informal sectors has led to the creation of job opportunities and an increase in real earnings in the latter.15 Given the easy nature of entry into the informal sector labour force, this has led to aged workers from low-income households flowing to this sector for the purpose of augmenting household income.

Figure 2
Informal Sector Participation of Different Age Groups in India in the NSS 55th and 66th Rounds



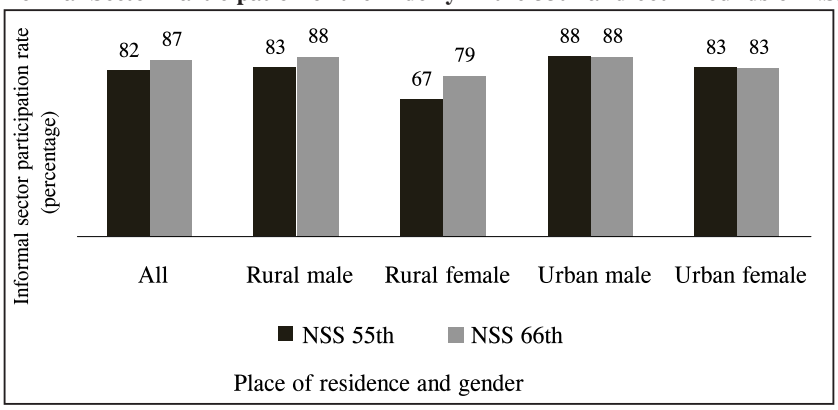
Source: NSS 55th and 66th Rounds.

Figure 3 presents the results of informalisation among the elderly workforce by disaggregating the place of residence and gender. Given the disadvantaged position of women in the labour market in most parts of the developing world—the result of long-standing societal norms which discourage the social and economic integration and advancement of women—a majority of the female workers are engaged in the informal sector (Sethuraman, 1998). This has also been observed in India (Figure 3). We also find that informalisation has increased among the rural male and rural female workers by 6 and 12 percentage points,

respectively. In contrast, the informal sector participation of elderly workers of both genders has remained about the same in urban areas in both the Rounds.

Figure 3

Informal Sector Participation of the Elderly in the 55th and 66th Rounds of NSS



Source: NSS 55th and 66th Rounds.

Econometric anlysis16 indicates that the variable TIME is significant and negative for rural males and urban females at a 1 per cent level; it is statistically insignificant for rural female and urban male workers (Appendix Table A3). This is in contrast to the results of the bivariate analysis reported in Figure 3, wherein we had seen that informalisation had increased among the elderly in rural areas but had remained the same in urban areas. Econometric results are consistent with only the bivariate results for urban male workers. In the case of the remaining three groups, changes in the demographic and social structure may have masked the true change in informalisation. The coefficient is particularly high for urban females, indicating that they have been the biggest losers. This may have happened because the aged female workers are in a disadvantageous position, which prevents them from competing with other workers—both younger females and elderly males—who are more capable of adjusting themselves to the demands of the technology and organisational forms emerging in the informal sector (Jhabvala and Sinha, 2002).

An analysis of the changes in the level of informalisation among urban males by expenditure levels (Table 5) reveals a sharp increase in informalisation among the first three expenditure quintiles (bottom 60 per cent of the sample) in rural areas. The trend is less clear in urban areas. Among male workers, the phenomenon of informalisation has changed only marginally. The percentage of female workers engaged in the informal sector has increased by 10 per cent in the top quintile. This may indicate a shift to household-based part-time jobs by women from affluent households. On the other hand, there has been a decline in the share of women workers in the informal sector from the bottom quintile group. Given the vulnerability and poor health status of elderly women (Eapen, 2001), this may reflect their inability to continue working. Another possibility is that these women may shift to household activities like looking after their grandchildren, cooking, and similar chores, thereby facilitating the entry of younger and more productive women into the labour market.

Table 5
Informal Sector Participation of the Elderly by Expenditure Quintiles in the 55th and 66th Rounds of NSS

Expenditure Group	*NSS 55th*	*NSS 66th*	*%age change*	*NSS 55th*	*NSS 66th*	*%age change*
	Rural Males			*Urban Males*		
Poorest	70.13	78.61	12.1	82.77	85.00	2.7
Poor	75.17	84.81	12.8	90.08	85.82	-4.7
Middle	80.66	88.40	9.6	88.23	90.46	2.5
Rich	86.47	90.90	5.1	89.25	90.48	1.4
Richest	91.27	94.18	3.2	91.04	89.46	-1.7
	Rural Females			*Urban Females*		
Poorest	51.25	69.70	36.0	78.75	72.66	-7.7
Poor	61.60	75.82	23.1	82.83	88.28	6.6
Middle	65.82	77.13	17.2	84.27	81.36	-3.5
Rich	71.83	82.26	14.5	91.07	87.01	-4.5
Richest	83.47	86.01	3.0	82.28	90.57	10.1

Source: Calculated from the NSS 55th and 66th Rounds.

2. Determinants of Informalisation

Table 6 presents the results of the probit model of determinants of informal sector participation only for the aged workers.

Regression results reveal the existence of an inverse U-shaped relationship between education and informalisation among male workers. While Lubell (1991) had noted that informal sector workers in South Asia had very low levels of education, it appears that a new trend is emerging with the informal economy in India converging towards that of the South-east Asian economies.17 Aged male workers with middle and secondary level education may be able to secure jobs in the dynamic, productive and lucrative 'upper-tier informal sector' (Fields, 1990; Charmes, 1998), while respondents with even higher education levels are able to access jobs in the formal sector. On the other hand, urban females with 5–8 years of schooling seem to be more suited to find jobs in the urban informal sector.

Male workers from affluent households seem to find it easier to enter the informal sector. This is another indication of the dynamic nature of the informal sector. Expectedly of course, the supply of labour to the informal sector tapers off at high levels of household expenditure. This possibly reflects a withdrawal of labour from affluent households as the savings made during their working period may provide them with the necessary economic security; their children also may be in a position to provide for their economic needs.

One important finding is that the workers from the disadvantaged castes are participating less in the informal sector than their counterparts from among the Hindu upper class. This may be because of reservation. However, the probability of a Muslim male participating in the informal sector is significantly higher than that of a Hindu upper caste worker in urban areas. This is in keeping with studies of the Muslim community (GoI, 2006). Over time, the participation of Muslim female workers in the informal sector has gone down (coefficients fall from 0.06 to -0.16). This may be attributed to a fall in the demand for items produced by household-based women workers, with such items being produced in factories. It may also

Table 6
Determinants of Informal Sector Participation of the Elderly People in the 55th and 66th Rounds of NSS

Variable	*Population Aged 60 Years and above*							
	Rural Males		*Rural Females*		*Urban Males*		*Urban Females*	
	NSS 55th	*NSS 66th*	*NSS 55th*	*NSS 66th*	*NSS 55th*	*NSS 66th*	*NSS 55th*	*NSS 66th*
LPCME	0.59*	0.52*	-1.00*	1.33*	0.38*	0.45*	-0.24*	1.12*
LPCME2	-0.03*	-0.02*	0.11*	-0.07*	-0.02*	-0.03*	0.02*	-0.07*
HHSIZE	0.03*	0.03*	0.05*	0.06*	0.01*	0.02*	0.01*	0.01*
UNEMP	-1.07*	0.02*	0.50*	0.005*	0.06*	0.003*	0.47*	0.01*
Education Level (Ref. Cat. PRIMARY)								
ILLITERATE	-0.12*	-0.08*	-0.06*	-0.08*	-0.04*	-0.07*	-0.45*	-0.10*
BPRIMARY	-0.04*	-0.02*	0.13*	-0.12*	-0.003*	-0.02*	-0.93*	-0.08*
MIDDLE	-0.004*	0.02*	0.22*	0.05*	0.03*	-0.06*	-0.93*	0.18*
SECONDARY	0.08*	0.10*	-	-	0.03*	0.02*	-0.92*	-0.30*
HIGHER	-0.01*	-0.03*	-	0.17*	-0.001*	-0.05*	-0.95*	-0.20*
Socio-religious Identity (Ref. Cat. HINDU OTHERS)								
MUSLIM	-0.05*	-0.08*	-0.18*	-0.005*	0.04*	0.05*	0.06*	-0.16*
HSC	-0.22*	-0.15*	-0.25*	-0.26*	-0.08*	-0.08*	-0.06*	0.49*
HST	-0.04*	-0.09*	-0.07*	-0.04*	-0.03*	0.43*	-0.06*	-0.02*
OTHERS	-0.12*	-0.16*	-0.12*	-0.18*	0.01*	-0.03*	-0.08*	-0.07*
Region specific fixed effect Included (Ref. Cat. CENTRAL)								
PSEUDO R2	0.18	0.16	0.18	0.19	0.08	0.07	0.14	0.13

Note: The variable SECONDARY and HIGHER in the 55th Round and SECONDARY in the 66th Round for the rural female elderly population predicts success perfectly. These variables are dropped in the result. * denotes significance at the 1% level.

Source: Calculated from the NSS 55th and 66th Rounds.

reflect the incapability of the latter to adjust themselves to the demands of the technology and organisational forms emerging in the informal sector (Jhabvala and Sinha, 2002) due to lower levels of education and social restrictions on movement and interaction. The participation of female SC workers in the urban informal sector has also gone up sharply.

Among other findings are the facts that aged workers from larger households are more likley to join the informal sector, and that the prevalence of high levels of unemployment in the state are is more likely to push aged workers towards the informal sector.

VI. OCCUPATIONAL STRUCTURE

Our analysis indicates so far that the WFPR of the aged has decreased as a result of rural prosperity. The extent of informalisation, on the other hand, has either increased (in rural areas) or remained the same (urban areas). Given that real earnings have increased in the informal sector, this need not necessarily be an alarming development. However, before arriving at a conclusion on this issue, it is necessary to examine the occupational pattern of elderly workers. Two questions become important in this context: is there any substantial level of segregation in occupational choice between the elderly and near-elderly workers? The absence of segregation would indicate that workers probably choose to remain in the same occupation after crossing 60 years. As part of the second step, we will identify the

sectors wherein aged workers are concentrated and examine whether these are high-earnings or low-earnings sectors.

1. Occupational Segregation

Occupational segregation refers to the inequality in the concentration of two groups (here, the elderly and near-elderly) of workers in different occupational categories. An analysis of occupational segregation helps us to determine the objective and subjective status of aged workers and to trace the reasons for differences between the wages earned by the aged and near-aged workers. A commonly used measure of occupational segregation, suggested by Duncan and Duncan (1955), is:

$$D = \frac{1}{2}\sum_{i=1}^{n}\left|\frac{p_i}{P} - \frac{r_i}{R}\right|$$

When pi is the number of workers from the first group in ith occupation, ri is the number of workers from the second group in ith occupation, and P and R are the respective group sizes. D ranges from zero to one, while a higher value for the index shows a higher degree of segregation.

Given that D is not sensitive to occupational distributions, Hutchens (2004) computes an alternative measure of segregation, called the 'square root' segregation index. This measure facilitates the additive decomposition of segregation, allowing us to define segregation as the summation of 'between group segregation' and 'within group segregation'. Let Pj be the number from social group A (elderly) in unit j and Rj be the number from social group B (near elderly) in unit j, and P and R be the total number of observations in groups A and B. The square root segregation index S is defined as:

$$S = 1 - \sum j \sqrt{[\{Pj/P\} * \{Rj/R\}]}\ j = 1,2,.....J$$

Or equivalently:

$$S = \sum j\ Cj \text{ Where } Cj = Rj/R - \sqrt{[\{Pj/P\} * \{Rj/R\}]}$$

'S' represents the summation of each unit's shortfall from distributional equality. For each value of occupation, this shortfall is the difference between the geometric mean of the shares of individuals with different backgrounds characterised by group of age when there is no segregation, and the geometric mean of the actual shares.

Table 7 reports occupational segregation between the above two groups of workers, that is, the elderly and near-elderly, in each Round—disaggregating the sample by place of residence and gender. We present results for both the two-digit and three-digit classification systems. Changes are marginal—with an increase being observed in rural areas, and a decrease in urban areas. The low value of the segregation index suggests that aged workers continue to use their skills and experience by remaining in the same occupation after 'retirement'—as the econometric results suggest, they only shift from the formal to the informal sector. Given that the latter is typically an unregulated sector, this would allow employers to exploit the skills and experience levels of elderly workers by offering them wages below the market rate.

Table 7
Occupational Segregation between the Elderly and Near-elderly

Classification Digit	*Group*	*Duncan Index*		*Hutchens Index*	
		NSS 55th	*NSS 66th*	*NSS 55th*	*NSS 66th*
2-digit Classification	Rural male	0.18	0.23	0.03	0.05
	Rural female	0.04	0.07	0.01	0.02
	Urban male	0.27	0.27	0.06	0.06
	Urban female	0.25	0.23	0.08	0.07
3-digit Classification	Rural male	0.21	0.24	0.06	0.06
	Rural female	0.08	0.09	0.03	0.03
	Urban male	0.39	0.31	0.15	0.10
	Urban female	0.34	0.30	0.16	0.11

Source: Calculated from the NSS 55th and 66th Rounds.

2. Occupational Structure and Earnings

As part of the last step of our analysis, we have examined the occupational pattern of the elderly sectors to identify the sectors wherein they are concentrated. We then estimate the average earnings of all workers in each occupational category to find out whether the occupations wherein the elderly workers are concentrated are high-earning or not. The tables are reported in Appendix (Table A4-A7). In the top panels of the tables, we have listed occupations (as per the two-digit NCO 2004 classification) where at least 2 per cent of the elderly workers are concentrated; this is followed by another panel, giving information for the remaining occupations. Corresponding to each occupation, we have given the proportion of aged workers and mean daily earnings of all workers.

Tables A4 and A5 present changes in the occupational structure of aged workers in rural areas. Both male and female rural workers are predictably concentrated in the primary sector (83 and 85 per cent workers, respectively, in 1999-2000). This is important as engagement in occupations in the primary sector, where food is directly produced, ensures a minimum level of security and protection against hunger. While the concentration in primary sector persisted in 2009-10, the proportion of aged workers in such occupations declined by 10 and 7 percentage points, respectively. This implies an increase in the vulnerability of elderly workers. In contrast, the aged elderly workers in urban areas are found to be concentrated in the service sector. In recent years, the percentage of workers in services has declined for both male and female workers.18 Another important point to be noted about the occupational structure is that most of the occupations wherein aged workers are concentrated are low-earning occupations. In the tables, the top ten earning occupations in each Round are shaded grey. It is easy to see that very few of the occupations with more than 2 per cent of the aged workers belong to the high-earning categories. This is an issue of concern. Interestingly, within the low-paying sector, the earnings of elderly workers (given in parantheses) are not necessarily below those of the average earnings in each occupational category. In several occupational categories, the elderly workers are earning more than the average payments in these occupational categories, while in some occupations, the gap between the average earnings and earnings of elderly workers is marginal. Variations in the earnings of aged

workers and the wage gap between the elderly and near-elderly workers across occupational categories requires greater in-depth analysis.

VII. CONCLUSION

As developments in the health sector prolong the life-cycle, the issue of meeting consumption and health needs of the aged becomes an increasingly important issue. In European and North America countries, the emergence of the concept of the welfare state has resulted in the creation of a social security system in many of these countries which ensures a minimum level of physical well-being for the elderly. Moreover, the realisation that longevity is increasing has also led to changes in the work and savings patterns which complements the efforts of the State. In developing countries, on the other hand, policies targeting the elderly from low-income households have failed to attain their objectives. This calls for other substitutes to protect the aged population from destitution and poverty. One such instrument is the labour market.

Our analysis finds a decline in the WFPR among the elderly. This is accompanied by a high level of informalisation of the aged workforce. This may be interpreted as a matter of concern, particularly if we take the Lewisean view of the informal sector as a traditional, low-productive and stagnant sector. However, when we take into account the effects of rural growth and expansion of employment opportunities in the manufacturing sector, the decline in WFPR appears more as a deliberate withdrawal from the labour force, rather than forced unemployment. Moreover, recent studies have pointed out that the informal sector is not homogeneous, but may contain a highly vibrant and productive segment with close links to the formal sector. If by using their skill and experience, aged workers are able to secure work in these sectors, the growing informalisation need not necessarily be alarming.

A study of the occupational structure and earnings can shed some light in this regard. Such an analysis reveals that aged workers are employed in sectors that are typically low-earning. However, contrary to expectations, their wages are not always lower than the average earnings in these occupational categories. Although this is a positive feature of the informal sector in India, further analysis, particularly that based on micro-studies, is necessary to substantiate such findings and allow us to conclude that the condition of aged workers has improved.

We should also note that our study period is only up to 2009-10. The study focuses on a period during which populist measures like the loan waiver schemes and programmes to ensure inclusive growth like PDS, MNREGA and MDMS were in full swing. However, it was also at this time that the economy was approaching the doldrums. Inflation was entering into double digits, while industrial and overall economic growth would soon start their slump. This would be followed by troubles in the external sector—persistent Current Account deficit followed by a decline in Foreign Institutional Investment (FII) and devaluation of the rupee. All these had an adverse effect on the economy, which would be reflected in the labour market. Extending the study period to the next major NSS Round may, therefore, find the bell tolling for the elderly workers. In such circumstances, the market would become an

unreliable substitute of the Government-provided social security network unless compensatory policies were adopted.

One of the tenets of globalisation was the increasing non-involvement of the State in the market and economy. This trend must not be confused with distancing the State from the social sector. In the context of the growing proportion of elderly persons in India's population, public policy must be targeted to reduce structural rigidities obstructing the entry of elderly workers into the labour market. Simultaneously, employers should be encouraged to discard the notion that elderly workers have outdated skills and low capability for adaptation and appreciate that the experience, skill and loyalty of such workers can make them a valuable asset. This realisation would motivate employers to modify job specifications and operations, and redesign work to facilitate the employment of aged workers. In this context, it should be kept in mind that aged workers are easily stressed, particularly as their working conditions are poor (OECD, 2006). While regulations to improve working conditions should be introduced, a potential solution to reduce work-related stress is to offer elderly workers flexible working hours in the form of part-time employment. Although this may lead to co-ordination problems within the workforce, the lower wages paid to elderly workers can compensate for such co-ordination costs. Another challenge before the State is to increase the substitutability between elder and younger workers. Although Goldin and Katz (2007) have shown that older workers are rapidly becoming closer skill substitutes for their younger counterparts, a similar trend is yet to be observed in India. This makes training an important issue. Although older workers are reluctant to enter training programmes, the increasing duration of working careers may help them overcome such reluctance—especially if it increases their flexibility with respect to occupational choice. Finally, investment in the health of the elderly workers is an important challenge before policy-makers. Poor health is a major reason for the withdrawal of the elderly from the labour market (Currie and Madrian, 1999). On the other hand, the aged from low-income households may be forced to work for monetary reasons, which is likely to aggravate their poor health. An important challenge before the State is thus to ensure healthy ageing through a public health policy which caters to the needs of the elderly. This would increase the motivation of the aged to work, while also reducing their dependence on the State social support system.

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Notes

1. If an individual is identified as a worker for the major part of the year, he/she is categorised as a worker on the basis of usual principal status.
2. If an individual is identified as a worker only for a minor part of the year, he/she is categorised as a worker on the basis of subsidiary status.
3. It is the activity status obtaining for a person during a reference period of seven days preceding the date of the survey.
4. Labour force includes persons who are working and those who are willing to work but may be currently unemployed.
5. Workforce includes persons who are currently working.
6. This activity status for a person is determined on the basis of his/her activity status on each day of the reference week.
7. In recent years, Linear Probability Models (LPM) have re-emerged as the latest fashion. The fundamental weakness of LPM is its underlying assumption that the probability of the event occurring increases linearly with the level of regressor. This may result in values of probability being greater than unity or less than zero. In addition, the assumption of homoscedasticity is often violated in LPMs.
8. Hayashi (2000) suggests the use of a C statistics (also known as a 'GMM distance' or 'difference in Sargan' statistic). This is defined as the difference of the Sargan–Hansen statistic of the equation with the smaller set of instruments (valid under both the null and alternative hypothesis) and the equation with a full set of instruments (that is, including the instrument whose validity is suspect). Under the null hypothesis that both the smaller set of instruments and the additional, suspect instruments are valid, the C statistis is distributed as □2 in the number of instrument tested.
9. The Wu–Hausman test checks for endogeneity of a variable by comparing instrumental variable estimates (□iv) to ordinary least square estimates (□ols). The null hypothesis is that both the estimators are consistant but □iv is efficient: the alternative is that □ols is consistant while □iv is not. If we reject the null hypothesis, this means that □iv is inconsistent.
10. The control function approach departs from the standard two-stage model by regressing Y on standardised residuals, instead of regressing Y on predicted values of the instrument. Adopting the latter implies that our model will be:

$$Y = 1\ (\alpha + \beta(Z) + \varepsilon \geq 0)$$

$$\text{where } \varepsilon \sim N(0, \sigma\varepsilon^2) \text{ with } \sigma\varepsilon^2 = 1 + \beta^2 \sigma\varepsilon^2 + 2\beta\sigma_v\rho$$

The problem is that though it is possible to get consistent estimates of $= \alpha/\sigma\varepsilon$ and $= \beta/\sigma\varepsilon$, we cannot obtain consistent estimates of α and β from the estimates and as □ is unknown (Arrelano, 2008, p. 5).

11. WFORCE = α + β1 AGE + β2 LPCME + β3 LPCME2 + β4 ILLITERATE + β5 BPRIMARY + β6 MIDDLE + β7 SECONDARY + β8 HIGHER + β9 MUSLIM + β10 HSC + β11 HST + β12 OTHERS + β13 UNEMP + β20 TIME. Reported in Appendix Table, Table A2.
12. Daily average real earnings of non elderly people increases from Rs. 87.73 in 1999-2000 to Rs. 137.98 in 2009-10.
13. We do not report the sample size and LR □2 statistic as both of them are very large due to the use of NSSO survey weights as multipliers.
14. A worker is said to work in the informal sector if: (1) (S)he is an own account worker or employer or helper in household enterprises; or (2) (S)he works in enterprises which do not use electricity (or the electricity use is not known) and the number of workers in that enterprise is less than twenty; or (3) (S) he works in enterprises which use electricity but the size of the workforce is less than ten.
15. The real earnings of the aged in the informal sector have increased by 21 per cent.
16. Regression model: IFS = α + β1 TIME + β2 MUSLIM + β3 HSC + β4 HST + β5 OTHERS + β6

LPCME+ β7 LPCME2+ β8 ILLITERATE + β9 BPRIMARY + β10 MIDDLE + β11 SECONDARY + β12 HIGHER + β13 UNEMP. Reported in Appendix, Table A3

17. Lubell (1991) reported that the informal workforce in South-east Asia generally had secondary, or even tertiary, level of education.

18. The percentage of male workers in services has declined from 51 per cent to 45 per cent over the study period. For female workers, the corresponding figures are 60 per cent and 55 per cent, respectively.

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APPENDIX

Table A1

Endogeneity Test Statistics

Gender and Place of Residence	*Hayashi Test*		*Wu-Hausman Test*	
	NSS 55th Round	*NSS 66th Round*	*NSS 55th Round*	*NSS 66th Round*
Rural Male	1165.2 *	778.41 *	815.85 *	1296.29 *
Rural Female	783.79 *	882.37 *	827.54 *	956.48 *
Urban Male	1177.946 *	1222.96 *	1427.49 *	1415.08 *
Urban Female	3113.53 *	25.63 *	25.74 *	326.62 *

Note: * denotes significance at 1% levels.

Source: Calculated from the NSS 55th and 66th Rounds.

Table A2

Change in Workforce Participation of the Elderly over Rounds

Variable	*Rural Male*	*Rural Female*	*Urban Male*	*Urban Female*
TIME	-0.07*	-0.04*	-0.07*	-0.48*
Control Variables	Yes	Yes	Yes	Yes
N	27891	25618	15346	8636
LR 2	5343.18*	2766.53*	2388.78*	2555.84*
PSEUDO R2	0.15	0.12	0.11	0.34

Note: * denotes significance at the 1% level.

Source: Calculated from the NSS 55th and 66th Rounds.

Table A3

Change in Informal Sector Participation of the Elderly Workers over Rounds

Variable	*Population Aged 60 Years and above*			
	Rural Male	*Rural Female*	*Urban Male*	*Urban Female*
TIME	-0.03*	-0.03	-0.01	-0.08*
Control variables	Yes	Yes	Yes	Yes
N	18249	4537	6368	1339
LR 2	2189.99*	985.93*	173.32*	139.24*
PSEUDO R2	0.1406	0.1825	0.0379	0.1136

Note: * denotes significance at the 1% level.

Source: Calculated from the NSS 55th and 66th Rounds.

Table A4

Occupational Pattern of Elderly Workers and Mean Daily Earnings in Occupation—Rural Males

Concentration	*Occupational Category*	*Distribution of Aged Workers across Occupation (%)*		*Mean Earnings for All Workers and Elderly Workers (Rs.)*	
		NSS 55th Round	*NSS 66th Round*	*NSS 55th Round*	*NSS 66th Round*
High Concentration (≥ 2%)	Market-oriented Skilled Agricultural and Fishery Workers	67.1	59.8	51(46)	82(69)
	Agricultural, Fishery and Related Labourers	15.8	9.1	41(40)	60(58)
	Models, Salespersons and Demonstrators	4.2	4.9	52(49)	73(68)
	Corporate Managers	2.2	4.7	161(141)	264(81)
	Labourers in Mining, Construction, Manufacturing and Transport	1.5	3.8	60(58)	77(72)
	Extraction and Building Trades Workers	2.0	3.7	73(76)	92(79)
	Subsistence Agricultural and Fishery Workers	0.0	3.2		61(90)
	Other Professionals	0.6	2.1	105(43)	186(77)
Low Concentration (< 2%)	Other Craft and Related Trade Workers	1.6	1.7	51(55)	70(80)
	Sales and Services Elementary Occupations	1.2	1.6	71(51)	114(56)
	Personal and Protective Service Workers	1.1	1.4	94(51)	172(76)
	Metal, Machinery and Related Trades Workers	0.4	0.8	84(68)	136(90)
	Precision, Handicraft, Printing and Related Trade Workers	0.5	0.7	69(39)	76(50)
	Other Associate Professionals	0.1	0.4	165(109)	254(78)
	Machine Operators and Assemblers	0.7	00.4	63(51)	109(61)
	Teaching Associate Professionals	0.1	0.3	173(175)	250(306)
	Life Science and Health Professionals	0.3	0.3	297	362(465)
	Teaching Professionals	0.1	0.3	199(228)	311(252)
	Drivers and Mobile Plant Operators	0.1	0.3	93(114)	108(107)
	Office Clerks	0.2	0.3	127(68)	219(152)
	Stationary Plant and Related Operators	0.2	0.1	92(40)	143(106)
	Life Science and Health Associate Professionals	0.1	0.1	153	242(309)
	Legislators and Senior Officials	0.0	0.1	241(30)	360(231)
	Customer Services Clerks	0.0	0.1	156	225
	Physical, Mathematical and Engineering Science Professionals	0.0	0.0	200(229)	393(222)
	Physical and Engineering Science Associate Professionals	0.0	0.0	168(100)	269(234)
	General Managers	0.0	0.0		273

Note: * Figures for daily average real earnings given. The figures in the last two columns are the daily average real earnings of of all workers (including the elderly), while the figures in parantheses are the daily average real earnings for elderly workers.

Source: Calculated from the NSS 55th and 66th Rounds.

Table A5

Occupational Pattern of Elderly Workers and Mean Daily Earnings in Occupation—Rural Females

Concentration	Occupational Category	*Distribution of Aged Workers across Occupation (%)*		*Mean Earnings for All Workers and Elderly Workers (Rs.)*	
		NSS 55th Round	*NSS 66th Round*	*NSS 55th Round*	*NSS 66th Round*
High Concentration (≥ 2%)	Market-oriented Skilled Agricultural and Fishery Workers	54.1	56.1	33(29)	50(48)
	Agricultural, Fishery and Related Labourers	31.1	19.2	29(27)	43(41)
	Models, Salespersons and Demonstrators	3.4	4.0	34(25)	47(26)
	Sales and Services Elementary Occupations	2.6	4.0	35(25)	52(31)
	Corporate Managers	1.5	3.3	53(30)	226
	Other Craft and Related Trade Workers	2.9	3.1	27(23)	49(51)
	Subsistence Agricultural and Fishery Workers	0.0	2.7		41(42)
	Labourers in Mining, Construction, Manufacturing and Transport	0.8	2.6	40(28)	56(52)
	Personal and Protective Service Workers	0.9	1.3	219(23)	67(35)
	Precision, Handicraft, Printing and Related Trade Workers	0.5	0.9	51(25)	41(30)
	Extraction and Building Trades Workers	0.1	0.9	40(30)	57(51)
	Other Professionals	0.0	0.8	82(33)	134(60)
	Machine Operators and Assemblers	1.6	0.7	38(18)	54(18)
	Life Science and Health Associate Professionals	0.1	0.2	135	175(18)
Low Concentration (< 2%)	Other Associate Professionals	0.0	0.1	126	207(255)
	Metal, Machinery and Related Trades Workers	0.0	0.1	57	94
	Teaching Associate Professionals	0.2	0.1	130(98)	149(44)
	General Managers	0.0	0.1		274
	Life Science and Health Professionals	0.0	0.1	224	212(192)
	Drivers and Mobile Plant Operators	0.0	0.1	57	97(39)
	Stationary Plant and Related Operators	0.1	0.0	38	56
	Physical, Mathematical and Engineering Science Professionals	0.0	0.0	88	349
	Customer Services Clerks	0.0	0.0	150	131

Note: *Figures for daily average real earnings given. The figures in the last two columns are the daily average real earnings of of all workers (including the elderly), while figures in parantheses are daily average real earnings for elderly workers.

Source: Calculated from the NSS 55th and 66th Rounds.

Table A6
Occupational Pattern of the Elderly Workers and Mean Daily Earnings in Occupation—Urban Males

Concentration	*Occupational Category*	*Distribution of Aged Workers across Occupation (%)*		*Mean Earnings for All Workers and Elderly Workers (Rs.)*	
		NSS 55th Round	*NSS 66th Round*	*NSS 55th Round*	*NSS 66th Round*
High concentration (≥2%)	Models, Salespersons and Demonstrators	23.1	15.4	62(66)	89(85)
	Market-oriented Skilled Agricultural and Fishery Workers	15.7	17.8	82(61)	137(74)
	Corporate Managers	13.7	18.0	259(209)	447(292)
	Other Craft and Related Trade Workers	6.4	4.9	66(66)	84(70)
	Extraction and Building Trades Workers	5.6	3.7	89(84)	106(104)
	Labourers in Mining, Construction, Manufacturing and Transport	5.3	5.8	69(63)	87(78)
	Sales and Services Elementary Occupations	4.9	5.3	76(52)	110(65)
	Personal and Protective Service Workers	3.5	3.3	95(83)	178(78)
	Other Professionals	3.3	7.9	186(122)	290(118)
	Agricultural, Fishery and Related Labourers	3.0	4.9	68(47)	67(64)
	Machine Operators and Assemblers	2.3	1.0	79(63)	133(107)
	Metal, Machinery and Related Trades Workers	2.3	1.7	91(82)	160(141)
	Precision, Handicraft, Printing and Related Trade Workers	2.3	1.4	92(71)	101(78)
Low Concentration (< 2%)	Other Associate Professionals	1.7	1.5	187(111)	301(248)
	Office Clerks	1.4	1.3	146(98)	250(134)
	Drivers and Mobile Plant Operators	1.4	1.2	106(97)	149(100)
	Life Science and Health Professionals	1.1	1.3	337(256)	535(575)
	Teaching Professionals	0.9	0.7	223(248)	346(315)
	Stationary Plant and Related Operators	0.6	0.1	116(54)	244(51)
	Teaching Associate Professionals	0.5	0.4	158(179)	262(715)
	Physical and Engineering Science Associate Professionals	0.4	0.2	213(186)	346(302)
	Customer Services Clerks	0.3	0.3	161(83)	255(66)
	Physical, Mathematical and Engineering Science Professionals	0.2	0.4	263(181)	463(692)
	Life Science and Health Associate Professionals	0.1	0.3	144(170)	237(142)
	Legislators and Senior Officials	0.1	0.3	301(173)	546(576)
	General Managers	0.0	0.7		485(430)
	Subsistence Agricultural and Fishery Workers	0.0	0.2		166(36)

Note: *Figures for daily average real earnings given. The figures in last two columns are the daily average real earnings of of all workers (including the elderly), while the figures in parantheses are the daily average real earnings for elderly workers.

