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Abstract : The rural labour market in India is still virtually, to a large extent, dominated by the agriculture related workers, both cultivators and hired workers consisting of more than 70 percent of the rural workforce even in the current decade. However, there have been signs of a shift from farm to non-farm occupations and industries during the recent times, at a magnitude relatively higher than the experience of the last three decades. This has brought in a lot of optimism among economy watchers that there is at last a visible structural shift in employment. Yet, it needs to be recognized that this shift has occurred in a period when the economy was reeling under the effects of a severe agrarian crisis. The trends and patterns in the structural shift support the argument that this has occurred mainly as a distress-driven response to the crisis. Logit and Multinomial logit analysis shows that in distress-driven regions the shift has occurred due to the push factors associated with the distress, while in the normal regions the shift has been relatively more responsive to growth driven factors.

1.   Introduction

The recent crisis in the agrarian sector that have appeared in the mid 2000s, has had many deleterious direct consequences such as declining growth and productivity in the sector, farmer indebtedness and farmer suicides. However, it is very evident that the effects of the crisis will not be restricted to the households that depend on farm outputs alone. The effect, depending on the inter-linkages with the various other sectors and markets can be wider and have cascading effects on the economy. In this study we focus on one such effect catalysed by the agrarian crisis in the rural labour market.

The rural labour market in India is still virtually, to a large extent, dominated by the agriculture related workers, both cultivators and hired workers consisting of more than 70 percent of the rural workforce even in 2005. However, there have been signs of a shift from farm to non-farm occupations and industries during the recent times, at a magnitude relatively higher than the experience of the last three decades. This has brought in a lot of optimism among economy watchers that there is at last a visible structural shift in

employment, which was stubbornly slow to change for the last three decades, in comparison to the corresponding output shares. Yet, it needs to be recognized that this shift has occurred in a period when the economy was reeling under the effects of a severe agrarian crisis. What kind of a structural shift was this? How did it occur during a crisis? These are the questions that I sought to answer in this paper.

The paper is structured as follows. Section 2 deals with the analytical context. Section 3 draws a profile of employment in the rural areas of India. Section 4 delves on the concepts and data on RNFS followed by the next section which characterizes the differences in employment between regions that are suffering with agrarian distress and normal regions. Section 6 provides a comparative analysis of the determinants of this structural shift in rural employment followed by conclusions in the final section.

2.   Theoretical Context

Structural change in India, which vary widely from the traditional Kuznets-Clark structural transformation hypothesis has come to be accepted as an empirical reality ((Bhattacharya and Mitra, 1990; Papola, 2005). However the service oriented structural transformation in the composition of GDP in India is not compensated with commensurate transformation in the workforce structure (Sharma and Abraham, 2005). This is truer in the case of the rural sector than in the urban sector. Data shows that substantial share of the rural workforce is still associated with the primary sector, though there have been some change in the recent past. This has, in effect, failed the theoretical predictions of the Lewis-type dual sector models (Lewis, 1972), wherein, workforce mobility to the urban-industrial sector from the rural-agrarian sector leads to productivity rise and growth of both the sectors. The missing link in the Lewisian predictions and structural change hypothesis arguably is the rural non-farm sector (RNFS) (Hazell and Haggblade, 1991). The RNFS lies at the cusp between the rural-agrarian sector and the urban-industrial sector. The workforce and income structural change in a rural economy depends crucially on the dynamism of the RNFS, which in turn, provides effective

backward and forward linkages with the urban economy, thus establishing a rural-urban continuum, a bridge that facilitates the above said structural transformation[1].

However, this professed role of RNFS, crucially depends on the 'dynamic' relation that it has with the farm sector, and the structure and performance of the farm sector. The RNFS, through a chain of backward and forward linkages functions closely with the farm sector (Mellor, 1976). The performance of the RNFS depends on the growth of the agrarian sector, the employment and wage conditions within the agrarian sector. If the agrarian sector is a laggard, surviving on subsistence forms of agriculture, the RNFS may act as a residual sector trying to provide a cushion for the excess labour in the sector to be accommodated in various non-productive low-end RNFS employment, which are most often traditional non-farm activities. Such rise in the RNFS is essentially distress driven. On the other hand, a productive and growing agrarian sector generates a lot of demand for dynamic and modern RNFS, which are growth driven.

However, these broad changes in the rural economy may be observable only in case of output and input markets that are highly integrated both vertically and horizontally. When markets are not integrated but are segmented, often such shifts may occur in isolation and within the same economy both distress driven and growth driven structural shifts may be visible. Given the fact that rural markets are highly segmented, both in the output market and input market, and segmented both vertically and horizontally, it can be expected that such phenomena co-exist. The agrarian crisis provides for such a setting in the economy. While the overall effects of agrarian crisis is very large, its incidence did not have a pan-India coverage. It was specific to some regions within several states. The agrarian crisis in these regions has affected the employment opportunities in the agriculture sector adversely, followed by the RNFS as well. But this may not be true in case of unaffected regions. To understand the effect of agrarian crisis on RNFS employment we make a comparative study between affected regions and non-affected regions in terms of characteristics of structural shifts and their determinants. But before we look into the regions that are affected by distress, it may be proper to situate the rural labour market in

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[1] Papola T S (1992) argues the formation of this continuity through the emergence and dynamic growth of semi urban areas and small towns that act as centers of non-farm activity that links with the rural farm sector .

the context of the agrarian crisis. For this purpose we draw the trends and patterns of rural employment.

3. Trends and Patterns of Employment in Rural Areas

An analysis of the rural labour market done by Abraham (2009) showed that the agrarian crisis had a significant effect on the rural labour market. Drawing from the above said paper the following observations can be made:

- Firstly, Both LFPR and WPR trends suggest that a larger share of the population are job seekers compared to previous period, and also   employment in the economy has picked up momentum during the period 99-00 to 04-05 compared to the previous jobless growth phase 93-94 to 99-00.

- Secondly, the female LFPR, after declining continuously since the peak of 25.4 percent in 1987-88, rose for the first time in 2004-05 to 24.9 percent. Moreover, this rise is the largest between any two NSS thick rounds, from 23.5 to 24.9 percent. It could be argued that this rise in female LFPR is a component of the distress participation in labour market that has come up due to the agrarian crisis that is gripping the rural economy. The highest LFPR for rural females recorded since 1983 was in the year 1987-88. It is common knowledge by now, that the 43rd round of NSS, in 1987-88, was conducted during a period of severe drought, which had struck the rural sector adversely. The 43rd NSS was also marked by a decline in rural male LFPR. The latest round of the NSS also exhibits patterns similar to that of the 1987-88 NSS round, wherein there is a spurt in the female LFPR due to agrarian crisis.

