

Rural Labour Markets: Insights from Indian Villages

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The paper examined labor market behavior in rural India, with the objective to assess the structure of work status among sample individuals and to test for segmented labor market theory. The paper uses simple regression techniques and estimated modified Mincer equation to determine earnings, followed by application of multinomial regression analysis. The labor markets are segmented based on social background to some extent and supports segmented labor market theory based on caste, gender and assets. Importance of education is limited to few regular employments. However, households investing heavily in education with hope of getting urban employment. Some of the policy prescriptions are enhancing the ownership of assets and savings which will increase participation in economic activities; education, skills development to increase employment in emerging sectors.

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I. INTRODUCTION

Segmentation of labor markets has been a subject of debate for labor and development economists for a long time. In his famous survey Cain(1976), summarizing the challenges raised by the theories of Segmented Labor Markets to the classical and neoclassical schools of labor economics, goes back until the end of the 19th century quoting John Stuart Mills as one of the first economists acknowledging the segmentation of the labor markets together with the existence of persistent wage differentials among different groups of workers. Many researchers attempted to understand the developing country labour markets in terms of segmented labour markets. Labor market segmentation can be characterized as a situation in which people working in some jobs or in some sectors experience difference in earnings and enjoy different levels of protection and sets of opportunities with respect to others with similar productivity. To have labor market segmentation, however, we need also this situation to be “rigid”, that is, these differences must persist and it must be difficult for the disadvantaged workers to move to the “good” jobs or segments of the market. Segmentation translates then into dramatically different levels of vulnerability which make some individuals much more likely to end up in a state of poverty and deprivation than others, especially in less developed countries, as labor is the main source of income for most poor people in the developing world (Fields 2006). If labor markets are becoming more segmented, such increase in segmentation is then likely to affect negatively the most vulnerable groups among workers. Women are one of these groups⁴. Past research, in fact, tells us that women tend to be more vulnerable than men, showing lower participation rates and, even when they do enter the labor market, to earn less and to advance more slowly in their career.

However, still the rural labor markets are poorly understood component in many developing countries including India. Even though the employment opportunities in high productive non-farm sector in urban areas are opening up employment opportunities for educated youth, they are very limited to absorb huge workforce. Most of the rural employment is still low productive, mostly informal sector and with low wage rates. Of-late, with the growing of the economy, there is increased dynamism in rural labor markets with increased rural-urban linkages, expansion of non-farm employment, migration and technological change in rural and agricultural sectors, farm mechanization, increase in labor productivity, implementation of social security programs like employment guarantee act and increased share of educated labor force. The increased dynamism in labor markets expands income and employment opportunities for a very few well-endowed workers with large proportion remained in low productive informal employment. This resulted in many rural uneducated, semi-skilled, less resourceful persons stuck in perpetual poverty resulted in a widening gap in wage rates between rural and urban sectors, agricultural and non-agricultural employment in line

with segmented labour market theory. As a result, there is persistent poverty especially among socially disadvantaged (like scheduled tribes and scheduled tribesⁱ) and economically less endowed population. In general poverty is higher in rural areas than urban areas. The poverty level in rural India is 33.3 percent, while it is higher among farm labour (49.4%) followed by non-farm labour (39.6%), self-employed in non-farm sector (28%), self-employed in agriculture (26.2%) and regular employed (14.4%)(Krishna A and Shariff A. 2011). The wide disparities in poverty within rural India are also an indication of segmentation of labour markets.

Over the last decade there has been a revival of research on informal employment and labor market segmentation in developing countries, generating a lively debate about the interpretation of the nature of informal employment. There are many studies which hinted that occupational diversification is playing key role in reducing the rural poverty since early 1990s. The labor market in developing countries consists of a small number of labor market segments or sectors linked to one another by actual or potential mobility of workers and/or firms (Dixit, 1973; Basu, 1997; Fields, 2007). The reason we need different segments is that some parts of the labor market operate in a qualitatively different manner from others. A very recent ILO study finds that “in most economies, women still earn 90 per cent or less of what their male co-workers earn” ILO (2007). The reason we need models that put together these various segments is that conditions in one segment affect and are affected by conditions in other segments. The path breaking work on multisector labor market models in the context of economic development was done by two Nobel Prize-winning economists, Lewis (1954) and Kuznets (1955). Lewis and Kuznets agreed that economic growth is marked by the gradual shift of workers out of the lower-paying segments and into the higher paying ones. They also agreed that the main development problem is not unemployment but rather low incomes in the poorer parts of the economy. And they agreed to that the same worker would earn quite different amounts depending on where he or she is located. The emergence of human capital theory in the 1960s by Schultz (1961) and Becker (1964) also earned its developers the Nobel Prize. According to their version of the human capital model, education and training would improve workers’ skills, enabling them to work in different economic sectors and earn more. There is a fundamental duality within the informal sector, whereby some people work in a lower tier because they can do no better, while others work in an upper tier into which entry is restricted because of human capital and financial capital requirements (Fields, 1990). A second is an integrated labor market model which starts with two or more sectors but assumes that all of the equilibrating forces that apply to a single labor market with market-clearing also apply to a labor market with a multiplicity of sectors, so that wages equalize across sectors (Krugman and Obstfeld, 2003). However, skeptics such as Rosenzweig (1988) remained unconvinced about segmented labour market theories, maintaining that different earnings reflected differences in unmeasured human capital. However,

most of the literature in developing countries is confirming more or less the segmented labour markets in developing countries. Hence, any policy study aims to reduce rural poverty need to focus occupational structure and who is benefiting from the new emerging occupations.

Analysts have also modelled intersectoral linkages in a variety of ways. One is a noncompeting groups model in which individuals belong to one labor market segment or another, and they cannot or will not switch from one to another (as in many human capital models). A second is an integrated labor market model which starts with two or more sectors but assumes that all of the equilibrating forces that apply to a single labor market with market-clearing also apply to a labor market with a multiplicity of sectors, so that wages equalize across sectors; nearly all international trade models have such a labor market specification (Krugman and Obstfeld, 2003). A third way of modelling intersectoral linkages is the crowding model, which assumes that any worker who is not employed in the high wage part of the economy takes up employment in the low wage part of the economy; the Lewis and Kuznets models mentioned above can be recognized as crowding models. A fourth specification is that one sector maintains higher wages than another, but the two sectors are linked via workers' job search behavior, such that in equilibrium the expected wages associated with the two sectors are equal to one another (Harris and Todaro, 1970). Finally, a fifth type of model posits that workers choose occupations which maximize their current and future returns, but because of imperfect capital markets, occupations that require high levels of investment cannot be entered by persons with low initial wealth. The distributions of workers in different occupations evolve over time as individuals invest their time and money to increase their wealth or the wealth of their children (Banerjee and Newman, 1993).

