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# Convergence of Social Protection Programmes in India

## The Impact of Self-Help Groups on Access to and Employment Under the Mahatma Gandhi National Rural Employment Guarantee Scheme

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## Contents

	<b>Page</b>
Abstract.....	iii
1. Introduction .....	1
2. Background.....	4
Bihar Rural Livelihoods Project .....	4
National Rural Employment Guarantee Scheme.....	4
Convergence of MGNREGS and NRLM .....	5
3. Mechanisms of Change .....	6
4. Data and Methods.....	7
Data Sources and Sample Construction .....	7
Empirical Strategy.....	8
5. Results.....	11
OLS Regressions With Fixed Effects .....	11
Instrumental Variable Regressions With Fixed Effects .....	12
Heterogeneous Effects .....	15
Nonlinear Relationship Between SHG Membership and MGNREGS Outcomes.....	16
Robustness Check: Using Time Since Rollout as IV .....	17
6. Conclusion .....	18
7. References .....	20

## Abstract

Policy makers increasingly emphasise the importance of setting up social protection systems and convergence between programmes to improve coherence and ensure coordination of intersectoral efforts. This study contributes to the literature on social protection systems by examining convergence between large-scale self-help group (SHG) and public works programming in Bihar, India. We use publicly available administrative data from the National Rural Livelihoods Mission and the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) and merge those data with data from a randomised controlled trial (RCT). The combined dataset allows for an instrumental variable regression analysis to examine the impact of the number of SHG members on access to job cards and employment under MGNREGS. We find large and statistically significant effects indicating that an increase of 100 SHG members results in 26 additional MGNREGS job cards applied for, and 14 additional households that are provided employment under MGNREGS. We find larger impact estimates on access to job cards and employment for scheduled caste and scheduled tribe households, and evidence for similar effects for women and men. We also provide some evidence on nonlinear larger effects for villages with a larger baseline number of SHG members, indicating that the results may be driven by increases in political bargaining power of SHG members or the formation of village organizations and cluster-level federations, which often coincide with an increase in the number of SHG members. Despite the positive impact on employment, we do not find positive effects on community-level assets created under MGNREGS.

## 1. Introduction

Policy makers and researchers increasingly emphasise the importance of a systems perspective when designing and implementing social protection programmes (e.g., Devereux et al., 2015; Gerard et al., 2020; Jones, 2021; Roelen et al., 2018; Tripathi et al., 2019). A system-level approach allocates resources to social protection policy and strategy development to limit gaps and overlaps in programme coverage and to improve coherence and cost-effectiveness (White et al., 2013). Yet only few impact evaluations integrate such a systems approach by examining interaction effects between different social protection programmes or assessing how the implementation of different social protection programmes interact. The development of integrated social protection systems requires a mix of different social protection interventions in coordination with other sectoral policies (Sanfilippo et al., 2012; Devereux et al., 2015; Gerard et al., 2020; Roelen et al., 2018). This mix includes the provision of social transfers, programmes to ensure access to services, social support and care provision, and legislation and policy reforms (Sanfilippo et al., 2012). However, the current impact evaluation literature mostly examines the impact of single interventions, with insufficient emphasis on the conjunction of programmes. Even when impact evaluations integrate a systems perspective, they primarily do so by examining interaction effects and not by assessing how different interventions can strengthen each other's fidelity of implementation or the take-up of other social protection programmes (Banerjee et al., 2020; Blattman et al., 2016; Bossuroy et al., 2021; Gram et al., 2019). One exception is a quasi-experimental study in Ghana that provides evidence for increases in health insurance uptake among cash transfer recipients following the integration of a fee waiver for health insurance under a cash transfer programme (Palermo et al., 2019).

