

Do Public Works Programs Increase Women's Economic Empowerment? Evidence from Rural India

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Abstract:

Although it is often argued that labor market discrimination, resulting in blocked employment opportunities and wage discrimination, reduces women's economic empowerment, it has been difficult to examine this constraint rigorously. The enactment of the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) of 2005 offers us a unique opportunity to examine the role of expanding opportunities on women's economic empowerment. Using survey data collected before and after the enactment of this program, we examine changes in women's participation in paid work and total earnings by using a difference-in-difference approach. The results suggest that women living in villages with a higher availability of MGNREGA work are more likely to participate in wage labor and have higher total wage incomes. These effects are absent for men, possibly because they have greater alternative opportunities.

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Introduction:

The prevalence of low employment rates among women in South Asia and the Middle East has been the subject of considerable attention in the literature for nearly four decades (Boserup 1970, Dixon 1982). However, a further decline from even these low rates has taken analysts by surprise (Klasen and Pieters 2012, Das et al. 2015, Kapsos, Bourmpoula, and Silbereman 2014, Desai 2013). The National Sample Survey data (Kapsos, Bourmpoula, and Silbereman 2014) show that in 1994, 42.7 per cent of the women aged 15 years and above were participating in the labor force while this proportion had fallen to 31.2 per cent, with the decline for rural women being greater (from 49 per cent to 35.8 per cent) than that for urban women (from 23.8 per cent to 20.5 percent).

How do we explain this decline? Does economic growth create conditions that allow poor women to step out of the labor force to meet their care responsibilities? Or are the patterns of economic growth such that rural women are unable to find appropriate work? This is the topic that the present paper explores by focusing on a unique labor market experience called the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), which came into effect in 2006. This Act is supposed to offer 100 days of manual labor to any rural household that demands work, with the same wages being offered to men and women.

Using panel data from the India Human Development Survey (IHDS), conducted twice in 2004-05 before the implementation of MGNREGA, and in 2011-12 after MGNREGA had been in existence for several years, this paper examines the differences in women's work participation and incomes before and after the implementation of the Act. This exogenous change allows us to test the impact of labor market interventions on women's economic empowerment.

Explanations for Declining Female Labor Force Participation:

One of the best known explanations for a U-shaped relationship between women's employment and economic development has been offered by Claudia Goldin, who argues that women's labor force participation is affected by two parameters of the Slutsky equation—own wage (compensated) elasticity and the income elasticity. Where

a high degree of stigma is associated with the participation of wives in wage work, rising incomes lead to a decline in female labor force participation. This is particularly true where women face poor job prospects. High levels of economic development help improve women's prospects while also reducing ideological barriers to women's participation in paid work—at least based on the Western experience—which combine to strikingly improve women's labor force participation rates (Goldin 1995, 2006).

However, before we assume that the economic growth explains the decline in women's labor force participation in India, it is important to note that empirical studies trying to analyze the extent of support for the U-shaped relationship between women's employment and economic growth have found only limited support (Gaddis and Klasen 2014).

A second argument for the decline in women's labor force participation is associated with rising education. As girls and young women spend more time in school and college, it may reduce their availability to participate in the labor force. Moreover, even acquiring a low level of education causes women to nurture preferences for jobs that are not easily available to them. For most rural women, agricultural work is usually the only option available, be it work on the family farm or for wages. For men who have acquired 4-9 years of education, it may be easier to find jobs as drivers, postmen or construction supervisors, but these jobs are not easily available to women. Consequently, women have relatively few options until they complete secondary education and can work at more skilled jobs as teachers, nurse midwives, or pre-school program workers. Thus, as education grows, initial educational expansion may be associated with women's labor force withdrawal (Neff, Sen, and Kling 2012).

A third potential explanation relates to changes in employment opportunities in the demand for labor. An overwhelming majority of rural Indian women work in agriculture, either as cultivators on family farms or as agricultural laborers in nearby farms. The National Sample Survey (NSS) documents that while 59 per cent of the rural male workers are in agriculture, the corresponding figure for female workers is 75 per cent (National Sample Survey Organisation 2013). However, both the proportion of GDP coming from the agricultural sector as well as farm sizes have steadily dropped, resulting in extreme crowding in the agricultural sector (Papola 2012, Agriculture Census Division 2014). Since women are disproportionately located in this sector, they may be adversely affected by these developments.

A fourth explanation may be that the data from the NSS, on which most researchers rely to estimate work participation rates, may be structured in a way that fails to capture the full range of women's activities and that structural changes in the nature of labor markets have intensified this omission in recent years.

From a public policy perspective, both eventualities, that is, whether women are crowded out of the labor market or have chosen to withdraw from it voluntarily, have significant implications, both for women's economic empowerment and for development planning. While declining female work participation remains subject to much speculation (Neff, Sen, and Kling 2012, Gaddis and Klasen 2014, Klasen and Pieters 2012), it has been difficult to empirically evaluate these competing explanations. Fortunately, the enactment of the MGNREGA in 2005 helps us to test the impact of the expansion of employment opportunities on women's work participation.

Mahatma Gandhi National Rural Employment Guarantee Act: A Natural Experiment

In 2005, India passed an extraordinary legislation, the National Rural Employment Guarantee Act (NREGA), later renamed as the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA). MGNREGA guarantees 100 days of manual labor to any rural household that demands work. The wage rates are fixed by each state but must be a minimum of Rs. 100 per day, and equal wages are to be offered to men and women. Households may split their entitlement of 100 days in any way they choose between different household members (Ministry of Rural Development 2013). On-site child care is to be provided, though studies show that this provision is poorly implemented (Khera and Nayak 2009). The Act requires that at least one-third of the work be given to women. Since few other jobs provide equal wages for men and women, it is not surprising that women have flocked in large numbers to MGNREGA work, and consequently, over the years, MGNREGA has come to be dominated by women workers (Desai, Vashishtha, and Joshi 2015).

MGNREGA has several characteristics that are particularly noteworthy: (1) It is supposed to be available to any rural household that demands work without any targeting. (2) It offers equal wages to men and women. (3) It is supposed to be available on demand with villages required to hold at least two meetings a year where households can register their work demand.

Evaluations of MGNREGA implementation, however, show that the promise of 100 days of work is rarely implemented. Since local and state governments are supposed to take a lead in program implementation, considerable heterogeneity in implementation is observed across the country. States like Chhattisgarh, Rajasthan and Andhra Pradesh have provided substantial rural employment through MGNREGA while Gujarat and Odisha have not had a strong program (Ministry of Rural Development 2015). Moreover, even within the same state and district, some village leaders have figured out how to formulate and implement projects that use MGNREGA funds while other local leaders have been more lackadaisical in their approach (Desai, Vashishtha,

and Joshi 2015). This failure is often due to a lack of understanding about the program structure and ability to navigate the system.