- Thirdly, another probable indicator of distress employment is the rise in WPR and LFPR among the elderly, age group of greater than 60. The LFPR among aged men had reached 684 per 1000 in 1993-94 and declined to 622 in 1999-00. But it increased to 631 in the 61st survey. More interesting is the trends among aged women workers. The LFPR had gradually increased from 156 to 174 per 1000 between 1983 to 1999-00. The increase in aged women LFPR during the five year period 1999-00 to 04-05 from 174 to 199 is much higher than the increase that was experienced during the seventeen year period of 1983 to 1999-00. This rise in work participation of aged population in the rural

economy is indicative of distress employment seeking in the wake of poor earnings and employment availability of the younger workers in the household.

- Fourthly, the trends in under employment also reflect the trends in distress driven employment. Even when the open unemployment (UPS) for males is stable at 2.1 percent, and PS+SS unemployment rates even reduced by a fraction from 1.7 in the 55th round to 1.6 percent in 61st round, the measure of underemployment (CDS) had increased from 7.2 percent in 55th round to 8 percent in 2004-05, the highest rate of underemployment recorded since 1983. For females, both open unemployment and underemployment recorded an increase. The unemployment had increased from 1.5 to 3.1 percent and underemployment rate had increased from 7 percent to 8.7 percent during the same period.

- Fifthly, casualisation of workforce, which continued through out the late eighties and nineties seem to have been arrested as reflected in the latest round of NSS. The rise in self employment in the latest round, both among male and female workers from 544 to 576 and from 500 to 564 respectively, may need to be seen as distress mobility from wage employment to self employment. It is generally argued that self employment is a superior option for the workers compared to casual wage employment due to lesser vulnerabilities. However, it can be argued that rise of self employment, in the current context, is a sort of residual last resort employment option.

- Sixthly, there has been wage stagnation in the rural areas , especially in the agriculture sector The table 1 shows the levels (at 1983 prices) and growth of wages during the period 1983 to 2004-05. The growth rate of wages for casual workers had declined from 3.51 percent to 3.14 to 2.8 percent during the period 1983 to 93-04, 93094 to 99-00 and 99-00 to 04-05. This decline is more pronounced among females than males. While the casual male workers experienced a marginal rise in the growth rate during 1983 to 1993-94 , the decline was across board in the period 1999-00 to 2004-05. If we take the case of regular workers the decline is severe, both for males and females during the entire period from 1983 to 2004-05. This slow down in growth of wages, both for regular and casual workers, probably is a pointer towards the rise of distress employment in the form of self employment.

Table 1 Real Wages per day in Rural Sector-Levels and Growth Rates (1983 prices)

	Regular			Casual		
	male	female	Persons	male	female	Persons
1983	15.33	10.44	14.63	7.79	4.89	6.77
1993	28.33	18.9	26.94	10.69	7.31	9.56
1999	36.98	24.88	34.99	13.02	8.39	11.51
2004	41.72	25.7	38.73	15.23	9.04	13.23
Compound Annual Growth Rate						
1983-1993	6.33	6.11	6.3	3.22	4.1	3.51
1993-1999	4.54	4.69	4.45	3.34	2.32	3.14
1999-2004	2.44	0.65	2.05	3.19	1.5	2.82
1993-2004	3.58	2.83	3.36	3.27	1.95	3

Source: Abraham (2007)

- Seventhly, the inertia among the rural male workers against inter-sectoral mobility seems to be gradually reducing. The total share of employment in the agriculture sector had declined from 77 percent of the workforce in 1983 to 66 percent in 2004-05 (table 2). The largest decline was in the period 1999-00 to 2004-05, where a reduction of 5 percent point was recorded. Correspondingly the Non- farm rural employment share among males increased from 23 percent in 1983 to 34 percent in the latest period. This increase in RNFS employment was spread within the manufacturing sector, construction sector, Trade, Hotel and Restaurant, and Transport , Storage and Communication.

Table 2 Industrial Composition of Rural Workers (UPS)

		(0)	(1)	(2&3)	(4)	(5)	(6)	(7)	(8)	RNFS
Rural Male	1983	77.2	0.6	7.1	0.2	2.3	4.4	1.7	6.2	22.8
	87-88	73.9	0.7	7.6	0.3	3.7	5.2	2.1	6.4	26.1
	93-94	73.7	0.7	7	0.3	3.3	5.5	2.2	7.1	26.3
	99-00	71.2	0.6	7.3	0.2	4.5	6.8	3.2	6.1	28.8
	04-.05	66.2	0.6	8	0.2	6.9	8.3	3.9	5.9	33.8
Rural Female	1983	86.2	0.4	6.5	0	0.9	2.2	0.1	3.4	13.8
	87-88	82.5	0.5	7.5	0	3.2	2.4	0.1	3.7	17.5
	93-94	84.7	0.5	7.5	0	1.1	2.2	0.1	4	15.3
	99-00	84.1	0.4	7.7	0	1.2	2.3	0.1	4.3	15.9
	04-.05	81.4	0.4	8.7	0	1.7	2.8	0.2	4.6	18.6

Source: NSS REPORT NO 515 *Employment and Unemployment Situation in India*

Note : Agriculture (0), Mining and Quarrying(1), Manufacturing(2&3),Electricity and Water (4) , Construction (5), Trade, Hotel and Restaurant(6), Transport, Storage and Communication (7) Other Services (8) , RNFS = Rural Non-Farm Sector

However, among women inter-sectoral mobility is still very limited. The female dependence on agriculture sector declined, by just 5 percent points during the entire period, from 1983 to 2004-05. An overwhelming share of more than 81 percent still depended on agriculture as the main source of employment, while only 19 percent depended on RNFS employment. Whatever little shift in share had occurred, the mobility was mainly into manufacturing sector and other services.

-        Eighthly, Industrial classification of workers by worker status shows that in the primary sector an overwhelmingly large share of workers , more than 60 percent of the workers are self employed, followed by casual workers consisting of nearly 40 percent, while the regular workers consisted of only about one percent (table 3). The share of casual male workers in the primary sector increased from 33 percent in 1983 to 40 percent in 1999-00, which declined to 36 percent in 04-05. The compensating rise was fully in the self employed workers in the latest period, even with a slight decline in the regular workers. However, it may be interesting to note that even though casualisation had been declining in general, within the manufacturing sector casualisation had been increasing unabated since 1993-94 till 2004-05 from 45 percent to 50 percent. Correspondingly the share of self employed and regular workers declined by varying levels. This rise in casual workers in the manufacturing sector meant that of all male casual workers in rural India nearly 24 percent was in the manufacturing sector(See Appendix Table 1) . Another important aspect to note is that along with decline in casual employment among rural males in the tertiary sector is the decline in the share of regular employment, in place of which share of self employment had increased from 55 percent to 58 percent. Similar to the male workers, female workers also experienced a rise in self employment in the primary sector, during the last period while share of casual workers in the manufacturing sector increased in the last period. Comfortingly, the share of regular workers among female workers increased to 44 percent in the tertiary sector. The rise of self employment in the primary and tertiary sector and casualisation in manufacturing sector in the rural economy are points of concern. They point to the distressed nature of employment that is generated in the absence of farm employment.