In this study, we examine whether self-help groups (SHGs) implemented under the Deendayal Antyodaya Yojana—National Rural Livelihoods Mission (DAY-NRLM) in India can serve as a vehicle to improve access to the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS). Our findings contribute to the existing evidence on social protection systems by examining how convergence between two of the largest social protection programmes in the world can strengthen implementation fidelity of such programmes in India. The Government of India defines convergence as the coordination of intersectoral efforts in development programmes to maximise the intended impact of these programmes (Ministry of Rural Development, 2009). The DAY-NRLM is the world's largest state-implemented financial inclusion and livelihoods programme for women. As of 2021, the DAY-NRLM has mobilised more than 70 million households into SHGs with the goal of providing them with access to financial services and sustainable livelihoods enhancements (Ministry of Rural Development, 2014). Enacted in 2005, the MGNREGS is the world's largest employment scheme; it provides a legal guarantee for 100 days of employment in every financial year to adult members of any rural household willing to do public work-related unskilled manual work (Imbert & Papp, 2015).

To assess convergence between the DAY-NRLM and MGNREGS programmes, we leverage an existing cluster RCT of an SHG programme in Bihar (Hoffmann et al., 2021; Kochar et al., 2020). Starting in 2011–2012 with the launch of DAY-NRLM, the state government of Bihar expanded the SHG outreach under DAY-NRLM through the Bihar Rural Livelihoods Promotion

Society or *Jeevika*. This process also included a cluster RCT in which 180 Gram Panchayats (GPs) from within 16 blocks in seven districts of Bihar were randomly assigned to enrol under the *Jeevika* or a control group.<sup>1</sup> After 2014, *Jeevika* was also rolled out in the control group. Kochar and colleagues (2020) conducted a follow-up study with 67 treatment GPs and 69 control GPs to determine the longer-term effects of participation in SHGs relative to a control group where SHG participation happened for a shorter period of time. In 2015–2016, the DAY-NRLM also developed a specific convergence strategy with MGNREGS. Barooah and colleagues (2022) used a quasi-experimental approach demonstrating positive effects of this convergence strategy on income and employment under MGNREGS in the states of Jharkhand, Chhattisgarh, Maharashtra, and Rajasthan.

We contribute to the literature on convergence by estimating the effect of the number of SHG members on access to and employment under the MGNREGS in Bihar. To achieve this goal, we combined data from Kochar and colleagues (2020) on the random assignment of 67 treatment panchayats and 69 control panchayats with administrative data on SHG formation and member characteristics from the DAY-NRLM management information system (MIS) and job card and employment data from the MGNREGS MIS. Specifically, we used an instrumental variable regression analysis that leveraged random variation in timing of access to the *Jeevika* programme to estimate the impact of the number of SHG members on MGNREGS job card and employment outcomes at the GP level.

The findings indicate that SHGs can serve as a strong vehicle for access to social protection under MGNREGS. We found that the number of SHG members had positive and statistically significant effects on the number of MGNREGS job cards applied for and the number of issued job cards. Although the point estimates are smaller, the results also suggested that the number of SHG members had positive effects on employment demanded and employment provided under MGNREGS. “Employment demanded” refers to the formal application made by the job card holder demanding workdays while “employment provided” refers to the instances where these demands are met. Therefore, our findings suggest that SHG membership significantly increased employment generation under the MGNREGS. On average, the results indicated that an increase of 100 SHG members resulted in 26 additional MGNREGS job cards applied for, 23 additional MGNREGS job cards issued, 16 additional MGNREGS jobs demanded, and 14 additional MGNREGS jobs provided.

The results also provide some indication that increases in the number of SHG members from a specific caste category resulted in increases in the number of active MGNREGS workers from that caste category. Increases in the number of scheduled caste and scheduled tribe SHG members seemed to only be associated with increases in MGNREGS workers from these caste categories. These results are consistent with the idea that SHG members can enable women to gain political empowerment and increase their political bargaining power at the village-level, especially because households gain access to MGNREGS job cards through their interaction with the Gram Panchayat (Ministry of Rural Development, 2017). This mechanism also aligns

<sup>1</sup> The GP is a governing institute in Indian villages. It is a democratic structure, the functioning of which is in accordance with the guidelines provided by the Ministry of Panchayati Raj.

with the finding that the number of job cards increases more than linearly with the number of SHG members. The increase in MGNREGS outcomes with respect to SHG members is more prominent at higher levels of SHG membership. Importantly, however, the nonlinear effect may also be driven by the formation of village organizations and cluster-level federations. SHGs under *Jeevika* are federated into Village Organizations, which are further federated into Cluster-Level Federations at the block level (World Bank, 2017). Both Village Organizations and Cluster-Level Federations may enable SHG members to engage in collective action to obtain a larger number of MGNREGS job cards and employment.