Source: Calculated from the NSS 55th and 66th Rounds.

Table A7
Occupational Pattern of Elderly Workers and Mean Daily Earnings in Occupation—Urban Females

Concentration	*Occupational Category*	*Distribution of Aged Workers across Occupation (%)*		*Mean Earnings for All workers and Elderly Workers (Rs.)*	
		NSS 55th Round	*NSS 66th Round*	*NSS 55th Round*	*NSS 66th Round*
	Sales and Services Elementary Occupations	16.5	16.9	45(28)	53(35)
	Market-oriented Skilled Agricultural and Fishery Workers	11.6	16.4	49(16)	61(77)
High Concentration (≥2%)	Models, Salespersons and Demonstrators	17.1	12.6	44(43)	99(26)
	Agricultural, Fishery and Related Labourers	9.4	10.9	31(30)	43(37)
	Corporate Managers	8.9	10.0	261(28)	503(894)
	Other Craft and Related Trade Workers	14.5	9.8	31(27)	49(24)
	Personal and Protective Service Workers	7.0	5.6	61(60)	85(69)
	Other Professionals	0.1	4.9	155	214(59)
	Labourers in Mining, Construction, Manufacturing and Transport	4.0	3.6	44(35)	56(41)
	Machine Operators and Assemblers	3.8	1.5	38(38)	61(29)
	Extraction and Building Trades Workers	1.5	1.1	57(56)	69(51)
	Life Science and Health Associate Professionals	1.1	1.1	143(45)	219(140)
Low Concentration (<2%)	Teaching Professionals	1.0	0.9	189(138)	299(588)
	Precision, Handicraft, Printing and Related Trade Workers	0.9	0.9	62(20)	69(34)
	Life Science and Health Professionals	0.3	0.9	311	357(638)
	Teaching Associate Professionals	0.3	0.9	121(34)	197(467)
	Subsistence Agricultural and Fishery Workers	0.0	0.8		39(36)
	Metal, Machinery and Related Trades Workers	0.3	0.4	81	133(53)
	Stationary Plant and Related Operators	0.8	0.2	65(23)	92
	Office Clerks	0.3	0.2	137(100)	232(213)
	General Managers	0.0	0.2		410
	Other Associate Professionals	0.6	0.0	190(400)	286
	Physical and Engineering Science Associate Professionals	0.1	0.0	160	308

Note: *Figures for daily average real earnings given. The figures in last two columns are the daily average real earnings of of all workers (including the elderly), while the figures in parantheses are the daily average real earnings for elderly workers.

Source: Calculated from the NSS 55th and 66th Rounds.

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RECENT OUT-MIGRATION PATTERN AND ISSUES FOR BIHAR

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This paper first analyses the recent pattern and determinants of out-migration, and then makes an observation about the associated costs and benefits of out-migration. While the main focus of this paper is on Bihar, a comparative picture of the all-India figures has also been presented throughout. Contrary to the all-India scenario, wherein the intra-state rural to urban migration is the dominant stream of migration, the people of Bihar show a preference for migrating to other states. Interestingly, these migrants from Bihar are not necessarily attracted by job opportunities in the other states, rather a lion's share of them migrate to become self-employed in their chosen migratory destinations. Further, a majority of the people who migrate are socio-economically better-off whereas the poor people have been unable to migrate. However, the migration of the well-off section of people to other states in search of perceived benefits is contested, given the precarious standards of living, discrimination and physical extortionthey face, as reflected in their increased Monthly Per Capita Consumption Expenditure (MPCE).*Finally, this paper also advocates a policy framework that would recognise migration across states in India asa right and for migrants to be givenall kinds of social entitlements available at the destination, thereby equating migrants with local citizens to reduce the cost of migration.*

Keywords: *Bihar, Migration pattern, Reasons for migration, Socio-economic impact*

INTRODUCTION

Migration is one of the most distinctive characteristics of humankind.Since time immemorial, people have chosen to move from one place to another for a variety of reasons—livelihoods, better opportunities, survival and escape from natural calamities,and socio-political conflicts,among others. Apart from these factors,pertaining to people's socio-economic-cultural context, regional diversity also leadspeople to migrate through the classic 'push and pull forces' (Lee, 1966; Harris and Todaro, 1970; Srivastava, 2003; Oberoi and Singh, 1983).

In India, the phenomenon of internal migration is considered to be the most important form of migration in terms of the number of people migrating from one place to another within the country. While for some people, migration might be a strategy to seek economic prosperity,for the particularlyindigent and socially deprived sections of the population, it may simply signifyan escape route from poverty. Given the rural–urban gap and the inter-state

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disparity in terms of the capacity to support livelihoods, the rate of internal migration in Indiahas been recoded to be as high as 30 per cent, on the basis of the place of last residence (Government of India, 2001 Census). Similarly, as per the National Sample Survey (NSS) data (2007-08), the rate of migration based on Usual Place of Residence (UPR) or the place where a person has been staying for the preceding six months (NSSO, 2010) accounts for around 29 per cent of the total migration in the country.

Expectedly, the migration rate varies across states with Maharashtra, Gujarat, Delhi, Punjab, and Haryana being in the forefront in terms of receiving migrants while Bihar, Uttar Pradesh (UP), and Rajasthan are at the bottom of the migration tableand account for a high degree of out-migration instead (Government of India, 2001 Census). It has been observed that an economically better-off state which offers greater employment opportunities acts a hot spot for in-migration from the economically backward states which are unable to offer livelihoods to their local citizenry.Therefore, it is equally important to consider both the nature of origin as well as the destination for determining the cause of migration determination as the individual and household characteristics of the migratory populations. Here, it must, however, be pointed out that while the migratory destination usually signifies a straightforward unidirectional flow of migrants from the relatively backwardto more developed regions, the individual and household characteristicsof the migrants are variable and are often contested. Ironically, most studies show that while the socio-economically poor and deprived people are more likely than others to migrate in order to escape from poverty (Oberai, *et al*. 1989; Sharma, 2005),the poorest of the poor, while aspiring to do so, cannot actually afford to migrate (Kundu and Sarangi, 2007; Srivastava, 1998; 2005; Shah, 2002; 2009).

Although some studies have been the basis of contestation with regard to the socio-economic determinants of migration,their scope remains limited,as this aspect can only be examined in greater detail on the basis of large-scale representative data. Even studies based on theavailable data sets on migration,that is, primarily the National Sample Survey (NSS) have been open to debate because of the manner in which the analysis has been carried out in these surveys. As per the NSS, if a person's present UPRdiffers from the last UPR, then the person is counted as migrant. The migration rate is the ratio of the migrants tothe total population. For a particular state, while the migrants include both those who have migrated from other states and those migrating withinthe same state, the total population includes both migrants and non-migrants. Therefore, this method of analysis mixes up the characteristics of internal and external migrantsin a particular context, say within a state. In other words, all migrants do not experience the same contextual exposure before migration. Again, the socio-economic characteristics of an external migrant are not the same as those prevailing at the time of his migration, and non-migrantstoo undergo changes in their characteristics and nature after leaving behind their places of origin and experiencing contextual exposure.

In the above backdrop, it is thus necessary to assess the determinants of migration separately for out-migrants and non-migrants, as alsothe impact of contextual exposure on the migrants after they have left their places of origin.

The focus of this paper is on the state of Bihar with reference to the all-India characteristics of migration for the purpose of making a comparison between the two. Bihar has a long history of out-migration. The early stream of out-migration started from the state during the 1830s in the form of indentured labourers to the British colonies of Mauritius, Guyana, Trinidad, and Fiji.The later phase of migration, however, gained momentum during the 1960s, particularly after the advent of the Green Revolution in the country,with the migrants moving to the richer north-western states of Punjab and Haryana (Dutta and Mishra, 2011). As per the 2001 Census, Bihar accounts for the second highest rate of out-migration in India,with 1.7 million out-migrants,just after Uttar Pradesh that has an estimated 2.6million out-migrants.A recent studyalso points out that the out-migration trend from Bihar continues to date, but the pattern of this migration has changed from short- to long-term migration (Sharma, 2005).This paper is divided intofoursections. After this introductory section, the next section outlinesthe patterns and determinants of out-migration,while Section III highlights the impact of out-migration and some of the other related issues. Section IV presents the conclusions of the paper.

PATTERNS AND DETERMINANTS OF OUT-MIGRATION

1. The In-migration and Out-migration Rates

The out-migration andin-migration ratesare presented in Table 1. The person whose present UPR is different from the last UPR is counted as an in-migrant. A person who has moved out of his home at any time in the past is an out-migrant. The out-migration rate is divided in this analysis into intra-state and inter-state. It is apparent from Table 1that internal mobility,or the intrastate out-migration as well as the in-migration rate is lower in Bihar as compared to the corresponding all-India figure.Bihar accountsfor an in-migration rate of 20.4 percent as compared to the corresponding national rate of 28.5 per cent. This trend is uniform across rural–urban settings and for the male–female population. A marked difference is observed for malesin particular. In total, the in-migration rate in Bihar among males is only 3.1 percent as compared to the corresponding all-India rate of 10.9 percent.Among rural males,the corresponding rates are 1.2 per cent and 5.4 percent for Bihar and India, respectively. The intra-state out-migration rate accounts for Bihar is 3 percent as against 7.7 percent for India as a whole. This stark gap between the two is observedboth across rural–urban settings and for the male–female population.

Expectedly, the reverse is the scenario as regards the inter-state out-migration rate as compared to the earlier-mentioned migration types for Bihar in comparison to India. The inter-state out-migration ratesare 5.1 per cent and 3 percent for Bihar and India, respectively. The gap is wider for males. Irrespective of rural and urban settings, the male inter-state out-migration rate is almost double for Bihar as compared to India as a whole. In rural areas,the rates for males are 8.7 per cent and 4.7 percent, respectively, while in urban areas,these are 4.3 per cent and 2.4 percent for Bihar and India, respectively.

Table 1
Rate of In-migration and Out-migration

	Rural			*Urban*			*Total*		
	Male	*Female*	*Total*	*Male*	*Female*	*Total*	*Male*	*Female*	*Total*
In-migration Rate									
Bihar	1.2	37.9	18.7	20.8	49.7	34.5	3.1	39.0	20.4
India	5.4	47.7	26.1	25.9	45.6	35.4	10.9	47.2	28.5
Inter-state Out-migration									
Bihar	8.7	1.4	5.0	4.3	1.5	3.0	8.2	1.4	5.1
India	4.7	1.8	3.3	2.4	2.2	2.3	4.1	1.9	3.0
Intra-state Out-migration									
Bihar	1.3	4.8	3.0	1.5	3.1	2.3	1.3	4.7	3.0
India	4.1	12.9	8.6	2.5	8.1	5.3	3.7	11.7	7.7

Source: Analysis based on the NSS 64thRound Migration Survey, 2007-08, unit level data.

2. Who Out-migrates?

Migration cannot be expected to be uniform across all sections of the population. It is a moot point as to whether the poor and deprived people migrate more (Sharma,2005; Oberai, *et al.*, 1989),or the percentage of migration is higher among the socio-economically well-off section of the population (Kundu and Sarangi, 2007; Srivastava, 1998; 2005; Shah, 2002; 2009).The analysis based on the NSS 64th Round data (2007-08) has to be considered in this context. Tables 2& 3 presentthe intra-state and inter-state out-migration for Bihar by some important socio-economic characteristics like the place of residence, social group, monthly per-capita consumption expenditure (MPCE) and the land-holdingsowned by the household. "For a household, the MPCE is the total consumption expenditure over all items divided by the household size and expressed on a per month (30 days) basis. A person's MPCE is understood as that of the household to which he or she belongs" (NSSO, 2010). As presented here, the first quintile indicatesthe level of MPCE below which 20 per cent of the population lies; for the second quintile, the level below which 20 to 40 per cent of the population lies; and so on. What is apparent from these tables is that the out-migration rate is higher among people belonging to the well-off sectionswhile the pattern isthe same for both Bihar and Indiaas a whole. The out-migration rates (both intra- and inter-state) are higher among the higher consumption expenditure groups, among those who possess more land and also among those are socially privileged (except in the case of STs in Bihar,who show a higher out-migration rate). The only exceptionisthe place of residence,as higher out-migration is seen from rural areas. This is, however,expectedgiven the huge stream of rural-to-urban migration. To sum up,the analysis indicates that people from rural areasbut belonging to the higher socio-economic strata are more likely to migratewhile the poorest of the poor cannot afford to migrate either within the state or to other states.

Table 2
Intra-state Out-migration Rate by Background Characteristics

Characteristics	*Bihar*			*India*		
	Male	*Female*	*Total*	*Male*	*Female*	*Total*
Place of Residence						
Rural	1.3	4.8	3.0	4.1	12.9	8.6
Urban	1.5	3.1	2.3	2.5	8.1	5.3
Social Group						
STs	2.3	8.3	5.5	3.3	8.9	6.1
SCs	1.0	3.8	2.4	3.1	11.5	7.4
OBCs	1.3	4.9	3.0	3.6	11.8	7.8
Others	1.9	4.8	3.3	4.3	12.5	8.4
MPCEQuintiles						
1stQuintile	0.8	3.7	2.2	2.4	9.1	5.8
2ndQuintile	1.9	6.9	4.3	3.7	13.3	8.6
3rdQuintile	4.1	9.3	6.5	5.4	15.4	10.5
4thQuintile	3.8	8.0	5.8	6.0	14.8	10.4
5thQuintile	7.8	5.9	6.9	5.9	13.7	9.7
Land-holding (in Acres)						
Less than 0.005	0.8	1.9	1.4	2.6	8.6	5.6
0.005-1	1.3	4.8	3.0	3.6	11.6	7.7
1.01-3	2.0	7.0	4.5	4.8	14.3	9.7
3.01-6	2.3	5.3	3.7	5.5	17.1	11.5
6+	3.9	5.3	4.6	7.6	23.5	16.2
ALL	1.3	4.7	3.0	3.7	11.7	7.7

Source: Analysis based on the NSS 64thRound Migration Survey, 2007-08, unit level data.

3. Reasons for Out-migration

The reasons for migration, in the NSSO survey, are recorded for each in-migrant by 17 types, that is, information has been recorded at the place of destination from an out-migrant's perspective. Considering the need for analysing the reasons for out-migration, out-migrants with respect to destination were filtered out for Bihar, if the last UPR was recorded as Bihar. The distribution of reasons for out-migration by males, females and the total is presented in Table 4. In order to facilitate easy understanding of the data, the reasons cited for migration have been grouped into the following five broad categories: (1) employment-related, (2) studies, (3) forced migration combining migration due to natural disaster(s), social/political problem(s) and migration due to displacement, (4) marriage, and (5) others. The table also presents the distribution for the whole of India to enable a comparison between the Bihar and all-India figures. It can be seen that the reasons for migration differ from males to femalesas well as fromintra- to inter-state migration. As regards intra-state migration, marriage was the leading cause for female out-migration, while it was employment for males. It has been found that 92.5 per cent of the females and 61.3 per cent of the malesout-migratedue to marriage and employment, respectively, which indicates marginally different figures from the all-India pattern. The distributional percentages of these categories are recorded as 80 percent and 49.5 percent,respectively. The other dominant causeof out-migration was

recorded as transfer/migration of parent(s). The rates for the transfer of parent(s)in the case of Bihar are 17.2 per cent and 5.7 per cent for males and females, respectivelyas against the corresponding all-India figures of 27.7 per cent and 13.6 percent for males and females, respectively. Another dominant reason of for migration among males was 'studies', accounting for 13.4 per cent and 5.1 percent for Bihar and India, respectively.

Table 3

Inter-state Out-migration Rate by Background Characteristics

Characteristics	*Bihar*			*India*		
	Male	*Female*	*Total*	*Male*	*Female*	*Total*
Place of Residence						
Rural	8.7	1.4	5.0	4.7	1.8	3.3
Urban	4.3	1.5	3.0	2.4	2.2	2.3
Social Group						
STs	11.5	2.9	7.2	1.6	0.9	1.2
SCs	6.9	.05	3.9	3.5	1.5	2.5
OBCs	8.3	1.4	5.1	4.7	1.7	3.3
Others	9.4	2.4	6.2	4.3	2.7	3.5
MPCE Quintiles						
1st Quintile	7.5	0.7	4.3	3.5	1.0	2.3
2nd Quintile	9.5	2.7	6.5	4.2	1.9	3.1
3rd Quintile	10.4	4.3	7.7	4.1	2.6	3.4
4th Quintile	13.1	3.3	8.8	4.9	3.6	4.3
5th Quintile	12.4	8.6	10.6	6.8	5.3	6.1
Land-holding (in Acres)						
Less than 0.005	5.9	1.0	3.6	1.9	1.4	1.7
0.005-1	8.7	1.3	5.3	4.8	1.9	3.4
1.01-3	6.9	2.5	4.9	3.9	2.2	3.1
3.01-6	8.1	2.9	5.7	3.8	3.3	3.6
6+	14.0	4.3	9.1	3.8	4.0	3.9
ALL	8.2	1.4	5.1	4.1	1.9	3.0

Source: Analysis based on the NSS 64th Round Migration Survey, 2007-08, unit level data.

Table 4
Reasons for Migration

Reasons	*Bihar*						*India*					
	Intra-state			*Inter-state*			*Intra-state*			*Inter-state*		
	Male	*Female*	*Total*	*Male*	*Female*	*Total*	*Male*	*Female*	*Total*	*Male*	*Female*	*Total*
1. Employment-related	**61.3**	**0.4**	**14.3**	**92.6**	**4.5**	**81.5**	**49.5**	**2.4**	**12.1**	**65.5**	**3.7**	**32.2**
In search of employment	11.6	0	2.7	31	1.8	27.3	7.3	0.4	1.8	20.0	0.9	9.8
In search of better employment	9.5	0.1	2.2	23.9	0.5	20.9	14.0	0.6	3.4	20.7	1.0	10.1
Business	5.7	0	1.3	2.5	0	2.2	3.1	0.1	0.7	3.8	0.2	1.9
To take up employment/ better employment	27.4	0.2	6.3	33.9	2.1	29.9	13.8	0.7	3.4	15.0	1.0	7.5
Transfer of service/ contract	5.9	0	1.4	1	0	0.9	9.7	0.4	2.3	5.5	0.3	2.7
Proximity to place of work	1.2	0.1	0.4	0.3	0.1	0.3	1.7	0.2	0.5	0.5	0.2	0.4
2. Studies	**13.4**	**1**	**3.8**	**1.4**	**4.4**	**1.8**	**5.1**	**0.8**	**1.7**	**2.6**	**1.0**	**1.7**
3. Forced Migration	**0**	**0.1**	**0.1**	**0**	**0**	**0**	**1.7**	**0.4**	**0.7**	**1.4**	**0.7**	**1.0**
Following a natural disaster (drought, flood, tsunami, etc.)	0	0	0	0	0	0	0.6	0.1	0.2	0.1	0.0	0.1
Social/political problems	0	0.1	0.1	0	0	0	0.8	0.2	0.3	1.2	0.7	0.9
Displacement by development project	0	0	0	0	0	0	0.3	0.1	0.1	0.1	0.0	0.1
4. Marriage	**4.9**	**92.5**	**72.6**	**0**	**29.2**	**3.7**	**4.1**	**79.9**	**64.2**	**0.8**	**56.5**	**30.8**
5. Others	**20.2**	**6**	**9.3**	**6**	**61**	**12.9**	**39.5**	**16.5**	**21.3**	**29.7**	**38.1**	**34.2**
Acquisition of own house/flat	0	0	0	0	0	0	3.2	0.5	1.1	0.8	0.7	0.8
Housing problems	1.2	0	0.3	0	0	0	2.0	0.4	0.7	0.7	0.4	0.6
Healthcare	0	0	0	0.2	0	0.2	0.4	0.1	0.2	0.7	0.3	0.5
Post-retirement	0.2	0	0.1	0	0	0	1.1	0.0	0.3	2.2	0.1	1.1
Migration of parent/ earning member	17.2	5.7	8.3	4	60.3	11.1	27.7	13.6	16.5	20.4	34.1	27.7
Undefined reason	1.6	0.3	0.6	1.8	0.7	1.6	5.1	1.9	2.6	4.9	2.5	3.6
ALL	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Source: Analysis based on the NSS 64thRound Migration Survey, 2007-08, unit level data.

As regards inter-state out-migration, a majority of the males in Bihar migrated for employment-related reasons (92.6 per cent) while a majority of the females migrated due to the transfer of their parents/earning members (60.3 percent), followed by marriage (29.2 percent). Migration to the other states for studies did not figure significantly in the reasons for migration, as the figures for males and females in this category were only 1.4 per cent and 4.4 percent, respectively. The pattern, however, is found to be different for India as a whole. While employment happened to be the main important cause of inter-state migration (65.5 per cent), marriage remained the top reason for females(56.5 percent), followed by the migration of parents (34.1 percent) for all-India migrants.

4. Stream of Out-Migration and Preferred Destination

The streams of out-migrationare grouped intothe following four types,viz.,(i) rural-to-rural (R-R), (ii) rural-to-urban (R-U), (iii) urban-to-rural (U-R), and (iv) urban-to-urban (U-U). Out-migrants are also classified into the following three broad categories, namely, (i) intra-district, (ii) inter-district, and (iii) inter-state (Table 5). The table shows that Bihar exhibits a different pattern than the all-India trend as far as the stream of male out-migrationis concerned. Among the male out-migrants from Bihar,inter-state migrants constitute the leading stream (at 67.2 percent) followed by intra-district migrants (19.5 percent) and finally by inter-district migrants (13.3 percent). For male out-migrants in India, the sequence is as follows: intra-district migrants (37.39 percent), followed by inter-district migrants (35 percent), and finally inter-state migrants (27.04 percent). However, no marked difference is observed in the stream of female out-migrationbetween Bihar and all-India figures. For females, the proportion of intra-district migration constitutes the largest category of out-migration followed by inter-district migration and then inter-state migration.

Across the state of Bihar and India as a whole, rural-to-urban migration constitutes the leading male migration stream,while the rural-to-rural migration is the leading stream for females. However, the proportion of rural-to-urban male migration for Bihar is greater by many points than the corresponding all-India figure. The percentage distribution of rural–urban male out-migration is 62.5 per cent and 39.03 percent for Bihar and all-India, respectively.

Overall, the analysis of out-migration streams indicates that a lion's share of rural males in Bihar out-migrate to the urban areasof other states as against a lion's share of rural males at the all-India level,who migrate to urban areas within the same state.

The people from Bihar migrate to almost every state in India. Their migration patterns andchoice of destinations are often discussed in the context of almost every state in India. For example, migrants from Bihar are the most talked about for ostensibly creating socio-economic imbalances in Maharashtra, in general, and in Mumbai, in particular. The same experiences are also witnessed with regard to migrants from Bihar in other states like Delhi, Punjab and Assam, among other states. The analysis based on NSSO data, nevertheless, reveals a picture that is contrary to the popular perception. It may be observed from this data that neither Maharashtra nor Punjab nor Assam falls comes under the threemost preferred destinationsof migrants from Bihar (Table 6). The analysis instead revealsthat the top three

preferred destinations for migrants from Bihar are Delhi (21.3 per cent), followed by West Bengal (18.5 per cent), and Uttar Pradesh (17.2 per cent). When it comes to male migration, Punjab happens to be the third most preferred destination (10.3 per cent) after Delhi (24.1 per cent) and West Bengal (17.1 per cent). The other states preferred by a significant proportion of migrants from Bihar include Haryana (6.2 percent), Maharashtra (5.6 per cent), Jharkhand (5.4 per cent), Gujarat (4.3 cent), Chhattisgarh (2.5 per cent), and Rajasthan (2 per cent).

Table 5

Distribution of Out-migrants by Streams

Streams	*Bihar*			*India*		
	Male	*Female*	*Total*	*Male*	*Female*	*Total*
Intra-district						
Rural to Rural	6.8	49.3	41.0	17.25	51.27	44.7
Rural to Urban	10.9	7.9	8.5	12.74	6.89	8.02
Urban to Rural	.6	2.1	1.8	2.87	2.73	2.76
Urban to Urban	1.2	1.5	1.5	5.09	3.33	3.67
Sub-total	19.5	60.9	52.7	37.95	64.21	59.14
Inter-district						
Rural to Rural	2.4	17.1	14.2	6.72	16.11	14.29
Rural to Urban	5.5	4.8	4.9	12.17	5.2	6.55
Urban to Rural	.6	1.0	.9	3.38	1.56	1.91
Urban to Urban	4.8	3.0	3.4	12.72	4.96	6.46
Sub-total	13.3	25.9	23.4	35.0	27.83	29.21
Inter-state						
Rural to Rural	11.1	3.4	4.9	3.21	2.63	2.74
Rural to Urban	46.1	7.1	14.8	14.12	2.7	4.91
Urban to Rural	1.7	.3	.6	2.68	0.58	0.99
Urban to Urban	8.2	2.4	3.6	7.03	2.04	3.01
Sub-total	67.2	13.3	23.9	27.04	7.96	11.64
ALL						
Rural to Rural	20.3	69.8	60.0	27.18	70.01	61.73
Rural to Urban	62.5	19.8	28.2	39.03	14.79	19.48
Urban to Rural	3.0	3.5	3.4	8.93	4.87	5.66
Urban to Urban	14.2	7.0	8.4	24.84	10.33	13.14
Total	100.0	100.0	100.0	100	100	100

Source: Analysis based on the NSS 64thRound Migration Survey, 2007-08, unit level data.

Table 6

Distribution of Out-migrants from Bihar by States

States	Male	Female	Total
Delhi	24.1	17.8	21.3
West Bengal	17.1	20.3	18.5
Uttar Pradesh	8.9	27.8	17.2
Punjab	10.3	3.8	7.5
Haryana	7.4	4.5	6.2
Maharashtra	7.7	2.9	5.6
Jharkhand	2.7	8.7	5.4
Gujarat	5.9	2.2	4.3

Chhattisgarh	2.7	2.2	2.5
Rajasthan	2.3	1.8	2.0
Uttarakhand	2	1.7	1.8
Orissa	1.6	1.4	1.4
Madhya Pradesh	0	1.2	1.3
Assam	1.3	0	1.0
Chandigarh	1.1	0	0
Others	4.9	3.6	4.0
All	100	100	100

Source: Analysis based on the NSS 64thRound Migration Survey, 2007-08, unit level data.

5. Results of the Multivariate Analysis

The results of the logistic regression analysis are presented in Table7. Both chances of out-migration within the same state and of migration to other states are modelled in order to understand the determining factors. The logistic regression models have been adopted while considering the following binary nature of the dependent variables, that is: (a) either migrating to another state or not, and (b) either migrating within the state or not.The results of the regression analysis are similar to what has been observed in the bi-variate analysis. As can be observed from the analysis, the economically better-offpeoplein terms of the MPCE and land-holdingsare more likely to migrate either within or outside the state. The likelihood of migrating within thestate of Bihar is found to be around seven times higher for individuals belonging to the top MPCE quintile as compared to those falling within the bottom quintile. For land-holdings, this probability is around three times higher among households having land-holdings of 6+ acres as compared to those having land-holdings of less than 0.005 acre. A similar gradient can also be observed for both Bihar and India with regard to migration outside the state.Age has also been found to havea significant impact on out-migration. The likelihood of out-migration is expectedly greater for those falling within the age group of 15-44 years and is lowest among the old age group (aged 60+ years). The differential in out-migration is also found to be significant for the place of residence and social group. Rural people are more likely to undertake out-migration. The multi-variate analysis is also similar to the bi-variate analysis, with the only difference being observed if the social groupsin the case of Bihar are compared to those in the case of India. Further, the Scheduled Tribes (STs) from Bihar are exceptionally more likely to undertake out-migration than their counterparts from the general group.

Table 7
Results of the Logistic RegressionAnalysis

Characteristics	*Within the State*		*Outside the State*	
	Bihar	*India*	*Bihar*	*India*
Place of Residence				
Rural	1	1	1	1
Urban	0.43	0.34	0.28	0.32
Social Group				
STs	1	1	1	1
SCs	0.54	1.02	0.61	2.40
OBCs	0.51	1.06	0.73	3.26
Others	0.48	1.11	0.82	2.48
Consumption Expenditure				
Quintiles	1	1	1	1
Bottom 20%	2.36	1.58	1.20	1.16
2nd 20%	5.20	2.55	1.36	1.25
3rd 20%	5.90	3.44	2.05	1.88
4th 20%	6.91	4.32	3.30	3.51
Top 20%				
Land-holding (in Acres)				
Less than 0.005	1	1	1	1
0.005-1	1.65	1.34	1.27	2.37
1.01-3	1.98	1.49	0.84	1.65
3.01-6	1.65	1.50	0.89	1.46
6+	2.82	1.98	1.82	1.32
Age (in Years)				
0-14	1	1	1	1
15-29	4.04	4.39	37.07	13.11
30-44	4.61	4.31	23.58	11.89
45-59	2.53	2.03	11.46	5.08
60+	0.61	0.42	1.39	0.71

Note: All odds ratios are significant at 99 per cent confidence interval level ($P < 0.01$).
Source: Analysis based on the NSS 64thRound Migration survey, 2007-08, unit level data.

IMPACT OF OUT-MIGRATION AND CONCERNED ISSUES

A large number of researches show that migration has a positive impact. Among many other social influences,including the escape from caste divisions and restrictive social norms, and the enhancement of dignity, freedom and capabilities (Deshingkar and Akter, 2009; UNDP, 2009), economic improvements in the lives of the migrant households at both the destination as well as the place of origin are known (Joe, *et al.*, 2009; Srivastava and Bhattacharya, 2003; Kundu and Sarangi, 2007). The analysis performed in this paper also re-establishesthe positive impact by highlighting the increase in both employment opportunities and MPCE post migration. As can be seen in Table 8, the extent of unemployment gets reduced substantially after migration. If the percentage distribution of the activity pattern before and after migration is compared, it may be observed that the proportion of unemployment reduces significantly from 7.6 percent to 1.2 percent for Bihar, and from 9.8 per cent to 2.2 percent for India

as a whole. The proportion of casual labour also gets reduced from 19.6 per cent to 16.1 percent for Bihar and from 16.5 per cent to 13.5 percent for India as a whole.

Table 8
Change in the Activity Status of Males

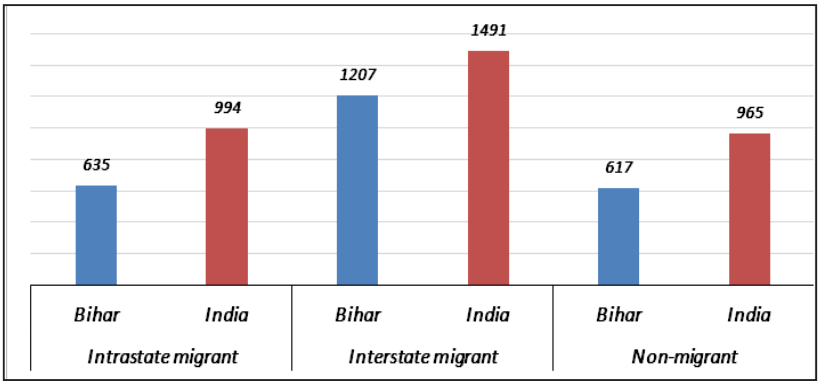
Activities	*Bihar*		*India*	
	Before Migration	*After Migration*	*Before Migration*	*After Migration*
Self-employed	14.9	23.3	13.0	21.7
Regular employees	16.5	18.0	20.1	31.5
Casual labour	19.6	16.1	16.5	13.5
Unpaid worker	6.9	7.7	4.3	3.7
Unemployed	7.6	1.2	9.8	2.2
Not in the labour force	34.5	33.8	36.4	27.3
All	100.0	100.0	100.0	100.0

Source: Analysis based on the NSS 64thRound Migration Survey, 2007-08, unit level data.