Studies analyzing micro data enable researchers to find out what makes a difference at the level of the individual worker or the individual household. This type of data analysis is at the core of most contemporary research studies on labor markets, and the literature using such data is correspondingly huge. However, they are suffering for limitations as small sample, limited to few socio-economic variables, not including nutrition or health related data, focus on only economic activities, not including non-economic but equally important domestic duties, attending educational institutions in their analysis.

There was an evidence of increased polarization of rural labour markets which benefited only the resource endowed. There are many socio-economic and other restrictions for the lower strata of the people to enter into higher hierarchy employment. Research on informal employment in developing countries has been very limited, above all because of a lack of appropriate data. There is huge gap in the literature in understanding the rural labour markets in holistic and multidisciplinary perspective mostly due to the lack of the household and individual data to integrate the socio-economic, nutritional and local factors. This

paper is probably the first attempt to analyze jointly and thoroughly labor market segmentation and the gender wage gap in the context of a developing country. Using the data of VDSA I am going to identify the patterns characterizing male and female employment, both in terms of mobility across labor market states and in terms of earnings, in an attempt to establish the extent to which labor market segmentation appears to influence the relative positions of the two genders in terms of wages and occupation.

This paper try to fill this gap by using unique dataset collected from eighteen villages in India with the following objectives.

- (i) To assess the labour supply and its determining factors in various economic and non-economic activities in rural India.
- (ii) To examine the returns to different socio-economic and personal characteristics in the labour market for men and women.
- (iii) To examine the determinants of labour market segmentation in to different occupations.

II. DATA AND METHODOLOGY

The data used in this paper were obtained from a larger research project entitled “Village Dynamic Studies in South Asia (VDSA), in which ICRISAT research team collected a range of data from households of 18 selected villages from SAT India for the year 2010. The 18 villages in the VDSA studies of ICRISAT were selected from five states (Andhra Pradesh, Maharashtra, Madhya Pradesh, Gujarat and Karnataka), which represent the broad agro-climatic sub-regions in the semi-arid tropics of India. The selected villages were: Aurepalle, Dokur, JC Agraharam and Pamidipadu from Andhra Pradesh; Babrol, KaramdiChingaria, Chatha, Makhiyala from Gujarat; Belladamadugu, Kappanimargi, Markabhinahalli, Tharati from Karnataka; Shirapur, Kalman, Kanzara, Kinkheda from Maharastra; and Papda and Rampur Kalan from Madhya Pradesh. The data was collected by the residence field investigators located in each village by using standard questionnaire K- Employment Schedule of Village Dynamics Studies in South Asia, the questionnaire and data collection methods and the data is available at <http://VDSA/ICRISAT website vdsa.icrisat.ac.in/VDSA-database.htm>. The sample households were selected based on the stratified random sampling method to represent landless, small, medium and large farmers in proportion to their population in each village. All the individuals between age of 15 to 65 years have been selected for the study. The paper examined the labor supply, wage rates and occupational structure among 948 men and 631 women of age between 15 and 65 years for the 18 villages of India. Taking advantage of high frequency of the data, we test the variation in hours worked per year and wage rates by gender, educational, social and economic status of households. We also test the segmented labor market theory.

The labour supply model

The data was collected with high frequency i.e., every 15 day interval for whole year to record hours spent on different employment statuses. We have collected the data for each day in the year; hence we have record

for all 365 days whether a person worked for wages (paid work) or own (self-employment) work, if he worked how many hours worked and at what wage rate? The details include hours spent on paid-work (farm and non-farm, with wage rate), own-farm work, own domestic duties (like utensils cleaning, washing clothes, cooking, preparing children for school etc), own-livestock rearing, own-non-farm work (like petty business, handloom etc), hours with seriously ill and unemployed-hours. We have run five labour supply (regression) equations with hours worked per year on each activity status (i) paid-work, (ii) own-farm work, (iii) own-livestock work, (iv) own non-farm work and (v) all economic activities as dependent variable to know the influence of the relevant explanatory variables mentioned in table 1. We have run simple regression equation after correcting sample selection bias.

Mincer equation

The modified mincer equation was run for the workers who were engaged in paid work only, as the wage rates data was available for only this category. The paid work includes both farm and non-farm work. Given the absence of the labour productivity data in rural India, we have taken actual wage rates as proxy for the labour productivity. In the modified mincer equation, we have used log of wage rates per day as dependent variable with a set of explanatory variables mentioned in the table 1 to know the influence of human and physical capital and socio-economic factors on the wage rates.

Table 1. Explanatory variables included in the various regression analyses

Variable	Rationale for inclusion	Mean	St.D	Labour Supply	Mincer equation	Multinomial regression model
Hours worked per year		2008	822.5	Dependent variable		
Wage rate(Rs/day)	Determine supply of labour	154.63	229.9	✓	Dependent variable	
Farm size (acre)	Indicator for physical capital, source of employment on own farm	1.68	5.2	✓	✓	✓
Irrigated area (acre)	Indicator for land productivity	0.58	2.51	✓	✓	✓
Value of assets (Rs.1000)	Economic status of households	24.57	64.9	✓	✓	✓
Value of residence (Rs.1000)	Long run socio-economic status of households	23.99	42.4	✓	✓	✓
Borrowings (Rs.1000)	Indicator of household needs	42.27	76.9	✓	✓	✓
Caste dummies	Indicator of social discrimination			✓	✓	✓
OBC	(reference group)	0.55	0.33	✓	✓	✓
ST		0.12	0.33	✓	✓	✓
SC		0.17	0.38	✓	✓	✓
FC		0.16	0.37	✓	✓	✓
Religion dummies	Discrimination based on religion			✓	✓	✓
Muslims	(reference group)	0.08	0.18	✓	✓	✓
Christian	Include Christian's	0.10	0.17	✓	✓	✓
Hindu		0.82	0.23	✓	✓	✓
Marital status (0=married, 1=unmarried)	Household responsibilities	0.7	1.2	✓		✓
Gender (0-women, 1-men)	Gender discrimination	0.60	0.49	✓		
Years of schooling	Human capital through education	5.67	4.9	✓	✓	✓
Experience(age-years of schooling-5)	Human capital through experience	16.38	12.2	✓	✓	✓
Experience ²	To represent non-linear relation	417.43	485.3	✓	✓	✓
Height(cm)	Physical capacity to work	158.07	10.3	✓	✓	✓
Weight(kg)	Physical capacity to work	51.36	11.2	✓	✓	✓
Arm(cm)	Physical capacity to work	23.97	3.7	✓	✓	✓
Main occupation	Occupational choice			✓	✓	Dependent variable
Self-employed on farm	(Reference group)	0.32	0.34	✓	✓	
Non-farm labour		0.11	0.31	✓	✓	
Livestock rearing		0.02	0.15	✓	✓	
Regular employment		0.09	0.28	✓	✓	
Student		0.05	0.22	✓	✓	
Domestic work		0.03	0.17	✓	✓	
Business		0.12	0.33	✓	✓	
Farm labourer		0.26	0.44	✓	✓	