The findings contribute to the expanding literature on how SHGs can contribute to improving women's empowerment, economic outcomes, and political participation in India. Brody and colleagues (2015) showed how SHGs contribute to women's economic, social, and political empowerment. In addition, Hoffmann and colleagues (2021) and Kochar and colleagues (2020) showed how the *Jeevika* programme in particular can result in reductions in informal interest rates and dependence on high-cost debt because of improved access to formal credit, but these same papers do not show effects on women's intra-household decision-making power. At the same time, Prillaman (2021) showed that SHG membership in India had a statistically significant effect on women's political participation because of access to larger networks, increased capacity for collective action within these networks, and development of civic skills. In addition, SHGs may become more effective and cost-effective after the introduction of federations. Kochar and colleagues (2020) provided some evidence suggesting that the effects of SHGs may increase after the introduction of federations, while Siwach and colleagues (2022) suggested that the marginal costs of introducing additional federations is smaller than the marginal costs of introducing additional SHGs. As discussed earlier in this paper, SHGs may have larger effects on access to MGNREGS job cards and jobs after the introduction of federations, which usually happens only after SHGs reach a certain level of maturity and a considerable number of SHG members.

Although each of these mechanisms could, by themselves, have contributed to a greater ability of women SHG members to negotiate access to MGNREGS, two other pathways may have contributed to the positive effects. First, the relationship between SHG and MGNREGS participation may have increased after the introduction of the formal convergence policy as shown in the study by Barooah and colleagues (2022). Second, women may have greater awareness about MGNREGS job cards because of their SHG membership, which may have enabled them to engage in collective bargaining through improved institutional capacity (Kumar et al., 2019).

In the remainder of this paper, we first present background information on the Bihar Rural Livelihoods Project and MGNREGS as well as the formal policy encouraging their convergence. Then, we describe potential mechanisms through which participation in SHGs may contribute to increased access to MGNREGS job cards followed by a description of the data and methods we used. Next, we present the results of the analyses and a conclusion that summarises the findings along with policy and research implications.

## 2. Background

### Bihar Rural Livelihoods Project

In 2005–2006, with support from the World Bank, the Government of Bihar started planning the implementation of the Bihar Rural Livelihoods Project (BRLP). The BRLP aims to contribute to poverty alleviation using similar mechanisms as SHG programmes in other states that fall within the realm of the NRLM. The programme aims to first improve livelihoods of the rural poor by developing institutional capacity through women's SHGs followed by the linking of these SHGs to formal financial institutions and other agencies to negotiate better services. The Government of Bihar established the Bihar Rural Livelihoods Promotion Society, or *Jeevika*, in six priority districts in 2007, with the aim of mobilising poor households into SHGs under the BRLP. Next, the NRLM launch and additional funding from the World Bank in 2011–2012 contributed to the ability of *Jeevika* to expand its services and the scale of SHGs in a larger number of districts. By 2021, the programme had mobilised more than 11 million households in the state of Bihar.

SHGs under the BRLP, and now under the NRLM, typically include 10 to 15 women who meet physically to contribute to savings and access programme services that include financial inclusion in the form of low-cost credit and access to formal banking, as well as basic literacy and livelihoods training (Hoffman et al., 2018). Further, SHGs under *Jeevika* follow a federated structure that is catalysed after the introduction of Village Organizations and Cluster-Level Federations (World Bank, 2017).