The improvement in the economic status of the migrants is reflected through the MPCE. In the earlier section of this paper, it wasshown that households having out-migrants have higher MPCEs. In other words, households with higher MPCEs account for a higher out-migration rate. For further clarity, the change in MPCE is analysed,which is presented in Figure 1. The figure shows a comparison of the MPCEamong migrant and non-migrant households with regard to both intra-state and inter-state migration. Although, given that Bihar is economically the most backward state,its MPCE is observed to be lower as compared to the national average, yet migrant households from the state are better off, with the MPCE being Rs. 635 for intra-state migrants and Rs. 1207 for inter-state migrantsas against the corresponding figure of Rs. 617 for non-migrants. For India as a whole, the MPCEs for intra-state, inter-state and non-migrant households amount to Rs. 994, Rs. 965,and Rs. 965,respectively. Therefore, the positive impact is more vivid for inter-state migration. The MPCE isfound to be much higher among inter-state migrant households for both Bihar and Indiaas a whole, with the corresponding figures being Rs. 1207 and 1491, respectively. In general, the economic status of out-migrants from Bihar can be seen to improve substantially, with the migrants from the state only marginally lagging behind their counterparts from the other states. This inequalityis perhaps grounded in the disparity in the earnings capacities of the two groups of migrants. Further analysis (not shown here) indicates that the migrants from Bihar earn Rs. 194 per day as against Rs. 214 per day earned by other migrants.

The gain of migration is further reflected in the flow of remittances. Bihar is one of the top states to receive remittances. The NSS 64thRound estimates that while,on an average, 9.2 percent of all households in India receive remittances, Bihar stands second highest in this regard with a corresponding figure of 15 percent after Uttar Pradesh with 24.6 percent (Srivastava, 2011).

Figure 1
Comparison of Per capita Monthly Consumption Expenditure (Rs.) for Migrant and Non-migrant Households



Source: Analysis based on the NSS 64thRound Migration Survey, 2007-08, unit level data.

Notwithstanding the positive impact of migration, migrants from Bihar,like all other migrants in India,face innumerable challenges at the place of destination. It is a fact that migrants in India are looked down upon by people at the destination; they are not included in the economic, cultural, political and social lives of the local population. Given the limited policy response from the Government, migrants are also denied basic facilities and face numerous constraints in terms of political representation, inadequate housing, and lack of access to social services and formal residency rights. They are also subjected to other problemspayment of low wage rates, discrimination and violence based on ethnicity, religion and gender (Chacko and Price, 2012).

DISCUSSION AND CONCLUSIONS

The trend of high out-migration from Bihar has continued to persist, as shown by the NSS data for 2008.It is also clear that this trend is primarily male-dominated and that fewer women are seen to migrate as compared to the men. However,people do not find much reason to migrate internally, that is, undertake intra-state migration. Contrary to the phenomenon of intra-state rural–urban migration,observed atthe all-India level, owing to various reasons including actual or perceived greater employment opportunities, higher wage rates and the promise of a better standard of living in urban areas, the urban areas in Bihar exhibit very low rates of urbanisation (11.3 percent, as per the Government of India, 2011, Census) and are, therefore, unable to attract people from the rural areas. People in Bihar have been more inclined to migrate to other states than within the state, responding to perhaps lower employment/earning opportunities in Bihar. In other words, it seems that Bihar has less regional or intra-district disparity as far as the opportunity for livelihoods is concerned, if this aspect is considered to be one of the driving forces of migration and people find it more cost effective to migrate to other states than within the Bihar. Another reason for the high rate of out-migration from Bihar, which is cited in a study by Sharma (2005),is that a change in the local place of residence helps people take up any type of jobs including those that

are not considered as socially prestigious and which they would hesitate to take up locally. Thus, it seems that the greater possibility of higher earnings in the migratory destination enables people to overcome the hindrance of social prestige,allowing them to break out of caste taboosin the other states where they are not visible to their neighbours, friends, and relatives. This aspect is further substantiated by the activity pattern at the destination. The proportion of self-employment is found to be the highest among all other activities in the destination, which is different from the national pattern.

There is also an indication that migration has a positive impactas far as at least the economic aspect is concerned. A comparison of the migrant and non-migrant households shows a substantial increase in MPCEamong the former. However, as Mosse, *et al*., (2002) have noted, the MPCE figures need to be verified for migrants,as they are differentially placed while the latter migrating and lead to different trajectories after the process of migration has been completed. This aspect is further substantiated through the very low level of out-migration observed among households belonging to the lower MPCE group and having low land-holdings as compared to their richer counterparts. This scenario perhaps indicates that migration, at least long-term out-migration, from Bihar has not been undertaken by the poor people as an escape route from poverty,rather they are unable to migrate due to the lack of economic and social resources. It, therefore,seems that the process of out-migration from Bihar has been adopted as an accumulative strategy bythe economically better-off people in the state.

Notwithstanding the contestation with regard to the change in MPCE, the precarious standards of livingof the migrants in their destinations and many other negative aspects of migration are issues of serious concern. In view of the lack of implementation of existing laws for protecting migrant labourers (NCEUS, 2007), the exclusion of migrants from any form of State-sponsored social protection schemes such as water supply, electricity, schooling, ration, and health facilities,among others, increasesthe cost of migration and increases their socio-economic vulnerability, which may even surpass any economic gain, if at all acquired. Added to these common problems of all types of migration, migrants from Bihar also experience discrimination and violence in many states in India due to the false impression that they constitute a huge in-flowof migrants in most other states andthat migration by them leads to an increase in local socio-economic imbalances.Therefore, the cost of migration from Bihar is expected to be greater than that of migration from any other part of India.

As far as the statutory provisions are concerned,presently, there are mainly three Acts that deal with the issue of protection of the fundamental rights of migrant labourers. These are the: (a) Contract Labour (Regulation and Abolition) Act of 1970; (b)Inter-state Migrant Workmen (Regulation of Employment and Conditions of Service) Act of 1979; and (c) Unorganised Worker's Social Security Act, 2008. Although these laws are still far from being totally implemented, no law exists to protect a 'migrant'*per se* who may not necessarily be a labourer. This has had very serious consequences for states like Bihar,which account for a major portion of out-migrants who are self-employed and who are consequently excluded

from the policy discourse. Therefore, given the problems of migrants, in general, and of those from the state of Bihar, in particular, the only apparent way left to safeguard their interests is by integrating their issues into the policy framework by recognising migration across states in India as a right as well asby providingall kinds of social entitlement available at the place of destination,which would equate migrants withlocal citizens and eventually reduce the cost of migration.

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AN EMPIRICAL VALIDATION OF THE 'PUSH-PULL FRAMEWORK' AND GAINS FROM MIGRATION IN INDIA

Pinak Sarkar*

The phenomenon of internal migration in India has gained huge momentum in recent years; this can be attributed to two major economic reasons— regional imbalances in development; and expectations of gain from migration. Therefore, in order to evaluate the current scenario with regard to the flow of human capital, an attempt has been made here to explore the inter-state quantum migration in India by using the NSS0 64th Round 2007-08 data and the Census 2001 data on migration. The present paper empirically examines the relation between regional imbalances and migration by using the 'Push–Pull framework' across states, which, in turn, uses the odds-ratios. On the other hand, the gains from migration have been analysed using the following three components: i) Employability of migrants at destination (the individual level), ii) Household transition achieved by migration at destination (the household level), and iii) Remittance dependence household at the origin (household level across states).

Keywords: *Internal migration, Regional imbalances, Push–Pull framework, Empowered Action Group (EAG) States, North-eastern States (NES), Rest of the Indian States (RIS), New Economics of Labour Migration (NELM), Odds-Ratios, Monthly Per Capita Consumption Expenditure (MPCE), Economic transition, Remittances.*

I. INTRODUCTION

Migration is a dynamic process; it evolves around much dynamism than is normally understood, thus carrying various attributes of its own such as factors associated with destination, origin, type of migration, reason for migration and duration of migration, among others. Also, migration is not confined to a particular group of people, as both the privileged and the under-privileged groups migrate, that is, some with endowments and some without endowments; such as education, skills, information and capital. Similarly, the purpose for which people usually migrate cannot be captured under a singular dimension; it varies depending on the set of conditions or circumstances under which migration takes place and usually differs across population and regions. The reason which makes migration a very interesting phenomenon to study is the complexities which are associated with all these multi-dimensional factors. However, it will be much rewarding to specifically relate migration behaviour to two major reasons which reflects migration decisions in the developing economies leading to flow

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of human capital across regions. Firstly, migration as a phenomenon can be attributed to regional imbalances in development, where people prefer to move from a backward region to a better-off region; and secondly, expectations of gain from migration, that is, improvement in economic well-being of the migrant and the migrant household.

For the purpose of exploring the various facets of the quantum migration in India, an attempt has been made to inter-link two independent and related issues by using mainly the 64th Round 2007-08 of the National Sample Survey Organisation (NSSO), and also the Census 2001,[1] D-Series data on migration. The two inter-linked and independent objectives are: firstly, to explore the inter-state quantum migration in India with reference to regional imbalances, and secondly, to understand the gains from migration in India at both the destination and origin.

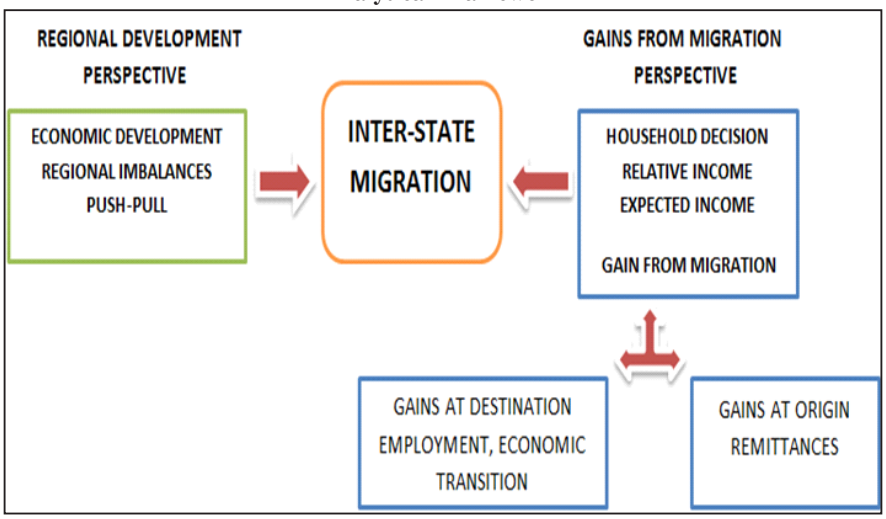
The regional imbalances in migration would be studied empirically by examining the 'Push–Pull framework' across the Indian states.

The gains from migration, on the other hand, would be studied by examining three components: employability of migrants at the destination (individual level), household transition achieved by migration at the destination (household level) and the remittance dependence households at the origin (household level across states).

II. ANALYTICAL FRAMEWORK

Graph 1

Analytical Framework



Source: Author's own compilation.

This study can be better understood with the help of this analytical framework. From the regional development perspective, this study visualises rapid inter-state migration in India as a result of imbalances in regional development across states. Where the developed states attract migrants from the poorer states due to the availability of employment opportunities, high per capita income, and development and infrastructural progress, among others, act

as 'pull' factors. Whereas the states lacking such positive attributes reflects 'push' factors and become major senders of migrants to the developed regions.

At the micro level, the migration decision can be attributed to the household/family decision of diversifying risk and to improve relative income and expected gains/economic welfare from migration. The New Economics of Labour Migration (NELM) developed by Oded Stark, in co-operation with others during the 1980s, is useful for understanding this phenomenon. According to this approach, migration decisions are often made by household members (collective decision) for the well-being of the family by sending one or more members as migrants. The NELM is the only migration theory that connects the migration decision to the impacts of migration, with gains realised from remittances, being this link at the origin/source. However, this does not undermine the benefits earned or gains achieved by the individual migrant, and can be interpreted as the gains achieved by the individual migrant at the destination.

III. AN OVERVIEW OF INTER-STATE MIGRATION IN INDIA

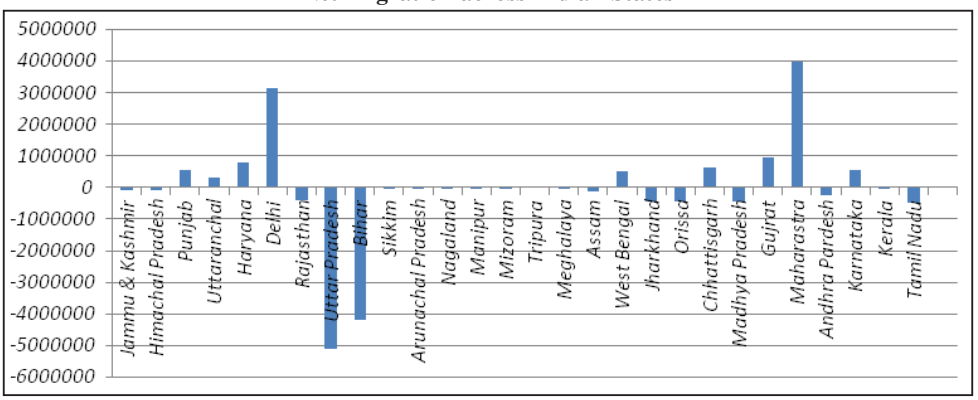
The quantum flow of migration provides a pattern of the dominant migrant-originating and migrant-receiving regions. However, migration just by quantum alone can be misleading as each and every state in India differs in terms of geographical size and population. Therefore, in this particular section, an attempt has been made to evaluate the net-migration[2] of the Indian states. Figure 1 shows that states such as Maharashtra, Delhi, and Haryana have been witnessing positive net migration, that is, they are gainers of human capital whereas, states like Uttar Pradesh (UP) and Bihar are the major losers of human capital as is evident from their rather high negative net migration.

As net migration provides a much more realistic picture of the gain and loss of human capital across states, it becomes more relevant to measure it in terms of the population adjusted net (Tables 1 and 2). To begin with, the population adjusted net migration shows that the number of states with positive net migration has reduced from 13 to 10, when examined between the 2001 Census data and the 2007-08 migration round of the NSSO (Table 1). This means that the inter-state in-migration has become more concentrated to fewer states, and that out-migration has become rampant as the number of negative net-migration states has increased from 15 to 18 (Table 2).

IV. REGIONAL DEVELOPMENT PERSPECTIVE OF MIGRATION[6]

Migration is a development-induced process and reflects uneven development (Ravenstein, 1885; McDowell and de Haan, 1997). This observation is reiterated by Dholakia (2006), who argues that geographically vast countries like India are more likely to face regional imbalances in economic development. The reasons cited for this are their natural endowments, climate and physical conditions, which vary significantly, resulting in unequal economic opportunities across regions, thereby prompting migration. It has been observed that there is a tendency to migrate to the areas of new industrial development with higher per capita income and better economic opportunities, which act as 'pull' factors, thus creating a

Figure 1
Net Migration across Indian States



Source: Author's calculation using NSSO 64th Round, 2007-08.

Table 1
Positive Net[3] Migration per '000 Population

Indian States	*Positive Net (Census 2001)*	*Indian States*	*Positive Net (NSSO 2007-08)*
Delhi	317	Delhi	239
Arunachal Pradesh***[4]	103	Maharashtra	42
Sikkim***	58	Uttarakhand	38
Maharashtra	53	Haryana	36
Haryana	44	Chhattisgarh	28
Gujarat	16	Punjab	24
Meghalaya	14	Gujarat	19
West Bengal	10	Karnataka	12
Jharkhand	10	West Bengal	6
Punjab	5	Tripura	5
Chhattisgarh	4		
Karnataka	4		
Madhya Pradesh	3		

Source: Author's own calculation using Census 2001, D-Series data on Migration; and NSSO 64th Round, 2007-08.

gravitational centre that receives an unregulated migration flow from the under-developed regions (Premi, *et al.*, 1980; Ray, 2003; Dzvimbo, 2003). The main reason behind the heavy flow of migrants, mostly from a rural place of origin to urban areas within a region or outside the region, are either the negative (repulsive) forces which are prevalent in the rural areas such as unemployment, backwardness, poverty, low wages, small size of landholdings, and poor infrastructure or the forces of attraction working in the urban areas in the form of availability of varied employment opportunities in diverse sectors ranging from soft manufacturing to heavy industries (Davis, 1951; Bogue, 1959; Bogue and Zachariah, 1962; Chapman, 1969). In India, there exists a very strong correlation between state level wealth (State Domestic Product) and in-migration (Castaldo, *et al.*, 2012). The states that offer better job opportunities such as Delhi, Maharashtra, Gujarat and Karnataka are gainers of

Table 2
Negative Net[5] Migration per '000 Population

Indian States	*Negative Net (Census 2001)*	*Indian States*	*Negative Net (NSSO 2007-08)*
Bihar	-44	Bihar	-56
Uttar Pradesh	-39	Uttar Pradesh	-30
Nagaland	-39	Manipur	-30
Kerala	-19	Arunachal Pradesh	-23
Manipur	-17	Jharkhand	-17
Rajasthan	-15	Mizoram	-13
Tamil Nadu	-15	Himachal Pradesh	-13
Himachal Pradesh	-14	Jammu & Kashmir	-12
Assam	-11	Orissa	-12
Jammu & Kashmir	-9	Tamil Nadu	-8
Orissa	-7	Madhya Pradesh	-7
Andhra Pradesh	-7	Rajasthan	-7
Uttarakhand	-4	Meghalaya	-7
Mizoram	-3	Assam	-5
Tripura	-1	Nagaland	-5
		Andhra Pradesh	-3
		Sikkim	-1
		Kerala	-1

Source: Author's own calculation using Census 2001, D-Series data on Migration; and NSSO 64th Round, 2007-08.

human capital whereas the traditionally backward states of Bihar, Uttar Pradesh and Orissa are losing human capital (Chandrasekhar and Sharma, 2014). However, the issue of regional development and internal migration in the Indian context cannot be fully understood without differentiating the migration-related concerns of certain key geographical locations such as the peripheral states of India, that is, the North-eastern states. The economic and social development in this region has always been abysmal, though the region has the potential to prosper, yet this is impeded by negligence and lack of infrastructure (Sachdeva, 2006; Lama, 2006). One of the many 'push' factors of migration which affects this region is the lack of good educational infrastructure. This region has quality primary educational facilities but lacks avenues for higher education, which led to a huge increase in student migration from the North-eastern states during the 1990s and 2000s (Baruah, 2006; Shimray and Devi, 2009; Chyrmang, 2010; Sarkar, 2014).

1. Empirically Examining the 'Push–Pull Framework' for Inter-state Migration in India

The purpose of this section is to examine the theoretical underpinnings and the relevance of the 'Push–Pull Framework' for inter-state migration in India. The 'Push–Pull Framework" was used as early as in 1958 by Petersen, but it is attributed to Lee (1966), even though he did not apparently invent or employ the term himself.

Quantum migration in a developing country such as India witnesses a huge mobility

from regions which do not reflect the constituents of development such as industrial growth, employment opportunities, the availability of quality educational facilities and infrastructural progress. The absence of these characteristics thus works in the form of 'push factors' from a backward region.[7] On the other hand, developed regions attract migrants from the comparatively lesser developed regions and also the absolutely backward regions due to certain 'pull factors'. The factors or characteristics of a region which pull or attract migrants are employment opportunities, educational infrastructure, presence of industries, adequate health service accessibility and a reasonably high standard of living, among other things.

In India, the extent of the 'Push–Pull Framework' can be analytically studied by using the Census data. For the purpose of analysis, we take employment and education-led migrants as the two main indicators to understand the 'Push' and 'Pull' phenomena in India. The justification for using these two reason-specific migration groups is that they represent the most dominant reasons for migration in India after excluding marriage. For the purpose of empirical analysis, it is assumed that indicator 1, that is, employment-led mobility occurs when employment opportunities are lacking or not up to the mark, leading to a 'Push' from an origin region, reflecting its development potential, whereas, attracting migrants for employment, that is, 'Pull' reflects the prospects and development of the destination region. Similarly, indicator 2, that is, education-led out-migration reflects the demand for educational infrastructure at the origin region working as a 'Push' factor for education and attracting migrant students, thereby reflecting the development of educational infrastructure acting as 'Pull' factors.

For the empirical work, the odds ratios are calculated for both indicator 1 (employment) and indicator 2 (education) for both in-migration and out-migration across the Indian states. The odds ratios are widely used descriptive statistics which indicate the measure of the effect size and the likelihood of occurrence of an event. In simple statistics, 'odds' are calculated by taking the ratio of probability of happening to that of not happening, but for this particular analysis, the odds are calculated on the basis of the ratio of occurrence to that of non-occurrence. The odds are calculated by using the following formula:

$$Odds = \frac{Probability}{1\text{-}Probability} \quad \text{or} \quad Odds = \frac{Occurrence}{1\text{-}Occurrence}$$

$$Odds\ Ratio,\ ORxi = \frac{\text{Oxi / (1-Oxi)}}{\text{Oxi / (1-Oxr)}}$$

where, ORxi= Odds Ratio of each data point I, Oxi / (1- Oxi) = Occurrence of each data point i to that of non-occurrence of I, Oxr/ (1- Oxr) = Occurrence of the reference point to that of non-occurrence.

Next, the 'odds' values for each state are divided with the 'Odds' value of the reference category, in this case India. The 'odds ratios' are, therefore, the ratios of the odds in relation to the reference category. In other words, an odds ratio implies the odds of the outcome in one group divided by the odds of the outcome in the other group (reference). The odds ratio of the reference category is always 1, in this case India. Here, the odds ratio for all

the states in each group is compared with the odds ratio of the reference category (India). This clearly distinguishes the likelihood of the reason-specific migration from each state and whether it falls below or above the India level.

2. Analysis of the Flow of Push Indicators of the Indian States Using Odds Ratios

In Table 3, the odds ratios are calculated on the basis of reason-specific out-migrants per thousand populations from the Indian states. Here, indicator 1, indicator 2 and the combined indicators represent the propensity or likelihood among the states to out-migrate in reference to the average of India* (reference category).

The odds ratio shows that the out-migration for employment is the highest for the EAG (Empowered Action Group) states. These include Uttarakhand—2.66 (highest) followed by Bihar—2.19, Uttar Pradesh—1.82, Jharkhand—1.25 and Chhattisgarh—1.01; it also includes the non-EAG states like Himachal Pradesh, Punjab, Haryana and Kerala. The higher out-mobility for employment from these states or 'Push Factors' could be due to the lack of employment opportunities resulting from the poor economic infrastructure and developmental prospects prevailing in these states. These are also the states with the lowest per capita income and the highest 'below poverty rate' (BPL) ratio.

Similarly, Indicator 2 shows the likelihood among the Indian states to out-migrate for educational purposes in reference to the India* average (reference category). The odds ratio shows that the out-migration for seeking education is specifically highest among seven out of the eight North-eastern states of India. The highest odds ratio is captured for Manipur—6.77, a state which exhibits a high degree of infiltration and political instability, followed by Arunachal-Pradesh—3.54, Mizoram—3.26, Sikkim—3.09, Nagaland—2.91, Meghalaya—1.49 and Tripura–1.37. The reason for the higher likelihood of people from the North-eastern states migrating for education can be due to the fact that the socio-economic development of the region falls within the premise of absolute neglect (Sachdeva, 2006), and also because of the fact that, on the one hand, the literacy rate has increased while on the other hand, there is a lack of avenues for higher education (Shimray and Devi, 2009). The overall trends in terms of the higher education opportunities in the North-eastern region are very limited, (Baruah, 2006). The other states with higher odds ratios are Himachal Pradesh—3.21, Uttarakhand—3.16 and Kerala—2.56. The third column of Table 3 represents the effect size and the likelihood of occurrence of the combined reason-specific migration. The dominant states belonging to this category are also the states wherein both the indicators represent a higher likelihood of migration than the reference category. These states are Uttarakhand—2.68, Bihar—2.18, Himachal Pradesh—1.81, Uttar Pradesh—1.79, Jharkhand—1.28 and Kerala—1.13. This implies that in these states, the maximum 'push' factors are working towards out-migration for both employment and education purposes.

Overall, it can be argued that the mentioned 'Push Factors' are most dominant among the regions or states which are economically backward such as the eight EAG states and the North-eastern states where education-related 'Push' has found the maximum dominance, reflecting the lack of educational infrastructure in the region. On the other hand, the 'Push' factors are relatively or less dominant in the better-off states where the metropolitan areas

Table 3

Push Indicators of Indian states Using Odds Ratios

Out-Migration Odds Ratio States	*Indicator 1 Employment*	*Indicator 2 Education*	*Employment and Education*	*States*	*Indicator 1 Employment*	*Indicator 2 Education*	*Employment & Education*
J & K	0.41	1.61	0.47	Tripura	0.31	1.37	0.36
Himachal Pradesh	1.74	3.21	1.81	Meghalaya	0.35	1.49	0.41
Punjab	1.18	1.37	1.19	Assam	0.41	0.77	0.42
Uttarakhand	2.66	3.16	2.68	West Bengal	0.53	0.56	0.53
Haryana	1.17	1.57	1.19	Jharkhand	1.25	1.69	1.28
Delhi	0.85	2.2	0.92	Orissa	0.84	0.52	0.82
Rajasthan	0.87	0.76	0.86	Chhattisgarh	1.01	0.94	1.01
Uttar Pradesh	1.82	1.02	1.79	Madhya Pradesh	0.58	0.62	0.58
Bihar	2.19	1.77	2.18	Gujarat	0.46	0.84	0.48
Sikkim	0.41	3.09	0.54	Maharashtra	0.35	0.34	0.35
Arunachal Pradesh	0.27	3.54	0.43	Andhra Pradesh	0.45	0.7	0.47
Nagaland	0.61	2.91	0.72	Karnataka	0.78	0.65	0.78
Manipur	0.42	6.77	0.72	Kerala	1.05	2.56	1.13
Mizoram	0.22	3.26	0.37	Tamil Nadu	0.73	0.6	0.73
India*	1	1	1	India	1	1	1

Note: India* is the aggregate of all the mentioned states and does not include the Union Territories (UTs).

Source: Author's calculation using Census 2001 D-Series data on migration.

are growing such as Mumbai and Pune in Maharashtra, Bangalore in Karnataka, and Ahmedabad in Gujarat.

3. Analysis of Pull Indicators of Selected Indian States Using Odds Ratios

The focus of this section is on examining the extent of the 'Pull' factors among the Indian states. However, for the purpose of evaluating the states which are attractive to migrants because of the availability of the 'Pull' factors such as educational infrastructure and employment opportunities, in this section only the analysis of a few states has been considered. Only those states are considered which do not reflect much 'Push' in the previous sections. States with a higher likelihood of 'Push' such as the North-eastern states and the other backward states have not been considered in this section because of the basic argument that the backward states, in general, do not attract much migration, which is also evident from Table 3. However, the states of Bihar and Uttar Pradesh have been included in the analysis to empirically prove that the higher out-migrating states are not the major receivers. As expected, it has been found that states like Delhi, Maharashtra and Gujarat, which are economically better-off and exhibit better employability conditions, infrastructure, and educational facilities, and higher per capita income, attract the maximum inter-state level migration in India for the given two indicators.

V. GAINS FROM MIGRATION/REWARDING NATURE OF MIGRATION IN INDIA

After examining the 'Push–Pull Framework' in the Indian context in relation to uneven development and regional imbalances in the previous section, it becomes interesting to examine the issues related to the rewarding nature of migration in India.

The most important and widely discussed attribute of migration is its rewarding nature. At the regional level, internal migration from rural areas to the urban centres has historically been very important for the urbanisation process (Lall, *et al.*, 2006). At the individual and household levels, migration can be viewed as a process of mobility which plays a positive role in improving the welfare of the migrant household; it also acts as a livelihood strategy for the poor, which helps in reducing poverty (de Haan, 1999; Skeldon, 2002; McKenzie and Rapoport, 2004). It is also a risk-sharing behaviour of not only the individual but the families and households at large, as households seem to be better than individuals in terms of diversifying their resources such as labour in order to minimise risks (Stark, 1980; Stark and Levhari, 1982). In India, migration seems to be a rewarding and rational choice for the rural poor who migrate to urban areas, as it helps the migrants to attain the Above the Poverty Line (APL) status (Joe, *et al.*, 2011).

The rewarding nature of migration can be defined through the various positive attributes associated with migration such as a gain in welfare, economic gains such as remittances, building up of a social network, and the flow of information and skills, etc. In this section, the rewarding aspect of migration would be evaluated both at the destination and origin through the following three criteria: 1) Increase in employability (individual level at the destination), 2) Economic transition (household level at the destination), and 3) Gain in remittances (household level across the states at the origin).

Table 4

Pull Indicators of Selected Indian States Using Odds Ratios

States	*In-Migration Odds-Ratio*			*States*	*In-Migration Odds-Ratio*		
	Indicator[1] Employment	*Indicator[2] Education*	*Employment & Education*		*Indicator $_1$ Employment*	*Indicator $_2$ Education*	*Employment & Education*
Jammu & Kashmir	0.32	0.19	0.31	West Bengal	0.76	0.61	0.75
Himachal Pradesh	1.45	1.63	1.46	Gujarat	1.17	0.47	1.14
Punjab	1.91	0.77	1.86	Maharashtra	2.53	2.09	2.51
Haryana	2.67	1.38	2.62	Andhra Pradesh	0.22	0.24	0.22
Delhi	14.46	10.74	14.45	Karnataka	0.83	2.68	0.92
Uttar Pradesh	0.21	0.41	0.22	Kerala	0.35	0.34	0.35
Bihar	0.08	0.21	0.09	Tamil Nadu	0.2	0.6	0.21
**India	1	1	1	**India	1	1	1

Note: India is the aggregate of all the mentioned states and does not include the eight North-eastern states and some other states and the UTs.

Source: Author's calculation using Census 2001 D-Series data on migration.

1. Gains from Migration at Destination: Increase in Employability (Individual Level)

Table 5 shows the increase in employability of migrants across the Indian states, that is, it shows a proportional increase in employability with migration. The comparison between pre- and post-migration reveals that the usual principle status (UPS) as employed has considerably increased after migration and this increase has been witnessed for migrants across all the states without any exception.

Table 5

Proportional Change of Being Employed (UPS) before and after Migration

Indian States	*Employed*		*Indian States*	*Employed*	
	Before Migration	*After Migration*		*Before Migration*	*After Migration*
Andhra Pradesh	0.43	0.52	Maharashtra	0.33	0.49
Arunachal Pradesh	0.49	0.59	Manipur	0.29	0.29
Assam	0.12	0.25	Meghalaya	0.49	0.63
Bihar	0.08	0.19	Mizoram	0.44	0.56
Chhattisgarh	0.37	0.6	Nagaland	0.32	0.42
Delhi	0.23	0.45	Orissa	0.19	0.29
Gujarat	0.27	0.36	Punjab	0.12	0.21
Haryana	0.13	0.28	Rajasthan	0.32	0.38
Himachal Pradesh	0.37	0.53	Sikkim	0.36	0.55
Jammu and Kashmir	0.09	0.14	Tamil Nadu	0.35	0.48
Jharkhand	0.18	0.38	Tripura	0.2	0.3
Karnataka	0.3	0.49	Uttarakhand	0.34	0.41
Kerala	0.27	0.33	Uttar Pradesh	0.09	0.2
Madhya Pradesh	0.2	0.41	West Bengal	0.12	0.2
All-India	0.23	0.36	All-India	0.23	0.36

Source: NSSO, 64th Round, Migration in India, 2007-08.