Multinomial regression analysis

Multinomial regression analysis was used to analyse choice of type of employment. The dependent variable was a categorical variable (type of occupation) with more than two categories (in this case of eight categories) and it has been regressed upon a set of independent variables. As the multinomial model requires that a particular category to be designated as the numerate against which all results should be compared. This implies that parameter estimates for the categories should be interpreted as indicators of the strength of association of a particular explanatory variable with the respective category relative to the same explanatory variable with 'numerate' (comparison) category. The main occupational categories were namely (i) self-employed in agriculture (self-employed in agriculture), (ii) non-farm labour, (iii) own-livestock rearing, (iv) regular employment (regular employment), (v) attending educational institutions, (vi) attending household domestic duties, (vii) petty business and (viii) farm labour based on major source of income. Here the self-employed in agriculture chosen as reference category. We have run two different multinomial logit models for men and women separately.

The Model specification

The general form of multinomial logit model is:

$$Y_{ij} = B_j X_i + U_{ij} \quad (1)$$

Where Y_{ij} is the i th individual's utility of the j th choice, and X_i is a vector of values of the i th individual on the independent variables. The model estimates a set of regression coefficients for each of the alternatives (except for the choice option that has been defined as reference category), hence the subscript in B_j [Decoster, 2004].

$$\begin{aligned} & \text{(occupation category)} \\ & = f \left(\begin{array}{l} \text{physical capital of workers, human capital of workers, socio group} \\ \text{, personal, work related variables, location specific variables} \end{array} \right) \end{aligned}$$

The independent variables included in occupational choice model were same as mentioned in table 1. In the multinomial regression, self-employed in agriculture was taken as reference category as this category is most prevalent type of occupation; historically workers try to move out of this occupation to other occupations in the development process (Poterba and Summers 1995; Lee, 1983; Boskin, 1974).

Multinomial logistic regression is used when nominal response variable (dependent variable) has more than two categories. Multinomial logit models are multi-equation models. A response variable with $k+1$ category will generate k equations. Each of these k equations is a binary logistic regression comparing a group with the reference group. Multinomial logistic regression simultaneously estimates the k logits. Further, it only displays coefficients for the k comparisons. Thus, the coefficients β_i represent the log odds of being in the target groups relative to the reference group. Thus a simplified multinomial logit model has the form:

$$p_j = \frac{\exp(\beta_j X)}{\sum_j \exp(\beta_j X)} \text{ for } j= 1, \dots, k+1$$

Where $\exp ()$ stands for the exponential function and x is the vector of independent (or explanatory) variables.

β_{k+1} can be set to 0 (zero vector) as a normalization and thus:

$$P_{k+1} = \frac{1}{\sum_j \exp(\beta_j x)}$$

As a result, the j logit has the form:

$$\log \frac{P_j}{P_{k+1}} = \beta_j X \text{ for } j= 1, \dots, k$$

The slope coefficient represents the change in the log odds of being in the k -category of employment versus the reference category with an increase in one unit of independent variable. The significance of the parameter estimates can be determined through usual t -test. However, the most common way of interpreting a logit is to convert it (log odd ratios) to an odds ratio (relative risk ratio is STATA) using the $\exp (\beta)$ function. The closer the odds ratio to 1.0, the lesser is its influence in choosing between k -category of occupation versus the reference category, with 1.0 representing full statistical independence. For Instance if the odds ratio (the exponential function, e^β) is 2.0, then we may say that when the independent variable increases one unit, the odds that the dependent = k increase by a factor of 2.0 compared to reference category (farm labor) when other variables are controlled. The best fit model is chosen based on the pseudo- R^2 for the multinomial regression.

III. RESULTS

Labour supply and earnings

The table 2 describes the activities of male and female in the year 2010. Men reported 2340 hours, of which maximum hours worked as paid worker (46%), followed by own-farm (19%), 14% each for own-domestic and own-livestock work. The women reported 2662 hours, of which they spent maximum hours (51% of hours) in domestic-duties, followed by paid-work (24%), about 10% each in own-farm and own-livestock work, while sick and unemployed days together constitute only 4%. Women's major role in unpaid domestic-work compared to men resulted in more working hours. Overall, in economic activities, men reported more hours than women. If we consider both economic and non-economic activities, women work more hours compared to men. In paid work, women average wage rate is only ₹99 per day of eight hours compared to men wage rate of ₹200 per day. Hence, the wage income per year for women is only ₹7920 compared to ₹27000 for men. If we impute the non-monetary activities for both men and women at their ongoing wage rate respectively, the gap between men and women income reduced to 77% from 241%. If we impute both male and female wage income for own-work hours as that of female wage rate (at ₹99/day of eight hours), then the gap between men and women further reduced to 29.1%. This indicates in rural

areas, if we impute the value of the domestic duties of both men and women equally, the gap in incomes between men and women drastically reduced from 241% to just 29%. The above figures demonstrate that the contribution of women is more in non-monetary activities. The less contribution in monetary activities by women is also due to social barriers in the rural society to enter into paid work. However, the lower educational level among women (average was only 5th standard) compared to men (average was 8th standard) also one of the causes for lower wage rates.