MGNREGA provides an extraordinary opportunity to examine the role of employment opportunities in shaping women's economic empowerment. In spite of considerable advocacy among feminist scholars and activists for increasing employment opportunities for women and for elimination of the gender gap in pay scales, we rarely come across situations that lend themselves to evaluating whether the expansion of employment opportunities will actually result in greater employment for women or whether their domestic and care responsibilities will dominate with little change in the trends for women's employment.

Research Strategy:

This paper relies on changes in participation in paid work and total wage income for rural Indian men and women aged 15-64 years between 2004-05 and 2011-12. Two aspects of the program make it possible for this paper to explore the way in which women's labor force behavior responds to expanding opportunities. First, by comparing women's participation in paid work before and after the implementation of the program in the same households and villages, we are able to trace the changes in cultural and social conditions that limit women's employment. Second, by comparing changes over time between villages that exhibited a strong implementation of MGNREGA with those that had weak implementation of MGNREGA, we are able to trace the program effect net of secular changes that affected the nation as a whole after 2005 when the Act was passed.

India Human Development Survey

The above analysis is facilitated by data from the India Human Development Survey (IHDS), Waves I and II. Wave I of the IHDS was conducted in 2004-05, just before MGNREGA was implemented.¹ Wave II of the IHDS was conducted in 2011-12, when the Act was fully implemented. IHDS-I interviewed 41,554 households spread across 1503 villages and 971 urban blocks in all the states and Union Territories of India, with the exception of the islands of Andaman and Nicobar, and Lakshadweep. IHDS-II set out to interview each of the IHDS-I households and any split households that lived in the same locality. It was able to re-interview 72 per cent of the urban and 90 per cent of the rural households. After a gap of seven years, an overall re-contact rate of 83 per cent puts the

¹ MGNREGA was passed in 2005 and implemented in a phased manner beginning with 2006. By 2011-12, when IHDS-II was conducted, the rural areas of all the districts were covered by MGNREGA.

IHDS among some of the best maintained panel samples in developing countries (Alderman et al. 2001).

The IHDS is a multi-purpose, multi-topic survey that contains information about:

- Basic background data (caste, religion, place of origin);
- Tracking of original household members and collection of proxy information for migrants as well as remittances from migrants;
- Housing conditions and asset ownership;
- Detailed income and employment; a consumption expenditure module with 50 broad categories; debt and financial sector participation data; and land ownership including intra-household differences in ownership;
- Morbidity and health expenditure, ADL;
- Education, educational expenditure, basic reading/arithmetical tests for youth aged 8-11 and 15-18 years;
- Social networks, trust and confidence in institutions, local crime, sexual harassment;
- Major household events between two interviews; and
- Gender relations, fertility, contraception, marriage history (collected from women by women interviewers).

The IHDS data are considered to be of high quality, and have been downloaded by over 8,000 users and have generated more than 220 papers and dissertations. Comparisons of the IHDS estimates of basic demographic characteristics with the Census, National Sample Surveys and National Family Health Surveys suggest that on most major variables, the IHDS results are similar to these other sources (Desai et al. 2010).

For this paper, we integrate the IHDS survey data on MGNREGA implementation from data provided by the Ministry of Rural Development (mgnrega.nic.in). The villages included in the IHDS were manually matched with the number of days of MGNREGA provided in 2010-11 and 2011-12 and with the village population from Census 2011. This allows us to estimate the average numbers of days of MGNREGA work provided per household in each of the villages in which the IHDS respondents live. We have been able to obtain this information for all the states except Tamil Nadu, which has thus been excluded in these analyses.² This provides us with an estimate of the intensity of MGNREGA efforts in the village.

² Efforts for obtaining data for Tamil Nadu are under way.

Measuring Women's Economic Empowerment:

In this paper, we focus on the two main measures of women's economic empowerment: (1) Whether women participate in paid work, including agricultural casual labor, non-agricultural casual labor, salaried employment, and MGNREGA work, during the year preceding the survey; and (2) Total cash earnings during the year preceding the survey. In order to examine the role of MGNREGA in shaping women's economic outcomes as opposed to men's economic outcomes, we estimate and present models for men and women separately but test for significance of relevant coefficients in a pooled model.

Women's economic contributions to the household well-being involve both wage work and work in household enterprises such as household farm or household business. While households benefit considerably from women's work on family farms, which often releases men to engage in wage work (Desai and Jain 1994), qualitative as well as quantitative studies suggest that women themselves attach considerable value to their role as economic actors as opposed to unpaid family labor and cash income often increases their voice, agency and control over household resources (Kabeer 1999, Presser and Sen 2000, Narayan 2006, Agarwal 1997). Hence, it is important to examine the role of MGNREGA in shaping women's access to paid work.

In addition to whether women participate in paid work or not, we also examine women's total cash earnings during the year preceding the survey. The total earnings are a function of both participation in wage labor and the wage rate. We focus on the total earnings, setting the earnings to zero for men and women who have no cash income.

The Challenge of Measuring Women's Work Participation:

India is home to a vibrant women's movement and one of the most important contributions of this movement is to ensure that employment data collection by the National Sample Survey Organization (NSSO) and the Census entails imparting adequate training to data collectors to ensure that the activities women participate in (for example, helping on family farms, caring for animals, making pickles or *gur* [jaggery] for sale) is considered as economically productive work rather than merely domestic work (Jain and Banerjee 1985). However, a focus on time allocation, combined with data collection strategies used by the NSSO, may not adequately capture women's economic activities, particularly in an era of transition.

The frequently used NSSO definition of employment is a combination of Usual Principal Status (PS) and Usual Subsidiary Status (SS). An individual is defined as being employed according to PS, if s/he engages in the NSS definition of economic activity for

a majority of the year. An individual is defined as being employed according to the SS if s/he is engaged in an economic activity for at least 30 days. If, in an era of rampant under-employment, a young woman spends five weeks collecting forest produce for own consumption, she will be classified as being employed according to the subsidiary status. However, if the sudden availability of construction work leads her to spend 20 days working at a wage that allows her to purchase firewood, she would not be considered as being employed, even by subsidiary status. Moreover, if she works in several different activities but none of these lasts for at least 30 days at a stretch, and for 183 days in combination, would she be classified as being employed by either principal or subsidiary status criteria? Instructions to the interviewer are somewhat ambiguous on this score. Time use research shows that women are far more likely to engage in multiple activities and the use of work participation rates based on time use data is better able to capture multiple activities. Consequently, work participation estimates based on the NSS may under-estimate the work participation of women (Hirway and Jose 2011, Kapsos, Bourmpoula, and Silbereman 2014).

Unlike the NSSO, the IHDS collects data on both income and employment in a single module. Thus, it first asks whether the household owns or cultivates land, then asks about season-wise production, and finally asks who engaged in farm work. Similarly, for wage and salary work, it lists every single paid activity that individuals undertake, regardless of the number of days they work. This allows for a greater capture of fragmented and multiple activities. As a result, IHDS work participation rates for women are higher than the NSS participation rates, but those for men are comparable.