2. Gains from Migration at Destination: Migration Leads to Economic Transition (Household Level)

Tables 6 and 7 show that across urban and rural India, migration leads to household transition, that is, with migration, the migrant household can achieve upward economic mobility. These two tables show that for each social group, especially for the backward groups such as Scheduled Castes (SCs), Scheduled Tribes (STs) and Other Backward Classes (OBCs), migration has led to upward improvement or mobility in terms of belonging to the higher consumption ladder. It is observed that the non-migrant households across communities mostly belong to the lower percentiles classes as against the migrant households at the destination. The fact that the dominance in the distribution of migrant households in the higher percentile classes has increased drastically across communities proves that migration brings about an improvement in the economic welfare of households.

Next, an attempt has been made to measure 'the extent of improvement', that is, belonging to the top two percentile classes (60-80 and 80-100) for non-migrant and migrant households across all the four categories (STs, SCs, OBCs and Others). It has been found that for the urban destined migration in India, the SC community has achieved the maximum

relative improvement or upward mobility. Within this community, only 28.7 per cent[8] of the non-migrant households belong to the top two percentile classes, whereas for the migrant households, this percentage share increases to 59.2 per cent.[9] The change in percentage share for The SC community is 30.5 per cent,[10] which is the highest among the other groups. For the other groups, the change in percentage distribution is as follows: STs—24.3 per cent, OBCs—27.8 per cent, and Others—15.4 per cent (showing the least difference). On the other hand, in the case of migration to the rural areas, the change in percentage distribution for non-migrant and migrant households belonging to the top two percentile classes is the highest for OBCs—18.8 per cent. This shows that migration is extremely important for the backward classes such as the SCs, STs and OBCs in order to bring about an improvement in economic mobility and a higher level of consumption expenditure.

Table 6

Distribution per '000 of Households in Percentiles for Each Social Group for Migrants and Non-migrants in Urban India (in per cent)

All-India Urban	*Average MPCE*	*Scheduled Tribes*		*Scheduled Castes*		*OBCs*		*Others*	
Percentile	Rupees	MH	N-MH	MH	N-MH	MH	N-MH	MH	N-MH
P1 (0-20)	501	8.2	23.9	14.9	25.0	12.4	18.5	1.2	8.2
P2 (20-40)	744	9.5	15.3	11.7	22.9	8.8	21.6	4.1	11.5
P3 (40-60)	1007	16.3	19.1	14.2	23.4	12.2	21.1	16.1	17.1
P4 (60-80)	1414	14.6	22.8	21.2	16.9	23.2	20.3	26.7	24.4
P5 (80-100)	2700	51.4	18.9	38.0	11.8	43.4	18.5	51.9	38.8
All Groups	1094	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: NSSO, 64th Round, Migration in India, 2007-08.

Table 7

Distribution per '000 of Households in Percentiles for Each Social Group for Migrants and Non-migrants in Rural India (in per cent)

All-India Rural	*Average MPCE*	*Scheduled Tribe*		*Scheduled Caste*		*OBC*		*Others*	
Percentile	*Rupees*	*MH*	*N-MH*	*MH*	*N-MH*	*MH*	*N-MH*	*MH*	*N-MH*
P1 (0-20)	352	21.7	27.9	12.4	21.6	12.1	14.6	5.6	9.8
P2 (20-40)	475	19.0	22.2	15.1	21.5	11.3	18.0	7.4	12.7
P3 (40-60)	580	22.8	18.5	26.7	20.4	10.8	20.4	8.4	16.7
P4 (60-80)	723	9.2	17.0	10.8	19.7	17.3	22.4	11.1	22.4
P5 (80-100)	1210	27.3	14.4	35.0	16.8	48.5	24.6	67.5	38.4
All Groups	666	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: NSSO, 64th Round, Migration in India, 2007-08.

VI. GAIN FROM MIGRATION AT ORIGIN: REMITTANCE RECEIPT (HOUSEHOLD LEVEL ACROSS STATES)

This section provides information about the gains from migration at the state level in terms of remittances received per '000 households. Here, the states are categorised into the following three sub-categories:

1) The eight Empowered Action Group (EAG) states including Bihar, Jharkhand, Orissa,

Uttarakhand, Rajasthan, Uttar Pradesh, Chhattisgarh and Madhya Pradesh;

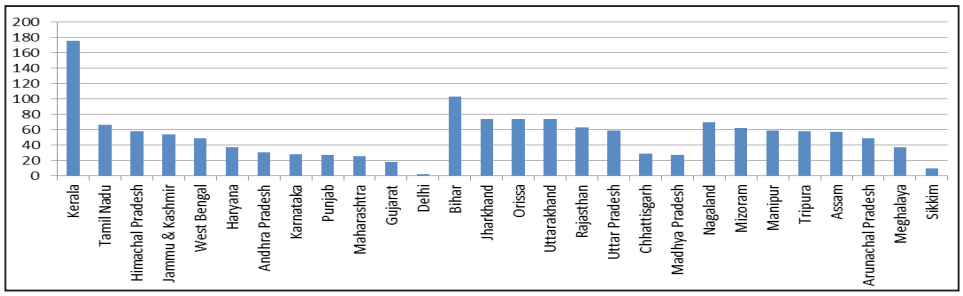
2) The eight North-eastern states (NES), or the peripheral states—Nagaland, Mizoram, Manipur, Tripura, Assam, Arunachal Pradesh, Meghalaya and Sikkim, and

3) The rest of Indian states (RIS), that is, Kerala, Tamil Nadu, Himachal Pradesh, Jammu & Kashmir, West Bengal, Haryana, Andhra Pradesh, Karnataka, Punjab, Maharashtra, Gujarat and Delhi.

It has been observed that the proportion of households receiving remittances per '000 households is very high for both the EAG and the North-eastern states as compared to the Rest of the Indian States (RIS). On an average, 62.87 per '000 households receive remittances in the EAG states, which also reflects the extent of remittance dependence, and the importance of migration in these states. It is followed by the North-eastern states, where on an average, 50.25 per '000 households receive remittances. The remittance dependence is found to be lowest for the rest of the Indian States (RIS), where on an average, only 39.40 per '000 households receive remittances. However, in this category, Kerala is an exception where the number of remittance-dependent households is the highest in India and remains an outlier. In Kerala, on an average, 175 per '000 households receive remittances. Given the fact that a higher number of households from the economically backward and low-income states such as the EAG states and the North-eastern states receive remittances, it can be argued from a macro perspective that migration is a rewarding phenomenon at the origin for the poorer states.

Figure 2

Proportion of Household Receiving Remittances per '000 Households



Source: NSSO, 64th Round, Migration in India, 2007-08.

VII. CONCLUSION

This paper carefully examines the various facets of quantum migration in India mainly from two broad perspectives, that is, the regional development perspective and the gains from the migration perspective. Firstly, it has been found that in India, migration is an outcome of regional imbalances in development as migration for education and employment is more rampant from the backward states such as the EAG states and the North-Eastern states. It is also more concentrated in the higher income states such as Maharashtra, Delhi and Gujarat. The theoretical 'Push–Pull Framework' has also been found to have empirical validation in this study. Secondly, it has also been observed that migration is a rewarding activity in

India, which improves the chances of employability at the destination across all the states. Migration also helps to achieve household transition, that is, in moving from a lower to a higher level of monthly per capita consumption expenditure (MPCE). Further, it has been found that the SCs and other backward groups have achieved the maximum economic transition from migration. And lastly, migration has been proved to be very important for the lower income and economically backward states as the numbers of remittance-dependent/ remittance-receiving households are the highest in these states.

Notes

1. The Census 2011 data on migration is yet to be published.
2. Net migration is the difference between in-migration and out-migration.
3. Positive net arises when in-migration is more than out-migration, and when it is adjusted with the population, it gives the extra number of persons added to the per '000 population. It is calculated by taking the difference between in-migration and out-migration, and the difference is then adjusted for population.
4. The positive net migration in Arunachal Pradesh and Sikkim in not because of better infrastructure like that seen in Delhi and Maharashtra but because of the highly concentrated migration from the other North-eastern states such as Manipur and Nagaland from where people are migrating because of the political violence and unrest prevalent there.
5. Negative net arises when in-migration is less than out-migration, and when it is adjusted with the population, it gives the number of persons reduced per '000 population. It is calculated by taking the difference between in-migration and out-migration, and the difference is then adjusted with population.
6. The limitation of this particular section is that it deliberately uses the information pertaining to 2001 for all the analysis. The main objective in this section is to examine the 'Push–Pull' framework, which can be better done only by using Census information that is available only for 2001. Therefore, for the purpose of comparability, the other data used such as per capita income and HDI values of states are also based on the information pertaining to 2001.
7. Examples of such states are the two sets of North-eastern states and the Empowered Action Group (EAG) states, consisting of eight states each. They are the states with the lowest per capita income, and the least economic development, industrialisation, and educational infrastructure.
8. 28.7= 16.9 (P4) + 11.8(P5).
9. 59.2= 21.2(P4) +38.0(P5).
10. 30.5= 59.2 (M-H, P4+P5)-28.7 (NM-H, P4+P5).

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EMPLOYMENT OF CASUAL WORKERS IN ORGANISED MANUFACTURING IN INDIA: ANALYSIS OF TRENDS AND THE IMPACT OF LABOUR REFORMS

Bishwanath Goldar and Suresh Chand Aggarwal*

The paper analyses trends in the employment of casual labour in India's organised manufacturing sector during the decade 1999-2000 to 2009-10 by using unit level data of the 55th, 61st and 66th Rounds of the Employment–Unemployment surveys conducted by the National Sample Survey Organisation (NSSO). An attempt has been made to explore the impact of labour regulations on the employment of casual workers. The analysis has been conducted at both the all-India level and the level of major Indian states. The trends in casualisation by education and by the size of firms have also been examined. An econometric analysis of the reasons as to why firms hire casual labour instead of regular labour has been attempted. The impact of labour market reforms on employment of casual labour has also been investigated. The results of the analysis presented in the paper basically show that casualisation of labour in organised manufacturing prevails in many traditional industries and in many major states of India. The presence of casual labour is higher among females, in rural areas, in 'big' firms and among relatively less educated workers. The wages of casual workers have tended to be lower than those of regular workers. It has been found that labour market reforms do benefit casual labour and firms tend to hire more of regular workers.

Keywords: *Casual labour, Organised manufacturing, Labour market reforms*

I. INTRODUCTION

Several studies have noted the increasing casualisation or informalisation of labour in India, particularly an upward trend in the share of casual or informal workers out of total employment in the industrial sector or the non-agricultural sector. To give some examples, Papola (2007) has drawn attention to the increasing casualisation in India and has noted that the proportion of casual workers out of aggregate employment in India increased from 23 per cent in 1972-73 to 33 per cent in 1999-2000. Maiti and Mitra (2010) have presented estimates of informal employment in Indian manufacturing for the years 1999-2000 and 2004-05. According to their estimates, the share of the informal sector in the manufacturing workforce increased from 78 per cent in 1999-2000 to 85 per cent in 2004-05. Srivastava

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(2012) observes that over the years, there has been a gradual decline in self-employment in India and an increase in casualisation. According to him, this has been more prominent for rural areas and for males. He reports that the share of informal workers in employment in the industry sector increased from 86 per cent in 1999-2000 to 89 per cent in 2004-05.

Since the focus of this paper is on organised manufacturing, more relevant to the paper are the available estimates of employment of casual or informal workers in the organised or formal sector of the economy, particularly manufacturing or industry. According to the estimates presented in a Report of the National Commission for Enterprises in the Unorganised Sector (NCEUS, 2007), the share of informal workers in employment in the organised sector of the economy increased from 38 per cent in 1999-2000 to 48 per cent in 2004-05, reflecting growing informalisation of the organised sector. Similarly, the employment estimates made by the Commission in another report (NCEUS, 2009) reveal that the employment in the formal sector of Indian industry increased from 20.27 million in 1999-2000 to 25.38 million in 2004-05, which is mostly accounted for by the increase in informal workers employed in the formal sector of Indian industry—from 12.13 million to 16.71 million (NCEUS, 2009, p. 135). The number of formal workers employed in the formal sector of Indian industry increased from 8.14 million to 8.67 million. According to the NCEUS estimates, the proportion of informal workers in the formal sector of Indian industry was about 60 per cent in 1999-2000, which increased to about 66 per cent in 2004-05.

Although some estimates are available on the share of informal workers or casual workers in total employment in the industrial sector, there are hardly any estimates of casual workers employed in the organised sector of Indian manufacturing. Hence, it is not known whether the observed upward trend in the proportion of casual/informal workers out of the total number of workers in the aggregate manufacturing sector also holds true for the organised manufacturing sector, or if the observed trend for organised industry, which includes construction, also holds true for organised manufacturing. Yet, it is the casualisation of the organised manufacturing sector, which if true would be a matter of serious concern (given the relatively low wages and poor working conditions of the casual workers as compared to the regular wage workers). It may be mentioned in this context that several studies have noted an upward trend in the share of workers employed through contractors (hereafter, contract workers) out of the total employment in organised manufacturing. Goldar and Aggarwal (2012), for instance, observe that the number of contract workers as a percentage of the total workers employed in organised manufacturing increased from 14 per cent in 1995-96 to 31 per cent in 2007-08.[1] However, an increase in the employment of contract workers relative to the directly employed workers does not necessarily imply an increase in the share of casual employment.[2] Thus, a study of trends in casual employment in organised manufacturing is important, and this paper makes an attempt in that direction.

Here, it is important to bring in the issue of labour market regulations and how that has impacted the nature of jobs created in the industrial sector. Many scholars (for example, Dutta, 2003; Ramaswamy, 2003; Sharma, 2006; Gupta, *et al.*, 2008; and Ahsan and Pagés, 2008) feel that the use of contact workers provides a means of getting around the labour

regulations, particularly the Industrial Disputes Act (IDA), and industrial enterprises in India have actually been adopting this means on a wide scale. Maiti, *et al*. (2009) and Sen, *et al*. (2010) have presented econometric evidence which indicates that stringent labour regulations have led to a greater use of contract workers. Goldar and Aggarwal (2012) have analysed the factors that have influenced the employment of casual workers in Indian manufacturing and found that labour market reforms tend to increase the creation of regular jobs, and import competition tends to raise casual employment among workers who have attained education above the primary level. Evidently, the available literature provides some basis to argue that stringent labour market regulations could be an important cause of the process of casualisation in manufacturing in India, and it would be useful to investigate this issue further for the organised manufacturing sector. This is another important objective of the paper.

The main data source used for the current study is the Employment and Unemployment Survey (EUS) conducted by the National Sample Survey Office (NSSO, Government of India) in the quinquennial rounds of 1999-2000 (55th Round), 2004-05 (61st Round) and 2009-10 (66th Round). Hence, the study covers the period from 1999-2000 to 2009-10 (it is a period during which India's organised manufacturing sector experienced a relatively fast growth). The number of employed workers has been estimated from Census-adjusted NSSO numbers by usual principal and subsidiary status. From the unit level data of these surveys, it is possible to identify the workers by their work status as well as the principal and subsidiary status of employed persons. Broadly, workers are categorised on the basis of status codes into self-employed (codes 11 to 21), regular workers (code 31) and casual workers (codes 41 and 51). NSSO (2006) defines a casual wage worker as "a person who was casually engaged in other's farm and non-farm enterprises (both household and non-household) and, in return, received wages according to the terms of the daily or periodic work contract." A regular salaried/wage worker, on the other hand, is defined to be one who receives salary or wages on a regular basis, either time wages or piece wages and full-time or part-time. The identification of the organised and unorganised sector from the EUS is done from the questions related to enterprise type and the number of workers in the enterprise.[3] The wages per day for regular and casual workers have also been computed from the unit level data of the EUS. This has been done by using the information about the wage and salary earnings for the work done during the week and the total number of days worked during the same week given in the current daily activity schedule of the survey.

The paper is organised as follows. Section II discusses the trends in employment of casual workers in India's organised manufacturing sector during the period 1999-2000 to 2009-10. The analysis of trends is undertaken by industry and by state. Sections III and IV analyse the distribution of casual workers by gender and sector (rural or urban), and the distribution of casual workers by the size of the firm where they are employed. Section V is devoted to an analysis of the distribution of casual and regular workers by general educational categories. Section VI compares the wage rates of regular and casual workers for the organised manufacturing sector of different states, and investigates if the inter-states differences in the extent of casualisation of the organised manufacturing sector are correlated

with the wage gap between regular and casual workers. Section VII presents an econometric analysis of the impact of labour reforms and certain other variables on the employment of casual workers in organised manufacturing. The analysis has been is kept simple, as only a small number of explanatory variables have been considered. The pooled data across industries and states have been used for the econometric analysis. Finally, Section VIII summarises and concludes the paper.

II. TRENDS IN THE EMPLOYMENT OF CASUAL WORKERS

Table 1 shows the status-wise distribution of the workforce in the organised manufacturing sector during the three years covered in the study. It is evident that at the aggregate level, the proportion of self-employed, regular wage workers and casual workers remained more or less the same between 1999-2000 and 2009-10. There was been only a marginal increase in the proportion of casual workers in total employment and only a marginal decline in the proportion of regular wage workers. Evidently, at the aggregate level, there is no indication of any significant casualisation of the workforce in the organised manufacturing sector during the period 1999-2000 to 2009-10.

Table 1

Distribution of Workforce in Organised Manufacturing by Status (Percentage)

UPSS Status	*Rounds (Years)*		
	55th Round (1999-2000)	*61st Round (2004-05)*	*66th Round (2009-10)*
Self-employed	6.21	5.59	6.4
Regular Wage Employment	71.39	70.76	70.77
Casual workers	22.4	23.64	22.84
Total	100	100	100

Source: Authors' calculations from NSSO "Employment and Unemployment in India" unit level data of 1999-2000 (55th Round), 2004-05 (61st Round) and 2009-10 (66th Round).

The share of casual workers in total employment is shown for the major industry groups of the organised manufacturing sector in Table 2. The industry groups in which the share of casual workers in total employment was more than 20 per cent in 1999-2000 are: (1) Food, beverages and tobacco, (2) Textiles, textile products, leather and footwear, (3) Wood and wood products, (4) Coke and petroleum refinery products, (5) Non-metallic mineral products, and (6) Manufacturing n.e.c. and recycling. Of these six industry groups, there was a fall in the proportion of casual workers in four cases. The non-metallic mineral products group is the only industry group in which the proportion of casual workers was high and there was a further increase in the proportion of casual workers in employment.

In the machinery and transport equipment groups, and the paper and printing group, the proportion of casual workers in total employment was relatively low. In some of these industry groups, there was a slight increase in the proportion in question, while in others there was a fall.

Table 2
Share of Casual Workers in Total Employment, by Industry (Organised Manufacturing)

Industry Group	*Rounds (Years)*		
	55th Round (1999-2000)	*61st Round (2004-05)*	*66th Round (2009-10)*
Food Products, Beverages and Tobacco	31.38	30.92	32.12
Textiles, Textile Products, Leather and Footwear	20.88	16.97	17.15
Wood and Products of Wood	43.41	31.08	39.12
Pulp, Paper, Paper Products, Printing and Publishing	7.49	7.98	9.84
Coke, Refined Petroleum Products and Nuclear Fuel	27.48	7.22	18.98
Chemicals and Chemical Products	13.02	16.81	10.11
Rubber and Plastic Products	13.32	8.76	13.40
Other Non-metallic Mineral Products	59.14	65.29	67.19
Basic Metals and Fabricated Metal Products	14.33	18.40	14.34
Machinery, n.e.c.	8.02	4.10	9.51
Electrical and Optical Equipment	3.21	5.75	5.22
Transport Equipment	5.55	8.60	3.38
Manufacturing, n.e.c.; Recycling	46.38	41.93	38.82
All Manufacturing Industries	22.40	23.64	22.84

Source: Authors' calculations from NSSO "Employment and Unemployment in India" unit level data of 1999-2000 (55th Round), 2004-05 (61st Round) and 2009-10 (66th Round).

It is evident from Table 2 that some industry groups have experienced an increase in the proportion of casual workers in total employment while others have experienced a fall, thereby neutralising the increase experienced by the former industry groups. As a result, at the aggregate level, the proportion of casual workers in total employment in the organised manufacturing did not change much between 1999-2000 and 2009-10. Clearly, among the manufacturing industries, there was no sign of an across-the-board or an almost across-the-board increase in the proportion of casual workers out of total employment.

Table 3 presents an analysis similar to that in Table 2. In this case, a state-wise analysis[4] has been undertaken. The table shows the proportion of casual and regular wage workers in the organised manufacturing sectors of the major states for three years, that is, 1999-2000, 2004-05 and 2009-10.

Table 3 shows that in some states, there was a significant increase in the proportion of casual workers in total employment in the organised manufacturing between 1999-2000 and 2009-10. These include Andhra Pradesh, Assam, Orissa, Rajasthan, and West Bengal. A modest increase in the proportion of casual workers also occurred in Himachal Pradesh, Karnataka, Punjab and Tamil Nadu. The state of Bihar needs to be considered together with Jharkhand to ensure the inter-temporal comparability of data. The proportion of casual workers in Bihar and Jharkhand combined increased from 34 per cent in 1999-2000 to 47 per cent in 2009-10, which is obviously a significant increase. Thus, in a majority of the states, considering only the major Indian states, there was an increase in the proportion of casual workers in total employment in the organized manufacturing sector between 1999-2000 and 2009-10. This has not, however, led to an increase in the proportion of casual workers in the organised manufacturing sector at the all-India level because some states have experienced

Table 3
Proportion of Casual and Regular Wage Workers in Total Employment in Organised Manufacturing, by State (Percentage)

States	*Years*					
	1999-2000		*2004-05*		*2009-10*	
	Casual	*Regular*	*Casual*	*Regular*	*Casual*	*Regular*
Andhra Pradesh	16.33	80.94	34.63	54.71	27.18	65.82
Assam	14.28	41.71	26.56	62.47	31.89	63.41
Bihar	33.64*	58.26*	68.21	24.41	38.89	54.43
Chhattisgarh	-	-	33.92	61.71	31.27	65.22
Gujarat	28.46	67.17	25.76	70.75	24.27	68.18
Haryana	38.20	52.97	9.17	86.29	8.90	90.21
Himachal Pradesh	21.47	62.28	31.11	67.20	26.35	73.55
Jharkhand	-	-	54.11	40.48	53.52	43.84
Karnataka	12.59	82.81	14.26	78.13	17.60	78.82
Kerala	42.81	48.62	45.61	49.22	43.80	52.10
Madhya Pradesh	43.80$	53.71$	12.75	77.54	12.58	84.96
Maharashtra	13.53	82.08	10.20	86.49	12.62	85.24
Orissa	15.08	84.31	36.18	56.15	30.74	65.88
Punjab	25.38	66.58	15.22	80.18	28.11	65.97
Rajasthan	9.29	83.25	35.06	61.50	27.80	57.96
Tamil Nadu	16.80	78.49	21.23	75.37	21.57	71.27
Uttar Pradesh	30.33@	61.13@	28.98	63.58	30.29	64.33
Uttarakhand	-	-	15.62	75.48	14.50	85.50
West Bengal	23.76	72.11	35.67	56.05	34.49	50.00
All India	22.40	71.39	23.64	70.76	22.84	70.77

Note: * includes Jharkhand; $ includes Chhattisgarh; @ includes Uttarakhand.

Source: Authors' calculations from NSSO "Employment and Unemployment in India" unit level data of 1999-2000 (55th Round), 2004-05 (61st Round) and 2009-10 (66th Round).

a marked fall in the proportion of casual works in organised manufacturing. A prominent case is that of Madhya Pradesh and Chhattisgarh combined, wherein the proportion of casual workers fell from 44 per cent in 1999-2000 to 20 per cent in 2009-10. A still bigger fall was experienced by Haryana, where the proportion of casual workers in the organised manufacturing sector fell from 38 per cent in 1999-2000 to only 9 per cent in 2009-10. Thus, while a large number of states experienced increasing casualisation of the organised manufacturing workforce between 1999-2000 and 2009-10, this does not show up at the all-India level because two states, namely (a) Madhya Pradesh and Chhattisgarh combined, and (b) Haryana experienced a significant reduction in the employment proportion of casual workers in the organised manufacturing sector.

Another point worth noting here is that in the cases of the states that experienced an increase in the proportion of casual workers in the organised manufacturing sector, the hike in the employment of casual workers took place mostly by displacing regular wage workers, rather than the self-employed workers. Similarly, the fall in the proportion of casual workers out of total employment in the organised manufacturing sector in Madhya Pradesh, Chhattisgarh and Haryana resulted in an increase in the proportion of regular

wage workers, suggesting thereby that the casual jobs in industries have been replaced by regular wage jobs.

III. DISTRIBUTION OF CASUAL WORKERS BY GENDER AND SECTOR

It has been seen above that in a number of Indian states, there has been a significant increase in casualisation. However, in two states, namely Madhya Pradesh and Chhattisgarh combined, and Haryana, there has been a sharp fall in casualisation. Where has that occurred? Is it among males or females, in rural enterprises or in urban enterprises? It would be interesting to find this out. Therefore, in order to understand the sources of variation in the share of casual workers both within the states and over time, we have explored the gender distribution and sector (rural–urban) distribution across states. In Table 4, we have summarised the percentage share of casual labour in total organised employment in each state for males and females separately. Thus, we find that of the total male employment in the organised manufacturing sector in 1999-2000, 20 per cent of the workers were employed as casual labour, whereas the corresponding figure was 36 per cent for females. This implies that of the total female employment in the organised manufacturing sector, more than one-third were employed as casual labour. The share in question ranged from 75 per cent to 90 per cent for the states of Haryana, Madhya Pradesh (combined) and Himachal Pradesh, indicating that in these three states, the major employment status available to females was that of casual labour and almost no employment opportunity was available to them as regular workers. However, in a few other states as in Assam and Rajasthan, either no females are working as casual labourers in the organised manufacturing sector or their percentage is quite low, as in the states of Andhra Pradesh, Gujarat, Karnataka, Maharashtra, Punjab and Tamil Nadu.

It is interesting to note that the variation across states in the percentage of male casual labour is not as much as that for female casual labour. However, the high variability in the case of female workers may have been caused by the fact that female workers constitute only about 15 to 20 per cent of organised manufacturing employment. Thus, the estimates of the share of casual workers in the total number of workers are subject to greater sampling error when the estimates are done for females than those for males. The implication is that one has to be cautious in interpreting the state level estimates of the share of casual workers among females employed in the organised manufacturing sector.

Over the period 1999-2000 to 2009-10, it may be observed that while the share of male casual labour remained almost stagnant, it went up for female casual labour, from 36 per cent to 40 per cent. The increase was more than 20 percentage points for the states of Andhra Pradesh, Bihar, Orissa, Punjab, and Rajasthan. The fall in the casual labour proportion in Madhya Pradesh and Haryana noted in the previous section can probably be traced to the massive fall by 41 and 56 percentage points in the female casual labour in the organised manufacturing sector in these two states.[5]

Another issue which has been explored is whether the rural or the urban sector is the source of changes in casual labour in the organised manufacturing sector. This is shown in Table 5. We observe that during the period 1999-2000 to 2009-10, casual labour is more a phenomenon witnessed in rural than urban areas. While in the urban sector, casual labour

Table 4
Share of Casual Labour in Total Males/Females Employment in Organised Manufacturing (Percentage), by State

States	*Year*					
	1999-2000		*2004-05*		*2009-10*	
	Males	*Females*	*Males*	*Females*	*Males*	*Females*
Andhra Pradesh	15.73	17.22	36.89	31.15	21.53	44.24
Assam	16.17	0.00	24.40	100.00	21.82	89.70
Bihar	29.83	54.25	62.09	100.00	36.39	85.91
Chhattisgarh	NA	NA	23.98	74.55	30.04	100.00
Gujarat	28.54	27.17	23.01	57.72	25.31	8.30
Haryana	34.64	74.74	7.07	43.88	5.57	33.93
Himachal Pradesh	20.24	88.62	30.19	35.96	20.95	60.07
Jharkhand	NA	NA	50.95	63.63	47.35	100.00
Karnataka	7.47	29.45	10.53	23.66	12.41	35.10
Kerala	23.40	59.66	28.80	60.92	22.75	66.20
Madhya Pradesh	27.05	86.71	13.10	12.22	9.78	30.74
Maharashtra	13.21	17.41	9.54	15.51	11.29	25.80
Orissa	15.50	10.99	27.87	74.07	29.70	41.78
Punjab	25.89	20.61	14.69	25.47	25.31	54.89
Rajasthan	9.96	0.00	29.64	69.74	23.70	47.87
Tamil Nadu	14.28	26.74	19.33	26.04	15.14	36.41
Uttar Pradesh	29.08	52.18	28.15	42.85	29.41	69.54
Uttarakhand	NA	NA	15.22	24.41	15.64	0.00
West Bengal	21.15	63.50	33.02	61.34	30.75	49.09
All India	19.83	36.21	21.05	35.48	19.55	40.54

Source: Authors' calculations from NSSO "Employment and Unemployment in India" unit level data of 1999-2000 (55th Round), 2004-05 (61st Round) and 2009-10 (66th Round)

Table 5
Share of Casual Labour in Total Rural/Urban Employment in Organised Manufacturing (Percentage), by State

States	*Years*					
	1999-2000		*2004-05*		*2009-10*	
	Rural	*Urban*	*Rural*	*Urban*	*Rural*	*Urban*
Andhra Pradesh	27.16	7.64	37.44	29.91	45.19	10.58
Assam	21.02	0.00	41.85	7.87	35.48	23.33
Bihar	49.94	4.71	79.33	33.04	43.65	31.77
Chhattisgarh	NA	NA	48.21	17.08	52.98	13.48
Gujarat	28.72	28.36	60.45	9.63	50.06	13.60
Haryana	48.47	28.03	16.05	3.58	17.53	5.55
Himachal Pradesh	25.54	0.00	22.13	42.85	10.02	51.21
Jharkhand	NA	NA	76.66	29.87	85.54	21.88
Karnataka	38.47	6.38	31.36	9.82	26.74	14.66
Kerala	50.63	25.54	53.19	27.84	53.34	25.61
Madhya Pradesh	79.21	14.60	13.90	11.30	18.98	11.74
Maharashtra	23.82	9.86	15.81	8.24	33.78	5.48
Orissa	46.89	2.46	53.48	12.31	56.44	10.77

Punjab	48.80	11.36	26.05	5.46	47.90	15.60
Rajasthan	18.86	2.88	53.98	5.20	41.95	13.33
Tamil Nadu	17.98	15.85	35.99	12.03	28.23	16.96
Uttar Pradesh	47.47	9.33	41.35	14.17	45.77	15.94
Uttarakhand	NA	NA	31.39	0.00	7.97	16.96
West Bengal	35.73	18.97	58.89	25.31	48.74	19.36
All India	36.58	12.95	39.71	12.55	40.45	12.20

Source: Authors' calculations from NSSO "Employment and Unemployment in India" unit level data of 1999-2000 (55th Round), 2004-05 (61st Round) and 2009-10 (66th Round).

remained at around 12 per cent of the total organised employment in organised manufacturing (that is, it is mostly the regular employment in the urban sector), the share of casual labour was around 37 to 40 per cent in the rural sector during these ten years.

Inter-state variations are found to be greater in the share of rural casual labour than in urban casual labour share. The percentage of casual labour out of the total employment in organised manufacturing in the rural sector fell drastically in the states of Madhya Pradesh[6] and Haryana (by 60 and 30 percentage points), whereas on the other hand, it increased substantially in Andhra Pradesh, Assam, Gujarat, Rajasthan and West Bengal. In the case of urban casual labour, a significant fall can be observed in the share in case of Haryana and Gujarat, while an increase was witnessed for Assam, Bihar, Himachal Pradesh, and Rajasthan.

