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An Indian Enigma? Labour Market Impacts of the World's Largest Livelihoods Program^{*}

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Abstract

We examine the labour market impacts of the largest livelihoods programs in the world, India's Deendayal Antyodaya Yojana- National Rural Livelihoods Mission (DAY-NRLM). A key aspect of this program is to mobilize rural women into self-help groups (SHGs). We combine administrative data on SHG membership across districts in India with survey micro-data on labour force and employment outcomes of rural women between 2011 and 2019. Using a generalized difference-in-differences approach, we find that SHG membership is positively associated with labor force participation and employment of rural women. We also find evidence that SHG membership is associated with a shift towards self-employment and a crowd-out of casual work among the employed. Our supplementary analysis based on large primary survey data from Maharashtra allows us to examine the relationship between SHG membership and economic activity at the individual level. This confirms our main results of a positive association between SHG membership and economic activity. Further, we show that longer duration of SHG membership is associated with higher participation rates.

JEL Codes: O20, O22, J16

Keywords: Self-Help Groups, Labor Force Participation, Employment, India

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1 Introduction

The theory of change underlying global livelihoods programs and microcredit interventions outlines several positive impacts, including economic empowerment through increased employment and incomes (Brody et al., 2015, 2017). This is expected as livelihoods interventions ease credit and information constraints, promote asset creation, and/or provide skilling opportunities. This can lead to increased levels of self-employment, entrepreneurial activity, and employment or labor force participation. Therefore, enrollment in livelihoods programs should be positively correlated with labor force participation rates and employment.

The contemporary Indian program, called Deendayal Antyodaya Yojana-National Rural Livelihoods Mission (DAY-NRLM), launched in 2011, is a renamed and expanded version of earlier rural livelihoods programs, which have been running in the country for over four decades. The program has seen a continuously rising enrollment over time, with a current mobilization of over 74 million women, a number higher than the combined population of Australia and Canada (Deshpande, 2022). DAY-NRLM is unique and unprecedented in its coverage and aims. It works via mobilizing women into Self-Help Groups (SHGs) aimed at creating or enhancing livelihood/income-generation opportunities through facilitating self-employment. The one-sentence mission statement of the NRLM states: “To reduce poverty by enabling the poor households to access gainful self-employment and skilled wage employment opportunities, resulting in appreciable improvement in their livelihoods on a sustainable basis, through building strong grassroots institutions of the poor.”¹

However, official labor force statistics from the National Statistical Office (NSO) reveal that female labor force participation (FLFP) declined between 2004 and 2018-19. This was driven by a decline in rural FLFP from 49 percent in 2004-05 to 25 percent in 2017-18, while urban FLFP remained stagnant at roughly 20 percent. Let us call this Stylised Fact 1 about Indian women, which is worrying, and has justifiably attracted a fair deal of attention. See, for instance, Mehrotra and Parida (2017); Afridi et al. (2018); Andres et al. (2017); Klasen and Pieters (2015), among others discussed below. This was observed along with rising enrolment in DAY-NRLM, or Stylised Fact 2. We call the conundrum of simultaneously observing both stylised facts in the macro data “The Indian Enigma”, and offer an explanation for the two trends that appear to be contradictory *prima facie*.

¹<https://www.myscheme.gov.in/schemes/day-nrlm>

While there is a large body of literature on each of the stylised facts individually, it is surprising that barring a handful of papers with small samples focusing on selected states ([Garikipati, 2012](#); [Kochar et al., 2022](#); [Pandey et al., 2019](#)), there is no nationwide, longitudinal assessment of the relationship between SHG enrolment under DAY-NRLM and FLFP or type of employment. To the best of our knowledge, ours is the first paper to empirically examine this relationship.

We use unit-level data on LFP and district-level data on NRLM enrollment to examine the relationship between SHG membership and FLFP, total employment, and the type of employment for working age women in rural India. Using a generalized difference-in-differences framework, we find a positive relationship between SHG enrolment in a district and FLFP: a ten percentage point increase in the share of households with an SHG member in a district is associated with a 1.4 percentage point increase in FLFP. This represents a 3.7 percent increase over the 2011 baseline district-level FLFP. We find that this increased FLFP, i.e., increase in the extensive margin, reflects higher employment probabilities and lower unemployment. Focusing only on employed women, we find that higher SHG enrolment is associated with an increase in the share of self-employment and a shift away from casual labour, in line with the program objectives. Thus, we find no conundrum: higher program concentration is associated with greater FLFP. Our results suggest that the decline in FLFP observed in the macro data could have been worse in the absence of NRLM.