Statistical Model:

In order to examine the impact of the availability and intensity of MGNREGA work, we estimate three level random intercept models where the household *I* is nested in village *j* and village *j* is nested in state *k*. This allows us to estimate three level random intercept models using STATA of the following form:

$$Y_{ijk} = \alpha_0 + \alpha_1 X_1 + \alpha_2 Year + \alpha_3 NREGA + \alpha_4 Year * NREGA + \beta_0 jk + \delta_0 k + \epsilon_{ijk}$$

where *X1* refers to individual and household characteristics to be controlled, while *Year* refers to wave 2 of the IHDS survey conducted during the year 2011-12, and measures secular change in outcome *Y* over time. *NREGA* is a continuous variable indicating the number of days of MGNREGA work provided in the village during the year preceding the survey³ and the interaction term *Year*NREGA* indicates the change in the impact of

³ Since the IHDS-2 survey spanned the period October 2011 to December 2012, we have taken an average of village level MGNREGA days for FYs 2010-11 and 2011-12.

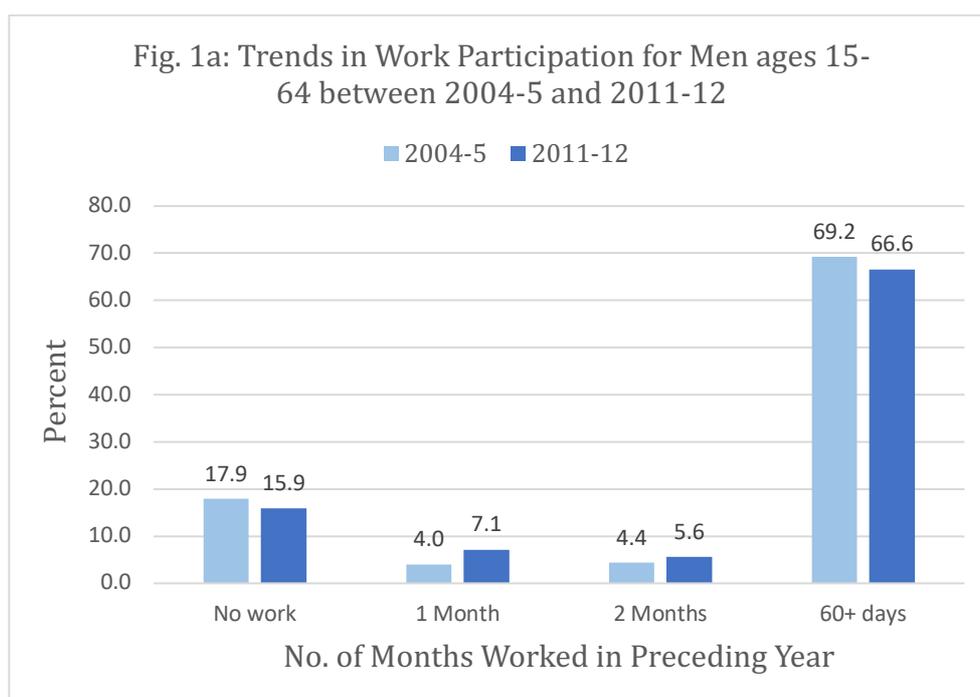
NREGA variable between 2004-05 and 2011-12. This difference-in-difference equation allows us to see the impact of MGNREGA implementation intensity on labor force behavior while controlling for both village and household characteristics.

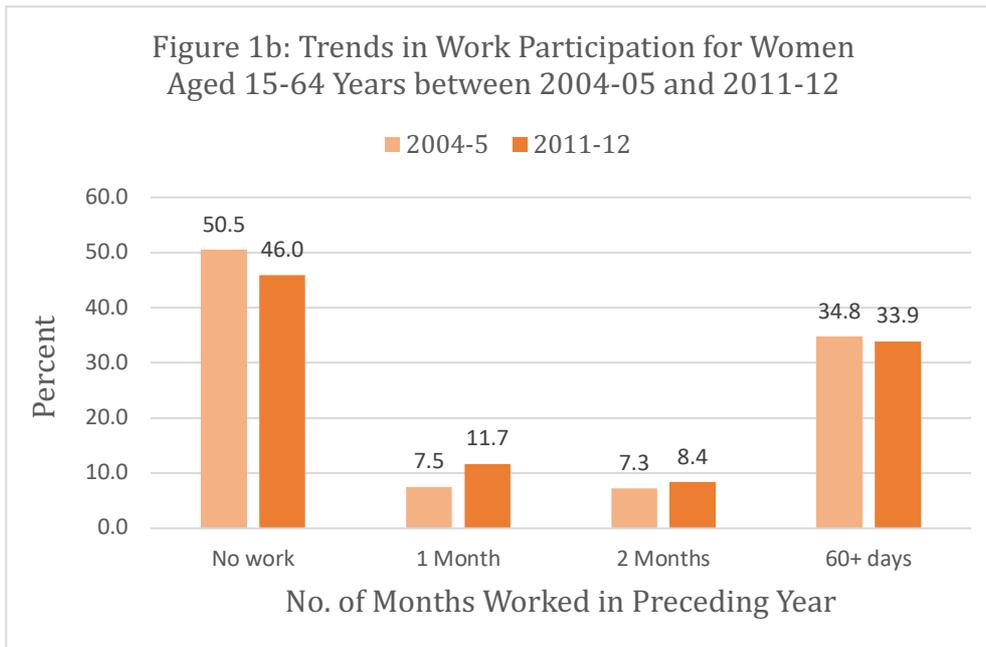
The control variables include marital status, age of the individual, caste and religion, land ownership, education of the individual, highest education level of any household adults, and whether individuals live in a village that has relatively low infrastructure facilities.

Descriptive Statistics:

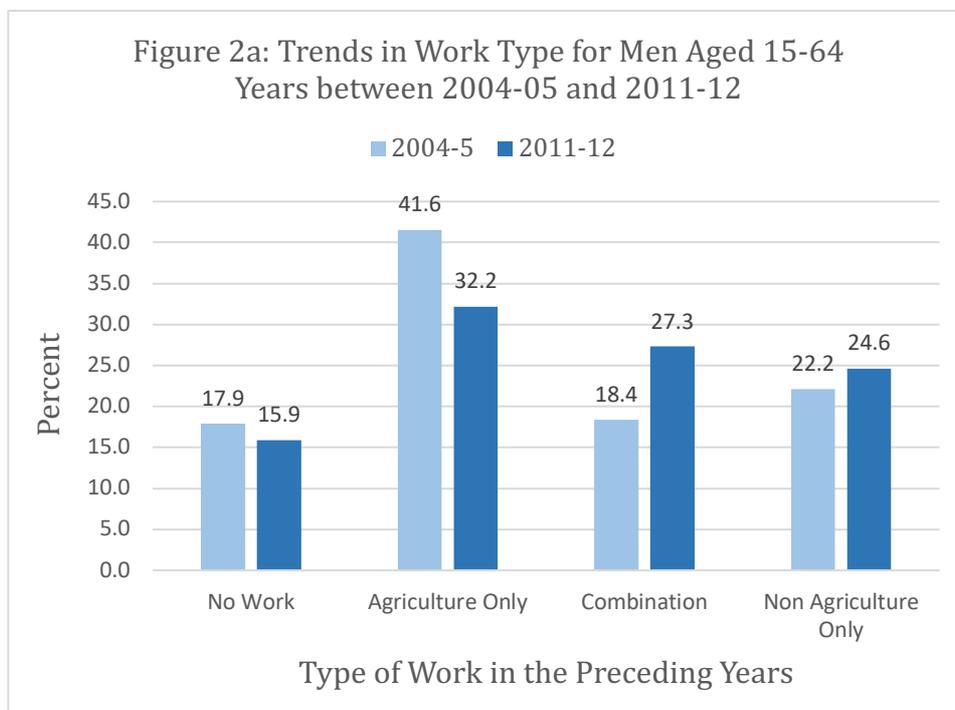
Work Participation:

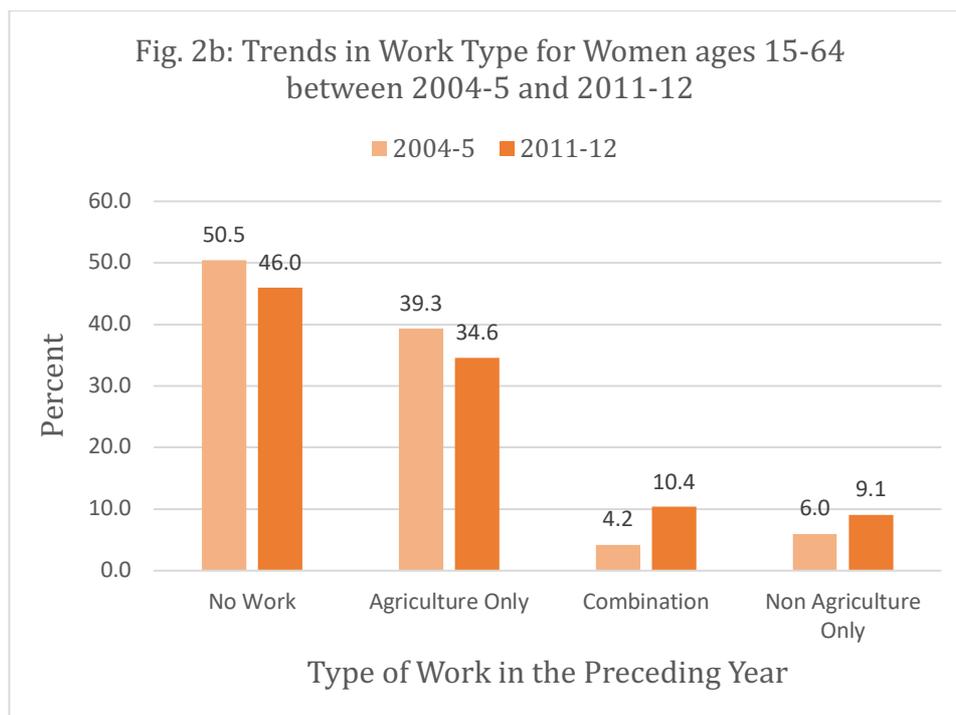
Figures 1 and 2 describe changes in the labor market participation of men and women aged 15-64 years between 2004-05 and 2011-12. Figures 1a and 1b show that if we do not limit ourselves to the NSSO definition of Principal and Subsidiary Status and focus on any work, even if it is undertaken discontinuously, spread across different activities and done for a short time, the proportion of population that is not employed drops for both men and women, but the decline is larger for women. The increase in women's labor participation comes mostly from the number of women who work for less than a month (increasing from 7.5 per cent to 11.7 per cent) but a small decline in the proportion of women working for at least 60 days. This suggests that the NSS criterion of ignoring short-term work may be missing out some important changes in Indian labor markets, particularly for women.





The other reason behind the under-estimation of work in the NSS may have to do with fragmentation of work. When individuals work in more than one activity and no activity meets the threshold of 30 days, it is possible that enumerators omit these activities from their activity count. Figures 2a and 2b document the considerable increase in the proportion of men and women who undertake both agricultural and non-agricultural work.





These observations are borne out by the data presented in Table 1. This table documents the decrease in the proportion of men and women who are out of the workforce. It also documents an overall decline in the number of days worked by each participant with the decline being the largest in agricultural work, whether the latter was working on the family farm or as a laborer on the farms owned by other farmers. But the results also show some sharp differences in the work patterns of men and women between the two surveys. Both men and women are less likely to work as agricultural laborers in 2011-12 than they were in 2004-5, and perhaps to make up for the declining use of hired labor, they increase their participation in work on family farms. However, this increase is greater for women than for men. In family business also, women have a larger increase in participation than men. In contrast, men have sharply increased their participation in non-farm wage labor, a trend not visible for women if exclude MGNREGA work. The impact of the introduction of MGNREGA is visible in Table 1 where men's participation in MGNREGA increase from no participation in pre implementation era to 12 per cent men and 9 per cent women undertaking MGNREGA work.

[Table 1 about here]

Participation in MGNREGA:

Although MGNREGA is supposed to offer 100 days of work to any household that demands work, the actual availability of work is considerably lower with less than 5 per cent of the IHDS households being able to get full 100 days of work (Desai, Vashishtha, and Joshi 2015). The issue of work rationing in MGNREGA has been extensively

documented (Dutta et al. 2012, Das 2015). State level policies determine MGNREGA implementation but there is considerable local variation in it, frequently due to the lack of capacity on the part of village officials and sometimes due to the pressure exerted by large farmers to ensure a continuous supply of agricultural work without competition from MGNREGA. While this posits an unfortunate situation for households seeking funds, it allows us to examine the role of MGNREGA in increasing women’s economic empowerment at different levels of MGNREGA implementation.