IV. DISTRIBUTION OF CASUAL WORKERS BY SIZE OF THE FIRM

In this section, we explore the effect of the size of the firm, as measured by the number of workers, on the share of casual labour in the organised manufacturing sector for the major states of India. We have concentrated only on two important size classes for organised employment—that of firms with the number of employees being (i) equal to or more than 10 but less than 20, and (ii) more than 20. The analysis is presented in Table 6.

Table 6
Share of Casual Labour in Total Employment in Organised Manufacturing, by Firm Size (Number of Workers) (Percentage), by State

Size of the Firm (in Terms of Employment)	*State*					
	1999-2000		*2004-05*		*2009-10*	
	10 and Above but Less Than 20	*20 and Above*	*10and Above but Less Than 20*	*20 and Above*	*10 and Above but Less Than 20*	*20 and Above*
Andhra Pradesh	15.94	74.17	10.78	72.42	8.24	72.63
Assam	0.00	52.88	0.00	99.36	7.60	72.12
Bihar	2.88	40.71	2.93	97.07	6.19	92.98
Chhattisgarh	NA	NA	19.54	71.83	1.64	27.52
Gujarat	37.94	56.32	15.01	84.84	29.77	68.37
Haryana	51.77	42.32	4.10	85.27	8.94	91.06
Himachal Pradesh	0.00	49.70	0.00	90.77	0.00	100.00
Jharkhand	NA	NA	8.34	88.52	29.10	65.50
Karnataka	45.01	48.21	29.15	51.95	14.53	51.76
Kerala	14.36	77.91	10.77	81.81	20.34	72.90
Madhya Pradesh	17.48	55.21	18.11	45.78	8.06	29.70
Maharashtra	41.23	42.69	25.38	66.64	14.92	74.94
Orissa	4.88	41.91	5.48	67.58	13.35	72.62
Punjab	10.95	85.93	5.62	81.97	10.69	71.97
Rajasthan	0.00	52.18	1.46	75.14	13.77	77.40
Tamil Nadu	46.74	44.09	33.34	59.68	21.48	76.71
Uttar Pradesh	13.35	69.16	19.10	68.34	18.68	74.89
Uttarakhand	NA	NA	15.88	84.12	0.00	71.67
West Bengal	18.30	64.42	27.00	64.86	7.46	82.19
All India	26.04	58.37	17.84	72.38	16.24	72.81

Source: Authors' calculations from NSSO "Employment and Unemployment in India" unit level data of 1999-2000 (55th Round), 2004-05 (61st Round) and 2009-10 (66th Round).

Table 6 shows that while in 1999-2000, about 58 per cent of the casual labour was in the firms with the number of workers being more than 20, the corresponding percentage increased to 73 per cent in 2009-10. This implies that the role of big firms in providing employment to casual labour is becoming increasingly important. The casual labour within the organised manufacturing sector in different states is concentrated more in the big firms employing 20 and more workers. The share of casual labour in big organised manufacturing firms increased significantly during the period 1999-2000 to 2009-10 in the states of Assam, Bihar, Haryana, Himachal Pradesh, Maharashtra, Orissa, Rajasthan, and Tamil Nadu. On the other hand, the share of casual labour in small firms was quite low in the states of Bihar, Orissa, Punjab, and Uttar Pradesh in 1999-2000 and in the states of Chhattisgarh, Bihar, Andhra Pradesh, Assam, Haryana, and Madhya Pradesh in 2009-10. The share of casual labour in small organised manufacturing firms reduced significantly—by more than 25 percentage points—in Haryana, Karnataka, Maharashtra, and Tamil Nadu. There was a modest but noticeable increase in the share of casual labour in small manufacturing firms in

the states of Rajasthan, Orissa, and Assam. Overall, it seems that the process of casualisation has been occurring in reverse in the small size manufacturing firms in the organised sector.

V. DISTRIBUTION OF CASUAL AND REGULAR WORKERS BY GENERAL EDUCATIONAL CATEGORIES

In this section, we analyse the education profile of casual labourers. The NSSO in its EUS gathers information about the general educational level of the households. The general educational level of employed persons has been classified into five education categories, namely, (1) Below the primary level, (2) Primary level, (3) Middle level, (4) Secondary and Higher Secondary level, and (5) above the Higher Secondary level. One may associate the educational level with the skill of the workers. Those with no education or with low levels of education are mainly unskilled workers while those with higher educational levels may be labelled as skilled workers. In Table 7, we present the educational profile of casual workers over the three NSSO Rounds, that is, from 1999-2000 to 2009-10, and compare it with that of regular workers.

Table 7

Proportion of Casual and Regular Wage Workers in Organised Manufacturing, by General Education (Percentage)

General Education	*Year*					
	1999-2000		*2004-05*		*2009-10*	
	Casual	*Regular*	*Casual*	*Regular*	*Casual*	*Regular*
Below Primary Level	50.21	19.00	47.27	16.88	44.10	11.75
Primary Level	15.48	11.23	19.77	13.20	17.89	11.20
Middle Level	21.83	18.80	22.64	19.58	22.45	17.50
Secondary and Higher Secondary Level	11.03	32.79	7.43	16.01	13.12	30.50
Above Higher Secondary Level	1.45	18.18	2.89	34.33	2.44	29.04
All	100	100	100	100	100	100

Source: Authors' calculations from NSSO "Employment and Unemployment in India" unit level data of 1999-2000 (55th Round), 2004-05 (61st Round) and 2009-10 (66th Round).

As expected, a very high proportion of casual labourers in the organised manufacturing sector have a low level of education as compared to regular workers. In 1999-2000, 50 per cent of the casual labourers were almost illiterate as compared to just 19 per cent of regular workers. Another 15 per cent of casual labourers had acquired just primary level education. Thus, we find that two-thirds of casual labourers had low levels of skills and that only 12.5 per cent had attained education above the middle school level. During the period 1999-2000 to 2009-10, there was some improvement in the educational levels of casual workers in the organised manufacturing sector. In 2009-10, the proportion of low skilled casual labourers fell to 62 per cent from 66 per cent while in 1999-2000 that of those who were educated above the middle school level increased to 16 per cent from 12 per cent. However a lot of variation is found among the major states, when one considers the educational distribution of casual workers in the organised manufacturing sector, as depicted in Table 8.

Table 8 shows the distribution of casual labourers by two main educational categories, that is, those having acquired education 'up to the primary level' and those with education

'above the primary to the higher secondary' level for all the major states. In 1999-2000, in six states out of sixteen, that is, Madhya Pradesh, Bihar, Andhra Pradesh, West Bengal, Punjab, and Karnataka, more than three-fourths of the casual labourers in the organised manufacturing sector had attained education only up to the primary level. On the other hand, in five states, namely Maharashtra, Gujarat, Kerala, Assam and Himachal Pradesh, the corresponding ratio was less than 50 per cent. Over the period 1999-2000 to 2009-10, a significant increase took place in some states in the share of causal workers who had acquired education 'up to the primary level'. Some of the notable examples are Assam, Haryana, Himachal Pradesh, and Rajasthan. In contrast, the states of Karnataka and Madhya Pradesh showed a sharp decline in the corresponding share of casual workers by more than 40 percentage points; whereas Punjab and Tamil Nadu have also experienced a substantial fall in the share of casual labourers who had attained education 'up to the primary' level.

Table 8

Proportion of Casual Workers in Organised Manufacturing in States, by General Education (Percentage)

States	*Education Level*					
	1999-2000		*2004-05*		*2009-10*	
	Up to Primary Level	*Above Primary to Higher Secondary Level*	*Up to Primary Level*	*Above Primary to Higher Secondary Level*	*Up to Primary Level*	*Above Primary to Higher Secondary Level*
Andhra Pradesh	87.53	12.47	76.98	21.75	83.41	16.51
Assam	47.12	52.88	76.55	23.45	85.31	14.69
Bihar	92.42	7.58	88.14	11.03	93.64	6.36
Chhattisgarh	NA	NA	77.43	22.12	26.55	55.42
Gujarat	37.26	58.84	44.55	53.06	46.68	47.93
Haryana	58.95	41.05	72.69	16.67	85.92	11.16
Himachal Pradesh	47.85	52.15	53.49	46.51	77.8	22.2
Jharkhand	NA	NA	71.16	22.38	41.07	58.39
Karnataka	77.04	22.96	76.24	23.76	35.91	64.09
Kerala	41.08	58.7	48.55	50.24	35.87	63.12
Madhya Pradesh	95.47	4.53	64.96	35.04	53.07	46.93
Maharashtra	36.65	61.49	47.84	52.1	41.46	51.52
Orissa	58.1	40.28	83.82	13.9	59.77	39.51
Punjab	78.52	21.48	87.36	12.64	64.81	35.19
Rajasthan	63.62	36.38	88.5	11.5	83.25	16.75
Tamil Nadu	67.59	31.67	66.79	32.94	51.74	44.92
Uttar Pradesh	72.69	23.4	79.08	20.47	73.56	26.42
Uttarakhand	NA	NA	81.86	18.14	66.11	33.89
West Bengal	79.59	20.41	78.4	20.64	87.46	11.38
All India	65.69	32.86	67.04	31.59	61.99	35.57

Source: Authors' calculations from NSSO "Employment and Unemployment in India" unit level data of 1999-2000 (55th Round), 2004-05 (61st Round) and 2009-10 (66th Round).

VI. WAGE RATES OF REGULAR AND CASUAL WORKERS

In this section, we first analyse the wage trends of casual labourers by education categories and the relative wage rate of casual workers of different educational categories vis-à-vis the wage rate of regular workers of those categories. Then, we make inter-state comparisons of the ratio of the wages of casual workers relative to that of regular wage workers.

It is expected that the wages of workers with higher educational levels would be higher because of positive returns to education, and that the wages of regular workers would be more than that of casual labourers. Table 9 presents a summary of the money wages of casual labourers and of the relative wages of casual labourers to regular workers by the major education categories for the period 1999-2000 to 2009-10. We find that the overall and the educational category-wise money wages increased over the decade. A positive feature of the trend in relative wages is the increase in the relative wages of casual labourers during the decade 1999-2009, indicating a reduction in the tendency of inequality in wages. However, we find that the inequality is very high for workers with education 'above the higher secondary' level as compared to those with 'below the primary level' education. The wage behaviour is on expected lines and is an incentive for casual labourers to move from low-education to high-education levels and from casual jobs to regular worker jobs.

Table 9

Money Wages and Relative Wages of Casual Workers in Organised Manufacturing

Education Categories	*Wages*					
	1999-2000		*2004-05*		*2009-10*	
	Money Wages of Casual Labour (Rs.)	*Relative Wages of Casual Labour to Regular Workers*	*Money Wages of Casual Labour (Rs.)*	*Relative Wages of Casual Labour to Regular Workers*	*Money Wages of Casual Labour (Rs.)*	*Relative Wages of Casual Labour o Regular Workers*
Below Primary Level	51.02	50.5%	53.94	66.2%	94.74	69.2%
Primary Level	61.13	48.8%	67.62	66.7%	112.68	73.3%
Middle Level	65.13	45.6%	73.04	63.2%	113.77	51.6%
Secondary and Higher Secondary Level	69.21	30.7%	71.98	43.2%	128.00	50.8%
Above Higher Secondary Level	63.75	18.1%	77.89	26.7%	167.41	26.3%
All	57.75	29.0%	63.33	35.8%	108.54	32.5%

Source: Authors' calculations from NSSO "Employment and Unemployment in India" unit level data of 1999-2000 (55th Round), 2004-05 (61st Round) and 2009-10 (66th Round).

We have further tried to investigate the status of regular and casual workers in the organised manufacturing sector across 19 major states[7] in terms of the wage trends. Table 10 summarises the relative wages of casual workers in the organised manufacturing to those of regular workers. It is observed that the overall wages of casual workers constituted a small fraction of the wages of the regular workers, and increased only marginally from 29

per cent to 32.5 per cent between 1999-2000 and 2009-10. However, one finds that between states, there is a wide variation in the relative wages being received by casual workers both during the same period as well as over the period.

Table 10

Ratio of Wages of Casual Wage Workers to Wages of Regular Wage Workers in Total Employment in Organised Manufacturing, by State (Percentage)

States	*1999-2000*	*2004-05*	*2009-10*
Andhra Pradesh	44.1%	33.9%	35.4%
Assam	42.6%	19.6%	21.5%
Bihar	13.8%	25.7%	30.3%
Chhattisgarh	NA	19.7%	25.1%
Gujarat	42.4%	50.9%	39.4%
Haryana	29.0%	21.5%	51.5%
Himachal Pradesh	59.5%	35.9%	69.7%
Jharkhand	NA	22.1%	13.8%
Karnataka	21.2%	27.9%	31.7%
Kerala	30.5%	37.7%	29.2%
Madhya Pradesh	13.9%	67.7%	37.3%
Maharashtra	20.9%	31.4%	22.6%
Orissa	36.9%	16.5%	37.3%
Punjab	69.5%	38.2%	48.9%
Rajasthan	49.9%	39.4%	51.8%
Tamil Nadu	29.6%	41.4%	41.2%
Uttar Pradesh	48.6%	44.0%	39.2%
Uttarakhand	NA	31.2%	57.4%
West Bengal	36.0%	34.1%	30.0%
All India	28.9%	35.8%	32.5%

Source: Authors' calculations from NSSO "Employment and Unemployment in India" unit level data of 1999-2000 (55th Round), 2004-05 (61st Round) and 2009-10 (66th Round).

In 1999-2000, there were a few states, such as Punjab, Himachal Pradesh, Rajasthan, Uttar Pradesh, Andhra Pradesh, and Assam, wherein casual labourers received a relatively high wage in relation to the wages of regular workers, that is, they received more than 40 per cent of the wages of regular workers. On the other extreme, we have states like Bihar, Karnataka, Madhya Pradesh and Maharashtra, wherein the relative wage of casual workers in relation to regular workers was very low, at less than 25 per cent. It may also be observed that though at the aggregate level, there was not much change in the relative wages of casual workers over the period 1999-2000 to 2009-10, there was a dramatic increase in the relative wages of casual workers, and this was neutralised by a similar fall in the relative wages of casual workers in a few other states. The states where the relative wages increased were Bihar, Haryana, Madhya Pradesh, Tamil Nadu and Uttarakhand, while the states they fell were Assam, Punjab, Uttar Pradesh, and West Bengal.

One would expect the relatively low wages of casual workers to be a factor encouraging the firms to employ such labour. By this logic, the states in which the relative wages of casual workers are low as compared to the national average should be the states in which the

proportion of casual workers in employment is relatively higher. Accordingly, a negative relationship is expected between the relative wage rate of casual workers and the share of casual workers in organised manufacturing employment in different states. Indeed, our data show a negative correlation between the two variables. We have found a negative correlation of -0.28 between the relative wages of casual workers and their share in total employment for 16 major states for the year 1999-2000. The correlation increased and became stronger over time and was -0.46 for the 19 major states in 2009-10. This finding indicates that the incidence of relatively low wages of casual labourers has something to do with our observation that in a number of the major Indian states, there was a tendency for industries to substitute regular labour by casual labour.

VII. ECONOMETRIC ANALYSIS: EXPLAINING EMPLOYMENT OF CASUAL LABOUR

As mentioned in the introductory section of the paper, that is, Section I, a key issue to be investigated is the impact of labour regulations on a firm's decision to employ casual workers rather than regular workers. There are reasons to believe that stringent labour regulations drive firms to resort to the employment of casual workers, while the implementation of labour reforms would reverse the process, thereby encouraging firms to create more regular jobs. Indeed, some earlier studies have found that labour regulations tend to encourage the employment of contract labourers or casual labourers in the Indian manufacturing sector (for instance, Maiti, *et al.*, 2009; Sen, *et al.*, 2010; and Goldar and Aggarwal, 2012).

Besides labour regulations, the openness of an industry to international competition could be an important factor influencing the use of casual labour. Sen, *et al.* (2010) have found evidence that import competition tends to raise the use of contract workers in Indian manufacturing industries, and similarly, Goldar and Aggarwal (2012) have found that import competition tends to increase the use of casual labourers.

A firms decision to use casual labourers would also be influenced by the wage rate of casual workers vis-à-vis that of the regular wage workers. Goldar (2009) has found econometric evidence in support of this assertion. In his estimated econometric model based on state by industry pooled data for 2004-05, a significant negative relationship has been found between the use of contract workers in industries and the ratio of the wage rate of contract workers to that of the directly employed workers. It may be added here that in the analysis in Section VI above, a significant negative correlation coefficient has been found between the share of casual workers in employment and the relative wage rate of casual workers. Thus, this variable needs to be included in the econometric model.

In the analysis presented in Section III above, it has been observed that the proportion of casual employment is greater among females than among males. Further, the proportion of casual employment is relatively greater in manufacturing enterprises in rural areas than those in urban areas. It seems reasonable to expect that as the proportion of females in organised manufacturing employment goes up, there would be an increase in the proportion of casual workers. Similarly, an increase in the rural share of organised manufacturing employment

should result in a hike in the proportion of casual workers. Accordingly, these two variables should be included in the econometric model.

The above-mentioned factors have been incorporated in the econometric analysis undertaken for this study. Pooled data for 19 major states and various two-digit industries for the year 2009-10 are used for the estimation of the model. In notation, the model may be written as:

$$\left(\frac{CW}{TW}\right)_{sk} = \alpha + \beta_1 LR_s + \beta_2\left(\frac{X+M}{Q}\right)_k + \beta_3\left(\frac{W_C}{W_R}\right)_s + \beta_4\left(\frac{WW}{TW}\right)_s + \beta_5\left(\frac{RW}{TW}\right)_s + u_{sk} \quad (1)$$

In this equation, $(CW/TW)_{sk}$ is the proportion of casual workers out of the total workers in state s and industry k. LR is an index of labour market reforms undertaken by the states. Thus, LR_s represents the extent of labour reforms undertaken in state s. X, M and Q denote exports, imports and domestic production, respectively. The ratio $[(X+M)/Q]_k$ represents the degree of openness in industry k. W_C and W_R are the wage rates of casual and regular wage workers. Thus, this ratio in the equation represents the relative wage. WW/TW and RW/TW imply the proportion of women workers out of the total workers and the proportion of rural workers out of total workers, respectively. The subscript s with these expressions indicates that the ratios in questions have to be taken for states. Finally, the term u_{sk} in the regression equation is the random error term.

A linear specification of the model has been used, and it has been estimated by the Ordinary Least Squares (OLS) technique.

As mentioned above, the model has been estimated from pooled state-wise industry-wise data for 2009-10. The analysis is confined to 19 major states. Although the analysis has been undertaken at the two-digit industry level, not all two-digit industries get included. For each state, only those two-digit industries are considered which account for at least 5 per cent of the organised manufacturing employment of the state.[8] As a result, the model estimate is based on only 84 observations, though 19 states are included.

Most variables for the regression analysis have been constructed from the EUS of NSSO. For the openness variable, data on imports, exports and domestic production have been taken from the input–output table for 2003-04 prepared by the Central Statistical Office (CSO), Government of India. The index of labour market reforms has been taken from Dougherty (2008). This index has been formed by Dougherty on the basis of a state level survey undertaken sometime between the mid- and later 2000s. The survey covered the eight major areas of labour law, identifying 50 specific subjects of possible reform, many of which could be implemented by administrative procedure rather than through formal amendments to the laws. The key features of this index have been discussed in Goldar and Aggarwal (2012), and the details are available in the paper of Dougherty (2008). Hence this is not discussed further here.

The regression results are reported in Table 11. A significant positive relationship is found between openness and the employment of casual labour. The implication is that as an industry faces greater international competition through import penetration or enhanced exports to international markets, the extent of casualisation tends to increase. The coefficient of the labour market reforms variable, on the other hand, is found to be negative and statistically

significant. It may be inferred, therefore, that labour market reforms encourage manufacturing firms to hire workers on a more regular basis than to hire workers on a short-term casual basis. These results are in agreement with the findings of both Goldar and Aggarwal (2012) and of Sen, *et al*. (2010).

Table 11
Factors Influencing the Share of Casual Workers in Organised Manufacturing Employment, Regression Results

Explanatory Variables	*Regression-1*	*Regression-2*	*Regression-3*	*Regression-4*	*Regression-5*
Labour reforms index	-1.85		-1.75	-1.14	-1.12
	(-2.80)***		(-2.61)**	(1.73)*	(-1.70)*
Openness	34.4	32.4	35.30	33.42	33.67
measure	(4.12)***	(3.76)***	(4.20)***	(4.26)***	(4.23)***
Relative wage of casual		-0.30			
workers to regular workers		(-1.27)			
Ratio of female workers to total			0.243		0.06
workers			(1.02)		(0.26)
Ratio of rural workers to total				0.57	0.56
workers				(3.43)***	(3.25)***
constant	58.22	29.38	52.15	20.43	19.63
Adj R-squared	0.219	0.139	0.200	0.293	0.285
No. of observations	84	84	84	84	84

Notes: t-values shown in parentheses.
*, **, *** statistically significant at ten, five and one per cent, respectively.
Source: Authors' calculations.

The coefficient of the variable representing the share of females in total employment in the organised manufacturing sector has a correct sign but is not statistically significant. The same applies to the relative wage variable. However, in this case, a simple correlation between the relative wages of casual workers and the share of casual labour in organised manufacturing employment has been found to be negative and statistically significant. Thus, there is some basis to argue that a hike in the relative wages of casual workers would reduce their employment.

The variable representing the share of rural workers out of total employment in the organised manufacturing sector has a positive and statistically significant coefficient. This indicates that as the employment in rural organised manufacturing enterprises increases in relation to employment in urban organised manufacturing enterprises, the share of casual labour in total employment in the organised manufacturing sector tends to increase. The econometric results suggest that a one percentage point increase in the rural employment share tends to raise the casual employment share by about 0.5 percentage points.

Given the significant effect of openness found on the employment of casual labour, this relationship has been investigated further by considering the export intensity and import penetration separately. The results indicate that the effect of export intensity is stronger. Accordingly, a second set of estimates of the regression equation has been made by replacing the openness variable by export intensity. The results are reported in Table 12, and are

similar to those in Table 11. The share of casual labour is found to be positively related with export intensity and the share of rural enterprises in employment, and negatively related with labour market reforms.

Table 12

Factors Influencing the Share of Casual Workers in Organised Manufacturing Employment, Regression Results, Additional Estimates

Explanatory Variables	*Regression-1*	*Regression-2*	*Regression-3*
Labour reforms index	-1.39	-1.20	-0.93
	(-2.58)**	(-1.97)*	(-1.76)*
Export intensity of the industry	82.1	82.5	77.3
	(9.77)***	(8.39)***	(8.37)***
Relative wage of casual workers to regular workers		-0.13	
		(-0.64)	
Ratio of female workers to total workers	0.275	0.281	
	(1.44)	(1.46)	
Ratio of rural workers to total workers			0.47
			(3.49)***
constant	40.20	40.72	16.53
Adj R-squared	0.481	0.477	0.538
No. of observations	84	84	84

Source: Authors' calculations.

VIII. CONCLUSION

The main objective of this paper has been to analyse trends in the employment of casual labour in India's organised manufacturing sector, and particularly to investigate the impact of labour regulations on the employment of casual workers. Although some earlier studies have noted an upward trend in the share of casual workers in employment in the Indian manufacturing sector, the analysis undertaken in the paper for the organised manufacturing sector revealed that the share of casual workers in organised manufacturing employment did not increase much between 1999-2000 and 2009-10. This, however, does not mean that casualisation is absent in the organised manufacturing sector. A state level analysis revealed that the share of casual workers in organised manufacturing employment increased between 1999-2000 and 2009-10 in many of the major Indian states. However, the share of casual labour in organised manufacturing employment fell significantly in the states of Madhya Pradesh, Chhattisgarh and Haryana with the result that the ratio in question did not increase at the all-India level. What made the share of casual labour in the organised manufacturing sector to fall in Madhya Pradesh, Chhattisgarh and Haryana is, therefore, a moot question.

An analysis of casual employment according to gender and the rural–urban dichotomy reveals that the share of casual labour in employment is relatively higher among females than males and for rural areas than urban areas. A similar analysis undertaken by considering the firm size reveals that a casual worker has a greater share of employment in enterprises with 20 or more workers than in an enterprise employing 10–19 workers. Thus, casualisation is more a phenomenon of the relatively bigger manufacturing enterprises than of small manufacturing enterprises. This finding is probably opposite of the belief that people commonly have about

the process of casualisation in Indian manufacturing.

The analysis of the distribution of casual and regular workers by general educational categories indicates that the level of education is relatively lower among casual workers. The study of the wages of casual and regular workers reveals that the wages of casual workers are rather low in relation to those of regular workers. However, the inequality of wages between these two categories of workers seems to have declined over time. It seems that the increase in the relative wages of casual workers would tend to reduce their employment in the organised manufacturing sector because a negative correlation coefficient across states is found between the relative wage rate of casual workers and their share in organised manufacturing employment.

In order to study the factors that influence the decision of firms to employ casual workers rather than regular wage workers, an econometric model was estimated. The results indicate that international competition, particularly competition in export markets, tends to raise the employment of casual workers, and labour market reform encourages organised manufacturing firms to hire workers on a regular basis. Thus, labour reforms would curb the process of casualisation in India's organised manufacturing industries.

Notes

1. These estimates are based on the *Annual Survey of Industries*, Central Statistical Office, Government of India.
2. For a discussion on this point, see Goldar and Aggarwal (2012).
3. The codes used in the 55th and 61st Rounds are different, but the codes used for the 66th Round are the same as those used for the 61st Round. Organised employment is defined as the workers employed in either (a) Government/Public sector enterprises (code 5) or in public/private limited company (code 6) or cooperative societies/trusts/other non-profit institutions (code 7), or (b) in enterprises using electricity and employing 10 or more than 10 workers. The details about the exact categories which are included for the purpose of defining the organised sector are also provided by Sundaram (2008).
4. Sometimes the state level analysis may involve a very small sample size for the estimated characteristics, so one has to be careful about it and the associated sampling errors.
5. In the case of Madhya Pradesh (MP), there was a fall in the proportion of females out of employment in the organised manufacturing sector by about 20 percentage points between 1999-2000 and 2009-10. This has further contributed to the fall in the proportion of casual workers.
6. The comparison of MP is of combined MP in 1999 and divided MP in 2009.
7. The states include the three newly created states of Uttarakhand, Jharkhand and Chhattisgarh for the years 2004 and 2009.
8. The estimates of casual workers and total workers at the state by industry level are based on a relatively small number of actual observations. If we consider all two-digit industries for each state, then the estimate for some of them would be unreliable as these may well be based on a very few observations. Hence, the analysis has been confined only to those industries which account for at least 5 per cent of the total employment in a state.

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PARTICIPATION OF FARM HOUSEHOLD WOMEN IN AGRICULTURAL ACTIVITIES AND ITS DETERMINANTS: A STUDY IN WESTERN UTTAR PRADESH

Kavita Baliyan and Sandeep Kumar*

This paper examines the determinants of participation of farm household women in agricultural activities on the basis of a field study conducted in two districts in western Uttar Pradesh (UP). The study reveals that women contribute about one-fourth of the total family labour spent on cultivation and about one-tenth of the total labour on the farm.

Regression analysis reveals that the female participation in agriculture is positively and significantly related with female status in the family, the age of the female and cropping intensity. The extent of women's participation is negatively but significantly related with the size of the family, the number of working male members in the family, and the number of years spent in school. The size of the landholdings and level of income also negatively influence the level of women's participation in agriculture. The mechanisation reduces female participation in agriculture. Cropping intensity, on the other hand, increases the participation of women in agriculture.

Keywords: *Farm women, Determinants of female participation in agricultural work, Labour use on farms, Agricultural policy*

I. INTRODUCTION

The work activities of women and men in rural areas primarily revolve around land and related resources. In the sex-based segmentation of labour, some activities are generally restricted to men and others to women. Agricultural activity is often termed as a man's job and household work as a woman's job. In a peasant household, agricultural activity is considered as the most important because it fetches a direct monetary reward for the household. The activities associated with the management and care of livestock are considered of secondary importance since they contribute to additional income or consumption for the household but do not constitute the main source of livelihood. Labour performed for one's own family is supposed to have only use value rather than exchange value. In patriarchal societies, men are assigned those types of activities which have a direct exchange value and, therefore, the work of women is considered of little exchange value and is considered less important (Menon, 1982, p.30).

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Rural woman are extensively involved in agricultural activities. Their roles range from that of managers to landless labourers (Kumar,*et al.*, 1985, p. 277). The nature and extent of their involvement differ with the variations in agri-production systems. The employment patterns of both male and female labour have changed significantly due to the combined effects of various factors such as the modernisation of agriculture, increase in irrigation facilities, changes in cropping patterns and cropping intensity (Ramesh Chand, *et al.*, 1985; Joshi and Alshi, 1985; Maria,*etal.*, 1986; Verma, 1992). The mode of female participation in agricultural production also varies with the land-owning status of farm households. The participation of women in agriculture also varies from activity to activity. Generally, it has been found that the participation of farm women is higher in activities like sowing, weeding and nipping/picking, and threshing (Chauhan and Thakor, 2006; Chayal and Dhaka, 2010; Chauhan, 2011).

The pattern of use of farm female family labour in crop activities also depends upon the size of the farm and the cropping pattern adopted (Barik, 2008; Mahendra Dev, 2004). The incidence of female agricultural labour responds to crop-specific demands such as the predominance of rice and cotton crops in a region (Unni, 1992).A number of studies show that the caste and socio-economic status of the family are important factors determining female participation in agriculture (Kaur, 1987; Kaur, 2008; Saradamoni, 1991; Devi, 1987; Sharma, 1992; Sethi, 1991).Women's participation in agriculture is also limited by conflicting family obligations. In households with old couples, the women were either too old or too sick to participate in agricultural activities (Damisa and Yohanna, 2007; Bastidas, 1999). Education level also affects female participation in work. As compared to illiterate women, women with higher levels of education have a lower probability of being in the workforce (Wasnik, 2006; Srivastava and Srivastava, 2010; Devendra and Chittedi, 2011; Bala, 2010).

II. OBJECTIVES AND HYPOTHESES

This paper seeks to examine the role and participation of women of the cultivatinghouseholds in agriculture and allied activities with particular reference to the western region of UP.It examines the extent and nature of participation of householdfemale members in agriculture and its determinants. It is hypothesised that the incidence of a higher area under labour-intensive crops increases female participation in agriculture, while the mechanisation of farm operations, farm size and the level of education decrease female participation in agriculture.

III. DATA AND METHODOLOGY

This paper is based on primary data. The field survey for it was conducted in the western region of UP. The region has been selected purposely as it is a relatively developed agricultural region, which is marked by the lower status of women in several indicators. A multi-stage sampling design has been used for the selection of the sample households. During the first stage, two districts from the western region of UP,viz.,Muzaffarnagar and Baghpat,were selected purposely reflecting the cropping pattern in the region. During the second stage, two blocks were purposely selected from each district with a higher proportion of the two crops

(sugarcane and wheat) in the region. During the third stage, two villages were randomly selected from the chosen blocks. During the final stage,for conduction of the field survey, 30 cultivating households were randomly selected from each village representing the different size classes of landholdings. Thus, the total sample for the study consists of two districts, four blocks, eight villages and 240 households.

Information from the selected households was collected personally with the help of a detailed survey schedule. Apart from the various socio-economic characteristics of the household, detailed information was collected about the time spent by different family members on agricultural activities, animal husbandry and household work. The total number of hours spent on work have been converted into person-days by assuming that one man-day consists of eight hours of work. The reference period for the study was the agricultural year 2007-08.

IV. THE STUDY AREA

Muzaffarnagar and Baghpat are among the richest districts of UP. Theper capita income of Baghpat district was Rs. 41,049while that of Muzaffarnagar district was Rs. 31,770in 2009-10, as compared to the per capita income of Rs. 23,132for the state as a whole.