### National Rural Employment Guarantee Scheme

The MGNREGS is the world's largest public employment scheme, guaranteeing up to 100 days of paid employment for a minimum wage to households in rural India. The programme started in 2006 and since then has offered employment to create "durable assets" such as those aiding in irrigation, land development, and rural connectivity. Village-governing institutes called *Gram Sabhas* are primarily responsible for planning, implementing, and monitoring the works that are undertaken. MGNREGS covers all rural districts in the country, with women accounting for 47% of the total person-days generated. In Bihar, women accounted for 54.6% of total person-days generated in 2020–2021.

Rural households interface with MGNREGS through their GP. To receive employment, eligible households must first apply to the GP for a job card (MoRD, 2017). The GP is legally mandated to issue the card within 15 days of the application. All adult members of the household listed on the job card are eligible to seek employment. The programme also provides unemployment insurance, through a mechanism in which an applicant receives unemployment allowance if they are not provided MGNREGS work within 15 days of expressing interest. The programme does not select individuals or households by income or poverty. Instead, individuals elect to enrol in the programme through self-selection (Bhatia et al., 2017).

Although GPs are legally mandated to issue job cards and jobs should be available upon demand, rationing of MGNREGS job cards and jobs is common because access to work is often constrained by budgetary allocations and by local capacity to implement projects (Dutta et al.,

2012). Rationing and other implementation challenges may limit the ability of households to gain access to MGNREGS job cards and employment. However, convergence with other social protection programmes, such as *Jeevika* may enable GPs to streamline the process of providing information about MGNREGS and enable households to gain access to job cards and employment.

Despite the implementation challenges, evidence from various cluster RCTs and quasi-experimental studies indicates that MGNREGS has considerable positive effects on wages, consumption, and expenditures, both through direct effects and through spillover effects that run through changes in wages and prices. Imbert and Papp (2015) and Zimmermann (2020) found evidence that rural wages rose in districts where MGNREGS was implemented first relative to districts where MGNREGS was implemented later, both in on- and off-seasons of agriculture. In addition, Deininger and Liu (2019) found improvements in consumption, expenditure, and poverty caused by MGNREGS in rural Andhra Pradesh, especially for poor and marginalised households. Muralidharan and colleagues (2021) also found that most of the income gains for households benefiting from MGNREGS came from non-programme earnings, driven by higher private sector real wages and employment. Finally, emerging findings suggest that MGNREGS may have cushioned the effects of the recent COVID-19 pandemic by generating employment, especially for women (Afridi et al., 2021).

Over the years, MGNREGS has steadily increased the list of admissible works it undertakes as part of the programme. This includes works such as fodder production for livestock, construction of preschools, and building of government scheme-sanctioned houses. Increasingly, governments at both the state and centre have also focused on convergence initiatives, emphasizing synergies between MGNREGS and existing programmes in other governmental departments.

## Convergence of MGNREGS and NRLM

The Ministry of Rural Development (MoRD) has outlined three levels of operationalization of convergence, which include (1) macro convergence with agriculture, (2) convergence at the level of micro-level planning under Integrated Participatory Planning Exercise (IPPE), and (3) convergence at the level of resources (Pankaj, 2017). The policy to stimulate convergence of NRLM and MGNREGS aims to sustainably address multidimensional poverty by intentionally targeting women and poorer households. To achieve this goal, the MoRD initiated IPPE in 2,500 of the poorest blocks in India in 2015–2016, with a view toward increasing participatory planning of Gram Panchayat budgets. By involving SHGs, IPPE aims to increase the role of women and excluded households in the planning and implementation of MGNREGS works. Village Organizations were assigned the responsibility of involving village members in the identification of the excluded poor, monitoring worksites, and assessment of assets created. Through convergence, MoRD aims to improve the efficiency and inclusiveness of MGNREGS by better assessing the demand for work and increasing coverage among poor households and women. Convergence between the NRLM and MGNREGS could also help the MoRD to improve trust and social networks of poor households and women and provide them with diversified livelihood options and productive assets.