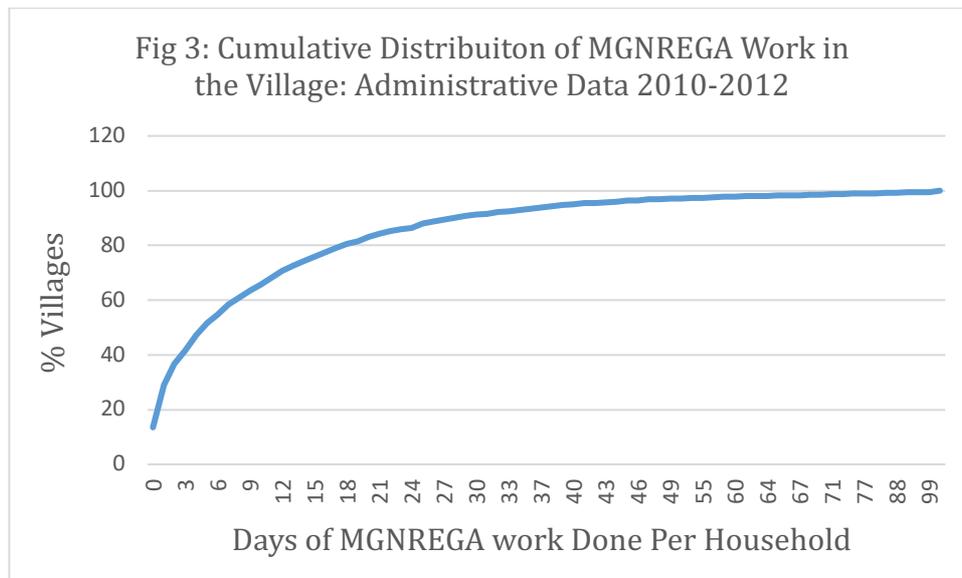


Figure 3 plots the cumulative distribution of per household MGNREGA work in the IHDS households. The results show that 17 per cent of the villages had no allocation of MGNREGA work at all, while an additional 30 per cent allocated less than one day of work per household. Of course, for individuals who participated in MGNREGA, the average number of days worked will be higher. Table 2 provides descriptive statistics for MGNREGA participants and non-participants in 2011-12. On an average, MGNREGA participants are slightly older and less educated than the non-participants, and tend to come from Dalit or Adivasi backgrounds.

[Table 2 about here]

Multivariate Results:

The goal of this paper is examine the role that the availability of MGNREGA work plays in shaping women’s economic empowerment. We do not examine the direct impact of MGNREGA since that is endogenous. However, since MGNREGA is a demand-driven program, it is hard to rule out the role of individual demand and endogenous program placement that afflicts many other areas of research (Angeles, Guilkey, and Mroz 1998). We argue, however, that two aspects of our strategy shield us somewhat from this challenge. First, we focus on before and after program implementation in the same villages. This difference-in-difference allows us to take into account the pre-existing differences between MGNREGA and non-MGNREGA villages. Second, we

compare men and women in the same villages, allowing us to test the relationship between MGNREGA-induced labor market changes for men and women, and economic empowerment. If we find a stronger impact for women than for men, we can argue that MGNREGA fills a niche that allows women with the latent demand for paid work to meet their needs.

[Table 3 about here]

Table 3 presents results from the random effects logistic regression model estimated with STATA with participation in paid work as the dependent variable. The results show that the participation of men and women in paid work increased between 2004-05 and 2011-12, with the increase being slightly greater for women. Villages that have a greater allocation of MGNREGA work also seem to be villages where paid labor was higher even before MGNREGA was implemented, that is, at the time of the 2005 survey. However, over and above these spatial and secular effects, participation in paid work increased at a greater pace in villages with greater MGNREGA implementation than in those with lower implementation, but this relationship is statistically significant only for women. The difference in this interaction term between men and women is statistically significant at the 0.001 level in pooled models (not reported here). This suggests that the expansion of opportunities due to MGNREGA draws those women into paid labor who might have otherwise continued to work on family farms. Other research based on IHDS data documents that nearly 45 per cent of the MGNREGA women workers worked on family farms during the preceding wave of IHDS.

While MGNREGA is the primary independent variable of interest in this paper, some of the other effects on participation in paid labor are also interesting. As documented by the other studies, education seems to be associated with lower participation in paid work for both men and women in rural India, and as Pieter and Klasen (2012) note, it is only at the highest level of education that we see women being pulled into paid work. Landowners are far more likely to work on their own farms than in wage and salary work. Dalits and Adivasis are substantially more likely to work as farm laborers and manual non-agricultural laborers and individuals from the forward castes, and this relationship is particularly strong for women.

It is important to remember that these models contain random errors for both villages and states. The proportion of total variance explained by the village of residence is far greater than that explained by the state of residence, suggesting strong local effects on labor force participation. The place of residence has a far greater impact on the work participation rates of women than on those of men, a result that will not surprise researchers familiar with stark differences in gender systems across different parts of India (Dyson and Moore 1983, Jejeebhoy and Sathar 2001).

[Table 4 about here]

Table 4 presents the relationship between village level MGNREGA work allocation and the log of annual wage income for all individuals aged 15-64 years. Incomes are presented in 2011-12 constant rupees and set to 0 for those who did not participate in wage labor. The results show that wage incomes for both men and women increased between 2004-05 and 2011-12, and that this increase is statistically

significant. Villages with greater MGNREGA allocation seem to have higher wage incomes for men and women even before MGNREGA was allocated, possibly reflecting higher pre-existing levels of participation in paid work. However, the interaction between the survey period and MGNREGA allocation in the village shows contradictory effects for men and women. The relationship between the survey period and MGNREGA availability is non-significant for men and the coefficient is negative. In contrast, the wages for women in villages with higher levels of MGNREGA work availability grew over time, and this increase is statistically significant at the 0.001 level. The interaction term for gender*survey*MGNREGA availability is statistically significant in a pooled model.

A number of studies based on the Maharashtra Employment Guarantee Scheme, the predecessor of MGNREGA, as well as on studies based on the early years of MGNREGA implementation, which rely on the phased roll-out of MGNREGA, suggest that the presence of public works employment tightens the labor markets and leads to an increase in wages (Datt and Ravallion 1994, Imbert and Papp 2011). However, the IHDS fails to support this. Despite some disagreement (Schultz 1967) most scholars of the Indian economy since B.S. Ambedkar and V.K.R.V. Rao have argued that rural India suffers from disguised unemployment (Krishnamurthy 2008, Bhagwati and Chakravarty 1969). If this is the case, public works employment that covers only part of the year should cause neither tightening of the labor market nor an increase in wages. And reducing disguised employment should not affect the market labor supply. The average increase in the household income of Rs. 4,000 from MGNREGA work for one in four rural households (Desai, Vashishtha, and Joshi 2015) can hardly create substantial changes in the wage structure of the rural economy, nor is it substantial enough to put individuals above a threshold where leisure is more valuable than work.

[Table 5 about here]

The results presented in Table 5 suggest that a higher allocation of MGNREGA work raises market wages (excluding MGNREGA) for men but this relationship is not statistically significant for women. This suggests that presence of MGNREGA program does little to reduce the availability of women for other work. This is consistent with the argument that there is substantial underemployment among rural women and introduction of public works programs is not sufficient to eliminate this underemployment. Studies using IHDS that examine individual MGNREGA participants' work in 2004-5 and 2011-12 find that about 45 per cent of MGNREGA participating women were not in paid labor before the program came into being, possibly because demand for female labor was low in the village.