The identification strategy in our main analysis exploits the temporal and spatial variation in SHG membership – over years and across districts in India. However, the labor market surveys used to construct our main outcomes do not contain data on the SHG membership status of individual women. To address this, we conduct a supplementary analysis on the impacts of SHG membership (and duration of membership) on women’s participation in economic activity using data and methods from [Deshpande and Khanna \(2021\)](#). Conducted in 2014-2015, the survey covered nearly 10,000 households across 334 villages in the ten poorest districts in the state of Maharashtra. One of the largest independent primary surveys at the time, these data have detailed information on household and village characteristics. Most importantly, the data have rich information on individual characteristics including data on women’s SHG membership status and duration. Using the entropy balancing technique ([Hainmueller, 2012](#)) which generates weights to achieve balance on all relevant covariates across the treated and control

groups, we can identify average treatment effects of SHG membership and duration. Consistent with our main results, we find that SHG membership is associated with a 3.9 percentage point increase in participation in an economic activity (relative to non-members). We also estimate the effect of membership duration by comparing long term members (above median membership duration) to more recent members (below median duration). Using the same empirical strategy, we find that longer duration is associated with a 4.4 percentage point higher participation rate.

The remainder of this paper is structured as follows: Section 2 presents data and descriptive statistics; Section 3 outlines the empirical strategy and presents the difference-in-differences results, and Section 4 concludes with a discussion.

2 Data and Descriptive Statistics

The main analysis uses two kinds of data: unit-level data on labour force participation and employment outcomes from nationally representative household surveys conducted by India's National Statistical Office, and district-level data on the number of households enrolled in self-help groups under the DAY-NRLM. We also use the 2011 national census data on the number of rural households in each district.

We assess three outcomes: labour force participation (LFP), employment, and employment type. Data on these three variables are from the unit-level data of the 68th round of the Employment-Unemployment Survey (2011-12), and three rounds of the Periodic Labour Force Survey (PLFS) conducted in 2017-18, 2018-19, 2019-20, both under the National Statistical Office (NSO). While our analysis is at the individual level, the treatment variation is at the district-level, since NSO data do not contain information about individual SHG membership. SHG membership figures from the Ministry of Rural Development are available at the district level.² The data on the number of rural households enrolled in self-help groups was collected from the 'Cumulative Progress Report (R24)' under the 'Analytical Reports' section of the NRLM's progress tracking dashboard maintained by the Ministry of Rural Development, Government of India.³ To capture the level of economic development in a state over time, we also obtain data on a state's domestic product from the Reserve Bank of India's Handbook of Statistics on

²In a robustness check (Appendix Tables A.1 and A.2, we find similar results if we do the analysis at a broader geographical level (regions).

³Link to data: <https://nrlm.gov.in/ConsolidatedProgressAction.do?methodName=showDetail>

Indian States.

Our treatment is defined at the district level as the proportion of rural households which are part of NRLM Self Help Groups (SHGs). We have mapped every NRLM district to its equivalent in the NSS, to account for any variations in names and renaming of districts.⁴ This process allows us to create a district-level panel from 2011 to 2020 reflecting the number of rural households mobilised into SHGs. For our analysis, we merged this district-level panel with the unit-level employment data from the PLFS and NSS.

Our population of interest is working-age women living in rural areas between the ages of 15 to 59. Our final sample consists of 322,137 working-age rural women surveyed over four survey rounds (2011-12, 2017-18, 2018-19, and 2019-20) from 606 districts for which data on SHG membership is available. All summary statistics and regression estimates use sampling weights from the respective surveys.

The recorded enrolment rates for NRLM SHGs appear very low in 2011 (left panel of [Figure 1](#)), with only a few districts showing more than 1% enrolment.⁵ However we should note that the DAY-NRLM, officially launched in 2011, started as a renaming of a pre-existing rural livelihoods scheme called the Swarnajayanti Gramin Swarozgar Yojana (SGSY). Pre-existing SHGs under SGSY and other local schemes were “onboarded” under the DAY-NRLM umbrella within the first year of the program. Thus, the low initial numbers also reflect the delays in the process of onboarding or re-designating SHGs under the DAY-NRLM program. To account for this procedural delay, we measure baseline SHG membership for the first year in our data by using program data from June 2012. For subsequent years, we use SHG membership data at the beginning of the month the labor market surveys are conducted.

Over time, the program and enrolment has expanded substantially with several districts at 20-30 percent enrolment and a few crossing the 50 percent mark, as evident from the right panel of [Figure 1](#). Summary statistics in [Table 1](#) show that mean enrolment

⁴The one major challenge to this mapping was the creation of new districts in Telangana as a part of the erstwhile Andhra Pradesh state splitting into Andhra Pradesh and Telangana. We have dealt with this challenge by mapping newer districts to older districts from which they were split, to maintain consistency in the data, effectively mapping everything back to NSS 2011. See [Appendix B](#) for details.