Emerging evidence indicates that convergence between the NRLM and MGNREGS may have positive effects on economic outcomes. For example, Barooah and colleagues (2022) leveraged a staggered implementation of the convergence of NRLM and MGNREGS in Jharkhand, Chhattisgarh, Maharashtra, and Rajasthan to demonstrate that an explicit emphasis on convergence led to an increase in income from MGNREGS at the household level, while also reducing household dependence on the private sector for casual labour. The effects are more pronounced for women, who saw significant gains in employment from MGNREGS and an increase in private sector wage rates following the introduction of the convergence policy. Kumar and colleagues (2019) also provided evidence indicating that SHG members may have larger access to information about MGNREGS because of information provided through SHGs meetings. However, none of the available evidence allows for establishing causal effects of SHG participation on MGNREGS outcomes using credible RCTs or natural experiments.

### 3. Mechanisms of Change

An increase in the number of SHG members could facilitate access to MGNREGS job cards and jobs through several mechanisms. First, SHG members receive information on how to obtain entitlements, such as job cards to participate in MGNREGS from *Jeevika* staff. Women SHG members may therefore have greater awareness about MGNREGS job cards. Their SHG membership may also enable them to engage in collective bargaining through improved institutional capacity (Kumar et al., 2019), especially after the formation of Federations (Kochar et al., 2020). Second, starting in May 2015, the Government of India (2015) provided guidance to all state governments to start “integrating, coordinating and converging” major poverty alleviation schemes at the GP level. This call for programme linkages included a specific focus on convergence between the NRLM and MGNREGS, with an emphasis on participatory planning of GP budgets with participation from women SHG members. As a result, Village Organizations were required to mobilise women and poorer households to participate in the planning of MGNREGS budgets, including in the selection of assets to be created and by ensuring employment of women (Barooah et al., 2022). Third, women SHG members may gain additional access to MGNREGS jobs after an increase in the number of SHG members because they gain political bargaining power (Kumar et al., 2019). In this case, a critical mass of women SHG members may provide SHG members with sufficient bargaining power to obtain MGNREGS job cards from GPs, which generally act as the interface for the distribution of MGNREGS job cards (Pankaj & Tankha, 2010). The increase in political bargaining power may be particularly pronounced after the formation of federations (Kochar et al., 2020), which could contribute to collective action of SHG members to gain access to MGNREGS job cards and jobs.

Importantly, however, several other mechanisms may lead to the number of SHG members having a negative effect on the demand for MGNREGS jobs and job cards. First, access to SHGs may increase access to formal credit as shown by Hoffmann and colleagues (2021) and Kochar and colleagues (2020), which could reduce the supply of women’s labour for MGNREGS jobs if women use the access to formal credit for investments in small businesses. In that case, self-employment may reduce demand for MGNREGS jobs. Second, access to

SHGs may reduce women's time for labour force participation, which may limit opportunities for participation in MGNREGS jobs. Third, increased hourly income from small businesses financed by SHG loans could lead women to substitute their MGNREGS work for leisure or domestic work because of income effects resulting from women choosing to participate fewer hours in the labour force, while maintaining the same income level.

## 4. Data and Methods

### Data Sources and Sample Construction

We combined three data sources to determine the impact of the number of SHG members on access to MGNREGS. The first data source with information on SHGs comes from the DAY-NRLM MIS.<sup>2</sup> Second, we obtained data on MGNREGS-related outcomes from the MGNREGS MIS.<sup>3</sup> Finally, we received the *Jeevika* implementation timing in 67 treatment GPs and 69 control GPs from the International Initiative for Impact Evaluation (3ie), which led the follow-up of the cluster-RCT of the *Jeevika* programme that was reported in the study by Kochar and colleagues (2020). We merged all the data sets described above to construct a longitudinal annual data set at the GP level spanning from 2013 to 2020. Our final data set includes 1,088 observations (8 years of data for 136 GPs).