Table 3 Industrial Distribution of workers by Status (UPS) (in percent)

		Rural Male				Rural Female			
		Self-Employed	Regular	Casual		Self-Employed	Regular	Casual	
Primary	38	63.2	4.3	32.6	100	54.7	1.2	44.1	100
	43	61.4	4.2	34.4	100	56.7	2.5	40.9	100
	50	60.4	1.8	37.9	100	50.8	0.5	48.7	100
	55	58.1	1.9	40.1	100	48.5	1.0	50.5	100
	61	63.1	1.4	35.5	100	56.6	0.5	42.9	100
Secondary	38	50.4	30.4	19.3	100	52.6	18.4	28.9	100
	43	48.1	29.0	22.9	100	51.3	17.9	30.8	100
	50	36.7	18.3	45.0	100	52.4	9.5	38.1	100
	55	36.4	18.2	45.5	100	63.6	9.1	27.3	100
	61	34.5	15.5	50.0	100	61.5	7.7	30.8	100
Tertiary	38	NA	NA	NA	NA	NA	NA	NA	NA
	43	NA	NA	NA	NA	NA	NA	NA	NA
	50	54.9	34.1	11.0	100	56.3	31.3	12.5	100
	55	52.4	34.5	13.1	100	50.0	37.5	12.5	100
	61	57.7	32.0	10.3	100	50.0	44.4	5.6	100

Note: For 38th and 43rd round the figures in secondary sector includes the tertiary sector as well.

4.   RNFS: Concepts, Definitions and Data

Given the above backdrop of the rural economy of India we proceed to study RNFS employment in India. Rural non- farm sector employment is defined as any form of employment other than farm employment in the type of wage, self, or unpaid family labour. Farm employment is taken to be those agricultural activities such as growing of crops ;market gardening; horticulture (NIC 011) ;farming of animals (NIC 012); mixed farming ,i.e., both crops and animal farming combined (013); agricultural and animal husbandry service activities (NIC 014); hunting and related services (NIC 015) .

For the analysis the household level data collected for the 61st round of the NSSO, on employment-unemployment was utilized. The data has been used without any multiplier. Total number of observations for rural employment in India is 145443 individuals in 62056 households. After cleaning we get 145359 observations in 62016 households.   All tables generated and the analysis done is based on this dataset.

To compare and contrast between characteristics of employment an analytical exercise is conducted for two types of regions, namely regions suffering from agricultural distress and non-distressed regions. The classification of regions into distressed and non-

distressed regions was done at the district level. The "Expert Group on Agricultural Indebtedness' formed under the behest of Ministry of Finance, Government of India; and headed by Prof. R.Radhakrishna had identified 100 distress affected districts in the country[2]. Using this list the distressed districts were identified and the residual was taken to be not affected by agricultural distress.

5. Distress in Farm Sector and Employment Patterns

The rural sector is predominantly agriculture based. More than 60 percent of the total employment in this sample of the rural area still is employed in the farm sector, while the non-farm employment consists of nearly 40 percent[3]. Rural employment is male centric. However, compared to farm employment the relative shares are higher for males in non-farm employment. Of the total rural sample an overwhelming 69 percent workers were male while only 31 percent were female.

Once we divide the regions into agriculturally distressed and non-distressed regions then the patterns of employment tend to change substantially from the overall picture. In the non-distressed region share of male workers in farm sector was 64 percent, but in the distressed regions the share declined drastically to 56 percent (Table 4). Correspondingly, the share of women workers increased from 36 percent to 45 percent. Even in the non-farm sector the share of males declined slightly from, 78 percent to 76 percent, while that of females increased from 22 percent to 24 percent. In total employment, the share of males declined from 70 percent to 63 percent , while the share of females increased from 30 percent to 37 percent, when one moves from non-distress region to distress region.

This essentially suggests feminization of work in the farm in regions experiencing agricultural distress. The incidence of this feminization seems to be much higher in farm

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[2]GoI (2007) . The criteria for identifying the distressed and less developed region were as follows . "The list includes the 31 distressed districts identified by the Government where the Prime Minister's special rehabilitation package is being implemented (these districts are marked with *). The remaining 69 districts have been included on the following criteria: (i) the district ranks low on the three-year average land productivity for 2001-02 to 2003-04, (ii) the credit-deposit ratio of the district is less than 60 per cent for 2006, (iii) the proportion of urban population in the district is less than 30 per cent in 2001. Districts in Goa, North-Eastern states other than Assam, and union territories are not considered due to lack of data on land productivity.

[3] All data expressed in this section is estimated from the unit level data of the 61st round of NSS as mentioned earlier.

sector rather than non-farm sector. One probable reason is the distress related male migration to other regions.

Table 4 Distribution of workers according to sex

	Non- distress region			Distress region		
	Farm	Non-farm	Total	Farm	Non-farm	Total
Male	64	78.31	69.74	55.5	75.77	63.06
Female	36	21.69	30.26	44.5	24.23	36.94
Total	100	100	100	100	100	100

A look into the time dimension of employment of who reported 'being employed' as their Usual Principal Status shows that unemployment in their 'minor time' (less than 6 months) was higher among the workers in the distressed region. While 79 percent of the workers in non-distressed regions were not seeking or available for employment, in distressed region the corresponding figure was 74 percent (table 5) . However, this underemployment is much more severe in the farm sector, in general and especially drastic in distressed regions. In the non-distressed region nearly 24 percent of the farm workers suffered unemployment in their minor time period, while 32 percent of the farm workers in distress regions faced unemployment in their minor period. In the non-distressed region nearly 16 percent of the workers were unemployed for 3 to6 months, while is distressed region it was much higher at 21 percent.