⁵Notable exceptions to this are districts in the southeastern region of the country, especially in the state of Andhra Pradesh. This state and a few other regions had a significant presence of Self-Help Groups even before the NRLM program began.

in 2011 was only 6 percent. By 2017, about 19.5 percent of rural households in a district had an SHG member, and this increased to over 30 percent in 2019. The median value in 2019 was somewhat lower at 23.6 percent.

Next, we turn to the main outcomes of interest in Panel B of [Table 1](#). We show trends in labor force participation, unemployment, employment, and the three main sub-categories of employment: regular wage work, self-employment, and casual labour.⁶ The labour force participation rate of rural women was close to 38 percent in 2011, and dropped quite sharply to 26.3 percent in 2017.⁷ In the next two years, it rose again to 28.2 percent in 2018, increased further to 35.4 percent in 2019-20, mainly due to increase in women's role as "unpaid helpers"⁸, before registering a slight decline in 2021-22. The next row shows that these trends were largely driven by changes to employment, though unemployment rates also increased from 1.7 percent in 2011 to nearly 4 percent in 2017, before falling again to 2.8 percent in 2019.

We take 2011 as the baseline year because that is the official start year for NRLM. The decline in FLFP between 2011 and 2017 is actually a continuation of a trend that started in 2004. Whether this decline represents a genuine decline, i.e., withdrawal of women from the labour force has been debated. We briefly discuss this debate in Section 5.

The last three rows of Panel B show that the majority of employed women in rural India are self-employed. In 2019, over 62% of employed women were self-employed, 27.4% were engaged in casual labour, and about 10% were in regular wage work. Broadly speaking, between 2011 and 2019, there has been a shift away from casual labor to regular wage work and self-employment.

Our supplementary analysis uses data from [Deshpande and Khanna \(2021\)](#). Conducted in 2014-2015, the primary survey covered nearly 10,000 households across the 10 poorest districts of Maharashtra. For this paper, the key outcome variable of interest is constructed from the question "Was the individual involved in any income generating activity during the last one year?". We find that around 64 percent of the women in the sample participate in an economic activity.⁹ We also have information on

⁶Labour force and employment statuses are assigned based on the time spent in activities the previous year (referred to as the "principal" status). As an alternative, we also construct outcomes using the current weekly status (based on the survey week). This yields qualitatively similar results (Appendix Table A.3)

⁷There is a debate about the factors underlying these trends, summarised in [Deshpande and Singh \(2023\)](#)

⁸<https://thewire.in/women/women-labour-force-india-growth>

⁹These are much higher due to the particular nature of the sample which was focused on the rural poor.

the individual SHG membership status of women, and on membership duration for those who are members. About 77 percent of women are non-members and 23 percent are SHG members. The median duration of SHG membership is 33 months (nearly three years). When defining our (binary) duration treatment, we consider those with above median duration as long duration members.

3 Empirical Strategy and Difference-in-Differences Results

We estimate the effects of SHG membership on female labour force participation using a generalized difference-in-differences approach. Our treatment of interest is measured as the share of households enrolled in SHGs in each district for each year. We estimate a Linear Probability Model which takes the form:

$$y_{idt} = \alpha + \beta \cdot SHG_{dt} + \gamma \cdot SDP_{dt} + \mu_d + \eta_t + \epsilon_{idt} \quad (1)$$

Here, y_{idt} is the outcome variable for individual i in district d for year t : whether the individual is in the labour force, whether the individual is employed, or the type of employment (regular wage, casual labour, or self-employment). μ_d and η_t are district and year fixed effects, respectively. SHG_{dt} is the treatment variable reflecting the percentage of households enrolled in DAY-NRLM Self-Help Groups for district d in year t , and β is our coefficient of interest. SDP_{dt} is an additional control for the State Domestic Product in year t for the state to which district d belongs. In some specifications, we also control for a district's prosperity levels by controlling for the mean monthly per-capita expenditure (MPCE), calculated using reported consumption in the household surveys. Our full specification additionally controls for the share of workers engaged in agriculture in each district, to ensure that our results are not driven by time-varying agricultural shocks that could have differential impacts across districts. We cluster standard errors at the district-level to account for district-level heterogeneity in policy implementation.