[Table 6 about here]

If this is the case, then women's rising wage income in the presence of MGNREGA is almost exclusively due to higher work participation by women rather than rising wages. Table 6 suggests the plausibility of this explanation. Here we estimate the household level fixed effects models for 2004-05 and 2011-12, and find that though in the overall household decision making process, women are far less likely to be chosen to participate in the paid labor than men, this negative effect is moderated in villages with greater allocation of MGNREGA days. Villages that have achieved a strong

implementation of the MGNREGA program are different in IHDS Wave I, even before the Act was passed, but by Wave II, the relationship between MGNREGA allocation and female work participation had nearly doubled, with households living in the high program implementation area being far more likely to favor women's participation in wage labor.

Discussion:

In this paper, we have examined the participation in wage employment and incomes of rural Indian men and women in the presence of different levels of MGNREGA work allocation in their respective villages. The results show that the primary impact of MGNREGA implementation is to increase women's participation in paid work, and thereby to increase their incomes, though a similar impact is not found for men. This suggests that the demand for labor may be a bigger constraint on women's work participation in India than labor supply. This observation is buttressed by the fact that nearly two-thirds of the women who are not currently employed report that if suitable work were available, they would be willing to work and their family members would not object to this decision.

Results presented in this paper raise a broader issue. We tend to think of men's and women's labor force participation decisions as being independent. However, families balance the time different individuals spend in market and non-market activities and in farming, wage labor and family business in a way that maximizes overall family income (Desai and Jain 1994). Consequently, when wages for agricultural and non-agricultural laborers are rising, it may make sense for some of the family members to participate in wage work and for others to concentrate on working on family farms and in family business. If men's market wages far outpace women's market wages, it would make sense from a family perspective for women to work in family business and on family farms and for men to engage in paid employment. However, this exclusion from earning independent income reduces women's bargaining power in the household (Agarwal 1997, Dwyer and Bruce 1988) and while family's overall access to resources may increase, women's own control over resources may decline. By ensuring equal wages to men and women, MGNREGA created a climate in which households are less likely to designate men as wage earners and women as helpers in family enterprises.

One caveat must be kept in mind. MGNREGA is a demand-driven program. The higher the demand for work, the greater would be the likelihood of the program to provide work. Hence, MGNREGA allocation is not strictly exogenous. Nonetheless, the fact that the availability of work mobilizes women who were not in the paid labor force in Wave I is quite an achievement. It suggests that responding to women's needs by expanding work opportunities is likely to mobilize more women to enter the workforce, thereby increasing their wage incomes. This is a very different story from the labor force withdrawal story that is being told on the basis of the NSS data. It suggests that the demand for labor is a bigger bottleneck than the restriction of labor supply imposed by cultural forces.

In addition to addressing the role of public works program in shaping women's participation in paid work, this paper also sheds some light on the mystery of declining female labor force participation rates in India. Our results suggest that although there are changes in rural women's employment in India, the net employment is a function of two divergent trends. First, if we move beyond the somewhat restrictive definition used by the NSS, more women are participating in the work force in 2011-12 than in 2004-5. However, their work is more fragmented and for short duration which may be easy to overlook in NSS type design that is fairly structured in what is counted as work. The decline that NSS has captured is real, however. Even IHDS with its more expansive definition finds that there is a distinct trend towards decline in number of days worked in a year for working men and women, particularly women. It is clear that MGNREGA is not able to offer the full 100 days of work to households and as a result, while it brings women into the labor force, it only offers a few days of work.

Work in Progress:

This extended abstract is based on work in progress. Future work on this paper includes completion of linkages between administrative and survey data for Tamil Nadu and estimation of individual level fixed effects models. Both of these tasks are easily feasible, we have been promised cooperation by Ministry of Rural Development to help with completion of the administrative linkages and estimation of individual level fixed effects models is relatively straightforward and preliminary results support the arguments presented above.

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Tables

Table 1: Change in Work Pattern between 2004-05 and 2011-12, Men and Women Aged 15-64 Years

	Men		Women	
	2004-05	2011-12	2004-05	2011-12
Percent Participating				
Not working	17.3	15.6	50.7	46.0
Work on own farm	48.6	50.6	34.6	37.5
Work on family business	11.5	10.0	3.1	4.0
Agricultural labor	24.8	21.6	17.4	16.6
Nonagricultural daily labor	20.2	24.6	4.5	3.9
Work on monthly salary	10.4	11.4	2.5	3.3
Work in MGNREGA	0.0	13.0	0.0	8.7
Worked only in agriculture (farmer or laborer)	42.1	32.7	39.7	35.5
Work only for family (on farm or in business)	32.8	28.7	26.8	27.6
All work excluding MGNREGA	82.7	83.8	49.3	52.7
All work including MGNREGA	82.7	84.4	49.3	54.0
Average No. of Days Spent in Preceding Year per Person (Population)				
Work on own farm	49.5	40.8	26.1	21.6
Work on family business	25.6	23.7	5.2	8.1
Agricultural labor	36.5	27.5	21.2	17.0
Nonagricultural daily labor	35.7	44.1	5.7	5.5
Work on monthly salary	26.9	32.1	4.5	7.4
Work in MGNREGA	0.0	3.8	0.0	2.5
Worked only in agriculture (farmer or laborer)	85.7	68.0	47.2	38.5
Work only for family (on farm or in business)	74.3	63.8	31.2	29.6
All work excluding MGNREGA	171.6	165.2	62.4	59.2
All work including MGNREGA	171.6	168.8	62.4	61.6
Average No. of Days Spent in Preceding Year per Participant				
Work on own farm	101.9	80.6	75.2	57.5
Work on family business	223.2	236.7	168.1	204.8
Agricultural labor	147.3	127.5	122.0	102.6
Nonagricultural daily labor	177.1	179.6	126.4	138.9
Work on monthly salary	259.2	280.9	183.5	222.6
Work in MGNREGA		29.5		28.5
Worked only in agriculture (farmer or laborer)	139.7	111.9	107.3	84.1
Work only for family (on farm or in business)	134.2	113.3	85.2	73.6
All work excluding MGNREGA	207.6	197.2	126.4	112.4
All work including MGNREGA	207.6	200.0	126.4	114.1
Total Sample Size	38949	41053	38629	43113

Table 2: Characteristics of MGNREGA Male and Female Participants and Non-participants Aged 15-64 Years, IHDS-II, 2011-12