Table 2. Average hours/annum of female and male

Work type /item	Female	Male	% over female
(I) Hours with economic activities	1201	1882	56.7
Paid work	640	1082	69
Own farm	270	442	62
Own livestock	265	328	24
Other own	26	31	33
(II) Hours with non-economic activities	1461	458	-68.7
Domestic duties	1368	338	-75
Seriously ill	47	31	-33
Unemployed	46	88	83
Hours with economic and non-economic activities (I+II)	2662	2340	-12.1
Wage income (₹/year)	7920	27000	241
Wage rate (₹/8 hours)	99	200	102
Imputed income ₹, if income of non-monetary work days are imputed with on-going wage rates for male and female respectively	32967	58400	77
Imputed income ₹, if income of non-monetary work days of both men and women at the on-going wage rates of female (₹99/8 hours)	32967	42551	29.1
Average level of education	5	8	

Still time allocation to paid work (monetary activities) is much lower in rural India (Table 2). Men spent more hours on monetary activities (paid work) compared to women, which is about 57.5% and 53.2% of hours spent on economic activities respectively. This indicates that the remaining 42.5% and 46.8% hours spent on self-employment activities by men and women respectively which is quite significant. Higher proportion of self-employment activities (like own-farm, own-livestock and petty business etc) among women is also due to their more involvement in livestock rearing activities. Another indication of segmentation of labour markets by gender is that the women spent more hours in paid farm-work with lower wage rates, while men spent more hours in paid non-farm work with comparatively higher wage rate (table 3).

Table 3. Paid hours per week by male and female

Gender	Type of work	Hours/year	Wage rate/day (₹/8 hours)	Total paid wage income per year (₹/annum)
Male	Non-farm	812	222	22530
	Farm	271	132	4470
	Total	1082	200	27000
Female	Non-farm	267	107	3550
	Farm	373	94	4363
	Total	640	99	7920

Men involvement in paid work increased up to middle education level. Among women, paid work and work in economic activities reduced as education level increases. It indicates that the employment opportunities in paid-work were higher for middle educated men, while educated women don't get. This is a reflection of the gender wise segmentation of labour in respect of education. It is to be noted that in rural areas work was available for only semi-skilled men like carpenter, two-wheeler/agricultural implement repair shop, electrician, brick workers, cleaners etc. Women find it difficult to get employment to commensurate with their higher education in paid-work due to entry barriers in terms of social rigidities and traditions. It is also to be noted that, women participate in the outside paid work largely determined by the head of the household, mostly men. The educated women were also not participated in casual laborer as it is inferior employment and head of household think it adversely affects the dignity of household (Table 4). Wage structure indicates that there is no significant increase in wages up to intermediate educational standard, but above that education level there is a steep increase in wage rates for both men and women. The total reported work-hours (include both economic and non-economic activities) are inversely related to education, as with the higher education work opportunities reduces in rural areas. This indicates that the most of the rural employment is informal, inferior, not organized, semi-skilled and don't require higher education. The higher educated prefer to be unemployed rather than engaging in these inferior employment. It is also true that the skill sets of the educated rural youth are not matching to the local needs and they also lack entrepreneurial skills required to start new businesses in rural areas. Recruiting local youth as teachers, nurses and health workers etc would reduce pathetic condition of rural youth in India.

Table 4. Work hours per year and wage rates by education level

Gender/ Education level	Economic activities					Non-economic activities				Total hours/year
	Paid work	Own farm	Own livestock	Own non- farm	Total	Domestic duties	sickness	Unemp Loyment	Total	
Male										
Illiterate	1100	473	499	26	2098	365	26	134	525	2623
Primary	1110	478	427	26	2041	355	26	103	484	2525
Middle	1182	473	421	26	2102	396	26	103	525	2627
High	1059	421	267	46	1793	308	21	87	416	2209
Inter	997	391	175	41	1604	272	21	57	350	1954
Graduate & above	977	370	195	21	1563	334	21	41	396	1959
Total	1064	442	324	26	1856	350	26	93	469	2325
Female										
Illiterate	833	319	344	31	1527	1239	57	57	1353	2880
Primary	714	329	236	31	1310	1578	31	62	1671	2981
Middle	535	293	242	26	1096	1470	51	51	1572	2668
High	416	211	211	26	864	1388	46	26	1460	2324
Inter	391	206	144	21	762	1254	41	0	1295	2057
Graduate & above	257	62	144	31	494	1018	31	46	1095	1589
Total	627	262	262	26	1177	1336	51	51	1438	2615

Traditionally, rural society is divided based on landholdings, land is an important asset, which will have positive influence on choosing better employment that provides more wages and higher socio-economic status. Its spillovers also spread to labour market as landless are discriminated in acquiring skills and employment. The study hypothesis that, having agricultural land increases employment and income opportunities, it also increases social status of households in the villages. We assume that it will have positive association with hours worked on own-farm and own-livestock, but it will have negative association with paid labour. It will also have positive impact on the wage rates, as it will increase reservation wage rates and bargaining power in the market. The owning irrigated area is also similar effect on the work and wage rates.

In rural areas not only land owned, but whether the land is irrigated or not influence in productivity and social status and its employment creating capabilities. Having irrigated land is an indication of higher productive land and household income in rural areas. The study, hypothesis that, having irrigated land increases work on own-farm, own livestock and other domestic activities for both men and women with simultaneous decrease in hours spent on paid work. It indicates that having higher productive lands (irrigated) increases self-employment in agriculture which reduce need to work as paid-laborer. We also assume that the wage rates are higher for workers who possess irrigated lands compared to un-irrigated lands, due to their higher bargaining power.

Socially backward castes (scheduled caste comprises 16.6 percent of population and scheduled tribes 8.6 percent and other backward castes 52 percent) are historically underprivileged sections of society; one of the main goals of planning in India is development of these caste groups. Historically scheduled caste and

tribes are socio-economically most regressive castes, while forward caste are more forward in education, income and wealth, while other backward caste group is situated in-between. However, there is significant difference between scheduled caste and tribes, with the SC group mostly depends on casual laborer, ST group possess more land and mostly dependent on agriculture. Among women, scheduled tribes reported more work, followed by scheduled caste, backward caste and the least among forward caste. It is interesting to see that the higher educated forward caste women were not preferred to work as paid workers and mostly engaged in domestic duties compared lower caste women due to the stigma attached to involvement in paid work. Among men there is no clear trend. Overall, forward caste men and women worked less hours as paid-workers, while scheduled caste men and women spent more hours (Table 5). Overall, still, the scheduled caste women and men are working mostly as paid casual workers in rural India.