Table 2 presents the difference-in-differences estimates from Equation 1. The first four columns show results for labor force participation rates using various specifications. We find a strong positive relationship between SHG membership and labor force participation rates of rural women. Our results are significant at the 1% level across specifications. The coefficient from the full specification indicates that a ten percentage point increase in the share of households with a SHG member (in a given district) is

associated with a 1.4 percentage point increase in labor force participation. This effect is a 3.7 percent increase over the 2011 baseline female labor force participation rate. The second panel of the table indicates that SHG membership is associated with higher employment (out of the total adult population of rural women), and this drives the labor force participation result. Our results are robust to specifications which include district level consumption expenditures, agricultural shares, or both. If anything, the point estimates are somewhat larger in the fully saturated model. In the analysis that follows, we only present results from the baseline specification and the fully saturated model.

We dive deeper into this result with further estimation, the results of which are shown in Table 3. Columns 1 and 2 show that SHG membership is positively associated with employment. Thus, in addition to finding extensive margin effects on labor force participation, we also find that SHG enrolment may improve employment probabilities and reduce unemployment. Next, we focus only on employed rural women to examine the relationship between SHG membership and the relative contributions of three major employment types (regular wage, self-employed, and casual labour). These results are presented in Columns 3 through 8 of Table 3. Consistent with program goals, we find that SHG membership is positively associated with the share of the self-employed. SHG membership is also negatively associated with the share of women engaged in casual labour. We do not find any significant impacts of SHG membership on the share of regular wage workers.¹⁰ The coefficients indicate that a 10 percentage point increase in the share of SHG-member households leads to a 1.2 percentage point increase in the share of the self employed, and about a 1 percentage point decrease in the share engaged in casual labour. Results are similar when we compare the saturated model to the baseline estimates.

Finally, since the NRLM intervention was directed at women, as a placebo outcome we also check for effects on labor force participation and employment of men. This also allows us to test for potential spillovers, i.e., the possibility that female LFPR or self-employment affects male employment. We examine these outcomes in Table 4. These estimates are negative, but neither statistically significant, nor large. Thus, we do not find evidence of any significant impact of the program on male labor force participation or employment. This is not unexpected, given the targeted nature of the policy towards women, as well as the norm that men are expected to be the primary breadwinners. The latter implies that men are unlikely to drop out of labor force as women in their

¹⁰By construction, note that coefficients in columns 3, 5, and 7 (and columns 4, 6, and 8) add up to zero.

households enter employment.

Turning to our supplementary analysis, Table 5 presents results for the impact of SHG membership on the likelihood of participating in an income-generating activity using the data and estimation technique in [Deshpande and Khanna \(2021\)](#). Entropy balancing ([Hainmueller, 2012](#)) is a re-weighting technique that assigns a scalar weight to each sample unit, such that the re-weighted groups (treated and control) satisfy a set of balance constraints that are imposed on the sample moments of their covariate distributions. In particular, we balance the groups on a range of individual, household, and village-level characteristics for the first three moments (mean, variance, and skewness).¹¹ In the left panel of Table 5, we use the full sample and define a binary treatment based on SHG membership. The right panel shows results for the alternative definition of treatment, where we focus only on members, and consider duration of membership as a binary treatment (longer versus shorter duration). The sample in the latter case is smaller, as it includes only members, but better addresses the issue of selection on unobservables. The first two rows summarize the weighted proportions for members and non-members (or long and short duration members), with the marginal effect in the third row. The marginal effects represent the average change in the probability associated with the treatment. Effectively, this reflects the coefficient on the SHG treatment dummy in a weighted logistic regression, where the weights have been generated using entropy balancing. Consistent with the main evaluation results for the national program, we find a positive effect of SHG treatment on economic participation. We find that after entropy balancing, members have 3.9 percentage point higher participation than non-members, significant at the 1% level. We also find positive impacts of the duration treatment, with long term members having a 4.4 percentage advantage over comparable short-term members.¹²

4 Discussion and Concluding Comments

Combining administrative data from the Indian Ministry of Rural Development on the DAY-NRLM (the world’s largest and longest running livelihoods program) and unit-level

¹¹Covariates include whether the respondent is the head of household, her years of education, whether she is currently married, her caste group, age, household size, household agricultural land ownership, and the highest level of male education in the household. Village covariates include the gender of the *sarpanch* (head of local council) or *upsarpanch* (deputy head) and whether *sarpanch* belongs to the same caste group as respondent. From the 2011 Census, we also use the caste (SC-ST) proportion in the village, village size as measured by the number of households, and village sex ratio.