Table 1 shows the demographic indicators of the two selected districts. Muzaffarnagar district had a population of 41.44 lakh in 2011, while Baghpat had a population of 13.03 lakh. The sex ratio in both the districts is adverse. The literacy rates of Baghpat and Muzaffarnagar districtswere 72.0 per cent and 69.1 per cent, respectively,as against the literacy rate of 67.7 per centfor UP as a whole, in 2011. Female literacy is markedly lower than male literacy in both the districts. The female work participation rate is also very low in the study area, at only about 10-12 percent including main and marginal workers, as per the 2011 Census.

Table 1
Demographic Indicators of the Study Area

Demographic Indicator		*Muzaffarnagar*		*Baghpat*		*Uttar Pradesh*	
		Total	*Rural*	*Total*	*Rural*	*Total*	*Rural*
Population, 2011	Persons (In '000)	4144	2952	1303	1028	199812	155317
	Male (%)	52.94	53.01	53.73	53.87	52.29	52.15
	Female (%)	47.06	46.99	46.27	46.13	47.71	47.85
Literacy Rate, 2011	Persons (%)	69.12	68.34	72.01	73.28	67.68	65.46
	Male (%)	78.44	78.71	82.45	81.54	77.28	76.33
	Female (%)	58.69	56.70	59.95	63.95	57.18	53.65
Work Partici-pation Rate, 2011	Persons (%)	31.17	31.96	31.98	32.84	32.94	33.45
	Male (%)	49.31	49.33	48.94	49.28	47.71	47.35
	Female (%)	10.77	12.36	12.29	13.63	16.75	18.30

Source: Census of India, 2011.

The land use pattern in the two districts is shown in Table 2. More than 75 percent 80 per cent, of the total areas in Muzaffarnagar and Baghpat districts, respectively,has been brought under cultivation, which is higher as compared to the proportion of the net cultivated area at the state level (68.9 percent). Almost the entire cultivated area is under irrigation in the two districts. Tube-wells constitute the main source of irrigation supplemented by

canals. In fact, most of the blocks in the two districts are classified as dark due to the high withdrawal of groundwater. The cropping intensity is 150 and 161 in Muzaffarnagar and Baghpat, respectively. This is so because the two districts specialise in growing sugarcane, which is a long-duration crop. The average size of the holding in both the districts is small—1.1 hectares in Muzaffarnagar and 1 hectare in Baghpat in 2005-06. The study area is known for its mixed farming pattern with animal husbandry as an important subsidiary industry. Both Muzaffarnagar and Baghpat districts also have a sizeable number of livestock, especially milch animals (Table 2).

Table 2

Geographic Indicators of the Study Area, 2011-12

Indicators	*Muzaffarnagar*	*Baghpat*	*Uttar Pradesh*
Net area sown as % of total area	75.3	80.1	68.9
Per capita net area sown (ha.)	0.08	0.09	0.08
Cropping intensity	150.5	161.1	154.8
Percentage of net irrigated area to the net area sown	99.1	97.1	81.0
Irrigation intensity	151.4	161.1	144.1
Average size of holdings (ha.) (2005-06)	1.11	1.00	0.83
Livestock per ha. of net area sown (2007)	3	4	3

Source: Statistical Abstract, Uttar Pradesh, 2013, and *District Level Development Indicators (Annual) 2013*, Lucknow, Economics and Statistics Division, State Planning Institute,UP.

V. WORK PARTICIPATION RATES

Table 3 shows work participation in agriculture by sex and size of the farm. The WPR for all sample households comes to about 20 percent for females and 49.00 percent for males. About 9 percent of the boys and 2 percent of the girls also work on family farms. The FWPR is the highest for marginal farmers (23.17 per cent) and lowest for large farmers (15.84 per cent). In the case of the MWPR,the highest participation is observed for medium farmers (53.73 per cent) and lowest for marginal farmers (44.67 per cent). The participation of boys and girls in agriculture is also relatively higher in marginal farm households.

Table 3

Work Participation Rates in Agriculture by Sex and Size of Farm (%)

Sex/Category	*Marginal Farmers*	*Small Farmers*	*Medium Farmers*	*Large Farmers*	*All Farmers*
Female	23.17	19.27	19.64	15.84	21.80
Male	44.67	49.19	53.73	48.95	50.40
Boy	11.14	8.02	6.22	11.59	10.60
Girl	3.27	0.92	1.52	1.14	2.50

Source: Field survey.

1. Participation of Family Labour in Agriculture by Activity

We first discuss the participation of family labour in agricultural activities by major crops and activities. The participation rate is measured as a proportion of the number of family members participating in a particular activity. For adult members,the participation ratio is calculated with reference to the members aged above 15 years, and for boys and girls with

reference to children in the age group of 5 to 15 years.

Table 4 shows family labour participation in agriculture by sex and activity. Theparticipation level varies from activity to activity. Thus, female labour participation amounts to 72.4 percent in the case of cleaning and storage of grain, 39 percent in harvesting and threshing, 39.7 percent in carrying produce to the home from the farm, and 37.7 percent in weeding. On the other hand, their participation in other areas like irrigation, fertiliser and pesticide application, and purchase of inputs, among other things, is very nominal. Male labour participation also varies from activity to activity. In operations that are more labour-intensive and have to be completed in a short duration, a large number of family members participate. Boys participate in larger numbers in loading and threshing, while girls are mainly engaged in storage.

Table 4
Family Labour Participation in Cultivation by Activity (%)

Type of Activity	*Female*	*Male*	*Boy*	*Girl*	*Total*
Land preparation and dung application	16.5	54.8	5.0	0.9	28.2
Irrigation	2.1	53.3	1.6	0.0	21.7
Sowing	24.6	66.8	11.8	2.2	37.0
Weeding	37.7	31.8	2.6	2.5	27.0
Application of fertilisersandspraying of pesticide	5.4	35.1	11.6	0.0	17.2
Digging	22.6	65.0	15.7	3.7	36.2
Bandhai of cane	2.6	48.3	3.6	0.0	20.2
Chilai of cane	31.4	62.9	13.3	3.7	38.3
Harvesting andthreshing	39.0	63.6	20.5	5.8	42.6
Carrying of produce	39.7	75.2	48.6	3.7	50.8
Cleaning and storage	72.4	0.0	2.1	14.8	28.8
Buying of inputs and sale of crops	3.1	36.8	2.4	0.0	15.8
Hiring of labour	4.1	41.1	0.0	0.0	17.5
Total	21.8	50.4	10.6	2.5	29.4

Source: Field survey.

2. Time Spent in Agricultural Activities by Family Members

We now proceed to discuss the time spent in agricultural activities by the family members. The analysis has been done in terms of the two main crops of the region (that is, sugarcane and wheat) and other crops taken together. Table 5 shows the use of family labour in agricultural activities in cultivation by sex. Family labour in agriculture comes to 433 person-days per hectare, out of which 330.4 are contributed by males and 90 person-days are contributed by women. The contribution of boys is 10.5 person-days and that of girls, 2.23 person-days.

Harvesting and threshing and cleaning of sugarcane are the most labour-intensive activities in which all family members participate. It was observed that women spent 29.4 per cent of the farm labour on harvesting and threshing, 25.2 per cent on *chilai* (cleaning) of sugarcane, and 16.3 per cent on weeding (Table 5). In the case of males the corresponding figures were 23.2 per cent, 23.1 per cent, and 4 per cent, respectively. Harvesting, threshing and cleaning of sugarcane were also the main activities performed by boys and girls though

Table 5
Use of Family Labour in Different Agricultural Activities per Hectare (in Person-days)

Type of Activity	*Person-days*					*% Share in Total Person-days*				
	Female	*Male*	*Boy*	*Girl*	*Total*	*Female*	*Male*	*Boy*	*Girl*	*Total*
Land preparation and dung application	3.6	20.2	0.4	0.0	24.3	4.0	6.1	3.8	0.0	5.6
Irrigation	0.5	31.4	0.1	0.0	32.0	0.6	9.5	1.0	0.0	7.4
Sowing	4.1	16.2	0.8	0.0	21.1	4.6	4.9	7.6	0.0	4.9
Weeding	14.7	13.2	0.5	0.2	28.6	16.3	4.0	4.8	9.1	6.6
Application of fertilisers and spraying of pesticide	0.2	7.6	0.5	0.0	8.3	0.2	2.3	4.8	0.0	1.9
Digging	1.8	8.1	0.6	0.1	10.7	2.0	2.5	5.7	4.5	2.5
Bandhai of cane	0.4	13.8	0.2	0.0	14.4	0.4	4.2	1.9	0.0	3.3
Chilai of cane	22.7	76.2	2.5	0.7	102.1	25.2	23.1	23.8	31.8	23.6
Harvesting and threshing	26.5	76.6	1.8	0.8	105.7	29.4	23.2	17.1	36.4	24.4
Carrying of produce	8.3	24.5	2.8	0.2	35.8	9.2	7.5	26.7	9.1	8.3
Cleaning and storage	5.8	0.0	0.0	0.3	6.1	6.4	0.00	0.0	13.6	1.4
Buying of inputs and sale of crops	0.8	37.3	0.3	0.0	38.4	0.9	11.3	2.9	0.0	8.9
Hiring of labour	0.5	5.3	0.0	0.0	5.8	0.6	1.6	0.0	0.0	1. 3
Total	90.0	330.4	10.5	2.2	433.1	100.0	100.0	100.0	100.0	100.0

Source: Field survey.

girls took more time in performing these activities as compared to boys.

The contribution of females in the total family labour spent on agriculture varies from activity to activity (Table 6). Women contributed about 95 per cent of the total labour spent on harvesting and threshing, while 51.6 per cent of the labourers' time was spent on weeding. Female labour accounts for about one-fourth of the time spent on harvesting and threshing, carrying of produce and *chilai* of sugarcane. Female labour is also used for sowing and digging.

Table 7 presents a synoptic picture of family labour use per farm, per person and per hectare by major crops. Sugarcane is the most labour-intensive crop. Labour use in sugarcane per hectare is 240 person-days, which is almost three times of the corresponding figure for the wheat crop (83.5 person-days) and other crops (109.5 person-days). Out of the 536.1 person-days of family labour spent in agriculture, 398.6 person-days (74 per cent) are spent on sugarcane crop alone. In the case of females, out of 104 person-days spent per farm, 67.6 person-days are spent on the sugarcane crop, 22.5 person-days on wheat, and 13.8 person-days on other crops. Boys spend 14.7 person-days in agriculture, out of which 11.8 person-days are spent on the sugarcane crop. The participation of girls in agricultural activities is only marginal.

Table 6
Percentage Share of Male and Female Family Labour in Different Agricultural Activities per Hectare

Type of Activity	*Female*	*Male*	*Boy*	*Girl*	*Total*
Land preparation anddung application	14.76	83.38	1.77	0.08	100.0
Irrigation	1.53	98.12	0.34	0.00	100.0
Sowing	19.60	76.66	3.60	0.14	100.0
Weeding	51.58	46.15	1.65	0.67	100.0
Application of fertilisers andspraying of pesticide	2.06	92.14	5.80	0.00	100.0
Digging	17.23	76.22	5.90	0.75	100.0
Bandhai of cane	2.84	95.56	1.60	0.00	100.0
Chilai of cane	22.19	74.63	2.49	0.70	100.0
Harvesting and threshing	25.08	72.45	1.72	0.74	100.0
Carrying of produce	23.30	68.46	7.77	0.47	100.0
Cleaning and storage	95.56	0.00	0.16	4.11	100.0
Buying of inputs and sale of crops	1.95	97.26	0.78	0.00	100.0
Hiring of labour	8.84	91.16	0.00	0.00	100.0
Total	20.77	76.28	2.43	0.52	100.0

Source: Field survey.

Table 7
Family Labour Use in Agriculture on Sample Farms by Crops (in Person-days)

Crop	*Female*	*Male*	*Boys*	*Girls*	*Total*
Per Farm					
Sugarcane	67.6	317.3	11.8	1.9	398.6
Wheat	22.5	45.4	2.6	0.9	71.4
Others	13.8	51.8	0.1	0.0	65.7
Total	104.0	414.6	14.7	2.8	536.1
Per Person					
Sugarcane	36.1	163.0	15.7	3.2	218.1
Wheat	12.0	23.4	3.8	1.6	40.8
Others	7.4	26.6	0.1	0.0	34.1
Total	55.5	213.0	19.6	4.8	293.0
Per Hectare					
Sugarcane	40.7	191.1	7.1	1.1	240.1
Wheat	26.2	52.9	3.3	1.1	83.5
Others	23.0	86.4	0.1	0.0	109.5
Total	89.9	330.4	10.5	2.2	433.1
Percentage Share					
Sugarcane	65.05	76.53	80.10	66.67	74.44
Wheat	21.62	10.99	19.39	33.33	13.92
Others	13.33	12.49	0.51	0.00	11.64
Total	100.00	100.00	100.00	100.00	100.00

Source: Field survey.

3. Total Labour Use in Agriculture

Table 8 shows the use of family and hired labour per farm by sex. On an average, 1029.2 person-days were spent on agriculture on the sample farms. Out of this 106.9 person-days were contributed by female family members and 132.7 person-days by female hired labour. The contribution of male family members was 429.3 person-days and that of hired male labour, 360.3 person-days.

Table 8
Total Labour Use in Different Agricultural Activities by Sex
(Person-days/per Farm)

Type of Activity	*Family Labour*			*Hired Labour*			*Total*
	Female	*Male*	*Total*	*Female*	*Male*	*Total*	*Person-days*
Land preparation	2.1	10.3	12.4	0	4.2	4.2	16.5
Dung spraying	1.5	10.6	12.1	0	4.8	4.8	16.9
Irrigation	0.7	36.4	37.1	0	8.1	8.1	45.2
Sowing	2.1	12.5	14.6	0	17	17	31.6
Weeding	17.1	16.8	33.9	16.4	18	34.4	68.4
Transplantation	0.4	0.3	0.7	5.6	1.2	6.8	7.4
	0.1	7.1	7.2	0	3.8	3.8	11
Pesticide application	0.1	4.4	4.5	0	1.8	1.8	6.3
Seed collection/cutting	2.1	5.8	7.9	5.3	7.5	12.8	20.7
Khudai (digging)	3.2	14.5	17.7	0	17.9	17.9	35.7
Bandhai (bundling or tying)	0.7	23.3	24	0	55.3	55.3	79.2
Chilai (cleaning of sugarcane)	38.8	130.7	169.5	82.5	152	234.5	404
Loading	17.6	48.4	66	6.7	17.1	23.8	89.8
Harvesting	2.2	4.9	7.1	0.8	4.1	4.9	11.9
Threshing	11.7	39.2	50.9	14.9	46.2	61.1	112.1
Cleaning grain/storage	5.2	0	5.2	0	0	0	5.2
Buying of inputs	0.6	8.9	9.5	0.5	0.8	1.3	10.9
Sales of crop	0	49.2	49.2	0	0	0	49.3
Hiring of labour	0.7	6	6.7	0	0.5	0.5	7.3
Total	106.9	429.3	536.2	132.7	360.3	493.0	1029.2

Source: Field survey.

Table 9 shows the percentage share of family and hired labour in the total labour use in agriculture. It can be seen from the table that female family labour contributes 10.4 percent of the total labour use in agriculture while hired female labour contributes 12.9 percent. Thus, roughly one-fourth of the agricultural labour is contributed by women workers in the study region. Male family workers contribute 41.7 percent of the total agricultural work while hired male workers contribute 23.3 percent. The share of household labour in the total farm labour comes to 52 per cent and that of hired labour to 48 per cent.

Table 9
Percentage Share of Family and Hired Labour in the Total Labour Use in Different Agricultural Activities per Farm by Sex

Type of Activity	*Family Labour*			*Hired Labour*			*Total Labour*	
	Female	*Male*	*Total*	*Female*	*Male*	*Total*	*Female*	*Male*
Land preparation	12.7	62	74.7	0	25.3	25.3	12.7	87.3
Dung spraying	8.9	62.7	71.6	0	28.4	28.4	8.9	91.1
Irrigation	1.5	80.5	82	0	17.9	17.9	1.5	98.5
Sowing	6.6	39.6	46.2	0	53.8	53.8	6.6	93.4
Weeding	25	24.6	49.6	24	26.3	50.3	49	50.9
Transplantation	5.3	4	9.3	74.7	16	90.7	80	20
Fertilising	0.9	64.5	65.4	0	34.5	34.5	0.9	99.1
Pesticide application	1.6	69.8	71.4	0	28.6	28.6	1.6	98.4
Seed collecting/cutting	10.1	28	38.1	25.6	36.2	61.8	35.7	64.3
Khudai (digging)	9	40.6	49.6	0	50.1	50.1	9	90.8
Bandhai (bundling or tying)	0.9	29.4	30.3	0	69.8	69.8	0.9	99.2
Chilai (cleaning of sugarcane)	9.6	32.4	42	20.4	37.6	58	30	70
Loading	19.6	53.9	73.5	7.5	19	26.5	27.1	72.9
Harvesting	18.5	41.2	59.7	6.7	34.5	41.2	25.2	75.6
Threshing	10.4	35	45.4	13.3	41.2	54.5	23.7	76.2
Cleaning Grain/storage	100	0	100	0	0	0	100	0
Buying of inputs	5.5	81.7	87.2	4.6	7.3	11.9	10.1	89
Sale of crop	0	99.8	99.8	0	0	0	0	99.8
Hiring of labour	9.7	83.3	93	0	6.9	6.9	9.7	90.3
Total	10.4	41.7	52.1	12.9	35	47.9	23.3	76.7

Source: Field survey.

The contribution of different groups varies from activity to activity. Work related to the cleaning and storage of grains is done entirely by female family members. The next most important work performed by them is weeding, wherein they contribute 25 percent of the total labour. In harvesting and loading of crops, female family members contribute one- fifth of the total labour. Hired female workers share 75 percent of the transplantation work and about one-fourth of the work related to weeding and seed collecting and cutting (in the case of sugarcane). Hired male workers, on the other hand, participate in nearly all the activities. They contribute more than half of the labour required for sowing, *khudai* (digging)and *bandhai* (bundling or tying)**.** More than one-third of the work related to threshing, *chilai* (cleaning of sugarcane), harvesting and fertilising is also done by them.

4. Determinants of Female Participation in Agriculture

The above discussion makes it clear that farm household women in western UP are extensively involved in agricultural activities, and contribute a significant part of the labour use on the farm. In this section, we have statistically examined the determinants of labour participation of women in farm households in agriculture. The determinants of labour participation have been analysed in a demand and supply framework. The immediate factors that affect labour supply on the farm are the size of the household and the availability of agricultural labourers,

the burden of childcare and domestic work, local social customs, and the subsistence need of the family. On the demand side, the significant factors determining the demand for female labour in agriculture are the cropping pattern and cropping intensity, type of agricultural implements used, extent of mechanisation, and distribution of landholdings, among other things.

We have identified the following 12 determinants of women's labour participation in farm households in terms of both the supply of and demand for female labour:

Factors Affecting the Supply of Female Labour	*Factors Affecting the Demand for Female Labour*
1. Age of the female member (Age)	8. No. of working male members in
2. Household size (HSIZE)	thefamily(NMM)
3. Marital status (MS)	9. Size of landholdings (SIZLH)
4. Status in the family (FSF)	10. Use of tractors (Tractors)
5. No. of years of schooling (NYS)	11. Cropping intensity (CIRN)
6. Caste (CT)	12. Use of hired labour (HLabour)
7. Household income (TINC)	

The total number of person-days spent by the household women in agricultural activities has been taken as the dependent variable. This total number of person-days has been used to measure the participation of females in work as it indicates the actual amount of work spent by them in agriculture. We hypothesise that the age of the female member and the large size of the household have a positive effect on the supply of female labour, while education, caste status and household income have a negative effect on the same. The participation of unmarried girls and elderly women is less than others in agricultural work. It is also hypothesised that various factors including a large number of male members in the family,and the use of machinery and of hired labour discourage the demand for female labour, while the size of the landholdings and cropping intensity have a positive impact on the demand for female labour.

The descriptive statistics of the explanatory variables have been given in Table 10.

Table 10
Descriptive Statistics of the Explanatory Variables

Variable	*Description*	*Continuous Variable*		*Categorical*
		Mean	*S.D.*	*Variables*
Total No. of Person-days	Total number of person-days in a year spent by the farm household women in agricultural activities	50.27096	71.46211	
Age	Age of the female (in years)	37.62986	15.29425	
HSIZE	Household size	7.543967	2.896898	
MS	Value 1 if married; 0, otherwise			1=363 0=126
FSF	Value 1 if mother-in-law/elder sister-in-law is part of the family; 0,otherwise			1=245 0=244
NYS	No. of years in school	6.687117	5.30989	

CT	Value 1 if Jat; 0, otherwise			1=424 0=65
NMM	No. of working male members in the family	3.137014	1.48201	
Tractor	Value 1 if the household has a tractor; 0, otherwise			1=102 0=138
TINC	Total annual income of the family (in Rs.)	292283.6	173705.5	
SIZLH	Size of landholdings (area in hectares)	2.148875	1.697746	
CRIN	Cropping intensity	1.522265	0.2452217	
HLabour	Value 1 if permanent hired labour is used; 0, otherwise			1=155 0=334

Table 11 shows the correlation matrix to enable us to assess the inter-relationship among all the variables. The table indicates that female work participation in agriculture is positively related with marital status, female status, age of the woman worker and cropping intensity. All other variables have a negative relationship with female work. The values of 'r' are strongest in the case of female status and schooling. Some of the selected variables are strongly correlated withthe other variables.Thus, age, female status in the family and the number of years spent in school are strongly correlated. Similarly, land area, household income and permanent hired labour are strongly correlated. Hence we have tried an alternative specification of the explanatory model for avoiding the problem of multi-collinearity.

Table 11
Correlation Matrix of Selected Variables

Variables	*T_P Days*	*M_S*	*FSF*	*Age*	*Hsize*	*NNM*	*NYS*	*T_inc*	*SizLH*	*Trac-tor*	*CRIN*	*Labour*
T_P Days	1.00											
M_S	0.18	1.00										
FSF	0.43	0.30	1.00									
Age	0.29	0.32	0.75	1.00								
HSIZE	-0.12	0.16	-0.24	0.04	1.00							
N_M_M	-0.18	0.21	-0.15	0.10	0.71	1.00						
NYS	-0.43	-0.28	-0.66	-0.67	0.07	0.01	1.00					
T_INC	-0.17	0.19	-0.14	0.01	0.51	0.51	0.18	1.00				
SIZLH	-0.16	0.09	-0.07	0.01	0.28	0.39	0.09	0.75	1.00			
Tractor	-0.11	0.04	-0.07	-0.05	0.17	0.23	0.12	0.54	0.63	1.00		
CRIN	0.12	-0.07	-0.05	-0.05	0.06	-0.11	-0.05	-0.15	-0.29	-0.29	1.00	
Labour	-0.15	0.07	-0.05	0.02	0.20	0.25	0.12	0.55	0.58	0.52	-0.06	1.00

Note: All values are significant at a 1 percent level of confidence.
Source: Calculations based on data collected from field survey.

On the basis of the study of the correlation matrix, we have selected five independent variables to explain the variation in women's participation in agriculture work as measured by the total number of person-days of work and the selected independent variables. The explanatory variables included were:

status of the female in the family, number of years in school, number of working male members in the family, land area and cropping intensity. The first two variables affect the supply of female labour, while the last three variables affect the demand for female labour. The results of linear regression are shown in Table 12.

Table 12

Results of Linear Regression

Independent Variables	*Coefficient*	*Standard Error*	*T-Value*
Constant	310.4878	185.515	1.670*
Female Status	264.479	61.12696	4.330***
No. of years in school	-29.14082	5.703319	-5.110***
No. of male embers in the family	-45.45998	16.84171	-2.700***
Land area (in hectares)	-14.22135	14.99607	-0.950
Crop intensity	214.9471	96.32038	2.230**
	R-squared=0.2469	F =33.01	Number of obs.=489

Note: *** Significant at the 99per cent level of confidence, ** Significant at the 95 per cent level of confidence; * Significant at the 90 per cent level of confidence.

Source: Calculations based on data collected from the field survey.

Our model explains about 25 percent of the total variance. The regression results show that the female status in the family is positively and significantly associated with the total number of person-days spent by the household women in agriculture. This variable also captures the respective ages of the female members. Thus, married and elderly women are more likely to participate in agricultural activities on their own farmsas compared to the younger and unmarried females. As expected, the education level as measured by the number of years in school shows a negative and significant relationship with the extent of women's participation in agriculture. The prevalence of a higher number of working male members in the family reduces the participation of women members in agricultural activities, as has been hypothesised. The work participation of women in agriculture is negatively but insignificantly related with the size of the landholdings. Similar results were obtained when the size of the holding was replaced by household income in the regression model. High household income also tends to reduce the supply of female labour. Cropping intensity shows a positive and significant relationship with the extent of women's participation.

VI. CONCLUSION AND SUGGESTIONS

Our study reveals that women's participation in agricultural activities on their family farms is quite widespread in the study region. Women contribute about one-fourth of the total family labour spent on cultivation and about one-tenth of the total labour on the farm.The analysis of labour use in agriculture indicates a clear segregation in the agricultural activities by sex. They are almost wholly responsible for the cleaning and storage of grains, and contribute a little more than 50 percent of the labour in the sowing and harvesting of crops. They also participate extensively in activities like sowing, weeding, harvesting, *chilai* of cane, and

threshing and carrying of produce to the home, and contribute about one-fourth to one-third of the labour spent on these activities. The share of women in activities related to irrigation, application of fertilisers and pesticides, and sale of produce is negligible. All market-related activities like the buying of agricultural inputs,hiring of labour, and sale of output are exclusively done by the male members, generally the head of the family. One can conclude from the above analysis that while women share a large burden of agricultural activities, they are mostly engaged in lighter manual work. Tasks requiring the use of machines, new inputs and market-related activities are controlled by men.

Statistical analysis reveals that female participation in agriculture is positively and significantly related with female status in the family, the age of the female, and cropping intensity. The extent of women's participation is negatively but significantly related with the size of the family, number of working male members in the family, and the number of years in school. The size of landholdings and the level of income also negatively influence the level of women's participation in agriculture. The mechanisation of agriculture as measured by the number of tractors deployed per hectare reduces the level of female participation in agriculture. Cropping intensity increases the participation of women in agriculture.

As our study has shown, women in the cultivating households play an important role and participate in agricultural and allied activities along with their male counterparts. Despite playing such an important role in economic activities, most of the women working in household farmsare not counted as workers in the Census records. Women's status remains low in all social, economic, and political indicators. They have limited decision-making power in relation to domestic or work-related matters and there are restrictions on their movement outside the house.

Even government programmes and agencies dealing with rural development tend to neglect the women and fail to treat them as a separate category requiring special attention. It is thus high time that when women's role in economic activities is duly recognised and they are empowered in the real sense. This would require a radical change in the prevalent patriarchal values and concerted efforts by both the civil society and the government for the empowerment of women. Government agencies working in the field of agricultural and rural developmentshould also consciously focus on women workers as a special category. They should be provided proper training in agriculture and animal husbandry in order to improve their efficiency and knowledge,as also their participation in decision-making. One of the most important measures for empoweringrural women would be to give them ownership rights on land along with their husbands, which should be duly incorporated in land records. Women in female-headed households and women with disabilities should be provided credit on soft terms by banks and other financial institutions for spending on agriculture and livestock, setting up their own businesses, and house building, among other things. Education programmes focusing on adult rural women should be undertaken to make them literate and to improve their knowledge base to enable them to discharge their economic and domestic duties efficiently.Research on farm machinery should focus on developing implements and machines which can be handled by women more easily, keeping in mind the activities with

a higher level of female participation.Awareness camps should also be organised to bring about attitudinal changes for removing the gender bias prevailing in the society.

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CONDITIONS OF EMPLOYMENT IN FISH FARMS: EVIDENCE FROM A VILLAGE STUDY IN WEST BENGAL

Shantanu De Roy*

This paper analyses the conditions of employment in fish farms in the Sunderban estuarine region in West Bengal. In particular, it focuses on operations in fish farms, wage rates in different occupations, and labour relations. The paper shows that conditions of employment in fish farms were characterised by very low work participation rates among men and women, particularly the latter. Data from various issues of the Census of India show that there was a sharp decline in work participation rates (WPRs) for both men and women between 1991 and 2001. This decline in WPRs was the result of a shift of land from agriculture to fisheries. The analysis of the present study is based on both secondary and primary data. The secondary data was taken from the Census of India and the National Sample Survey Organisation (NSSO), while the primary data was collected from a village survey conducted in May–June 2006.

Keywords: *Employment, Fisheries, West Bengal*

I. INTRODUTION

West Bengal is one of the largest producers of prawns in India, and had registered an impressive growth rate of 13.8 per cent in prawn production between 2000-01 and 2006-07, while the corresponding figure for India as a whole was 0.08 per cent.[1]

The state has the highest potential area for prawn farming among the maritime states in India (Bhattacharya, 2009). The total potential culturable area for brackish water prawn farming in the state is 5,25,000 acres. By 2007-08, about 27.6 per cent of the total potential area (145,000 acres) was under brackish water prawn farming. The share of West Bengal in the total prawn production in India was 14.6 per cent in 2006-07. Brackish water prawn farming in West Bengal is undertaken in three districts, viz. North 24 Parganas, South 24 Parganas and East Medinipur. This paper discusses the conditions of employment in fish farms in the Sunderban estuarine region in West Bengal. It also analyses trends in female employment in fish farms in the Sunderban estuarine region. Further, it discusses the level of employment, wage rates and labour relations in fish farms. The core of this study is based on primary data collected from two surveys in May–June 2006.

Prawn farming is an important source of income and employment in the Sunderban estuarine region in West Bengal. It has led to dynamism in the local economy in these areas. However, the impact of development of prawn farming has been skewed, whereby a small section of the population that had access to capital had cornered the benefits

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and a large majority of the population was left out of the development trajectory (De Roy, 2012).

Very few studies have statistically analysed the impact of the development of prawn farming on labour use and employment. On the basis of data collected from two villages in Khulna district, Bangladesh, Barmon, *et al*. (2004a), argued that labour use in prawn farming was higher than labour use in paddy production. They computed agricultural incomes prior to and after the introduction of prawn farming, and argued that the development of prawn farming in the study area had resulted in an increase in the agricultural incomes of prawn farmers (Barmon, *et al*., 2004b).

However, it may be pointed out that while Barmon, *et al*. (2004b) provided evidence on the impact of prawn farming on the incomes of fish farmers, they did not analyse its impact on workers and other households in the study villages. The evidence on the impact of prawn farming on employment and income seems inconclusive.

Some studies have argued that labour use in prawn farming was lower than that in agriculture and hence the expansion of prawn farming had led to the loss of employment for workers (see, for instance, Primavera, 1997; Neiland, *et al*., 2001; Ranga, 2006; and Pradhan and Flaherty, 2008). For example, Ranga (2006) argued that the transformation in land use from agriculture to prawn farming had resulted in a decline in labour use from 63 person-days per acre to 20 person-days per acre in Kerala. He pointed out that the development of prawn peeling sheds provided employment to women workers for 100 to 150 days in a year. Ranga (2006) differentiates between employment in prawn farms and ancillary industries like prawn peeling sheds. The overall impact of prawn farming on employment is, however, not clear from his study. Primavera (1997) noted that in India, a prawn farm of 40 hectares employed five labourers while an agricultural farm employed 50 labourers; in Indonesia, paddy cultivation required 76 working days per hectare while the corresponding figure for a prawn farm was 45.

On the other hand, a few studies have also argued that the development of prawn farming had resulted in an increase in the number of days of employment of workers (see Ito, 2002; Kumaran, *et al*., 2003). Kumaran, *et al*., argued that the development of prawn farming in the East Godavari district of Andhra Pradesh, had led to an increase in the number of days of employment from two months to five months, annually, for the wage labourers. However, it may be noted that these studies are mainly descriptive and do not provide a methodologically rigorous estimate of the impact of prawn farming on employment.