Table 5. Work hours per year and wage rates by social group (males)

Social group	Economic activities					Non-economic activities				Total reported hours/week
	Paid work	Own farm	Own livestock	Own non-farm	Total	Domestic duties	Sickness	Unemployment	Total	
Caste group										
BC	1100	433	334	26	1893	360	26	94	480	2372
ST	918	448	292	47	1705	334	21	136	490	2195
SC	1361	203	229	21	1814	297	21	89	407	2221
FC	959	605	396	21	1981	302	21	21	344	2325
Religion group										
Muslim	1549	532	214	10	2305	318	26	26	370	2675
Christian	1392	318	501	10	2221	344	26	52	422	2643
Hindu	1069	443	323	21	1856	349	21	94	464	2320

In India, about 80.5% of Indian population is Hindus; the rest belongs to other religions like Muslim and Christianity. It is constitutional obligation to protect interests of these minorities (Muslims, Christians and others) in a secular country like India. Many studies reported that minorities are in disadvantage in labor market, especially Muslim women. Our survey results shows that overall, hours spent in economic activities were less for Muslim women compared to Hindu women (Table 5). Total reported-work-hours were higher for Muslim and Christian men compared to Hindu men that too they are working more hours as paid-work. In general, landownership was less among the minority religion population and they mostly depends on petty business, self-employment in non-farm occupations. As expected, Muslim and Christian religion women worked more hours in domestic duties, compared to Hindu women, while Hindu women worked more hours on own-farm and own-livestock. The low participation of Muslim and Christian women in economic activities can be rectified by the distribution of land to women for undertaking self-employed in agriculture activities. The social dimension of wage rates and employment structure shows that minorities and socially backward caste women and men constrained to some extent to enter into higher wage rate economic activities.

Labour supply model (hours worked per year)

To know the determinants of labour supply (hours worked) in each economic activity (paid work, own-farm, own-livestock, and own-non-farm and total) we have run separate labour supply equations with hours worked per year as the dependent variable. The results were presented in table 6. We have used both ordinary least square (OLS) and Maximum Likelihood estimates and presented only OLS results, as both

give similar results. Labour supply to paid work is positively related to wage rate, with every one rupee increase in wage rate will increase work hours by only 0.55. However, labour supply to own-farm, own-livestock was not significantly influenced by wage rates. Labour supply to own-farm and own-livestock was positively influenced by the farm size at mean level. A one acre increase in farm size will increase employment by 9.64 hours on own-farm, 3.56 hours in own-livestock. Overall an additional acre of land will increase employment by 13.09 hours. With the average family size of 5 persons, it will increase employment by 65 hours per annum after controlling for other factors. Irrigated area is having negative influence on hours worked, but not significant. In the recent years, irrigated farmers displace human labour with machine labour. The negative association between irrigation and labour supply may be also due to the wealth effect, as irrigated farmers earn more income from agriculture. Value of assets owned (other than land) have negative influence on hours spent on paid work, as with more assets people shift to own-employment like rearing of livestock or own business which have positive sign. Years of education has significant negative influence on hours spent on livestock rearing as it considered as most inferior work with lot of drudgery. Experience(age minus years attended school) was having significant positive influence on hours spent on paid work and own-farm work, as most of the old and experienced stay in the more traditional self-employed in agriculture and paid work. The young were more likely to engage in non-farm activities. Among physical capability indicators arm circumference and height were having significant positive influence on hours spent on paid work, livestock rearing as they require more manual work. Weight was having significant negative influence on livestock rearing, as livestock rearing require bending of body, which may not be possible with higher weight. Scheduled caste and scheduled tribes were positively associated with hours spent on own non-farm activities, but negatively associated with own-livestock and total economic activities. The scheduled caste workers spend less hours on own-farm and own-livestock but more hours in own-non-farm. Hindus were more likely to spend time in own-livestock activities, Christians were less likely to spent time in own-farm activities compared to Muslims. Married were more likely to spend more time in own-farm activities compared to unmarried who can take up any activity. Men were more likely to supply more labour hours than women in all activities.

Table 6. Determinants of hours spent per year in different work status (labour supply model)

Explanatory variable	Paid work		Own farm		Own livestock		Own non-farm		All economic activities	
	B	t	B	t	B	t	B	T	B	t
Wage rate	0.55	3.4	0.01	0.2	-0.11	-1.2	0.03	1.8	0.65	1.7
Farm size	0.18	0.0	9.64	4.4	3.56	1.4	-0.30	-0.6	13.09	2.6
Irrigated area	-21.33	-1.5	4.39	0.7	-8.19	-1.0	-0.75	-0.5	-34.65	-2.3
Value of assets	-0.35	-1.0	0.55	3.2	1.15	5.5	0.07	1.8	1.42	3.6
Value of residence	-0.16	-0.3	0.23	0.9	-0.12	-0.4	-0.11	-1.8	-0.15	-0.3
Borrowings	0.87	3.1	0.26	2.0	-0.14	-0.9	-0.04	-1.3	0.94	3.1
Caste dummies										
ST	-59.04	-1.1	-25.53	-1.0	-57.55	-1.9	13.99	2.3	-128.13	-2.2
SC	-34.57	-0.6	-72.23	-2.9	-55.92	-1.9	13.06	2.2	-149.65	-2.6
FC	-104.98	-1.9	14.78	0.6	48.86	1.6	-2.29	-0.4	-43.64	-0.8
Religion dummies										
Christian	-80.90	-0.7	-92.48	-1.8	42.17	0.7	7.50	0.6	-123.71	-1.0
Hindu	-251.50	-1.6	35.03	0.5	305.53	3.5	-10.24	-0.6	78.82	0.5
Marital status	9.93	1.4	-4.23	-1.3	-1.88	-0.5	-0.21	-0.3	3.60	0.5
Gender	132.74	2.6	96.65	4.1	154.09	5.4	-3.08	-0.5	380.39	6.9
Years of schooling	-8.96	-1.8	0.83	0.4	-9.00	-3.3	-0.43	-0.8	-17.57	-3.4
Experience	13.03	2.0	8.80	3.0	3.48	1.0	-0.33	-0.5	24.97	3.6
Experience ²	-0.33	-2.3	-0.23	-3.4	-0.06	-0.8	0.00	0.2	-0.62	-4.0
Height	4.28	2.0	-0.28	-0.3	2.35	1.9	0.02	0.1	6.36	2.7
Weight	-1.13	-0.5	-1.93	-1.8	-4.50	-3.4	0.71	2.7	-6.85	-2.7
Arm circumference	18.54	2.8	0.82	0.3	12.50	3.4	-3.78	-5.1	28.08	4.0
Constant	107.83	0.3	648.65	3.8	194.28	-0.9	65.60	1.6	627.80	1.6
Adjusted R2		0.33		0.37		0.24		0.029		0.27

Note: Paid work 1499 hours, own farm work 267 hours, own livestock work 230 hours, non-farm work 12 hours and all economic activities 2008 hours. Note: If “t” value is more than 2.58 significant at 1 percent, between 1.96 to 2.58 at 5 percent, between 1.65 to 1.96 at 10 percent level of significance

Mincer equation (Returns to education)

A modified Mincer equation was estimated for only paid wage earners. In this log of wage rate per day taken as dependent variable. The explanatory variables included in the model explained about 19% of variation in wage rate among women and 30% variation in men. Most of the explanatory variables are not significant in the case of women, as there is no much variability in the wage rates of women with the change in the explanatory variables. Women mostly engaged in casual labourer in agriculture, in which the human, physical and social background of the workers will have little impact on wage rates. Whereas among men, educated, workers with more assets, land, forward caste members, members belongs to Hindu religion, more weight and arm circumference were getting significantly more wages per day compared to others. Workers engaged in non-farm labour, regular employment and petty business also getting higher wage rates

compared to other occupational groups among men. However, there is no significant variation in the wage rates with occupational change among women. (Table 7). Overall, women are mostly engaged in low paying casual labourer in agriculture, while men are diverse in their occupation and wage rates are higher for higher for the workers who did have human, physical assets, although social background was also playing a significant role.