¹²For the duration treatment, the entropy weights are re-generated such that the covariate distributions of short-term and long-term members are identical after reweighting.

data on labour force participation and employment from the National Statistical Office (NSO), we provide the first national, longitudinal assessment of the relationship between the spread of SHG membership and female labor force participation. We show that the two are positively correlated in that increases in SHG concentration in a district are associated with higher female LFP. We show that higher LFP reflects higher probability of being employed (and a lower probability of being unemployed) and within employed women, an increase in self-employment and a decline in casual labor.

We have argued that the simultaneous occurrence of Stylised Fact 1 (decline in female LFP) and Stylised Fact 2 (increase in SHG membership) in the macro data is not an enigma or a conundrum. Our results suggest that in the absence of the rural livelihoods program, the decline in FLFP would be even greater. This is because the DAY-NRLM aims to “reduce rural poverty by enabling poor households to access gainful self-employment and skilled wage employment opportunities, resulting in appreciable improvement in their livelihoods on a sustainable basis, through building strong grassroots institutions of the poor.”¹³ Deshpande (2022) elaborates on the multiple components of the program explicitly aimed at boosting livelihoods: tapping opportunities in the farm and non-farm sectors, skill development to access jobs outside one’s village, and nurturing self-employment as well as entrepreneurship. The definitive focus of DAY-NRLM on boosting livelihoods appears to have counteracted the fall in FLFP that would have been larger in the absence of the program for reasons discussed in the literature, which we summarise below.

The literature regards the decline in LFPR of Indian women since 2004 as a puzzle. This is because over the period Indian female LFP has been falling, India has had in place most of the prerequisites that have elsewhere led to an increase in female participation in the labour force, *viz.*, declining fertility and maternal mortality rates, rising education of women, especially tertiary education, sharp reduction in male-female gaps in quantity of education, and high rates of GDP growth between 1991 and 2011. Following international precedent, Indian female LFP ought to have seen an increase, rather than a decline. Many aspects of the falling FLFP puzzle have been analysed in the vast literature on the subject (Mazumdar and Neetha, 2011; Neff et al., 2012; Chaudhary and Verick, 2014; Chatterjee et al., 2015; Das et al., 2015; Klasen and Pieters, 2015; Dubey et al., 2017; Chatterjee et al., 2018; Sarkar et al., 2019; Afridi et al., 2020; Siddique, 2021; Afridi et al., 2021), among others.

¹³<https://aajeevika.gov.in/en/content/welcome-deendayal-antyodaya-yojana-nrlm>

While the mainstream explanations for declining FLFP focus on conservative social norms that affect women's labour supply, there is strong evidence suggesting that the decline in LFP is likely to reflect demand-side issues related to structural shifts in the nature of employment (Deshpande and Singh, 2021, 2023). In other words, women's willingness to work has not declined, but the demand for female labour has declined. This is partly due to the fact that technological changes have replaced women's work in agriculture (Afridi et al., 2020) and climate change, resulting in uncertain rainfall and drought, decreases women's workdays more than men's (Afridi et al., 2021). Using nationally representative panel data, Deshpande and Singh (2021) show that women enter and exit the labour force several times over short time periods and these switches in their LFP status cannot be explained by supply-side factors such as marriage, motherhood, being in education or changes in the demand for labour due to agricultural seasonality. Social norms do not oscillate over short 4-monthly periods; therefore, the volatility in women's labour market engagement indicates that they join the labour force when there is work available.

The literature also throws up a very important question about labour force statistics that tend to mis-measure or undercount women's work: is there really a decline in FLFP? Li (2022) compares Time Use Survey data between 1998 and 2019 and shows that for women, there was little change in usual activity status between 1998 and 2019 – about 27 percent of women reported that their usual status was working for pay, and about 32 percent reported that their usual status was any kind of work. However, average minutes of paid work fell from 103 to 64 minutes and average minutes of total work fell from 206 minutes to 140. Thus, the proportion of economically active women did not decline but their hours worked declined, which fails to get adequately picked up in household surveys.

This possibility is demonstrated by another important nationally representative survey, the India Human Development Survey (IHDS), which does *not* show a decline in FLFP between 2005 and 2011-12, as it is better able to capture women's economic work on family enterprises, which EUS/PLFS is not able to capture adequately. Thus, what is seen as a decline could be shorter duration of paid employment, which would reflect scarcity of employment, rather than women dropping out permanently and irreversibly. Women, especially in developing countries, are less likely to report themselves as looking for work, i.e., openly unemployed. Thus, when there is a scarcity of jobs, women who

are not employed but might be looking for work, tend to self-report as out of the labour force.