	Males		Females	
	Non-participant	Participant	Non-participant	Participant
Any Paid Work	0.49	1.00	0.19	1.00
Total Earnings	21745	18729	3406	9787
No. of Days of NREGA Work in the Village	10.24	19.15	10.53	22.86
Age	34.16	38.61	34.16	39.51
Marital Status				
Married (Omitted)	0.64	0.84	0.73	0.84
Unmarried	0.34	0.13	0.20	0.04
Widowed/Divorced	0.02	0.03	0.07	0.12
Education of Respondent				
No Schooling (Omitted)	0.20	0.36	0.42	0.69
1-4 Grades	0.08	0.13	0.07	0.08
5-9 Grades	0.39	0.36	0.31	0.19
10-11 Grades	0.16	0.07	0.10	0.03
12th and Some College	0.11	0.05	0.07	0.01
College Graduate	0.07	0.02	0.03	0.00
Highest Education by Any Adult in the Household				
No Schooling (Omitted)	0.16	0.26	0.19	0.33
1-4 Grades	0.06	0.10	0.06	0.09
5-9 Grades	0.34	0.40	0.34	0.36
10-11 Grades	0.16	0.10	0.14	0.10
12th and Some College	0.15	0.08	0.13	0.07
College Graduate	0.14	0.05	0.13	0.04
Caste/Religion				
Forward Caste (Omitted)	0.19	0.11	0.19	0.07
Other Backward Classes (OBCs)	0.37	0.30	0.36	0.37
Dalit (SC)	0.21	0.34	0.21	0.35
Adivasi (ST)	0.11	0.14	0.10	0.15
Muslim	0.11	0.10	0.12	0.04
Christian, Sikh, Jain, etc.	0.02	0.00	0.02	0.01
Land Ownership				
No Land (Omitted)	0.39	0.34	0.39	0.41
Marginal (< 1 Hectare)	0.38	0.47	0.40	0.39
Small (1-1.99 Hectares)	0.12	0.12	0.11	0.12
Medium/Large (2+Hectares)	0.11	0.07	0.10	0.08
Household Size	5.84	5.23	5.86	4.93
No. of Children in the Household	1.50	1.61	1.69	1.52
Less Developed Village	0.53	0.70	0.55	0.62
Sample Size	36543	4510	39626	3487

Table 3: Availability of MGNREGA Work and Participation in Wage Labor Results from Random Effects Logit Model, Men and Women Aged 15-64 Years

Variable	Men		Women	
	Coeff.	SE	Coeff.	SE
Survey Wave 2	0.332 ***	0.020	0.329 ***	0.025
No. of Days of NREGA Work in the Village	0.006 ***	0.001	0.007 ***	0.002
Survey*NREGA days	0.001	0.001	0.009 ***	0.001
Age	-0.022 ***	0.001	-0.002 *	0.001
Marital Status (Married Omitted)				
Unmarried	-1.681 ***	0.027	-0.703 ***	
Widowed/Divorced	-0.557 ***	0.059	0.132 ***	
Education (None omitted)				
1-4 Grades	-0.109 ***	0.038	-0.121 **	
5-9 Grades	-0.339 ***	0.029	-0.540 ***	0.030
10-11 Grades	-0.669 ***	0.037	-0.897 ***	0.052
12th and Some College	-0.669 ***	0.044	-0.538 ***	0.064
College Graduate	0.059	0.056	0.515 ***	0.083
Household Education (None omitted)				
1-4 Grades	-0.026	0.044	-0.162 ***	
5-9 Grades	-0.142 ***	0.031	-0.438 ***	0.029
10-11 Grades	-0.235 ***	0.038	-0.707 ***	0.040
12th and Some College	-0.342 ***	0.041	-0.813 ***	0.044
College Graduate	-0.621 ***	0.048	-0.967 ***	0.053
Caste/Religion (Forward Caste Omitted)				
Other Backward Classes (OBCs)	0.182 ***	0.027	0.390 ***	0.036
Dalit (SC)	0.874 ***	0.030	0.992 ***	0.038
Adivasi (ST)	0.769 ***	0.042	1.032 ***	0.049
Muslim	0.156 ***	0.043	-0.090	0.057
Christian, Sikh, Jain, etc.	-0.312 ***	0.068	0.096	0.100
Land Ownership (None Omitted)				
Marginal (< 1 Hectare)	-0.526 ***	0.022	-0.383 ***	
Small (1-1.99 Hectares)	-1.133 ***	0.029	-0.754 ***	0.036
Medium/Large (2+Hectares)	-1.814 ***	0.033	-1.447 ***	0.042
Household Size	-0.075 ***	0.005	-0.126 ***	0.006
No. of Children in the Household	0.093 ***	0.009	0.161 ***	0.010
Less Developed Village	0.113 ***	0.034	0.157 ***	0.048
Constant	2.143	0.095	-0.796 ***	0.215
Level 3 (State) Variance	0.100	0.034	0.829	0.266
Level 2 (Village State) Variance	0.217	0.013	0.498	0.027
Likelihood Ratio Test vs. Logistic model	2590 ***		9578 ***	
ICC				
State	0.028		0.179	
Village State	0.088		0.287	
Sample Size	79784		81431	

Table 4: Availability of MGNREGA Work and Log of Annual Wage Income Results from Random Intercept Model, Men and Women Aged 15-64 Years

	Men		Women	
	Coeff.	SE	Coeff.	SE
Survey Wave 2	0.727 ***	0.039	0.384 ***	0.030
No. of Days of NREGA Work in the Village	0.010 ***	0.002	0.008 ***	0.002
Survey*NREGA days	-0.003	0.002	0.013 ***	0.002
Age	-0.040 ***	0.002	-0.003 *	0.001
Marital Status (Married Omitted)				
Unmarried	-3.389 ***	0.049	-0.793 ***	0.039
Widowed/Divorced	-1.103 ***	0.115	0.381 ***	0.048
Education (None omitted)				
1-4 Grades	-0.154 *	0.072	-0.145 ***	0.050
5-9 Grades	-0.522 ***	0.055	-0.638 ***	0.036
10-11 Grades	-1.100 ***	0.070	-0.857 ***	0.053
12th and Some College	-1.059 ***	0.083	-0.446 ***	0.066
College Graduate	0.478 ***	0.105	0.633 ***	0.093
Household Education (None omitted)				
1-4 Grades	-0.031	0.082	-0.258 ***	0.055
5-9 Grades	-0.223 ***	0.058	-0.747 ***	0.038
10-11 Grades	-0.383 ***	0.072	-1.069 ***	0.048
12th and Some College	-0.601 ***	0.077	-1.139 ***	0.052
College Graduate	-1.002 ***	0.088	-1.123 ***	0.057
Caste/Religion (Forward Caste Omitted)				
Other Backward Classes (OBCs)	0.332 ***	0.052	0.285 ***	0.040
Dalit (SC)	1.662 ***	0.057	1.108 ***	0.044
Adivasi (ST)	1.379 ***	0.078	1.392 ***	0.062
Muslim	0.298 ***	0.082	-0.236 ***	0.064
Christian, Sikh, Jain, etc.	-0.658 ***	0.126	0.428 ***	0.099
Land Ownership (None Omitted)				
Marginal (< 1 Hectare)	-1.269 ***	0.042	-0.631 ***	0.032
Small (1-1.99 Hectares)	-2.494 ***	0.056	-1.076 ***	0.043
Medium/Large (2+Hectares)	-3.613 ***	0.058	-1.730 ***	0.046
Household Size	-0.136 ***	0.009	-0.116 ***	0.007
No. of Children in the Household	0.181 ***	0.016	0.164 ***	0.012
Less Developed Village	0.139 *	0.063	0.237 ***	0.062
Constant	9.140	0.171	3.271	0.272
Level 3 (State) Variance	0.319		1.315	
Level 2 (Village State) Variance	0.760		0.894	
Residual Variance	19.228		11.283	
Likelihood Ratio Test vs. Logistic model	2450 ***		10275 ***	
ICC				
State	0.016		0.097	
Village State	0.053		0.164	
Sample Size	79784		81431	