Table 7. Determinants of log of wage rates (modified Mincer equation)

log of wage rates	women			men		
	B	t	mean	B	t	mean
			4.447			5.003
Farm size	-0.010	-1.7	1.979	0.015	3.5	3.071
Irrigated area	0.024	1.4	0.605	0.023	1.8	1.109
Value of assets	0.001	2.7	21.941	0.002	4.6	26.320
Value of residence	0.000	0.0	23.788	0.002	3.9	24.126
Borrowings	0.000	0.0	38.151	0.001	4.8	45.017
Caste (OBC reference)						
ST	-0.092	-1.7	0.109	0.089	1.6	0.135
SC	-0.018	-0.4	0.189	-0.043	-0.7	0.159
FC	0.053	1.0	0.132	0.204	3.8	0.178
Religion (Muslim reference)						
Christian	0.065	0.5	0.956	0.173	1.6	0.937
Hindu	-0.085	-0.5	0.024	0.428	2.9	0.034
Gender (0=women; 1=men)						
Years of schooling	-0.016	-3.2	3.611	0.001	0.2	7.041
Experience	-0.005	-0.9	17.515	0.024	4.3	15.624
Experience ²	0.000	0.5	449.729	-0.001	-4.3	395.891
Height	-0.008	-2.6	150.891	0.002	1.2	163.306
Weight	0.018	6.4	46.144	0.007	3.1	55.160
Arm circumference	-0.020	-3.1	23.256	0.016	2.2	24.497
Main occupation						
Non-farm labour	0.029	0.3	0.052	0.135	2.2	0.148
Livestock rearing	0.120	1.2	0.030	-0.044	-0.3	0.021
Regular employment	0.013	0.1	0.039	0.237	3.3	0.116
Attending educational institution	-0.135	-1.4	0.046	-0.145	-1.5	0.058
Domestic work	-0.089	-1.2	0.072	0.097	0.3	0.004
Petty business	-0.115	-1.5	0.060	0.351	6.1	0.166
farm labourer	0.046	1.1	0.425	0.037	0.7	0.154
Constant	5.309	11.3		3.280	9.1	
Adj R2		0.14			0.29	

Note: If “t” value is more than 2.58 significant at 1 percent, between 1.96 to 2.58 at 5 percent, between 1.65 to 1.96 at 10 percent level of significance

Occupational segmentation

Table 8 presents the main occupation of individuals based on the maximum number of days spent in a year. Out of 948 male-members between the age group of 15-65 years in the sample, 29 percent were engaged in cultivation, 14 percent were attending educational institutions, 12 percent were in non-farm labor, 10 percent were in farm labor, eight percent were in regular employment and village petty business each, three percent were in livestock rearing and traditional occupation like cleaning cloths, gold smith and only one percent were engaged in domestic work. This shows that still self-employed in agriculture is a major activity in the villages for men, followed by non-farm-labor, farm labor. It is interesting to see that many (14%) are still going to educational institutions, which shows that many male members of the households were attending higher education institutions. However, out of 631 women of age between 15 and 65 years in the sample, participation in cultivation, attending domestic duties, farm labor, livestock rearing were main occupations. Farm laborer and livestock rearing was dominant among illiterate, while literates were mostly engaged in self-employed in agriculture. Although non-farm laborers were mostly concentrated in middle level of education, but they spread up to 10+2 levels. Many of the salaried and business persons are educated even up to graduate and above. Farm laborer and non-farm laborer are mostly landless. Again farm labor and non-farm labor were much younger than the farmers and persons engaged in domestic duties. Salaried and business persons were mostly in middle to old aged. Scheduled castes were mostly working as farm laborer and also non-farm laborer, some were in self-employed in agriculture also. Scheduled tribes were mostly engaged in self-employed in agriculture, farm laborer and livestock rearing. Majority of backward and forward caste workers were engaged in self-employed in agriculture.

Table 8. Distribution of individuals by main occupation by socio-economic status (%)

	Self-employed in agriculture	Non-farm labour	Livestock rearing	Traditional occupation	Regular employment	Attending educational institutions	Attending Domestic Duties	Petty Business	Farm labour	Total
Gender										
Male	40	12	3	3	8	14	1	8	10	100
Female	29	3	11	1	2	10	21	2	21	100
Education										
Illiterate	42	8	10	3	1	0	9	2	25	100
Primary	44	6	6	2	1	0	14	6	21	100
Middle	39	9	9	2	4	2	14	5	16	100
Higher	30	9	6	2	5	19	11	9	10	100
10+2	26	7	1	2	10	32	10	8	5	100
Graduate	15	1	1	1	22	43	7	7	2	100
Landholding										
Medium	45	7	6	1	5	12	10	4	10	100
Large	51	2	8	1	6	14	11	3	3	100
Landless	8	13	6	6	7	10	10	8	31	100
Age group										
below 15	3	4	0	0	0	82	6	0	5	100
15 to 24	17	10	4	2	5	36	10	4	11	100
25 to 60	42	7	8	2	6	1	10	6	18	100
above 60	45	6	7	3	1	0	26	5	7	100
Social group										
BC	37	8	6	3	4	12	8	5	16	100
ST	38	6	10	0	7	11	10	4	14	100
SC	18	15	4	2	8	11	9	5	28	100
FC	35	3	7	0	7	14	20	7	6	100
Total	35	8	7	2	5	12	11	5	15	100