In conclusion, while there is no Indian Enigma, in that livelihoods programs work along expected lines in India just as they do elsewhere in the world, the need to boost rural non-farm employment remains strong and urgent. The increase in India's working age population far outstrips the number of jobs, and as long as there is scarcity of jobs, women will tend to lag behind in the queue compared to men due to the norm of heavy and disproportionate burden of domestic chores and care responsibilities on them. Increasing Indian FLFP to international standards would require much more than SHG enrolment.

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Tables and Figures

Table 1: Summary Statistics: Treatment and Outcome Variables

	2011	2017	2018	2019
Panel A: Treatment				
NRLM SHG (%) Mean	0.060	0.195	0.252	0.306
NRLM SHG (%) Median	0.002	0.108	0.170	0.236
Number of Districts	606	611	609	606
Panel B: Outcomes				
FLFPR (% rural adult female population)	0.377	0.263	0.282	0.352
Employed (% rural adult female population)	0.371	0.253	0.271	0.342
Unemployed (% rural adult female population)	0.006	0.010	0.010	0.010
Employment Rate (% rural female labour force)	0.983	0.961	0.963	0.972
Regular Wage (% rural females employed)	0.059	0.108	0.114	0.098
Self-Employed (% rural females employed)	0.588	0.575	0.595	0.627
Casual Labour (% rural females employed)	0.353	0.317	0.290	0.274

Notes: SHG statistics calculated at district level, other statistics are at all-India level for rural women in the working age group.

Table 2: Labour Force Participation Rates and Employment-Population Ratios

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	FLFP (% Adult Women)				Employed (% Adult Women)			
	Baseline	MPCE	Agri-Share	All	Baseline	MPCE	Agri-Share	All
NRLM SHG (%)	0.122*** (0.036)	0.123*** (0.036)	0.136*** (0.035)	0.139*** (0.035)	0.135*** (0.036)	0.136*** (0.036)	0.150*** (0.035)	0.152*** (0.035)
Observations	322137	322137	322137	322137	322137	322137	322137	322137
R-Squared	0.167	0.167	0.168	0.168	0.165	0.165	0.166	0.166
National Mean	0.377	0.377	0.377	0.377	0.371	0.371	0.371	0.371
MPCE Control	No	Yes	No	Yes	No	Yes	No	Yes
Agricultural Share	No	No	Yes	Yes	No	No	Yes	Yes
SDP Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The outcomes variables are calculated as the share of people in the labour force or people employed out of the total adult population. State Domestic Product control used throughout, controls include mean per capita consumption expenditure and share of agricultural workers in the district. Standard errors in parentheses, clustered at the district level. ***, **, * show significance at 1%, 5% and 10%, respectively.

Table 3: Employment Rates and Employment Types

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Employment Rate		Regular Wage		Self Employed		Casual Labour	
	Baseline	All Controls	Baseline	All Controls	Baseline	All Controls	Baseline	All Controls
NRLM SHG (%)	0.042** (0.018)	0.042** (0.018)	-0.014 (0.026)	-0.018 (0.026)	0.110* (0.061)	0.117* (0.061)	-0.096* (0.056)	-0.099* (0.057)
Observations	104360	104360	99951	99951	99951	99951	99951	99951
R-Squared	0.078	0.078	0.140	0.143	0.199	0.200	0.180	0.180
National Mean	0.983	0.983	0.058	0.058	0.589	0.589	0.354	0.354
MPCE Control	No	Yes	No	Yes	No	Yes	No	Yes
Agricultural Share	No	Yes	No	Yes	No	Yes	No	Yes
SDP Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Employment rate is calculated as the share of people employed out of the labour force, and the employment types are the share of employed people working in that type of work. State Domestic Product control used throughout, controls include mean per capita consumption expenditure and share of agricultural workers in the district. Standard errors in parentheses, clustered at the district level. ***, **, * show significance at 1%, 5% and 10%, respectively.

Table 4: Labour Force Participation Rates and Employment-Population Ratios for Men

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	LFP (% Adult Men)				Employed (% Adult Men)			
	Baseline	MPCE	Agri-Share	All	Baseline	MPCE	Agri-Share	All
NRLM SHG (%)	-0.026 (0.018)	-0.026 (0.018)	-0.023 (0.018)	-0.023 (0.018)	-0.033* (0.020)	-0.033* (0.020)	-0.031 (0.020)	-0.031 (0.020)
Observations	328213	328213	328213	328213	328213	328213	328213	328213
R-Squared	0.020	0.020	0.020	0.020	0.026	0.026	0.026	0.026
National Mean	0.836	0.836	0.836	0.836	0.821	0.821	0.821	0.821
MPCE Control	No	Yes	No	Yes	No	Yes	No	Yes
Agricultural Share	No	No	Yes	Yes	No	No	Yes	Yes
SDP Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The outcomes variables are calculated as the share of people in the labour force or people employed out of the total adult population. State Domestic Product control used throughout, controls include mean per capita consumption expenditure and share of agricultural workers in the district. Standard errors in parentheses, clustered at the district level. ***, **, * show significance at 1%, 5% and 10%, respectively.