Income set to 0 for non-workers

**Table 5: Availability of MGNREGA Work and Log of Non-NREGA Daily Wage Income
Results from Random Effects Model, Men and Women Aged 15-64 Years**

	Men		Women	
	Coeff	SE	Coeff	SE
Survey Wave 2	0.250 ***	0.006	0.303 ***	0.009
No. of Days of NREGA work in village	-0.003 ***	0.000	-0.001	0.001
Survey*NREGA days	0.001 ***	0.000	-0.001	0.000
Age	0.005 ***	0.000	0.002 ***	0.000
Marital Status (Married Omitted)				
Unmarried	-0.087 ***	0.008	-0.072 ***	0.013
Widowed/Divorced	-0.060 ***	0.018	0.003	0.011
Education (None omitted)				
1-4 Grades	0.051 ***	0.011	0.011	0.013
5-9 Grades	0.123 ***	0.009	0.040 ***	0.011
10-11 Grades	0.226 ***	0.012	0.114 ***	0.020
12th and Some College	0.283 ***	0.016	0.380 ***	0.025
College Graduate	0.484 ***	0.020	0.648 ***	0.032
Household Education (None omitted)				
1-4 Grades	-0.006	0.012	0.000	0.012
5-9 Grades	-0.003	0.009	0.012	0.009
10-11 Grades	0.023	0.012	0.011	0.014
12th and Some College	0.033 *	0.014	0.017	0.016
College Graduate	0.231 ***	0.017	0.171 ***	0.021
Caste/Religion (Forward Caste Omitted)				
Other Backward Classes (OBCs)	-0.062 ***	0.009	0.009	0.014
Dalit (SC)	-0.077 ***	0.009	0.019	0.014
Adivasi (ST)	-0.082 ***	0.012	0.017	0.016
Muslim	-0.047 ***	0.014	-0.019	0.022
Christian, Sikh, Jain, etc.	-0.032	0.024	0.064	0.042
Land Ownership (None Omitted)				
Marginal (< 1 Hectare)	-0.038 ***	0.006	-0.002	0.008
Small (1-1.99 Hectares)	0.021 *	0.010	0.032 **	0.012
Medium/Large (2+Hectares)	0.078 ***	0.012	0.054 ***	0.016
Household Size	0.004 *	0.002	0.004	0.002
No. of Children in the Household	-0.004	0.003	-0.004	0.003
Less Developed Village	-0.050 ***	0.013	-0.018	0.017
Constant	4.688	0.071	4.320	0.073
Level 3 (State) Variance	0.093	0.031	0.092	0.029
Level 2 (Village State) Variance	0.037	0.002	0.060	0.003
Residual Variance	0.238	0.002	0.184	0.002
Likelihood Ratio Test vs. Linear model	10362 ***		4743 ***	
ICC				
stateid2	0.253		0.274	
idpsustateid2	0.354		0.454	
Sample Size	40427		18474	

Sample restricted to employed individuals.

Table 6: Household Fixed Effects Logistic Regressions for Men and Women Aged 15-64 Years, 2004-05 and 2011-12

	2004-05		2011-12	
	Coef.	Std. Err.	Coef.	Std. Err.
Female	-2.327 ***	0.034	-2.357 ***	0.030
Female*NREGA Days	0.011 ***	0.001	0.019 ***	0.001
Marital Status (Married Omitted)				
Unmarried	-1.919 ***	0.044	-1.638 ***	0.036
Widowed/Divorced	-0.443 ***	0.067	-0.107	0.055
Education (None omitted)				
1-4 Grades	-0.096	0.052	0.077	
5-9 Grades	-0.108 **	0.040	-0.162 ***	0.034
10-11 Grades	-0.082	0.056	-0.443 ***	0.047
12 th and Some College	0.004	0.072	-0.295 ***	0.054
College Graduate	0.699 ***	0.088	0.468 ***	0.069
Age	-0.011 ***	0.001	-0.005 ***	0.001
Likelihood Ratio	11885 ***		13730 ***	
DF (10)				
No. of Households	12090		13240	

Fixed effects models are estimated only on households in which there is variation in paid work participation.

Appendix Table 1: Distribution of Independent and Dependent Variables for Men and Women Aged 15-64 Years

	Men		Women	
	2004-05	2011-12	2004-05	2011-12
Any Paid Work	0.50	0.56	0.23	0.26
Total Earnings (in 2011-12 constant Rs.)	15251	21352	2640	3959
No. of Days of NREGA Work in the Village	10.97	11.40	11.14	11.60
Age	33.66	34.74	33.53	34.62
Marital Status				
Married (Omitted)	0.67	0.67	0.75	0.74
Unmarried	0.31	0.31	0.18	0.18
Widowed/Divorced	0.02	0.02	0.07	0.08
Education of Respondent				
No Schooling (Omitted)	0.27	0.22	0.54	0.44
1-4 Grades	0.11	0.09	0.08	0.07
5-9 Grades	0.37	0.38	0.26	0.30
10-11 Grades	0.13	0.15	0.07	0.10
12th and Some College	0.07	0.10	0.03	0.06
College Graduate	0.05	0.06	0.02	0.03
Highest Education by Any Adult in the Household				
No Schooling (Omitted)	0.22	0.17	0.24	0.20
1-4 Grades	0.09	0.07	0.09	0.07
5-9 Grades	0.34	0.35	0.34	0.34
10-11 Grades	0.14	0.15	0.13	0.14
12th and Some College	0.10	0.14	0.10	0.13
College Graduate	0.10	0.13	0.10	0.12
Caste/Religion				
Forward Caste (Omitted)	0.18	0.18	0.18	0.18
Other Backward Classes (OBCs)	0.37	0.36	0.37	0.36
Dalit (SC)	0.23	0.23	0.22	0.23
Adivasi (ST)	0.10	0.11	0.09	0.10
Muslim	0.11	0.11	0.11	0.11
Christian, Sikh, Jain, etc.	0.02	0.02	0.02	0.02
Land Ownership				
No Land (Omitted)	0.38	0.38	0.38	0.40
Marginal (< 1 Hectare)	0.33	0.39	0.34	0.40
Small (1-1.99 Hectares)	0.13	0.12	0.13	0.11
Medium/Large (2+Hectares)	0.16	0.11	0.15	0.10
Household Size	6.56	5.76	6.58	5.78
No. of Children in the Household	2.02	1.52	2.17	1.67
Less Developed Village	0.54	0.55	0.54	0.55
Sample Size	38,949	41,053	38,629	43,113