Table 5 Level of unemployment among UPS main workers

	Non-distressed region			Distressed region		
	farm	non-farm	total	farm	non-farm	total
Unemployed Less than 1month	1	1.24	1.09	1.17	0.77	1.02
Unemployed 1 to 2 months	6.93	5.69	6.43	9.55	5.91	8.2
Unemployed 3 to 6 months	16.17	8.76	13.2	20.89	9.04	16.48
did not seek/ not avialable	75.9	84.31	79.27	68.38	84.28	74.29
Total	100	100	100	100	100	100

The share of workers according to their status shows that nearly39 percent of the total workers are self employed in non-distress region, while the share declines substantially to 33 percent in distressed region(Table 6) . Correspondingly, the segment that shows the maximum increase is unpaid family worker. The share of unpaid family worker in

distressed region increased by 4.5 percent points to 27.47 percent from 23 percent in non-distressed regions. Casual employment also is higher in the distressed region at 28 percent in the distress region compared to 24 percent in non-distressed region. On the other hand the share of regular wage employees is higher in the non-distressed region compared to distressed region. During distress the labour shifts from self employed status to unpaid family workers and casual workers. However , the distress in agriculture sector seem to be keeping non-farm sector insulated in terms of status of employment, except that regular employees share declined in distressed regions, while unpaid family workers share increased**.**

Table 6 Share of workers by status

	Non-Distress region			Distressed Region		
	Farm	Non-farm	Total	Farm	Non-farm	Total
self-employed	38.45	39.35	38.81	29.55	39.29	33.18
employer	1.91	0.94	1.52	1.72	0.83	1.39
unpaid family worker	**30.9**	**11.03**	**22.94**	**34.96**	**14.88**	**27.47**
regular salaried/ wage employee,	1.59	27.79	12.09	0.79	24.02	9.45
casual labour: in public works	0.04	0.59	0.26	0.1	0.84	0.38
casual labour on other works	**27.11**	**20.31**	**24.39**	**32.88**	**20.15**	**28.13**
Total	100	100	100	100	100	100

6.1 The Determinants of RNFE : Method of Analysis

Now, we turn to analyzing the factors that affect RNFS employment. As stated earlier, the objective is to identify the differential effects of these factors on RNFS in regions that are affected by agrarian distress vis-à-vis normal regions. To fulfill the objective we begin with a logit model to analyse the choice of individuals between farm and non-farm employment. The following model is set for analysis.

$$Emp_i = a + ßX_i + u_i \quad (1)$$

Wherein the dependent variable $Emp =1$ if the current status of the ith worker is being employed in the RNFS, and $Emp = 0$ if the current status of the worker is employed in the farm sector. The independent Variables X are defined below in section 5.2 , u is the error term.

Separate Logit estimations were done for regions affected by agrarian distress and normal regions. Further, comparative results are provided for different types of farm and non-farm employment such as casual wage employed, regular wage employed, Self employed and unpaid family workers, along with the total workers. The results are discussed in Table 7 and the odds ratios of logits are provided in Table 8

The logit model estimations done while gives us a detailed scenario of the employment prospects in these regions, this model has the essential flaw that it considers each binary choice as independent of other options in the labour market. To overcome this flaw we turn towards a Multinomial logit estimation of the same[4]. Here we assume that the workers have four choices;

> (1). To be employed in the farm sector in a distressed region;(2) To be employed in farm sector in a non-distressed regions, (3). To be employed in farm sector in non-distressed regions ; (4). To be employed in non-farm sector in non-distressed regions.

We assume that the rational individual maximizes utility by choosing one among the four mutually exclusive employment alternatives. Extending the above logit equation into a generalized form, for the ith individual with j choices the utility choice may be assumed as follows (Greene 2003)

. $$Emp_{ij} = a + \text{ß}X_{ij} + u_{ij} \qquad (2)$$

For a particular revealed choice j , it may be assumed that Emp_{ij} generates the maximum utility. So the statistical model is derived by the probability that choice j is preferred over all other choices k, which is:

$$\text{Prob } (Emp_{ij} > Emp_{ik}) \text{ for all other } K \neq j \qquad (3)$$

Multinomial logit model allows us to estimate a set of coefficients ß corresponding to each occupational category as follows

$$Prob(Emp = j|\chi) = \frac{e^{\beta_j x_i}}{\sum_{j=1}^{j=4} e^{\beta_k x_i}}, j = 1, 2, 3, 4 \qquad (4)$$

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[4] For a similar application of multinomial logit model see Khan (2007)

Normalising the model we take the parameter vector associated with non-farm employment in non-distress regions as zero ($\beta_1 = 0$) and the remaining coefficients b_j measures the change relative to this base group.

$$Prob(Emp = j|\chi) = \frac{e^{\beta_j x_i}}{1 + \sum_{j=2}^{j=4} e^{\beta_k x_i}}$$

(5)

$$Prob(Emp = 1) = \frac{1}{1 + \sum_{j=2}^{j=4} e^{\beta_k x_i}}$$

(6)

Further classifications of choices though theoretically are possible, such as self employed, casual employed and regular employed this is not attempted to avoid the classic problem multinomial logit regressions of irrelevance of independent variables. The results of the Multinomial Logit model are shown in Table 9. We also derive the marginal effects on change in the probabilities as we assume one unit change in continuous variables and a shift from the one type to another in discrete variables[5]. This would help us to assign relative positioning of the choices with regard to each independent variable. The marginal effects are expressed in Table 10.

6.2 Hypotheses

The factors that influence an individual joining the farm or non- farm sector work force, in a region characterized by a productive agriculture sector, may differ widely from a region suffering from agricultural distress. The former is related to an eclectic set of 'pull factors' while the latter to a set of 'push factors'. For the purpose of analysis we identify the factors that are argued to affect RNFS employment in theoretical and empirical literature both as push and pull factors.

Further, the factors that influence rural employment decision may conceptually be identified as belonging to two different realms. One set of factors related to the characteristics of the individual, and another set to that of the household he belongs. The individual factors considered are gender, age of the individual, level of education. At the

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[5] For a continuous variable x_i Marginal Effect of x_i = limit [Pr(*Emp* = 1|X, x_i +Δ) − Pr(*Emp* =1|X, x_i)] / Δ], $\Delta \rightarrow 0$. For a categorical variable x_i the marginal effects are derived as follows: Marginal Effect x_i = Pr(*Emp* = 1|X, x_i = 1) − Pr(*Emp* =1|X, x_i = 0)

household level the factors considered are land ownership and cultivation, monthly consumption expenditure at household level, size of the household and social group to which the household belongs. The choice of variables is based on prior literature on RNFS.