Table 5: Weighted Labor Force Participation Rates and Treatment Effects of SHG Membership/ Duration using Entropy Balancing and data from [Deshpande and Khanna \(2021\)](#)

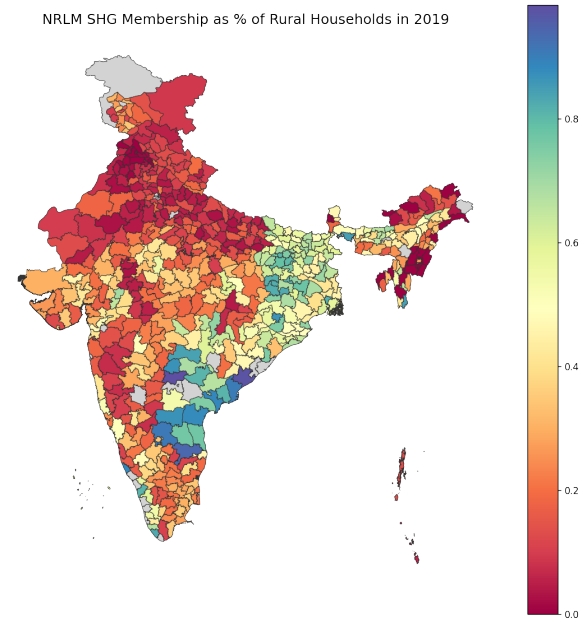
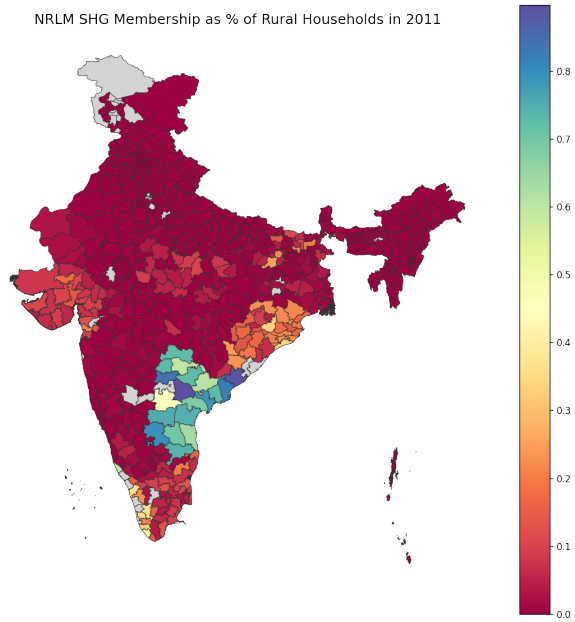
FLFP: SHG Membership Treatment		FLFP: SHG Duration Treatment	
Non-Members	0.642	Short Duration Members	0.663
Members	0.681	Long Duration Members	0.707
Difference (Marginal Effect)	0.039***	Difference (Marginal Effect)	0.044*
N	9147		1801

Notes: Results are based on data and methods used in [Deshpande and Khanna \(2021\)](#). Labor force participation is based on women participating in any income generating activity in the year preceding the survey. The first two rows show weighted proportions representing labor force participation of the control and treated groups. The third row represents the marginal effects of SHG treatment on the outcome in a weighted logistic regression. These weights are determined using the entropy balancing method. Standard errors are clustered at the village level. ***, **, * show significance at 1%, 5% and 10%, respectively.

Figure 1: NRLM SHG Membership (% of Rural Households)

(a) 2011

(b) 2019



Appendices

A Robustness Checks

Table A.1: Region Analysis: Labour Force Participation Rates and Employment-Population Ratios

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	FLFP (% Adult Women)				Employed (% Adult Women)			
	Baseline	MPCE	Agri-Share	All	Baseline	MPCE	Agri-Share	All
NRLM SHG (%)	0.173** (0.074)	0.175** (0.075)	0.235*** (0.066)	0.239*** (0.067)	0.188** (0.074)	0.190** (0.075)	0.253*** (0.065)	0.256*** (0.066)
Observations	328779	328779	328779	328779	328779	328779	328779	328779
R-Squared	0.135	0.135	0.136	0.136	0.133	0.133	0.134	0.134
National Mean	0.377	0.377	0.377	0.377	0.371	0.371	0.371	0.371
MPCE Control	No	Yes	No	Yes	No	Yes	No	Yes
Agricultural Share	No	No	Yes	Yes	No	No	Yes	Yes
SDP Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The outcomes variables are calculated as the share of people in the labour force or people employed out of the total adult population. State Domestic Product control used throughout, controls include mean per capita consumption expenditure and share of agricultural workers in the region. Standard errors in parentheses, clustered at the region level. ***, **, * show significance at 1%, 5% and 10%, respectively.