Since this paper is mainly based on primary data, a village was selected in which prawn farming was done extensively. Tentultala, located in the medium saline region of the Sunderbans, North 24 Parganas, was the study area, as it satisfied this criterion perfectly (see Alagarswamy, 1995; and Ghosh, 2001). The location of the village in the medium saline region facilitated the production of the Rohu, Parsia and Tilapia varieties of prawn, along with the Giant Tiger Prawn (Penaeus Monodon). Ghosh (2001) had argued that the Giant Tiger Prawn, Parsia and Tilapia were most important varieties of prawn and fish cultured in the medium and low saline fish farms. He argued that in these regions, carp culture was

taken up after the monsoons in order to exploit fresh water conditions. The terms 'prawn farming' and 'fish farming' (and consequently thereof, the terms 'prawn farmers' and 'fish farmers') have been used synonymously in this paper.

Fish farming was the main source of income and employment in the study village. Fish and prawn farming in the study village was crucially dependent on the supply of brackish water from an adjoining canal, Kumarjole Khal. Channels were constructed to supply water to the fish farms in the study village.

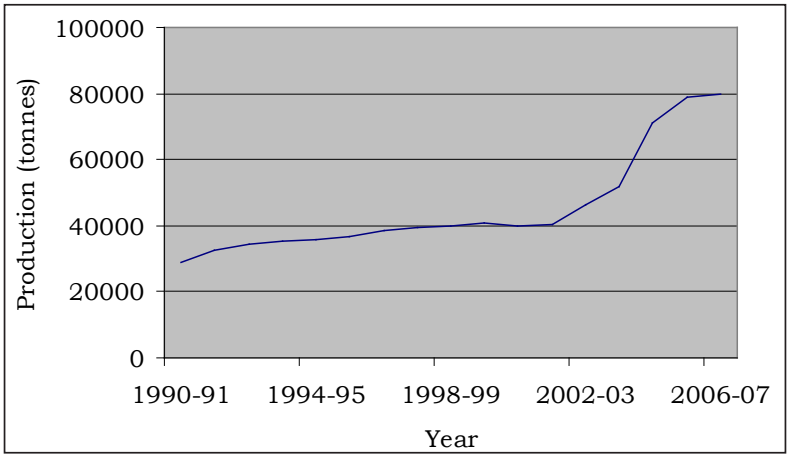
This paper is organised as follows. Section II provides an overview of prawn farming in West Bengal. Section III discusses the location of the village. Section IV delineates the field work methodology. Section V highlights the basic features of Tentultala, the study village. Section VI analyses the WPRs in the study village. Section VII analyses the number of days of employment of the workers. Section VIII expounds the structure of wage employment in Tentultala; while Section IX presents the conclusions.

II. PRAWN FARMING IN WEST BENGAL[2]

In West Bengal, the total potential culturable area for brackish water fish farming is 5,25,000 acres. In 2007-08, 1,45,000 acres of water area, or 27.6 per cent of the total potential area, was brought under brackish water prawn farming.[3] Figure 1 shows that prawn production in West Bengal was increasing in the early 1990s, and then stagnated from the mid-1990s onwards. Stagnation in production continued between 1997-98 and 2001-02 when the production of prawns amounted to around 40,000 tonnes. The average annual growth rate of prawn production in West Bengal in the 1990s was 3.4 per cent (Table 1). As compared to the 1990s, the growth rate of prawn production in West Bengal increased to 13.8 per cent per annum between 2000-01 and 2006-07.

Figure 1

Prawn Production in West Bengal between 1990-91 and 2006-07 (in tonnes)



Sources: Based on the *Handbook on Fishery Statistics of West Bengal*, Department of Fisheries, Aquaculture, Aquatic Resources and Fishing Harbours, 2003; published and un-published data.

Table 1
Growth Rates of Prawn Production in West Bengal between 1990-91 and 2006-07

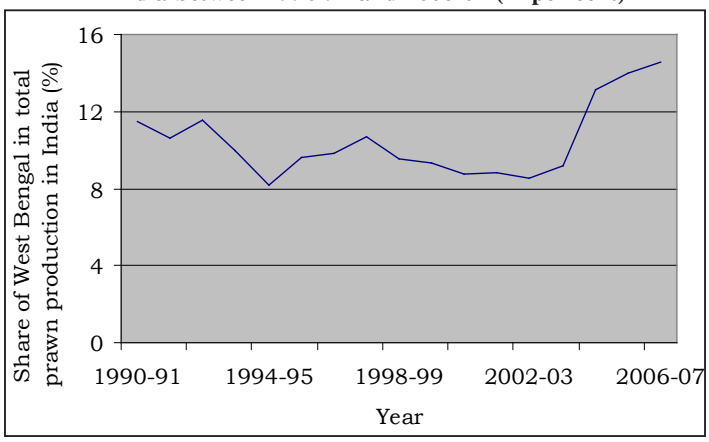
(in per cent)

Periods	*Growth Rates of Prawn Production in West Bengal (in per cent)*
1990-91 to 1999-2000	3.4
2000-01 to 2006-07	13.8

Sources: Based on the *Handbook on Fishery Statistics of West Bengal*, Department of Fisheries, Aquaculture, Aquatic Resources and Fishing Harbours, 2003; published and unpublished data; and the Fisheries Global Information System (FIGIS) database, FAO, 2009.

Figure 2 shows a declining trend in the share of West Bengal in the total prawn production in India in the 1990s. This declining trend continued till 2002-03. However, there was a sharp increase in the share of West Bengal in the total prawn production in India from 9.1 per cent in 2003-04 to 14.6 per cent in 2006-07.

Figure 2
Shares of West Bengal in Total Prawn Production in India between 1990-91 and 2006-07 (in per cent)

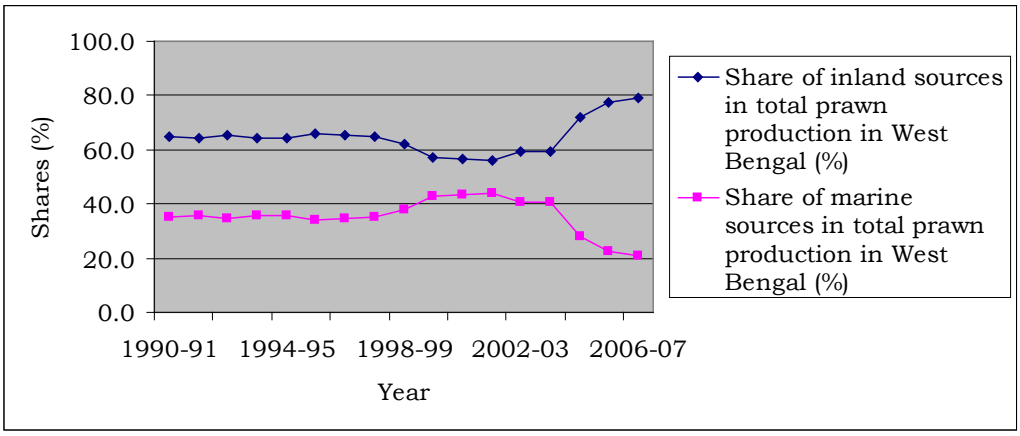


Source: Based on the *Handbook on Fishery Statistics of West Bengal*, published and unpublished data, Department of Fisheries, Aquaculture, Aquatic Resources and Fishing Harbours, 2003; and the FIGIS database, FAO, 2009.

Figure 3 shows the trend in the shares of inland and marine sources in the total prawn production in West Bengal. It can be seen from the figure that inland sources were major sources of prawn production in West Bengal between 1990-91 and 2006-07. The figure also shows that the gap between the two curves narrowed between 1998-99 and 2001-02. During this period, the share of marine sources in the total prawn production increased from 38.1 per cent in 1998-99 to 44.1 per cent in 2001-02. However, the share of marine sources, in the total prawn production, declined from 40.5 per cent in 2002-03 to 20.7 per cent in 2006-07. As a result, the gap between two curves increased between 2002-03 and 2006-07.

The studies on fish and prawn farming in West Bengal have mainly discussed the viability of integrated culture of fish-prawn and paddy, particularly in the Sunderban estuarine region (see Central Soil Salinity Research Institute, 1988; Chakraborty, *et al.*, 2002;

Figure 3
Trend in the Shares of Inland and Marine Sources in the Total Prawn Production in West Bengal between 1990-91 and 2006-07



Source: Based on the *Handbook on Fishery Statistics of West Bengal,* Department of Fisheries, Aquaculture, Aquatic Resources and Fishing Harbours, 2003; published and unpublished data.

Chattopadhyay, *et al*., 1983; Das, *et al*., 1996; Ghosh, 2001; and Natarajan, 1983). In these studies, it is argued that prior to the introduction of prawn farming, the land in these areas was used for agriculture, that is, for paddy cultivation during the monsoons, when salinity of soils decreased. These studies have also pointed out that land in the Sunderban estuarine region of West Bengal was profitably utilised through the introduction of prawn farming. According to Natarajan (1983), "paddy cultivation in coastal saline regions being dependent almost entirely on the availability of monsoon precipitation, getting a good crop every year is absolutely uncertain. In that context, brackish water paddy-cum-fish culture not only provides a substantial subsidiary income to the farmers by increasing not only the biological production per unit land area but also generates a year-wise employment opportunity to the local people which is about 3 times higher to those in seasonal paddy cultivation (p. 29)."

Alagarswamy (1995) and Ghosh (2001) have classified the fisheries as follows, according to the level of salinity.

(a) In low-saline fisheries, salinity did not rise above 10 ppt during summers and remained at the fresh water level during monsoons.[4] Paddy cultivation was done during the monsoons when the salinity of water decreased. Prawn farming was done for the remaining part of the year.

(b) In medium-saline fisheries, salinity did not exceed 20 ppt during summers, and it was lowest during the monsoons when paddy cultivation was done.

(c) Highly saline fisheries were located in the southern part of the Sunderbans, or areas that were close to the sea. The salinity level here was usually 30-37 ppt during summers and it was the least, at 6-7 ppt, during the monsoons.

Naskar (1985) has discussed the impact of fish and prawn farming on income and employment in West Bengal. The study has argued that the introduction of fish and prawn

farming in the Kulti–Minakhan area of Sunderbans has led to an increase in the income and employment of the local population. It has also resulted in the profitable utilisation of agricultural land in the region. However, the study is descriptive and has not statistically analysed the impact of prawn farming on the employment and incomes of different sections of the population in the study area.

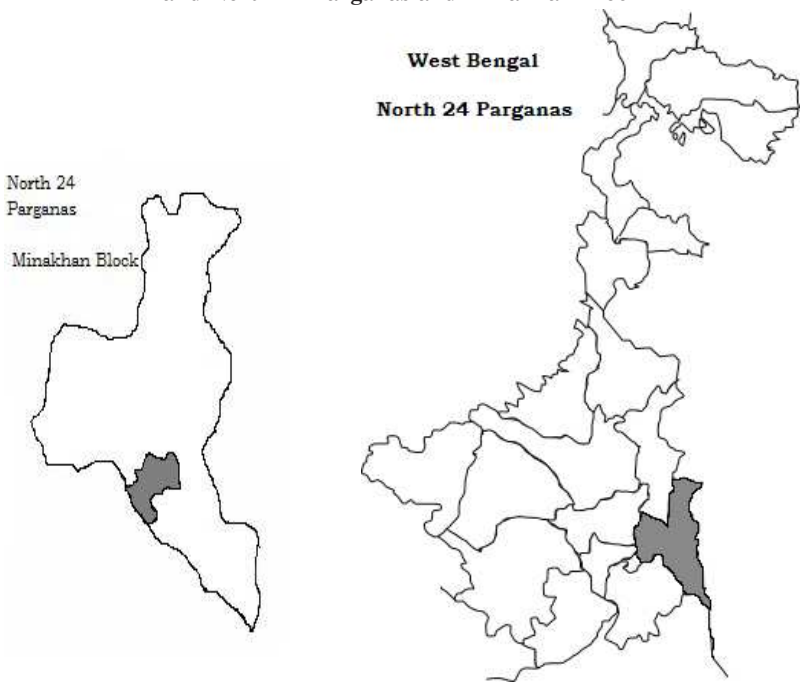
III. LOCATION

Tentultala is situated in the Minakhan Block of North 24 Parganas, West Bengal (see Maps 1, 2 and 3). It is located adjacent to Kumarjole Khal, which starts from the river Sakha Bidyadhari—an offshoot of the Raimangal river. The nearest town, Ghusighata, is situated about 2 km away. Ghusighata is situated on the Basanti Road, which is a state highway.

Tentultala is situated about 34 km from Kolkata and buses to Kolkata are frequently available from Ghusighata. It has an all-weather road passing through it. The means of transport within the village are manually driven van-rickshaws or motor van-rickshaws.

Map 1

West Bengal Map 2: North 24 Parganas and North 24 Parganas and Minakhan Block



Map 3

Minakhan Block and Tentultala Mouja

IV. FIELD WORK METHODOLOGY

The core of this study is based on primary data, which was collected from a Census survey of households in Tentultala in May–June 2006. About 244 households were surveyed during this period. In this survey, a household was defined as an economic unit wherein a group of persons stay together and partake of food from the same kitchen. The questions were usually addressed to the head of the household. However, if considered necessary, information was collected from other members of the household as well.

The data on employment in fish farms was collected for different members of a household during the surveys in 2006. The names of each member of the household who had worked in any wage labour occupation in the fish farms were recorded. Then, for each of these members of the household, the number of calendar days worked, the daily hours of work and daily wages were collected for each month and operation. There was regularity of employment in the fish farms. Different occupations like earthwork for land preparation in the fish farms, fishing and guarding were done at particular points of time in a calendar year. Details pertaining to the number of days of employment in a year, daily wage earnings, and daily hours of work in other non-agricultural occupations were collected for each member of the household, employed in different occupations.

Data on employment in agriculture were also collected during the survey in May–June 2006. This was done for every member of the household employed in agricultural tasks,

crop by crop and for each operation. Fish farms were found to be the main sources of employment in Tentultala. Agricultural employment and non-agricultural employment other than fish farms were rarer as compared to employment in the fish farms, which is why the household members remembered employment in these occupations clearly. During the survey, household members recalled the number of days of employment and wage earnings quite easily since the data on these factors were collected separately for each non-agricultural occupation other than the fish farms and for different agricultural tasks.

V. BASIC FEATURES OF TENTULTALA

1. Population

According to the data collected during the survey conducted in May–June 2006, the total population of the village of Tentultala was 1,336 and the total number of households was 244. Of the total number of households in 2005-06, 44.7 per cent were Scheduled Castes (SCs) while the rest (55.3 per cent) were Muslims. There were 698 males and 638 females in the village. In terms of proportions, about 47.3 per cent of the total population was that of females while the rest were males. Muslims (comprising 781 out of the total of 1336 persons) accounted for 58.5 per cent of the total population. Hindus comprised the rest, that is, about 41.5 per cent of the total population, and they belonged to the Paundra Kshatriya caste. All the Hindus in the village were SCs. The average household size in the village in 2005-06 was 5.5. Table 2 shows the distribution of households and population by social groups in 2005-06.

Table 2

Distribution of Households and Population by Social Groups, Tentultala, 2005-06

Social Groups	*Number of Households*	*Proportion of the Total Number of Households (%)*	*Male*	*Female*	*Total*	*Proportion of the Total Population (%)*
SCs	113	44.7	308	247	555	41.5
Muslims	131	55.3	390	391	781	58.5
Total	244	100.0	698	638	1336	100.0

Source: Field survey, May–June 2006.

2. Literacy Rate

The literacy rate in Tentultala was 62.2 per cent in 2005-06 (Table 3), while the corresponding figure for West Bengal was 68.6 per cent, according to the 2001 Census. The literacy rates for both men and women in Tentultala were lower than the corresponding figures for West Bengal. However, as seen in Table 4, the literacy rates for Dalits and Muslims in Tentultala were higher than the corresponding figures in West Bengal.

In 2005-06, the spread of higher education among the local populace (that is, those who had passed standard ten and above) was very limited in Tentultala. In 2005-06, there were only 25 graduates in Tentultala, that is, graduates accounted for only 2.2 per cent of the total population above 6 years of age in the village. Of the total literate persons, only 3 per cent were graduates in 2005-06. The proportion of the total population above 6 years of

Table 3
Literacy Rates across Gender Groups, Tentultala and West Bengal (in per cent)

Gender Groups	*Literacy Rate in Tentultala*	*Literacy Rate in West Bengal*
Males	70.3	77.0
Females	53.3	59.6
Total	62.2	68.6

Sources: Field survey, May–June 2006; and Census of India, 2001.

Table 4
Literacy Rates among SCs and Muslims, Tentultala and West Bengal (in per cent)

Social Groups	*Literacy Rate in Tentultala*	*Literacy Rate in West Bengal*
SCs	65.4	59.0
Muslims	59.2	54.5

Sources: Field survey, May–June 2006; and Census of India, 2001.

age that had acquired education up to the *madhyamik* (standard ten) level was 7.7 per cent, while in 2005-06. Among the total literate population, the proportion of the total literate population was 10.2 per cent of the total population in 2005-06.

3. Access to Basic Services

In 2005-06, there was a middle school (up to standard ten) and a primary school (up to standard five) in the village. There were higher secondary schools in Ghusighata (located 2 km away), Chandipur (3 km away), and Ghatakpukur (7 km away). In 2005-06, the nearest government-sponsored college was in Bhangar (about 10 kms away). Thus, people wishing to pursue education beyond the *madhyamik* level had to go outside the village.

There was no public healthcare facility in the village in 2005-06. Also, there were no trained medical practitioners and medicine shops in the village. People had to go to Ghusighata town even for their minimum medical needs, as that the primary healthcare facilities in the village were very poor. The nearest commercial bank branch of Allahabad Bank is situated in Ghusighata town. There is no post office in the village.

4. Pattern of Land Use

Salinity of the soil is a feature of the village and its surrounding areas. During summers, the salinity in the region was in the range of 15-25 ds/m—the water salinity during this point of time was 20-40 ds/m (Central Soil Salinity Research Institute, 1988). As a result, the land was unsuitable for cultivation of agricultural crops during summers. Thus, prior to the introduction of fish farming in the early 1990s, agricultural land in the village remained fallow during summers. During the monsoons, soil salinity declined to 4-7 ds/m and agricultural crops were cultivated for four months.

It was for the purpose of making profitable use of these fallow lands and vast resources of saline water that fish farming was introduced in Tentultala in 1990. The transformation in land use from agriculture to fish farming was, therefore, expected to yield more profitable utilisation of land. The survey data showed that the net profit accruing from fish farming was higher than that from agriculture.[5]

The extent of operational holdings (in fish farms and agriculture) is the sum of the extent of the land leased in and the extent of owned land operated. All agricultural land operated by resident households in Tentultala was situated outside the village. Table 5 shows the proportion of the total extent of the operational holdings of resident households in Tentultala which was used for agriculture and cultivation of fish farms. The table shows that in 2005-06, almost 96.4 per cent of the total extent of operational holdings of resident households in Tentultala, were used for fish farming while the rest were used for agriculture. It may, however, be noted that though there were changes in land use, in official documents, the land was still registered as agricultural land and official permission for changes in the use of land was not taken by the landowners (Shukla, 2008).[6]

Table 5
Extent and Proportion of Operational Holdings Used for Fish Farms and Agriculture by Resident Households in Tentultala, 2005-06

Land Use	*Extent (acres)*	*Proportion of the Total (%)*
Fishery	316.8	96.4
Cropland/agriculture[7]	11.8	3.6
Total	328.6	100.0

Source: Field survey, May–June 2006.

VI. WORK PARTICIPATION RATES

According to Mitra (2008), the worker–population ratio is an indicator of the availability of job opportunities in an economy. He had argued that for India as a whole, the usual status work participation rate (WPR) for rural males had increased from 51.7 per cent in 1987-88 to 53.8 per cent in 1993-2004, and then declined to 52.2 per cent in 1999-2000. It increased again in 2004-05; however it was marginally lower in 2004-05 as compared to 1993-94. The subsidiary status WPR had declined from 2.2 per cent in 1987-88 to 1.1 per cent in 2004-05. Among rural females, the principal status WPR declined by more than 1 per cent point between the years 1987-88 and 1993-94 (decreasing from 24.5 per cent to 23.4 per cent), remained almost constant in the 1990s, and increased in 2004-05 (to touch 24.5 per cent). Mitra (2008) had also argued that the principal status WPR had increased in most of the age groups except in the age groups below 19 years due to a rise in school enrolment. In the case of males, the younger age groups (up to 19 years) had experienced a major decline in the male principal status WPR due to a rise in the school enrolment ratio.

Chowdhury (2011) had argued that that there was a decline in employment in the rural areas mainly due to a sharp fall in the employment of rural women. The number of persons in the workforce in the rural areas had declined from 342.9 million in 2004-05 to 336.4 million in 20-10. While the total male workforce had increased during this period, there was a sharp decline in the total female workforce, which dropped from 124 million in 2004-05 to 104.5 million in 2009-10. He also claimed that there had been an increase in employment of less than a million people in the country between 2004-05 and 2009-10. He says, "To argue that employment declined because of a decline in supply of labour, since more people attended education in the age group 15-24 years, is to argue that there is full employment

in the economy or a situation of labour shortage. Clearly, this is not the case in India. The only explanation then for an almost stagnant employment situation is simply that not enough jobs are being created in the economy, even with an 8% plus growth rate." Mitra (2008) and Chowdhury (2011) agreed that the Indian economy had witnessed 'jobless growth', post 2000, in which employment generation for the poor people had suffered.

While analysing the NSSO data between 1972-73 and 2004-05, Srivastava and Srivastava (2010) argued that the WPRs of males and females show no systematic variation, despite a larger percentage of persons in the younger age group entering education. They had argued that there has been an increase in the employment rate for urban women in 2004-05 as compared to earlier rounds on account of economic reforms; however, its impact on rural areas was limited.

West Bengal has been noted in the literature for low WPRs among women (see Nayyar, 1987; UNDP, 2004; Sinha, 2005; and Chakraborty and Chakraborty, 2009). According to the data from the NSSO Surveys of Employment–Unemployment, 2004-05, West Bengal had the second lowest rural female WPR (18 per cent) among all the states of India (Report number 515, Part 1, of the NSSO). It is further noteworthy that the overall WPRs for both men and women in Tentultala were lower than the corresponding estimates from official statistics for rural West Bengal as a whole.

Data obtained from the 2005-06 survey show that the overall WPRs in Tentultala were very low, particularly because of low work participation among women. In 2005-06, the proportion of workers in the total population was only 29.3 per cent.

Table 6 shows the WPRs of men and women in Tentultala. The table also presents estimates of the rural WPRs for West Bengal from the 61st round of the NSSO's Employment–

Table 6
Work Participation Rates, Men and Women, Tentultala and West Bengal

(in per cent)

	Worker Population Ratio	*Male*	*Female*	*All*
Tentultala	Workers as a proportion of the population in the age group of 18-60 years	76.3	16.7	48.0
	Workers as a proportion of the total population	47.6	9.2	29.3
West Bengal (Census 2001)	Workers as a proportion of the total population (rural)	54.2	18.1	36.8
West Bengal (NSSO, 2004-05)	Total workers as a proportion of the total population (rural)	57.4	17.8	37.9

Note: Workers employed in both principal and subsidiary activities were considered.

Source: Field survey, May–June 2006; NSSO, 2004-05, and Census of India, 2001.

Unemployment Surveys (2004-05) and the Census of India (2001). The table shows that the proportion of workers in working age population (18 to 60 years) in Tentultala was only 48 per cent. It is noteworthy that even among working age men, almost 24 per cent were non-workers in Tentultala. Among women in the working age group, about 83.3 per cent were non-workers.

According to the UNDP (2004), "low work participation rates for women have typically been seen as evidence of gender discrimination, not only because they reflect a resistance to women working outside the home, but more significantly because they may reflect under-reporting due to the social invisibility and lack of recognition of women's unpaid work."

Table 7 shows data from the Census of India on the WPRs in Tentultala and rural West Bengal between 1991 and 2001. This period saw a drastic shift in land use in Tentultala from agriculture to fish farms. The table shows that the female WPRs in Tentultala were lower than the corresponding figures in rural West Bengal as a whole. The table also shows that there was a steep decline, of over three percentage points, in the WPRs of both men and women in Tentultala between 1991 and 2001. This was in sharp contrast to the situation in rural West Bengal as a whole, where the WPRs of rural women increased by about five percentage points and the WPRs of rural men increased by about two percentage points. The WPRs among women were low because mainly male workers were employed in fish farms that have become the most important source of employment in Tentultala. The decline in female employment in Tentultala was largely on account of the lack of employment opportunities for women in fish farms, which is also revealed in Tables 6 and 7.

Table 7

Work Participation Rates across Gender Groups between 1991 and 2001, Tentultala and Rural West Bengal

(in per cent)

Area	*Gender Groups*	*Year*	
		1991	*2001*
Tentultala	Male	57.1	53.4
	Female	7.5	4.2
West Bengal (Rural)	Male	52.1	54.2
	Female	13.1	18.1

Sources: *District Census Handbook*, Primary Census Abstract, Census of India, 1991-2001.

In order to analyse how changes in land use had adversely affected the WPR in the study area, the labour use in agriculture has been compared with that in prawn farming on the basis of the data collected in the survey in 2005-06. The survey data shows that labour use in per acre of land used for agriculture amounted to 59 person-days; the corresponding figure in prawn and fish farming was 20 person-days in 2005-06, which indicates that labour absorption in fisheries was almost one-third as compared to that in agriculture. Thus, changes in land use from agriculture to fisheries had adversely affected the employment scenario in the village.

Data on the occupational structure of the workforce presented in Table 8 show that there was a steep decline in the proportion of cultivators and agricultural workers (particularly

women) in the population in Tentultala between 1991 and 2001. It is particularly noteworthy that low levels of female labour absorption in fish farms were the primary reason for very few women in Tentultala being workers. This is likely to have been a result of the change in the pattern of land use from agriculture to fish farms over this period.

Table 8 shows that the decline in the WPRs in Tentultala between 1991 and 2001 was mainly on account of the loss of employment for women in agriculture. This was in sharp contrast to the situation prevailing in rural West Bengal as a whole, wherein an increase was seen between 1991 and 2001 in the proportion in the total female population employed in 'household industry' and 'other' activities.

Table 8

Proportion of the Total Male and Female Population in Tentultala and West Bengal (Rural) Who Were Employed in Different Occupations (in per cent)

Occupations	*Areas*							
	Tentultala				*West Bengal (Rural)*			
	Male		*Female*		*Male*		*Female*	
	1991	*2001*	*1991*	*2001*	*1991*	*2001*	*1991*	*2001*
Main workers	56.7	47.9	7.5	1.50	51.2	45.8	8.7	8.9
Marginal workers	0.4	5.6	0.0	2.70	0.9	8.3	4.3	11.8
Cultivators (Main+Marginal)	28.7	14.3	0.3	0.20	21.3	15.5	3.6	3.5
Agricultural labourers (Main+Marginal)	26.3	27.5	6.9	0.40	15.6	16.8	5.5	8.1
Household industry (Main+Marginal)	0.2	0.2	0.1	0.09	1.4	2.2	1.5	1.9
Other workers (Main+Marginal)	1.5	10.8	0.2	0.80	13.6	19.5	2.5	3.2

Note: Main and marginal workers were included in calculating the proportions of the total male and female population who were employed in different occupations.

Source: District Census Handbook, Primary Census Abstract, Census of India, 1991 and 2001.

As mentioned earlier, prawn and fish farms, which had become the main sources of employment in Tentultala since the introduction of this activity in the village, showed low female work participation as largely men workers were employed in almost all operations in fish farming. On the basis of NSSO data, Srivastava and Srivastava (2010) had argued that as regards social groups, the WPR among women in rural areas was the highest for Scheduled Castes (SCs) and Scheduled Tribes (STs), and the lowest for those belonging to the 'Other Castes'. Among religious groups, the WPR was the lowest for Muslim women in 2004-05. Srivastava and Srivastava argue that orthodox social norms and customs restrict women's mobility and entry into the workforce, and keep more Muslim women tied to household activities. Data on WPRs disaggregated by social groups for Tentultala show that while the male WPRs were higher among Muslims than Dalits, the WPRs among Muslim women were very low and considerably lower than those for Dalit women (Table 9).

Table 9
Work Participation Rates across SCs and Muslims for Males and Females, Tentultala, 2005-06 (in per cent)

Social Groups	*Workers as a Proportion of the Total Population (Males)*	*Workers as a Proportion of the Population in the Age Group of 18-60 Years (Males)*	*Workers as a Proportion of the Total Population (Females)*	*Workers as a proportion of the Population in the Age Group of 18-60 Years (Females)*
SCs	46.5	72.3	18.9	30.9
Muslims	48.8	93.0	3.1	6.2

Source: Field survey, May–June 2006.

In 2005-06, the women workers in Tentultala had participated in two occupations. These were: (a) removal of algae in the fish farms, and (b) embroidery work. The low female WPR was due to lack of opportunities of work for women in the fish farms and the lack of other occupations in the village. Also, the prevalence of orthodox social customs among the large Muslim population in the village was a determining factor for the low WPRs among women. Chakraborty and Chakraborty (2009) used block level data to examine variations in female WPRs in West Bengal. They pointed out that, along with other factors, blocks with higher proportion of Muslim population tended to have lower female WPRs.

In order to analyse the pattern of variation in work participation among women in Tentultala, a Logistic model has been estimated here, which analyses the probability of a woman being a worker on the basis of a number of demographic and socio-economic variables. It is noteworthy that this model has been estimated by using cross-sectional data collected in 2005-06 and cannot, therefore, capture the impact of the shift of land use from agriculture to fish farms on female employment. The model uses multivariate analysis to understand variations in the WPRs of women in 2005-06 across social groups, classes and demographic variables. The estimated model is as follows:

$$\text{Log } (Y/1\text{-}Y) = a + bX + u$$

where, Y is the work participation of female workers in casual occupations. The matrix of explanatory variables included age, the square of age, a dummy variable, SG, denoting social groups, the per capita income of households, the number of male workers as a proportion of the household size and the variable, CHILD06, denoting the number of children in the age group of 0-6 years in the household. The dummy variables were defined as follows:

WP = 1, if a woman worker participated in wage employment
= 0, otherwise

SG = 1, for SCs
= 0, otherwise

The results of the regression analysis are shown in Table 10.

The results of the regression analysis show that the explanatory variables other than the number of children in the age group of 0-6 years had a significant effect on female work participation in Tentultala. The results also indicate that as the age increased, the probability

Table 10
Results of Logistic Regression Analysis Explaining Variation in Work Participation among Women in Tentultala, 2005-06

Variables	*Co-efficient*	*Std. Error*	*z-value*	*P>|z|*
Constant	-9.300	4.5000	2.07**	0.04
Age	0.730	0.3300	2.23**	0.03
Square of age	-0.013	0.0050	2.26**	0.02
Social group (SC=1)	2.300	0.5600	4.17***	0.00
Per capita income	-0.001	0.0002	-4.45***	0.00
Proportion of male earners in the households	-0.400	0.3100	-1.93**	0.04
Children in the age group 0-6 years	0.170	0.2400	0.70	0.48
Log likelihood -64.70				
Chi2 93.60				
Prob>chi2 0.00				
Pseudo R2 0.42				
No of observations 270.00				

Note: *** Implies a 1 per cent level of significance and ** implies a 5 per cent level of significance.
Source: Field survey, May–June 2006.

to participate in wage employment occupations increased at a decreasing rate as the coefficient of square of age was negatively significant.

he variable social group (SG) had a positive significant effect on the work participation of women workers indicating that women from Dalit households were more likely to participate in casual wage employment than women from Muslim households. The per capita income and proportion of male workers in the household had a negative significant effect on the decision of women to participate in wage employment.