The results of multinomial regression analysis for men were presented in table 9. Among men, probability to be engaged in self-employed in agriculture increases with increase in irrigated area and years of education. Probability in self-employed in agriculture was higher for scheduled tribes and forward caste workers. Probability to be engaged in non-farm labor increases with value of residential house, experience squire and arm circumference, while decreases with experience. The social group, religion group and education do not influence choice between non-farm labor and farm labor. Probability to be engaged in own-livestock activity was higher among Hindu compared to other two religions and also increased with irrigated area, value of assets and arm circumference (increases with arm circumference: physical capability). Probability to be engaged in regular employment increases with irrigated area, value of residence and years of education, which are indicators for increasing labor productivity in rural areas. Regular employment was also significantly higher among scheduled tribes and forward caste workers. In same lines, probability to be engaged in business activities increases with irrigated area and years of education. Scheduled caste workers were less likely to be engaged in petty business activities. Individual's large farm size, value of residential house, married and old aged and less educated were having higher probability to be engaged in domestic duties. But workers with more assets (other than house), more educated and more physical capability (height, weight and arm circumference) were less likely to be engaged in domestic duties. Attending educational institutes were positively influenced by irrigated area

and value of residence which are generally indicators of the wealth. In case of physical capital indicators, owning irrigated land having positive influence in choosing self-employed in agriculture, traditional occupation, and regular employment. Social status was also having significant influence on choice of occupation. Attending higher educational institutions and participation in domestic duties were less frequent activities among men in the rural areas.

Among men, one acre increase in irrigated area from its mean increases probability to be engaged in self-employed in agriculture increases by 60%, increase in one year of educational level increases probability to be engaged in self-employed in agriculture by 10% compared to farm labor after controlling for other factors (table 9). Scheduled tribe workers 2.8 times, forward caste workers 2.3 times more likely to be engaged in self-employed in agriculture compared to other backward caste workers. Experience (age) will reduce probability to be engaged in non-farm laborer by 20%. One centimeter increase in arm circumference increases probability to be engaged in non-farm labor by 30% and increases probability to be engaged in livestock rearing by 50%. One acre increase in irrigated area increases probability to be engaged in regular employment by 50% after controlling for other factors. One year additional schooling increases probability to be engaged as regular employment increases by 30%. One acre increase in irrigated area increases probability to be engaged in petty business by 60%. One year extra schooling increases probability to engage in business increases by 20%.

Table 9. Relative Risk Ratios of Determinants of main occupation of men (farm labor as comparison group)

	Self-employed in agriculture		Non-farm labour		Livestock rearing		Regular employment		Attending educational institute		Attending domestic duties		Petty business		Farm labour
	RRR	Z	RRR	Z	RRR	Z	RRR	Z	RRR	Z	RRR	Z	RRR	Z	RRR
Farm size	1.1	1.2	1.0	-0.1	0.9	-1.1	1.0	0.0	1.1	1.4	3.4	3.7	0.9	-1.3	1.0
Irrigated area	1.6	2.6	1.3	1.0	8.0	2.0	1.5	2.2	1.8	1.8	0.01	0.1	1.6	2.4	1.0
Value of assets	1.0	0.1	1.0	-1.6	1.0	1.9	1.0	-0.9	1.0	-2.5	0.9	-3.4	1.0	-0.1	1.0
Value of residence	1.0	1.2	1.0	2.5	1.0	-0.4	1.0	2.2	1.1	4.0	1.3	6.3	1.0	1.0	1.0
Caste dummies															
ST	2.8	2.9	1.8	1.2	2.1	0.9	6.1	3.5	4.2	2.0	0.0	0.1	1.5	0.9	1.0
SC	0.5	-2.1	1.3	0.6	0.7	-0.5	2.1	1.5	0.6	-0.6	0.0	0.1	0.2	-2.7	1.0
FC	2.3	2.1	1.4	0.7	0.7	-0.3	5.2	3.2	0.6	-0.6	8.0	11.9	1.4	0.8	1.0
Religion dummies															
Christian	0.8	-0.3	1.3	0.2	8.0	2.4	0.9	-0.1	0.5	-0.4	0.0	.	2.6	0.9	1.0
Hindu	1.9	1.0	1.8	0.9	8.0	2.6	3.2	1.0	0.9	-0.1	8.0	1.5	1.2	0.3	1.0
Marital status	0.8	-3.7	0.9	-1.7	1.0	-0.1	1.0	-0.2	3.9	7.0	25.2	17.7	0.9	-2.2	1.0
Years of schooling	1.1	2.0	1.0	-0.4	0.9	-1.7	1.3	5.8	2.2	5.2	0.1	-12.6	1.2	6.0	1.0
Experience	1.0	-0.5	0.8	-3.6	0.8	-1.2	1.0	-0.7	0.2	-1.4	19.8	16.7	0.9	-1.1	1.0
Experience ²	1.0	0.9	1.0	3.2	1.0	1.4	1.0	1.2	1.0	-0.1	0.9	-15.9	1.0	1.4	1.0
Height	1.0	-0.7	1.0	-1.8	1.0	-0.3	1.0	0.0	1.0	-0.7	0.6	-6.3	1.0	-0.3	1.0
Weight	1.0	0.5	1.0	-0.8	0.9	-1.7	1.1	2.3	0.9	-2.3	0.5	-5.2	1.0	1.9	1.0
Arm	1.1	1.0	1.3	4.8	1.5	3.7	1.1	0.8	1.1	0.4	0.1	-8.0	1.0	0.7	1.0
	0.27														

Note: If “z” value is more than 2.58 significant at 1 percent, between 1.96 to 2.58 at 5 percent, between 1.65 to 1.96 at 10 percent level of significance

The explanatory variables explained about 30% of difference in the occupations (Table 10). Among women, probability to be engaged in self-employed in agriculture increases with farm size and body weight of workers in reference to farm labor. Probability to be engaged in livestock rearing increase with irrigated area. Hindu women were more likely to be engaged in livestock rearing than other region women. Probability to be engaged in domestic duties increases with education level after controlling for other variables. Probability to be engaged in regular employment will increase with the increase in irrigated area, years of schooling, experience, height and weight. Probability to be engaged in petty business activities increases with increase in value of assets owned (other than residential house) and years of education. Regular employment, attending to higher educational institutions and non-farm labor were less frequent among women in rural areas.

Among women, probability to engaged in self-employed in agriculture increased by 10% with one additional acre of land. With increase in one acre of land, probability to be engaged in non-agricultural labour reduced by 20%. The probability of scheduled caste women to be engaged in non-farm labour will be higher by 240% compared to other backward caste women. Probability to be engaged in livestock rearing will increase by 290% with one acre increase in irrigated area and increase by 10% with one kg body weight. The probability to be in regular employment will increase by 330 % with one acre increase in irrigated area, by 50% with one year of schooling, by 30% with one additional year of experience, by 10% by increase in one kg body weight and one centimeter weight. With one year of additional schooling increased the probability to be engaged in petty business increases by 20%, to be engaged in regular employment by 50% and to be engaged in domestic duties by 40%.