Gender: Previous studies argue that gender is an important determinant of RNFS employment and it also is indicative of the character of RNFS employment in terms of growth vs distress driven patterns. If the RNFS employment experienced is growth oriented with a greater growth dynamism in the modern RNFS sectors then males and females may find new employment opportunities in the growing sector, though with a marginal higher level for males based on the prevailing level of gender institutional structures of the region. However, males have a greater propensity to diversify into other forms of income generating activities while females are more prone to continue in farm sector in regions that experience poor farm sector growth and RNFS growth (Ellis, 1998; Newman and Canagarajah 2001). In regions with poor pull factors, with distress related RNFS growth of traditional sectors males seem to 'push' females into farm sector while males mopped up the RNFS employment (Jha, 2001). Thus while it can be expected that in general females have a greater propensity to be working in the farm sector than males, in regions with poor opportunities in RNFS, the female propensity to work in farm sector would be higher.

Age: Similarly, Age of the worker has been postulated as an important individual factor that influences the decision to join RNFS. Non farm work requires certain attributes such as skills, mobility and training (Bhaumik 2007). Also employment opportunities in the RNFS require greater information flow which, in the rural setting is acquired through informal social networks. The network externalities would increase as the age increase and build greater social networks. Launjow and Shariff (2004) found that at younger age the probability of workers being engaged in the agriculture sector was higher, but beyond a threshold age the probability of RNFS would become higher than farm sector employment.

Level of Education: Level of education of the individual also would influence ones decision to join the RNFS. Education acts as an asset that enables to seek opportunities outside of the farm sector. Studies show that education increases the probability of

seeking wage and self employment and more remunerative in the non-farm sector (Escobal 2001; Lanjouw and Shariff 2004). However, education would play an important role in regions which experience growth of modern RNFS sector, where education and skills are demanded, while in traditional RNFS sector growth, which is related to distress driven growth education may not be a determining factor in obtaining employment in the RNFS.

Ownership and Cultivation of Land: Landlessness is an important push factor that drives rural poor to search for RNFS employment. However the effect of ownership is different from cultivation. Land is an asset, whose ownership is an insurance against a multitude of risks and uncertainties of rural life. Whether it is cultivated, left fallow or leased out, the land owned is a fall-back for the rural household. Hence, it can be expected that rural households who own land may opt for RNFS only if the RNFS is sufficiently remunerative. On the other hand, those who don't own land as an asset, their ability to avail credit, is severely restricted. This would imply that they are rendered more vulnerable and therefore may be ready to take up any employment in the RNFS in case the farm sector fails. Households that cultivate land has lesser propensity to join RNFS is the farm sector is sufficiently remunerative. However, if the farm sector is experiencing poor growth and productivity then some members of the cultivating household may choose to work in RNFS to compensate for the poor farm performance. Here again we should note that this is a risk aversion strategy in a distress situation.

Size of the Household: Households with a large number of members may tend to diversify into non-farm sector if the size of land holding is small, or alternatively, members would be able to find wage employment in the RNFS.

Social Group: The social position in the rural areas plays an important role in land ownership and cultivation, which in turn determines the occupational choice that households have. Households belonging to lower caste order, especially scheduled castes are traditionally landless agricultural workers. Hence they have a greater probability to join the RNFS than the higher caste workers. However, with poor performance of the agriculture sector these caste differences may get mellowed down.

Table 7
A comparison of Logits of employment in the non-farm sector in agriculturally distressed and non-distressed regions

	Total		Casual wage Empt.		Regular wage Empt		Self employed		Unpaid family labour	
	NON-D	Distress	NON-D	distress	NON-D	distress	NON-D	distress	NON-D	distress
Male	0.53354	0.74261	0.91079	1.54736	-0.12242	-1.53367	0.42008	0.22733	0.25795	0.23465
	(35.35)**	(23.20)**	(29.13)**	(23.05)**	(1.59)	(5.00)**	(15.29)**	(3.33)**	(6.69)**	(2.84)**
Age	-0.00270	0.03762	0.01120	0.02166	-0.05494	0.07408	-0.00840	-0.03786	-0.01728	-0.00405
	(1.56)	(7.36)**	(2.95)**	(1.91)*	(6.37)**	(2.12)*	(3.13)**	(4.10)**	(3.60)**	(0.32)
age2	-0.00006	-0.00053	-0.00026	-0.00056	0.00079	-0.00075	-0.00017	0.00010	0.00013	-0.00004
	(2.65)**	(8.31)**	(4.93)**	(3.55)**	(6.33)**	(1.65)*	(4.91)**	(0.92)	(1.98)*	(0.22)
Edu_lit	0.28713	0.39238	0.30404	-0.01044	0.40180	0.91565	0.13982	0.47164	0.09064	0.22974
	(13.90)**	(8.51)**	(8.02)**	(0.12)	(4.27)**	(3.00)**	(4.28)**	(6.17)**	(1.57)	(1.91)*
Edu_prim	0.41184	0.53247	0.48302	0.06705	0.92659	1.87439	0.22962	0.45275	0.18836	0.25376
	(20.53)**	(11.57)**	(12.75)**	(0.75)	(9.64)**	(5.62)**	(7.14)**	(5.82)**	(3.52)**	(2.18)*
Edu_mid	0.64387	0.63784	0.70100	0.26168	2.10353	1.75464	0.37909	0.49975	0.18210	0.07065
	(32.10)**	(14.16)**	(17.56)**	(2.99)**	(17.76)**	(6.29)**	(11.65)**	(6.33)**	(3.38)**	(0.62)
Edu_sec	0.97223	1.10364	0.76188	0.29980	2.79485	2.88228	0.52700	0.73381	0.28031	0.49192
	(39.60)**	(19.61)**	(12.38)**	(2.09)*	(18.28)**	(6.85)**	(13.23)**	(7.67)**	(4.19)**	(3.56)**
Edu_high	1.78004	1.87117	0.61736	0.23201	3.24738	4.09980	0.98078	1.22010	0.58489	0.31066
	(70.17)**	(32.49)**	(7.63)**	(1.25)	(24.80)**	(8.59)**	(23.23)**	(11.66)**	(8.13)**	(1.99)*
Percap_landown	0.00001	-0.00019	0.00037	-0.00001	0.00085	0.00145	-0.00012	-0.00005	-0.00035	-0.00069
	(0.58)	(2.25)*	(3.09)**	(0.05)	(3.70)**	(1.95)*	(1.89)*	(0.33)	(2.57)**	(2.95)**
Percap_landcult	-0.00338	-0.00269	-0.00040	-0.00032	-0.00119	-0.00189	-0.00444	-0.00373	-0.00761	-0.00680
	(78.66)**	(24.73)**	(2.61)**	(1.03)	(5.31)**	(2.61)**	(44.23)**	(18.64)**	(36.14)**	(19.86)**
HH_size	-0.04765	-0.07663	0.00636	0.04013	-0.02178	0.02158	-0.02778	-0.08088	-0.09964	-0.15483
	(21.22)**	(14.70)**	(1.27)	(3.42)**	(2.05)*	(0.58)	(7.47)**	(8.60)**	(16.54)**	(12.27)**
Soc_OBC	0.09007	0.11545	-0.17068	-0.11382	-0.04730	-0.27497	0.21201	0.45827	0.36905	0.36471
	(5.57)**	(3.19)**	(4.71)**	(1.29)	(0.57)	(1.08)	(8.35)**	(7.77)**	(8.82)**	(4.40)**
Soc_SC/ST	-0.17602	-0.26511	-0.25679	-0.15771	0.13700	-0.13331	-0.30773	-0.08970	-0.14130	-0.44107
	(10.36)**	(6.69)**	(7.16)**	(1.80)*	(1.58)	(0.48)	(11.21)**	(1.29)	(3.04)**	(4.46)**
Constant	-0.31410	-1.05632	-1.52796	-2.18686	2.05105	1.02135	0.50548	1.62308	0.41751	0.98316
	(8.13)**	(9.81)**	(18.41)**	(9.71)**	(11.28)**	(1.40)	(8.04)**	(7.66)**	(4.30)**	(4.05)**
Observations	118727	26572	28950	7476	14358	2512	46062	8814	27248	7301
LR chi2	20702.80	5710.11	2178.60	882.59	1371.63	246.91	9555.69	2431.14	5709.78	2149.94
Pseudo R2	0.1295	0.1627	0.0591	0.1017	0.1731	0.2386	0.1536	0.2010	0.2137	0.2927