Table A.2: Region Analysis: Employment Rates and Employment Types

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Employment Rate		Regular Wage		Self Employed		Casual Labour	
	Baseline	All Controls	Baseline	All Controls	Baseline	All Controls	Baseline	All Controls
NRLM SHG (%)	0.051** (0.025)	0.059** (0.024)	-0.044 (0.040)	-0.073** (0.036)	0.193** (0.085)	0.226** (0.089)	-0.149** (0.073)	-0.152** (0.076)
Observations	107405	107405	102844	102844	102844	102844	102844	102844
R-Squared	0.048	0.048	0.094	0.096	0.140	0.141	0.125	0.125
National Mean	0.983	0.983	0.058	0.058	0.589	0.589	0.353	0.353
MPCE Control	No	Yes	No	Yes	No	Yes	No	Yes
Agricultural Share	No	Yes	No	Yes	No	Yes	No	Yes
SDP Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Employment rate is calculated as the share of people employed out of the labour force, and the employment types are the share of employed people working in that type of work. State Domestic Product control used throughout, controls include mean per capita consumption expenditure and share of agricultural workers in the region. Standard errors in parentheses, clustered at the region level. ***, **, * show significance at 1%, 5% and 10%, respectively.

Table A.3: Difference-in-Differences Results, Labour Force Participation Rates and Employment-Population Ratios (using Current Weekly Status)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	FLFP (% Adult Women)				Employed (% Adult Women)			
	Baseline	MPCE	Agri-Share	All Controls	Baseline	MPCE	Agri-Share	All Controls
NRLM SHG (%)	0.056* (0.033)	0.058* (0.033)	0.069** (0.032)	0.071** (0.032)	0.072** (0.033)	0.073** (0.033)	0.084*** (0.032)	0.087*** (0.032)
Observations	322137	322137	322137	322137	322137	322137	322137	322137
R-Squared	0.140	0.140	0.141	0.142	0.133	0.133	0.134	0.134
National Mean	0.320	0.320	0.320	0.320	0.309	0.309	0.309	0.309
MPCE Control	No	Yes	No	Yes	No	Yes	No	Yes
Agricultural Share	No	No	Yes	Yes	No	No	Yes	Yes
SDP Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The outcomes variables are calculated as the share of people in the labour force or people employed out of the total adult population. State Domestic Product control used throughout, controls include mean per capita consumption expenditure and share of agricultural workers in the district. Standard errors in parentheses, clustered at the district level. ***, **, * show significance at 1%, 5% and 10%, respectively.

B Data Concordance

1. We use different sources for our analysis which enlist districts differently (primarily due to variation over time). This includes the Census from 2011, the NSS round from 2011-12, the PLFS rounds from 2017-18 to 2019-20, and NRLM data which was obtained in February 2022.
2. The district concordance exercise essentially maps everything back to NSS 2011-12, which is the baseline for our employment data. Census 2011 maps fairly well to it as they are from the same time period.
3. For later datasets, the challenge arose either due to the creation of new districts or renaming of districts. We were able to map all renamed districts to their NSS 2011-12 equivalents.
4. This involved mapping NRLM districts to NSS districts, and mapping PLFS 17-18 districts to NSS 2012-12.
5. Mapping Telangana
 - The one major challenge in this process was the creation of Telangana in 2014. The state inherited 10 districts from erstwhile Andhra Pradesh, which were then split into 31 districts in 2016. PLFS 17-18 still reflects the 10 inherited districts but the NRLM data and the last two rounds of PLFS reflect the expanded 31 districts.
 - To deal with this challenge, we superimposed the newer map of Telanga over the older map, allowing us to figure out which newer district belonged to the territory of which older district. This is not perfect, but the boundaries largely overlap.
 - We also test our results by dropping Telangana, and they remain robust.
6. Concordance Files:
 - "NSS PLFS NRLM Mapping.xlsx": contains details on district mapping between NSS, PLFS, Census, and NRLM. All mapped to NSS 2011-12.
 - "Telangana Mapping.xlsx": All Telangana Mapping related keys.
 - "nrlm_districts.csv": NRLM District level data
 - [Link to the Concordance Folder](#)