Table 10. Relative risk ratios of determinants of main occupation of women (farm labour is comparison group)

	Self-employed in agriculture		Non-farm labour		Livestock rearing		Regular employment		Attending educational institute		Attending domestic duties		Petty business		Farm labour
	RRR	Z	RRR	Z	RRR	Z	RRR	Z	RRR	Z	RRR	Z	RRR	Z	
Farm size	1.1	2.3	0.8	-1.8	0.8	-1.2	0.8	-1.2	1.3	1.4	1.1	1.3	1.1	0.9	1.0
Irrigated area	1.2	0.8	1.9	1.6	3.9	2.3	4.3	2.6	0.6	-1.2	1.0	0.1	0.8	-0.7	1.0
Value of assets	1.0	1.1	1.0	-0.8	1.0	-0.3	1.0	-1.5	1.1	1.9	1.0	0.7	1.0	2.5	1.0
Value of residence	1.0	-0.9	1.0	0.5	1.0	0.3	1.0	1.6	1.0	-0.4	1.0	-0.8	1.0	-2.0	1.0
Borrowings	1.0	4.4	1.0	-0.1	1.0	-2.2	1.0	0.8	1.0	0.2	1.0	0.0	1.0	-0.3	1.0
Social group															
ST	0.5	-1.8	0.3	-1.1	1.7	0.8	1.0	0.0	0.5	-0.7	0.4	-1.2	0.0	.	1.0
SC	0.6	-1.7	3.4	2.5	0.3	-0.9	4.4	1.6	1.9	0.7	0.8	-0.4	0.6	0.8	1.0
FC	1.4	1.0	0.0	.	2.5	1.3	4.7	2.1	0.0	.	2.6	1.7	1.3	0.4	1.0
Religion group															
Christian	0.0	.	0.0	.	0.0	.	0.0	.	0.0	.	0.4	-0.7	0.0	.	1.0
Hindu	3.8	1.2	0.4	-1.2	8.0	3.0	8.0	3.3	8.0	6.3	0.3	-1.0	0.1	-2.6	1.0
Marital status	1.0	-0.9	1.1	1.6	0.8	-1.5	1.3	3.6	5.3	6.7	0.9	-1.9	0.9	-1.6	1.0
Years of schooling	1.1	1.4	1.1	1.3	1.0	0.2	1.5	4.9	1.5	2.5	1.4	5.5	1.2	4.2	1.0
Experience	1.1	1.4	1.2	1.7	0.9	-0.5	1.3	2.6	0.0	-5.8	0.9	-1.5	1.0	-0.5	1.0
Experience ²	1.0	-1.3	1.0	-1.9	1.0	0.5	1.0	-1.8	1.2	5.2	1.0	2.1	1.0	1.3	1.0
Height	1.0	1.5	1.0	0.1	1.1	2.3	1.1	1.9	0.9	-0.8	1.0	0.0	1.0	-0.8	1.0
Weight	1.0	1.8	1.0	-1.6	1.0	1.0	1.1	1.9	1.0	-0.3	1.0	1.2	1.1	2.3	1.0
Arm	1.0	-0.4	1.2	2.3	0.9	-1.4	0.8	-1.9	0.8	-1.4	0.9	-1.7	1.0	-0.5	1.0
Adj. R2	30.0														

Note: If “z” value is more than 2.58 significant at 1 percent, between 1.96 to 2.58 at 5 percent, between 1.65 to 1.96 at 10 percent level of significance

Conclusions and policy options

In rural India historically men participate in economic activities and women participate in non-economic activities like domestic duties. Within economic activities, men participation in monetary activities (paid wage) was higher than the women. As a result there is huge gap between monetary income between men and women, even though women work more hours if we take into account both economic and non-economic activities. The less participation of women in monetary activities was mainly due to the social rigidities, cast system rather than their lack of skills, education and physical capabilities. Segregation of rural labour market by gender was particularly visible in rural labour markets in India with men are shifting to non-farm occupations with higher wage rates. While women still depends on farm work (both self-employment and as casual laborer). Rural labor markets were also segmented based on social group (caste and religion) to

some extent (after discounting for human and physical capital) which supports segmented labor market theory.

It is interesting to see that the hours worked in economic activities increases with ownership of land and assets rather than education in rural India. Level of education and experience have little influence on choice of occupation and quality of employment especially among women. Still majority of employment was provided by the technologically backward sectors like agriculture and traditional occupations. Even many of the non-farm sectors like petty business, retail shop, agro-processing, repair and maintenance of agricultural implements, transport and construction require only semi-skilled workers with little education. However, the quality of work improves significantly for only few higher educated men and women in regular employment like teachers, nurses, record keeper, health workers; most of the educated youth remain unemployed. Especially most of the educated women engaged in domestic duties due to social barriers to enter in to commensurate employment opportunities.

The traditional rural labour markets in India were highly segmented based on caste, gender and traditional occupations, however, they are slowly reducing their influence on labor market outcomes. They are replaced by the ownership of land and assets and owning higher productive land (like irrigated area) in influencing the labor market outcomes. The driving force behind the changes are increase in the employment opportunities for semi-skilled and middle educated men with the development of rural non-farm sector. The new emerging sectors like repair of mobile phones, electric motor, computers, tractor drivers, etc were also helping the semi-skilled workers to gain wages and employment. A few higher educated were also able to earn incomes in nearby urban areas that will increase dynamism in rural labor markets and increasing returns to education. Demand for some traditional occupations like traditional toddy-tapping (making locally made alcohol), cleaning of cloths, etc is increasing in near-by towns which can be captured by rural men and women with middle level of education. Some of the policy prescriptions from the study are (i) enhancing the ownership of assets like land, irrigated area through providing loans which will increase hours worked in economic activities (ii) enhancing semi-skilled and middle education in rural areas to take advantage of growing employment in service sector and new emerging occupations like repair of mobiles, electric motors computer centres and (iii) emphasis on women empowerment through reducing social rigidities to enhance women participation in economic activities.

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ⁱ **Note:** The Scheduled Castes (SC) and Scheduled Tribes (STs) are two groups of historically-disadvantaged people recognised in the Constitution of India. Other Backward Class (OBC) is a collective term used by the Government of India to classify castes which are educationally and socially disadvantaged. Forward caste (FC) are educationally and socially better off than others.