Absolute value of z-statistics in parentheses, * significant at 5% level; ** significant at 1% level

Table 8   Odds ratio calculated from the Logits

	Total		Casual wage employment		Regular wage employment		self employed		Unpaid family labour	
	Non-distress	Distress	Non-distress	Distress	Non-distress	Distress	Non-distress	Distress	Non-distress	Distress
Male	1.705	2.101	2.486	4.699	0.885	0.216	1.522	1.255	1.294	1.264
Age	0.997	1.038	1.011	1.022	0.947	1.077	0.992	0.963	0.983	0.996
age2	1.000	0.999	1.000	0.999	1.001	0.999	1.000	1.000	1.000	1.000
Edu_lit	1.333	1.481	1.355	0.990	1.495	2.498	1.150	1.603	1.095	1.258
Edu_prim	1.510	1.703	1.621	1.069	2.526	6.517	1.258	1.573	1.207	1.289
Edu_mid	1.904	1.892	2.016	1.299	8.195	5.781	1.461	1.648	1.200	1.073
Edu_sec	2.644	3.015	2.142	1.350	16.360	17.855	1.694	2.083	1.324	1.635
Edu_high	5.930	6.496	1.854	1.261	25.723	60.328	2.667	3.388	1.795	1.364
Percap_landown	1.000	1.000	1.000	1.000	1.001	1.001	1.000	1.000	1.000	0.999
Percap_landcult	0.997	0.997	1.000	1.000	0.999	0.998	0.996	0.996	0.992	0.993
HH_size	0.953	0.926	1.006	1.041	0.978	1.022	0.973	0.922	0.905	0.857
Soc_OBC	1.094	1.122	0.843	0.892	0.954	0.760	1.236	1.581	1.446	1.440
Soc_SC/ST	0.839	0.767	0.774	0.854	1.147	0.875	0.735	0.914	0.868	0.643

6.3 Empirical Results

6.3.1   Logit Model Estimates

Gender: In general the results suggest that males, in comparison to females, have a greater probability of joining the non-farm sector. Across varying status of employment this trend seems to stand, except that of regular salaried employees, where it is not significant in the normal group. Lanjhow and Shariff (2004) had made similar observation that in rural India females tend to prefer agricultural wage labour than non-farm employment or cultivation. However, interestingly, the odds of male workers joining non-farm against farm employment are highest among casual workers even in normal regions. Moreover, this odds almost doubles to 4.79 in distressed region from 2.5 in non-distressed region. This is a very suggestive pointer towards the push factors that force male workers to be mobile across regions and sectors in the wake of their stagnation of their agrarian economy. If the pull factors were more important then odds would have been higher in the non-distress region, where non-farm employment would have been a complimentary to farm sector rather than a substitute. This above mentioned trend could be due to two reasons: male selective migration for alternate employment in the wake of distress. The other reason is male shifting to more productive employment in non-farm sector compared to the stagnant agricultural sector.

AGE : Age, in the model for the non-distress region does not turn out to be significant determinant for decision to join the non-farm sector, though the sign of the coefficient suggests a negative relation between age and probability of employment in the non-farm sector. But on the other hand Age is a highly significant variable in explaining the probability of an individual working in the distressed regions to join the non-farm sector. As age increases the odds favor more the non-farm sector rather than the farm sector in a distressed region. Within various categories, the wage employment sector, namely casual and regular wage employment groups is different from non-wage sector, with respect to how age affects their probability of being employed in non-farm sector. Within non-wage groups, as age increases the probability of being in the non-farm sector declines, (both for self employed and unpaid family group), whether they belong to a distressed region or non-distressed region. On the other hand, in the distressed regions, both wage employed sectors (casual and regular) age is positively related with the

probability of joining non-farm employment. But in non-distress regions the probability of regular wage employment in non-farm sector tends to decline as age increases, while that of casual wage employment tend to increase.

The variable 'square of age' suggests that whatever be the sector of work, after a threshold age the probability of employment in the non-farm sector declines and that of farm sector employment increases.

Education: The general trend suggests that as the level of education increases, the probability of non-farm employment increases. In both distressed and non-distressed regions this trend does stand. Among the categories of employment, the probability of joining non-farm sector is highest among regular wage employment. But there is one glaring exception. Again among casual workers, while non-distress regions seem to fit into the conventional knowledge of increasing probability of non-farm sector employment with increasing levels of education, the case is different in distressed regions. Except for middle and secondary school education level none of the education dummy variables are significant. In other words the relation between level of education and non-farm employment is not statistically significant in the case of casual wage employment in distressed region. The lack of a clear relation between level of education and non-farm sector casual employment is suggestive of the low skilled less productive casual wage employment that is being generated within the non-farm sector in the distressed region. However, casual employment in non-distressed region continues to show the typical 'education-non-farm' relationship. These trends point towards push factors, associated with farm distress, in determining non-farm employment.