VII. NUMBER OF DAYS OF WAGE EMPLOYMENT

This section presents an analysis of the number of days of employment of workers who were employed in wage labour occupations in the fish farms, other non-agricultural wage labour occupations, and agricultural wage labour. In 2005-06, workers were employed in self-employment/business occupations for some part of the year and in wage labour occupations for certain period of time during year. They were not included in the present analysis.

Table 11 shows the distribution of the number of days of employment of workers employed in wage labour occupations in 2005-06. The data from the table shows that male workers were employed for just over five months (156 days), on an average, in 2005-06. Thus, for the major part of the year they were unemployed. This indicates that fish farms as the main sources of employment in Tentultala, failed to provide year-round employment to large sections of male workers who participated in wage labour occupations. The condition of female workers in terms of accessing wage employment opportunities was worse than their male counterparts in 2005-06. The average number of days of employment of female workers was as low as eight days in 2005-06. An important factor responsible for this abysmally low level of employment of female workers was that it was primarily the male workers who received employment opportunities in fish farms.

Table 11
Distribution of Number of Days of Employment of Workers Employed in Wage Labour Occupations in Tentultala, 2005-06

Size Class of Number of Days of Employment	*Proportion of the Total Male Workers (%)*	*Average Number of Days of Employment*	*Proportion of Total Female Workers (%)*	*Average Number of Days of Employment*
1-30	8.4	21	100	8
31-60	12.6	33	NA	NA
61-90	13.2	65	NA	NA
91-120	20.4	101	NA	NA
211-240	14.4	212	NA	NA
241-270	4.8	242	NA	NA
271-300	8.4	272	NA	NA
301-330	11.4	302	NA	NA
331-360	6.6	331	NA	NA
Total	100.0	156	100	8

Source: Field survey, May–June 2006.

Table 11 shows that about 8.4 per cent of the male workers were employed for less than a month. The data in the table thus clearly shows the lack of employment opportunities in the fish farms and other wage labour occupations for a substantial portion of time during a year for workers in Tentultala. The average number of days of employment was 65 for 13.2 per cent of the male workers, while for another 20.4 per cent male workers, it was three-and-a- half months (101 days). These workers were employed in occupations like earthwork in the fish farms, fishing and other casual non-agricultural occupations. In contrast, a small minority of male workers, comprising about 6.6 per cent of the total, received employment almost for the whole year in 2005-06. The average number of days of employment for these workers was 331. They were employed as long-term workers in the fish farms and other regular wage labour occupations like factory work and shops, which provided year-round employment opportunities to male workers.

As mentioned above, in 2005-06, male workers were employed both in the fish farms and in other wage labour occupations. Usually, these workers were employed in other wage labour occupations either before or after the commencement of fish farms in Tentultala. The lack of employment opportunities in the fish farms for a substantial portion of time during a year led them to look for work in other non-agricultural occupations like hiring out labour in the brick kilns and construction work. The availability of other non-agricultural occupations thus provided an alternative source of employment to the workers, which enabled them to enhance their wage incomes. In 2005-06, about 14.4 per cent of the workers were employed for 212 days, on an average, and another 4.8 per cent workers were employed for 242 days, on an average.

VIII. STRUCTURE OF WAGE EMPLOYMENT IN TENTULTALA

1. Wage Employment in Fish Farms

In 2005-06, almost 16 per cent of the total expenditure on fish farming for resident households in Tentultala was in terms of wages. The share of wages in the total expenditure was lower than the shares of the rent paid for leased land (44 per cent), and fish and prawn fries (26.1 per cent). One of the reasons for this was the prevalence of lower than legally prescribed minimum wages in various occupations in the fisheries sector in 2005-06. Also, fish farmers other than the big farmers of fish were primarily dependent on family labour for carrying out major tasks pertaining to fisheries. In 2005-06, the average daily wage earnings for male workers and female workers in fisheries in Tentultala were Rs. 57.7 and Rs. 31.8, respectively. The legally prescribed minimum daily wages in fisheries in West Bengal was Rs. 77.6 at 2005-06 prices.

In 2005-06, fish farms constituted the most important source of employment in Tentultala (De Roy, 2012). About 59.1 per cent of the total workforce worked for wages in different occupations in the fish farms (Table 11). In the fish farms, the workers were hired on long-term contracts primarily for guarding the fish farms. These long-term workers also participated in other tasks when required. However, for all the other major tasks, casual workers were used. The major tasks for which casual workers were hired included earthwork, removal of algae, and fishing.

One of the most important features of the pattern of wage employment in fish farms was that primarily male workers were hired in fish farms. Consequently, all long-term workers were men, and only male workers were hired for earthwork and for fishing. Female casual workers were used only for the removal of algae; no male casual workers were used for the removal of algae though occasionally long-term male workers helped the womenfolk in the work.

Some activities in the fisheries sector depended on the dynamics in the fish and prawn markets. However, certain other activities like guarding in fisheries and earthwork were not affected by the supply and demand situations in product markets. The contracts with guard workers were finalised at the start of a season and large farms were dependent on hired labour for these operations. Earthwork was undertaken at the start of a season with hired labour, particularly by large farms, and the supply–demand situations in the product market hardly affected labour use in these activities. Small farms used family labour for guarding, and depended on both family and hired labour for earthwork. However, in fishing, labour use depended on price signals and the supply–demand situation in product markets. Fish farmers hired more workers for fishing to reap the benefits of any short-term increase in the prices of prawns and fish by increasing their fishing activity during that period and vice versa. Typically, the demand for fishing workers is high when the demand for fish and prawns reaches its peak, that is, during the months of May–September.[8] Thereafter, the demand for these workers declines. Irrespective of the situation in the product market, however, the number of days of employment for workers in the fisheries sector is low, except for the

long-term workers. As a result, the workers in the study area were found to be searching regularly for other wage employment occupations in order to be able to maintain a decent standard of living.

(i) Long-term workers: In 2005-06, 16.3 per cent of all male workers were employed as long-term workers in the fish farms. These workers were typically hired from the month of March onwards, after the stocking of fish and prawn fries started in the fish farms, on contracts with durations of up to nine months.

The average number of days of employment for long-term workers was about nine months (261 days). The work schedule of long-term workers was characterised by long daily working hours and very few holidays. In 2005-06, the long-term workers in Tentultala were hired either as double shift workers or as single shift workers. The primary task of long-term workers in the fish farms was guarding. Double shift guards stayed in the fishery for 13-16 hours a day, whereas single shift guards worked during the night for about 8-10 hours. Of all the men employed as guards, about 35 per cent worked on double shifts. The guards were paid a monthly wage. In 2005-06, single shift guards were paid Rs. 500-700 per month while double shift guards were paid Rs. 1,000-1,200 per month.

In 2005-06, long-term workers got a maximum of two holidays per month, and pay-cuts of Rs. 10-15 per day were imposed by the fish farmers on all workers who exceeded this limit. In addition to guarding, the long-term workers also performed other tasks in the fish farms, such as stocking of fish and prawn fries, removal of algae, and transporting the product to the market. However, they were not given any additional remuneration, over and above the monthly wages, for doing these tasks.

In a study in south-western Bangladesh, Ito (2002) had mentioned about the existence of guards in the fisheries. Typically, the wages of the guards in these fisheries were Taka 1000-Taka 1800 per month, without food. Also, the wage rates fixed in long-term contracts were lower than the daily wages, which varied between Taka 60 and Taka 100. It was argued that the reason for the lower wages in these long-term contracts was that the worker in such cases lived in the farmer's house and performed all types of household work.

(ii) Earthwork: Earthwork for land preparation in the fish farms was undertaken in the months of December and January. In 2005-06, about 42.8 per cent of male workers were employed in earthwork. The workers who participated in earthwork worked, on an average, for 22 days in this task.

Earthwork was done primarily by using casual workers hired on daily wages. In 2005-06, the wage paid to workers for performing earthwork in the fish farms was Rs. 65-70 per day. Typically, these workers worked from 9 AM to 5:30 PM, with a lunch break of 30 minutes between 1 PM and 1:30 PM.

Since the months when earthwork was undertaken in the fish farms were different from the months when workers were hired for guarding, a number of workers who worked on

monthly wage contracts for guarding between February and November, also participated in earthwork as casual daily wage workers in the months of December and January.

(iii) Fishing: Fishing was also done exclusively by male workers. About 24.7 per cent of all male workers were employed in fishing. In 2005-06, the workers, on an average, got employment for about 52 days in fishing.

In 2005-06, workers were hired for fishing primarily on piece-rated contracts. Wage rates in fishing varied by types of the fish and prawns caught, their sizes and the method of fishing. In 2005-06, for catching Giant Tiger Prawns, workers were paid Rs. 10-20 per kg, depending on the size and the method of fishing. Workers were paid Rs. 20 per kg for catching using nets while the wages for catching them during high-tide by using bamboo traps ranged between Rs. 10 and Rs. 15 per kg. The wages for catching other types of fishes (primarily, Rohu, Tilapia and Parsia) were much lower, and the workers were paid Rs. 2.5-3 per kg for catching these types of fish in 2005-06.

(iv) Removal of Algae: This was the only operation for which female workers were employed in the fish farms. At the time of the survey in May–June 2006, the workers were hired for about four hours a day for the removal of algae. The workers were hired on a time-rate basis and were paid Rs. 30-35 per day for working for about four hours. In 2005-06, they were employed for eight days, on an average, for this work. Gender specificity of occupations was visible in the fisheries sector in south-western Bangladesh, where women workers are employed in fishing in which a worker, on an average, earned Taka 20 per day.[9] In a study conducted in Bhadrak district, Odisha, Pradhan and Flaherty (2008) had argued that there was almost no employment of women in fisheries. They averred that the lack of women's participation in prawn farming was due to: (a) the distance of prawn fisheries from the village, (b) the nature of occupations in which workers had to stay overnight at the site, and (c) lack of feasibility in providing adequate safety measures for women workers. They argued that the involvement of women was more visible in off-farm activities like sorting, drying, packaging, and marketing.

2. Wage Labour Occupations Other Than Fish Farms

This section highlights the other occupations in which workers in Tentultala were employed in 2005-06. About 17.1 per cent of the male workforce was employed in other wage labour occupations. These occupations comprised regular salaried jobs in factories and other business establishments as well as casual employment in construction work and hiring out of labour in brick kilns.

(i) Regular Salaried Employment: In 2005-06, about 7.5 per cent of the male workers were employed in regular salaried employment in the factories, and in shops and business establishments. The monthly wage rates in regular occupations were Rs. 1,100-1,500 in 2005-06. Of these, factory work constituted an important source of employment. About 5.4 per cent of the male workers were employed in the factories in 2005-06. These workers were employed in leather factories and small-scale manufacturing units located in small towns along the state highway (Basanti Road) and in Kolkata. Factory

workers usually worked for six days a week and, on any working day, left home at about 6 AM and returned at about 10 PM. In 2005-06, the average monthly wage earning of a factory worker was Rs. 1,437.

In 2005-06, about 2.1 per cent of the male workers were employed as shop helpers. The average monthly wage earnings for these workers was Rs. 1,242.

(ii) Other Casual Employment

(a) Construction Work: In 2005-06, about 5.1 per cent of the male workers were employed in construction work and the daily wage rates in construction work were Rs. 90-100. Employment in construction work was primarily available in Kolkata. Typically, hired manual labourers went out to work at 7 AM in the morning and came back at around 8 PM. They were employed in the construction of roads and buildings in Kolkata. The workers who participated in construction work got, on an average, 147 days of employment in construction.

(b) Hired Labour in the Brick Kilns: These were daily wage-paid casual occupations. In 2005-06, about 3.6 per cent of the male workers were employed in the brick kilns, and the daily wage rates for these workers were Rs. 80-90. These were located along the banks of River Bidyadhari in areas neighbouring Tentultala. Usually, the workers were employed in these occupations after the completion of activities in the fish farms in October–November. These workers had to work for seven days a week, at an average of 8.7 hours per day. The average number of days of employment of the workers employed in brick kilns in 2005-06 was 128 days.

Table 11

Proportion of Workers, Average Daily Hours of Work, Average Number of Days of Employment and Average Daily Wage Earnings in Work Done on Casual Contracts, Tentultala, 2005-06

Casual Occupations	*Days and Wage*			
	Earnings	*Average Daily Hours of Work*	*Average Number of Days of Employment*	*Average Daily Wage Earnings (Rs.) (8-hour day)*
Earthwork (men)	42.8	8.0	22	67.5
Fishing (men)	24.7	7.8	52	78.7
Removal of algae (women)	83.1	4.0	8	64.2
Construction work (men)	5.1	10.0	147	67.0
Hired labour in brick kilns (men)	3.6	8.7	128	50.4

Note: The proportion of workers in occupations where only men were employed was computed with respect to the total number of male workers; the corresponding figure for workers engaged in the removal of algae was computed with respect to the total female workers.

Source: Field survey, May–June 2006.

An analysis of the secondary data shows that the WPR in the study area is low and is, in fact, lower than that of West Bengal as a whole. Also, the work participation rates of men and women had decreased with the introduction of fisheries in 1990. The overall low WPR is largely due to the very low WPR among women. The survey data have also

corroborated these tendencies. The primary data show that the WPR was lower for Muslim women as compared to their SC counterparts. The changes in land use from agriculture to fisheries and orthodox social customs also adversely affected the employment scenario in the area. Labour use in fisheries was lower than that in agriculture. Also, women workers were employed in only one occupation, that is, the removal of algae, in the fisheries. The average number of days of employment for men workers was only five months in a year, while for women workers, the corresponding figure was as low as eight days.

IX. CONCLUSIONS

West Bengal is one of major prawn-producing states in India. The state had registered an impressive growth rate of 13.8 per cent in this activity between 2000-01 and 2006-07. The study shows that inland sources accounted for a major share of prawn production in West Bengal between 1990-91 and 2006-07. The existing literature on prawn farming in West Bengal has mainly discussed the feasibility of promoting an integrated culture of fish, prawns and paddy. Hitherto, no study in West Bengal has discussed the conditions of employment and labour relations in fish farms in West Bengal. This paper is a contribution towards filling this gap in the existing literature.

The conditions of employment in the study village of Tentultala were characterised by very low WPRs among both men and women, which were lower than the corresponding figures for rural West Bengal as obtained from official data sources like the Census of 2001 and the 61st Round of the NSSO. The WPRs were particularly low among women. Data from the population censuses show that there was a sharp decline in the WPRs for both men and women between 1991 and 2001. For women, this decline occurred from an already abysmally low base. The decline in WPRs was the result of a shift of land from agriculture to fisheries. Labour absorption in fisheries was characterised by very low deployment of female labour. Regression analysis showed that work participation by females in Tentultala was lower among Muslims than Dalits, and was negatively associated with per capita household incomes and the proportion of male earning members in the household.

Of all occupations in fisheries, women workers were employed only in the removal of algae. In contrast, men were employed in a larger repertory of occupations including guarding, earthwork and fishing. In addition, male workers were also employed in wage labour occupations in factories, brick kilns, and other commercial establishments in the neighbouring markets and in Kolkata.

An analysis of the data on the number of days of employment showed the lack of employment opportunities for workers for the major part of the year. The average number of days of employment for male workers in 2005-06 was 156 days, and the situation was worse for female workers, who got work for an average number of only eight days during the year. The distribution of the number of days of employment of male workers was uneven whereby a small minority among them (18 per cent) received employment for more than ten months in a year. Most of these workers were employed on long-term contracts in fisheries. However, unemployment was a prominent feature for a large proportion of male workers,

who were employed in casual occupations like earthwork, fishing, and other casual non-agricultural occupations.

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Notes

1. Growth rates are computed from the data collected by the Food and Agriculture Organisation (FAO) of the United Nations and the Handbook of Fishery Statistics in West Bengal.
2. Prawn farming was being undertaken with other varieties of fish in the study village. Prawns generated the highest revenue among all varieties of fish that were farmed. Thus, given the importance of prawn farming in the study village, this paper presents an overview of prawn fisheries in West Bengal.
3. Data obtained from the Directorate of Fisheries, Government of West Bengal.
4. Salinity is measured in ppt or parts per thousand.
5. The net profit accruing from fish farming, at Rs. 4,131, was higher than that from agriculture, at Rs. 2,932, in 2005-06.
6. According to Section 4D(1) of the West Bengal Land Reforms Act, 1955, "Any change, conversion or alteration in the area, character or mode of use of any land, ... shall be a cognizable and non-bailable offence and shall be punishable with imprisonment for a term which may extend to three years or with fine which may extend to fifty thousand rupees or with both."
7. This is the net sown area in agriculture in 2005-06.
8. For a detailed discussion, see De Roy (2014).
9. See Ito (2002) for a detailed discussion.

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BOOK REVIEWS

Jason Heyes and Ludek Rychly (eds.), *Labour Administration in Uncertain Times: Policy, Practice and Institutions*, Edward Elgar, Cheltenham, UK, and International Labour Office, Geneva, Switzerland, (2013), pp. 301, USD 45.

As the Foreword to the edited volume states, labour administration is fundamental not only for implementing the international instruments concerning the labour sector but also for giving effect to the national policies and regulations. It is thus important to accord due importance to this facet of public administration.The discussion arises primarily for two reasons, viz., the growing marginalisation of the Labour Department (which is also known by other nomenclatures) and the limited attention paid to the study of labour administration. The perspective of the International Labour Organisation (ILO) has been reinforced by the creation of a section called 'Governance and Tripartism' in the International Labour Office as part of the restructuring process initiated by the new Director General of ILO, Guy Ryder. While the recent economic crises have brought to the fore the useful role played by the labour administration, the buoyancy was short-lived. This 'fire-fighting'or crisis-driven perspective of the labour administration,in the minds of both the government and social actors, is worse than the inadequacies likely to plague any public administrative body. Further, there is a dire need for serious research on *all* aspects of labour administration which would help 'educate'those involved in influencing the economic and labour policies in a system. It may be mentioned here that all aspects need to be researched as hitherto research has covered only some aspects like public employment service owing to its vital role in the economy while other aspects have been under-researched.The volume under review makes a worthy contribution in this sense.

The book includes eight special contributions which have been contextualised in the introduction and conclusion chapters by the editors. It would be neither feasible nor desirable to cover all the articles of the book in this review. Therefore, only a few of them have been randomly selected for reviewing in order to impart a 'sense of the book' to the readers.

While labour inspection is a fundamental aspect of the working at ILO,the ILO Convention on the broad aspect of 'labour administration' was adopted in 1978. According to the Labour Administration Convention, 1978, labour administration includes "public administration activities in the field of national labour policy". The accompanying Recommendation on Labour Administration and the Convention together provide "the ILO's vision of the tasks associated with labour administration and fundamental principles to which national governments should adhere" (p.3 of the book).I am a little puzzled as to why the editors rate 72 ratifications (as on 7 May 2014, 74 ratifications) as "one of the highest ratification rates of *any* ILO Convention"(emphasis added), thereby ignoring the ILO Core Conventions which earned legitimacy and popular appeal due to the concerted conceptual (through the Decent Work paradigm) and institutional support. Hence higher ratifications, that is, the 'governance conventions' like the Conventions on Labour Inspection (C081), Employment Policy (C122), and Tripartite Consultation (International Labour Standards) (C144) received

much higher ratifications (108 to 145) than the Labour Administration Convention. However, it is interesting to note that among all the conventions adopted *since* 1978, this Convention received one of the highest ratifications!

The editors take the reader on a delightful and informative historical tour while tracing the evolution and development of labour administration, starting with the debate on the 'social question' raging during the late nineteenth century through the World Wars, the Great Depression, the post-War period, the Asian crisis of the late 1990s, and even the recent period.This piece is an instruction on the art of compressing history while at the same time capturing the essence and impact of each epoch!Quite understandably, though with concern, I note that the historical discussion has *solely* centred on the experiences in the developed countries. It is clear from the overview that labour administration has been aided or impeded by the exogenous happenings but has grown strong due to its potential in aiding the achievement of economic and social objectives—I am a little uncomfortable at the use of the 'social' tag for objectives such as full employment, improvement in working conditions and social security: it is social in the sense that it covers the constituents of the society, but it is 'economic' as well, as these have material outcomes, and 'political' too as it could be achieved through the implementation of 'public policies and laws'.

The editorial introductory essay is complemented by an excellent piece on "the changing fortunes of labour administration" by one of the editors, Ludek Rychly. It is interesting to note that the Convention on Labour Administration does not define the term 'labour policy' and has instead left it to the member countries to do so in recognition of the diversities. However, Rychly dares to identify its components such as regulations of aspects like employment relationships, of industrial relations, and of the labour market. However, Rychly may want to redefine the Recommendation on Employment Relationship (2006), which seeks to broaden the defined arena and plug in the undefined and uncaptured dimensions.

But the following key questions he poses arouse enormous interest: (1) Is industrial relations (IR) *still* a legitimate focus of public policy; and (2) Under whose territory does employment policy lie?The rise of new forms of work organisation, decline of collective institutions and individualisation of employment relations, and the existence of a huge informal economy (which he does not mention explicitly) have raised empirical questions on the place of IR in public policy. However, thanks to the crises occurring somewhat frequently,the governments look up to the labour administration to mediate between the social actors for effecting adjustments and taming the conflictual tendencies. Post-globalisation, the boundaries between the ministries in governance have vanished (a benign interpretation) or the ministries representing economic activity have gained ascendancy over non-or-minimal revenue-earning and employment-generating ministries like the Labour Ministry (a malign interpretation).On the issue of determining the natural ministerial locus of employment, researchers in the developing countries would add that as a result of the multi-faceted nature of the labour sector in these countries, it is not only employment that is competing for attention with regard to the claims of ownership between the ministries but also women's labour, the right to work, and so on! However, his analysis in this case should be seen as a 'classic' case of 'administrative dilemma'. Notwithstanding all the complications (in terms of

the mandate, roles, complementarities between ministries, agencification, etc.), the Labour Ministry (however nomenclature it may be) *still* remains a guardian of social peace. Rychly deserves praise for traversing complex issues without losing sight of this fundamental point.

This book is an academic response to the developments arising in the wake of the economic crises and the chapter by the other editor, Jason Heyes,makes two fundamental arguments through four country studies, that is,Great Britain, the Czech Republic, Ireland, and Germany.His principal contribution in understanding the 'responses' to the economic crises lay in identifying the nature of the regulatory regime coupled with the institutional differences obtaining in the labour market. While collective bargaining was robust in Germany, tripartite forums were useful in the Czech Republic to find internal flexibility or to save jobs in contrast to the absence of social dialogue mechanisms in Great Britain. As a result, the solutions were framed at the social level in the former countries while they were left to the discretion of the individual enterprises in Great Britain.The second thesis is that crises and the response-austerity measures have rendered both flexicurity and deregulationist advocacy less effective as neither the employability deficit (supply side) nor the lack of a flexible employment regulation regime (demand side) was a problem; it was just that the demand for labour was weak.

If spice were was required to entice the readers, the editors have succeeded in roping in Richard Hyman as a contributor, who revels in challenging the established order both theoretically and as an ideological tool! While free collective bargaining as an autonomous institution of regulation of the IR system enjoys legitimacy, even approval from the ILO *via* their Fundamental Human Rights concept, it is ironic that its effectiveness relies on State support. Thus, IR is a field caught up in the tension between the autonomy of the social regulatory institution and State regulation. The empirical realities are complex, which warrants a critical analysis; and from who better than Richard Hyman could we have that?!

Firstly, he demonstrates the complexities involved in conceptualising the idea of the 'State' by examining the presence or absence of the State and its various roles and forms in types of capitalism which themselves are poor approximations at best. Of course, as expected liberal market economies commodify labour by leaving the bargain to the market agents, which if contextualised in an unequal relationship, leads to adverse outcomes for labour.

Secondly, Hyman highlights several conflicts with regard to the two fundamental ILO Conventions, viz., the freedom of association and the right to collective bargaining (C.87 and C.98, respectively). By guaranteeing the workers' right to choose their representative organisation, the Convention implicitly favours organisational pluralism, which may militate against the social preferences for organisational monopoly to enhance the effectiveness of trade unions as in the corporatist countries; hence arises the conflict between freedom of choice and effectiveness. Thirdly, if the trade unions depend on the State resources or effective recognition and support from the employers for their functioning (in terms of law, and organisational subsidies, for instance), then the independence of trade unions, as stressed by the ILO Conventions, is questionable. The exclusion of selected segments of employees (such as the armed forces, police personnel, and civil servants) from the ambit of both the conventions circumscribes the universality of these segments. Further, the State can

exercise several restrictions on and interfere with the effectiveness of collective bargaining *via* compulsory arbitration, restriction of bargaining agenda, and so on. All these strike at the roots of the *purities* of the two ILO Conventions. Finally, he delineates the differing roles of the State, from the minimalist to the most interventionist that often determine the *effectiveness* of social dialogue. The governments often wish to distance themselves from unpopular measures and shift the adjustment mechanisms to the market or technocratic agencies such as the Central Bank,as observed during crises such as when social dialogue had a mixed record. This is nothing but moving away from the hard forms of regulation to the soft ones and a redefinition of the State's role and its strategies. This simply means that workers' rights lose their ally either openly or stealthily. These sound familiar to the observers of reform strategies of the labour market in India.

The chapter on labour inspection focuses on the impact of crises on the functioning of the enforcement machinery, which is further debilitated in its capacity to deliver the mandate structured by the ILO Conventions by the forces of globalisation with its attendant variations in the developed and developing countries, thanks to the structural attributes [informal economy (legal or illegal) in the developing countries and new forms of vulnerability like the undeclared work (paid and lawful work not declared to the government authorities concerned) in the developed countries]. The economic crises caused re-allocation of resources of the labour administration towards exigencies created by crises such as redundancies,thus leading to the neglect of other equally important issues like safety and health, apart from intensifying the challenges that already plague the enforcement system. At the same time, technological developments, the crises and their social implications (like fraud or undeclared work) meant that the enforcement system changed for the better. Thus, changes in the labour market occurring as a result of the crises have multiple impacts.

The volume under review has sought to contextualise labour administration in the larger social systemic context, which could at once constrain and aid the service delivery of labour administration in significant ways, and to document the contrasting influences caused by the bumps and slides in the business cycle on labour administration. It makes a powerful plea for a separate and comprehensive study of labour administration *per se*,a plea that is strengthened by the outline for future research agenda by the editors, which includesthe forms and functions, and the impact of labour administrative systems; a component-wise and across-components study of labour administration; the nature of the relationship between labour policy, labour administration and public sector management; and comparative international research (convergence or divergence). However, it is a notable omission, perhaps reflective of the poor research and database in the developing countries, that the editors did not consider mentioning the developing countries in the research agenda. Also, though this is not the place for deliberating on the 'varieties of capitalism' approach, which has dominated the comparative discourses on industrial relations, this rubric does not adequately capture the peculiarities or infirmities (negatively put) obtaining in the developing countries, wherein neither the liberal market nor coordinated institutional action is relevant.

This volume, though largely covering the crises and the resultant blows and constructions that labour administration has received,would surely kindle interest in academics, policy makers and social actors. The scientific temper that characterises the analyses would lend confidence to the social actors and researchers across the ideological spectrums of the constructive potential in the subject and arouse their interest in understanding the dynamics of labour administration. Further, the unique blend of academics and practitioners from a key global agency like the ILO imbues this volume with a flavour that is rare indeed in the academic circles. I would urge all those engaged in and concerned with the world of work to buy this book.

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Premilla D'Cruz, Workplace Bullying in India, Routledge India, New Delhi, 2012, pp. 179, Rs.557.

The phenomenon of status-blind workplace harassment, popularly known in India as 'workplace bullying', has garnered wide attention across the globe during the past two decades but it has not received much academic attention in the Indian context. The book under review addresses this very gap by ascertaining, for the first time, the prevalence of workplace bullying in India. It encapsulates the study of different connotations of workplace bullying based on empirical studies conducted on India's Information Technology-Enabled Services–Business Process Outsourcing (ITES-BPO) industry.

The prologue to the book begins with the author setting the precinct by outlining the existing literature on workplace bullying, distinguishing workplace bullying from other incidences of work-related harassment. She discusses the negative aspects of bullying, and identifies and analyses different parameters of workplace bullying. Further, she refers to literature in the disciplines other than organizational behaviour like law, economics, and sociology. Such an exhaustive review of the existing literature is highly commendable considering the fact that it is the very first book on the subject in India across all disciplines.

The first chapter titled, 'Establishing the Presence of Workplace Bullying in India', primarily relies on a survey using the Work Harassment Scale (WHS) undertaken by D'Cruz and Rayner in 2009, in the Indian ITES-BPO sector for establishing the presence of inter-personnel workplace bullying. She compares the percentage of bullied respondents to the percentage of bullied workmen in the Nordic countries and the UK, obtained from other studies and observes that its incidence is higher in India. However, she rightfully adds that the incidence of bullying can vary depending on how it is measured. One of the disadvantages of the method adopted by her is that it is characterized by the lack of verification of bullying incidents. The discussion of the chapter focuses on the socio-cultural reasons for the existence of workplace bullying along with status-based harassments like sexual harassment and caste harassment. The author has also delved into the literature and has done a reasonably good effort

in identifying the complex social issues that make the Indian workplace prone to bullying.

The second chapter of the book pertains to the organisational response to workplace bullying and rightfully underscores its importance in jurisdictions which lack a clear anti-bullying legislation like India. This chapter is based on an empirical study by D'Cruz in the ITES-BPO sector. New economic industries adopt the soft HRM policies of Western industries because they facilitate collaboration and offer a competitive advantage. The study goes beyond the organisational measures to deal with workplace bullying and includes in its ambit the organisational features that affect the measures. The discussion evaluates other studies on the issue of organisational response to workplace bullying. What is lacking in the study is the effect of perpetrator characteristics and forms of harassment on organisational responses and the effectiveness of the organisational response in mitigating bullying at workplaces.

The third chapter pertains to the experiences of the targets in interpersonal bullying at the workplace. This is based on a study conducted by D'Cruz and Noronha in 2009. The findings of the study depict two core themes: coping with the situation and long-term existential questions. Both these themes have been elaborated in depth, detailing the constituent themes. What is conspicuous by its absence, however, are the extra-organisational remedies, if any, resorted to by the targets. The social life of the targets and the impact on the family lives of the targets could have also been included in the book.

Chapter 4 pertains to the experiences of witnesses/bystanders with respect to workplace bullying, which is a comparatively lesser researched terrain as compared to the impact of bullying on the targets. Nevertheless, bystander/witness intervention has been widely touted as the most effective remedy for mitigating workplace bullying. The study brings to light the complexity of the situation that a witness/bystander may find himself/herself in; personal relationships prompt the witnesses to protect targets, and supervisory and managerial decisions sometimes negatively influence these efforts. The importance of bystander training has also been highlighted in the book.

De-personalised bullying or institutionalised bullying attributable to organisational design and practices is a nascent area of study, which is why it is highly appreciable that the book dedicates an entire chapter to this issue. Chapter 4 is based on a study conducted by Noronha and D'Cruz in 2009. The importance attributed to Service Level Agreements, which the employer may sign with overseas clients, is widely perceived to be one of the cardinal causes of de-personalised bullying at the workplace by the participants in the study. The entire range of aspects which fall within the ambit of de-personalised bullying has been covered as a part of the study. Finally, the study also analyses how professional identity and job-related material gains contribute to de-personalised bullying through acceptance of an oppressive work environment.

The book is a pioneering work in the field of workplace bullying in the Indian context. It is highly recommended as a foundation for all future research on workplace bullying in India across disciplines. D'Cruz has managed to analyse nearly all the relevant literature on the subject, and for this very reason, it is a treasure trove for any researcher on the given area. Albeit, since the book covers the subject matter quite comprehensively, any extra

organizsational remedies available for dealing with workplace bullying, if added, would have directly helped the targets of bullying.

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