Per capita Land Ownership: while per capita land owned does not have any significant effect on the probability of non-farm employment in non-ditress regions, it does have a negative and significant effect in distress regions, i.e; as the per capita ownership increases there is a greater probability of joining farm sector in distressed regions. Casual workers have a greater probability of being employed in the non-farm sector in non-distress regions, while for distress regions it is not significant. Regular workers tend to get employed in non-farm sector the more they own land. Land ownership being also a sign of theis asset holdings, and hence their inceom levels, greater land holding also is having a positive effect on obtaining regular nonfarm employment,

be it in the distress region or non-distress region. The probability of being a farm Unpaid family labour is high as the per capita land owned keeps increasing.

Land Cultivation: Land cultivation per capita is different from land owned per capita. Land cultivation includes the actual amount of land that is cultivated. This excludes land not cultivated; land leased out and includes land leased in for cultivation. The common trend across most categories show that as the land cultivated per capita increases the probability of being employed in the farm sector increases, which is obvious. However, in the case of casual workers in distressed region this relation does not show any statistical significance.

Household size: The coefficients for the totals show that size of the household , in general, have a negative impact on the probability of non-farm sector, be it in distressed sectors or non-farm sectors. However, the disaggregated analysis shows that among casual workers as the size of household increases, their probability of joining the non-farm sector increases. Another interesting observation is that probability of being employed in the non-farm sector for both types of wage employment in distressed regions are much higher compared to non-distressed region. On the other hand for self employed and unpaid family workers, as the size of household increased their probability of joining non-farm sector further declined. Thus there seems to be a dichotomous relation between household size and the probability of joining non-farm sector employment, wherein large family size seem to encourage wage employees to get employed in non-farm sector , especially during times of distress, while self employed and family workers seem to get employed in the farm sector with the increasing size of family.

Social Groups : (reference group is general category) : Compared to the general category , the socially deprived castes and tribes (SC/ST) seems to have less probability of being employed in the non-farm sector, be it in the non-distress region or distress region.

6.3.2 Multinomial Logit and Marginal effects

Given the four choices of work, the probability of employment in the distressed region, whether it is farm or non-farm is negative for *males,* while it is positive for farm employment in non-distressed region. Yet the constant for farm employment in non-distressed region is -3.87 implying that after controlling for the effects of the various factors in the model non-farm employment in non-distressed region is preferred to farm employment in non-distressed regions. So in effect, though farm employment is a preferred choice for males in non-distressed regions, their preference would be greater for non-farm employment in non-distressed regions between the two. On the reverse of this also implies that females have a greater probability to get employed in farms, either in distressed or non-distressed regions. The marginal effect of a change from female to male shows that the probability for non-farm employment in non-distressed region is the highest, implying the greatest preference for this type of employment, which is followed by farm employment in non-distressed regions (Table 10). On the other hand, the marginal effect is negative for all employment in distress regions and the size of the change is largest for non-farm followed by farm, implying the increase in probability of women employment in distressed regions, both in farm and non-farm sectors

As *age* increases the probability of taking up farm employment, either in distressed regions or non-distressed regions is higher compared to non-farm employment in non-distressed regions, while non-farm employment in distressed regions is not a preferred choice with increase in age. However age beyond a threshold levels reduces the probability of doing farm employment in non-distressed region as well. Comparison of marginal effects for age shows that for a unit change in age the probability of farm employment in non-distressed regions had the highest increase, followed by farm employment in distressed regions. Non-farm employment in the non-distressed region has the least positive effect, while non-farm employment in distressed regions has a negative sign implying that in distressed regions younger people preferred to do non-farm employment than farm employment. Thus there seems to be an age based differentiation in employment choices in the distressed regions, with the younger members preferring non-farm employment while the older members chosing farm employment.

Table 9 Multinomial Logit Estimates of Employment in Distressed region

	farm employment in distressed region	farm employment in non-distressed region	Non-farm employment in distressed region
	Coef. (Std. Err).	Coef. (Std. Err).	Coef. (Std. Err)..
Sex (female = 0)	-.5310* (.0277)	.1026* (.0353)	-.38135* (.0146)
Age	.0348* (.0036)	.0923* (.0049)	-.0114* (.0017)
Age2	-.0002* (.00004)	-.0009* (.00006)	.0002* (.00002)
Education_only literate (illiterate=0)	-.4180* (.0382)	.1621* (.0403)	-.2826* (.0185)
Education_primary	-.1260* (.0399)	.0150 (.0467)	-.0395* (.0197)
Education_Middle	-.6511* (.0429)	.0193 (.0430)	-.5546* (.0189)
Education_Secondary	.2880* (.0461)	-.1193* (.0610)	-.5747* (.0255)
Education_grad. above	-.8392* (.0560)	.4298* (.0468)	-1.545* (.0262)
Land cultivated per capita	.0017* (.00003)	.0001* (.00006)	.0016* (.00002)
HH Monthly consumption exp.	-.00038* (.00001)	-.0003* (.00001)	-.00002* (.000003)
Household Size	.2405* (.0056)	.1830* (.006)	.0671* (.0027)
Social Group_SC (ST=0)	-1.5144* (.0420)	-.6734* (.0523)	-.8737* (.0229)
Social Group_OBC	-1.1297* (.0330)	.0340 (.0437)	-.7844* (.0204)
Social Group_general	-1.2085* (.0383)	-.5205* (.0503)	-.6525* (.0218)
Constant	-1.7575* (.0797)	-3.876* (.1063)	1.0328* (.0386)
Number of obs = 142716			
LR chi2(42) = 25201.50			
Prob > chi2= 0.0000			
Log likelihood = -131461.73			
Pseudo R2 =0.0875			

Base category is non-farm employment in non-distressed regions

* coefficients are significant at least at 5% level

Education has a systematic effect on employment choices. As can be seen from Table 10 , as the level of education increases, the probability of farm employment in distressed regions reduces consistently, in comparison to non-farm employment in non-distress employment, as shown with a negative sign and reducing size of the coefficient. The only aberration is secondary level education of workers, which shows a positive sign. In non-distressed regions the only literates category has a positive effect on farm employment compared to illiterates. However higher levels of education has ambiguous effects on employment choice of farm employment in non-distressed regions. Again, non-farm employment in distressed region is having a negative relation with education. Education, thus, seems to act as risk averting strategy. The marginal effects also show that education is a clear marker for employment choice between distressed and non-distressed regions. Probability of Employment increases in non-distressed regions with higher levels of education, with a greater preference for non-farm employment, while in the distressed regions the employment probability decreases with higher levels of education.

Size of land under cultivation per capita seems to favour employment in distress region, or farm employment in non-distress region in comparison to non-farm employment in non-distress employment. As the *monthly consumption expenditure per household* increased there is a visible preference towards non-farm employment in non-distressed region than any other type of employment. The probability of being employed in this sector is higher as the levels of income per household increased.

As the *household size* increased it decreased ones probability of joining non-farm employment in non-distress regions compared to other types of employment. Marginal effects shows that for a unit increase in the size of the household the probability of doing farm employment in distressed regions increases the highest among all choices. This is followed by non-farm employment in distressed regions, while there is a decrease in the probability of being employed in the non-farm sector in non-distressed regions.

Ones social status also played an important in determining her employment choice. Keeping the scheduled tribes, the SCs, OBCs, and general castes in general shows higher probability

to be employed in non-farm employment in non-distressed region than farm employment, or non-farm employment in distressed region. Thus STs as a social group seems to be the worst affected in terms of having inferior employment options compared to other social groups.

Table 10 Marginal Effects: Changes in Probabilities

Variable	Average change	farm employment in distressed region	farm employment in non-distressed region	Non-farm employment in distressed region	Non- farm employment in non-distressed region
Sex (female = 0)	0.0460	-0.0156	0.0118	-0.0763	0.0802
Age	0.0028	0.0019	0.0033	-0.0057	0.0004
Age2	0.00004	-0.00001	-0.00003	0.0001	-0.00003
Education_only literate (illiterate=0)	0.0370	-0.0120	0.0133	-0.0620	0.0607
Education_primary	0.0056	-0.0049	0.0015	-0.0063	0.0097
Education_Middle	0.0689	-0.0154	0.0139	-0.1211	0.1226
Education_Secondary	0.0750	0.0386	0.0060	-0.1501	0.1054
Education_grad. above	0.1804	-0.0081	0.0640	-0.3526	0.2967
Land cultivated per capita	0.0001	0.00003	-0.00003	0.0003	-0.00035
HH Monthly consumption exp.	0.00001	-0.00001	-0.00001	0.00001	0.00001
Household Size	0.0097	0.0096	0.0044	0.0053	-0.0194
Social Group_SC (ST=0)	0.1073	-0.0385	-0.0046	-0.1716	0.2147
Social Group_OBC	0.0957	-0.0318	0.0196	-0.1597	0.1719
Social Group_general	0.0793	-0.0349	-0.0031	-0.1206	0.1587

7.   Conclusion

This study had aimed at understanding the employment effect of the agrarian crisis in the rural economy. In specific terms, it enquired the question of diversification into rural non-farm sector employment under conditions of crisis. Analysis showed that rural labour market has shown signs of a deepening crisis, with underemployment increasing, participation rates of secondary workers rising, wage stagnation and rising self employment. Further, owing to the crisis, there have been structural shifts in employment towards non-farm employment. We find that in crisis affected regions, the push factors are largely at operation, while in normal regions, the pull factors are relatively more dynamic in generating RNFS employment. Some factors such as

social group had siginificant effect in both distressed regions and normal regions. It also interesting to note that the pull factors such as education, land ownership etc that play an important role in RNFS employment in normal regions, their effects get vastly muted in the distress regions, while the push factors gain greater weight. Also the effects are most pronounced in case of casual workers and unpaid family workers when compared to self employed and regular workers. The multinomial logit model and marginal effects derived from the model also seem to support the argument RNFS in the distressed region is driven by push factors, while in the non-distressed regions the conventional results of pull factors are visible. The analysis point to the fact that the effect of the agrarian crisis is not limited to the agriculture sector, rather it would spread to the input market. Moreover, given the muted effects of pull factors to the RNFS in distress affected regions regular policy interventions may not generate the desired result. Rather, the specificities of RNFS in crisis affected regions need to be understood within this context to stimulate productive employment both in the farm and non-farm sector.

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Appendix 1 Districts experiencing Severe Agricultural Distress in India

No	State	District Names
1	Andhra Pradesh	Adilabad, Nizamabad,Karimnagar, Medak, Ranga Reddy, Mehabubnagar, Nalgonda, Warangal, Khammam, Guntur,Prakasam,Nellur, Cuddappah, Kurnool, Anantapur, Chitoor
2	Bihar	Banka, Bhagalpur, Darbhanga, Jamui, Lakhisarai, Madhubani, Saran
3	Chattisgarh	Bilaspur, Janjgir, Jashpur, Kanker
4	Gujarat	Dahod, Patan
5	Jammu & Kashmir	Baramulla, Doda, Kargil, Kupwara, Udhampur
	Jharkhand	Deoghar, Gumla, Hazaribag, Lohardaga, Pakaur, Sahibganj, Seraikela, Simdega
7	Karnataka	Belgaum, Chikmangalur, Chitradurga, Hassan, Kodagu, Shimoga
8	Kerala	Kasargod, Palakkad, Wyanad
9	Madhya Pradesh	Anuppur, Ashoknagar, Balaghat, Barwani, Betul, Burhanpur, Chhatarpur, Chhindwara, Dindori,Jhabua, Katni, Mandla, Panna, Rewa, Seoni, Shahdol, Sidhi, Umaria
10	Maharashtra	Akola, Amravati, Buldhana,Gadchiroli, Gondia, Nanded, Nandurbar, Osmanabad, Wardha, Wasim, Yavatmal
11	Orissa	Boudh, Koraput, Malkangiri, Nawapara
12	Rajasthan	Churu, Dungarpur, Jaisalmer, Nagaur, Pali, Rajsamand, Sikar, Udaipur
13	Tamil Nadu	Sivaganga
14	Uttar Pradesh	Banda, Chitrakoot, Hamirpur
15	Uttaranchal	Almora, Pauri ,Garhwal, Rudraprayag, Tehri Garhwal

Appendix 2   **Variable Definitions**

	Variable Name	Variable Definition
Gender (Ref: Female)	**Sex**	Male =1 , female =0
Age	**Age**	Age of the workers
	age2	Square of age
Education (Ref: Illiterate)	Edu_lit	Not illiterate , but has not attended a formal school
	Edu_prim	Primary education
	Edu_mid	Middle education
	Edu_sec	Secondary education
	Edu_high	Higher education
Land ownership	Percap_landown	Average Land owned by a household/no. of persons in the household
Land Cultivation	Percap_landcult	Average Land cultivated by a household/no. of persons in the household
Consumption Expenditure	HH_mpce	Household monthly per capita consumption expenditure
Size of HH	HH_size	Size of the household
Caste	Soc_OBC	OBC
(Ref:SC/ST)	Soc_gen	General