The NRLM MIS data provide village-level information on the date of SHG formation, details on the bank account that the SHG operates (in case it has one), the number of SHG members, and demographic characteristics of the SHG members, including religion, gender, and caste category. We accessed data on all SHG members residing in the 136 GPs that were included in the follow-up of the RCT conducted by Kochar and colleagues (2020). We downloaded these data during the month of March 2021.<sup>4</sup>

The MGNREGS MIS data provide GP-level information on the number of job cards and registered workers, including a breakdown by demographic characteristics such as scheduled caste, scheduled tribe, religion, and gender. These data also contain information about registrations for work, job cards deleted and included in the financial year, employment demanded and offered, and number of community-level assets created at the GP level, Panchayat Samiti level, and at Zila Parishad level.<sup>5</sup> We downloaded these data for the financial years 2013–2014 to 2020–2021.

Finally, we combined the data with the Socioeconomic High-resolution Rural-Urban Geographic (SHRUG) data set on India, compiled by the Development Data Lab, to access information on socioeconomic, population, and financial services.<sup>6</sup> The socioeconomic and population data

<sup>2</sup> <https://nrlm.gov.in/shgOuterReports.do?methodName=showShgreport>

<sup>3</sup> <http://mnregaweb4.nic.in/netnrega/MISreport4.aspx>

<sup>4</sup> Therefore, we observe only those SHGs that are in the MIS during that month.

<sup>5</sup> Gram Panchayat, Panchayat Samiti, and Zila Parishad are the three levels of the Panchayati Raj Institution that is the system of self-government for villages in India. The Gram Panchayat is the governing body at the village level, the Panchayat Samiti is the governing body at the block level, and the Zila Parishad operates at the district level.

<sup>6</sup> [http://www.devdata.org/shrug\\_download/](http://www.devdata.org/shrug_download/)

include information on population, other demographics, power supply, and education institutions at the village level, based on the 2011 Census.

## Empirical Strategy

### *Two-Way Fixed Effects and Instrumental Variable Regression Models*

We conducted a panel data analysis to estimate the impact of the number of SHG members on access to MGNREGS, starting with a linear regression with two-way fixed effects, as shown in equation (1):

$$Y_{gt} = \beta_0 + \beta_1 SHGMembers_{gt} + G + T + Population_{gt} + v_{gt} \quad (1)$$

In equation (1),  $Y_{gt}$  is the outcome observed for GP  $g$  in year  $t$ ;  $SHGMembers_{gt}$  is the number of SHG members in GP  $g$  in year  $t$ ;  $Population_{gt}$  is the annual GP-level population,  $G$  and  $T$  correspond to GP and year fixed effects, respectively; and  $v_{gt}$  is the error term. We considered six key outcomes for this regression, including number of job cards applied for, number of job cards issued, number of households that demanded employment, number of households that were provided employment, and the number of public works assets created under MGNREGS at the GP-level.

$\beta_1$  shows the relationship between GP-level SHG membership and GP-level MGNREGS outcomes. While our specification controls for GP fixed effects, other time-varying unobserved factors could influence both SHG membership and MGNREGS access. For example, a shift in the political landscape, state expenditures on public works, and other macroeconomic shocks could influence both variables, such that  $E(SHGMembers_{gt}, v_{gt}) \neq 0$ . We address this by employing an instrumental variable design, where we leverage the variation in the timing of *Jeevika* expansion across the GPs. Specifically, as part of a RCT impact evaluation in 2011, the 136 GPs in our sample were randomly divided into an early rollout and a late rollout group (Hoffman et al., 2021). Implementation in early rollout villages began in 2012, while implementation in late rollout villages began after 2014.

Following this early versus late assignment, we created a binary variable  $Post_{gt}$ , indicating post-*Jeevika* implementation year, which is 1 for all years for early implementation GPs, and 1 for the years after 2014 and 0 for 2013 and 2014 for late implementation GPs. We use  $Post_{gt}$  as an instrument for  $SHGMembers_{gt}$ , and estimate a two-stage least squares model, where the first stage is estimated in equation (2) and the predicted SHG membership from the first stage is used as the key independent variable as shown in equation (3). We use two-stage least squares (2SLS) to estimate the model, and cluster our standard errors at the GP level following the level of treatment assignment.

$$SHGMembers_{gt} = \alpha_0 + \alpha_1 Post_{gt} + G + T + Population_{gt} + u_{gt} \quad (2)$$

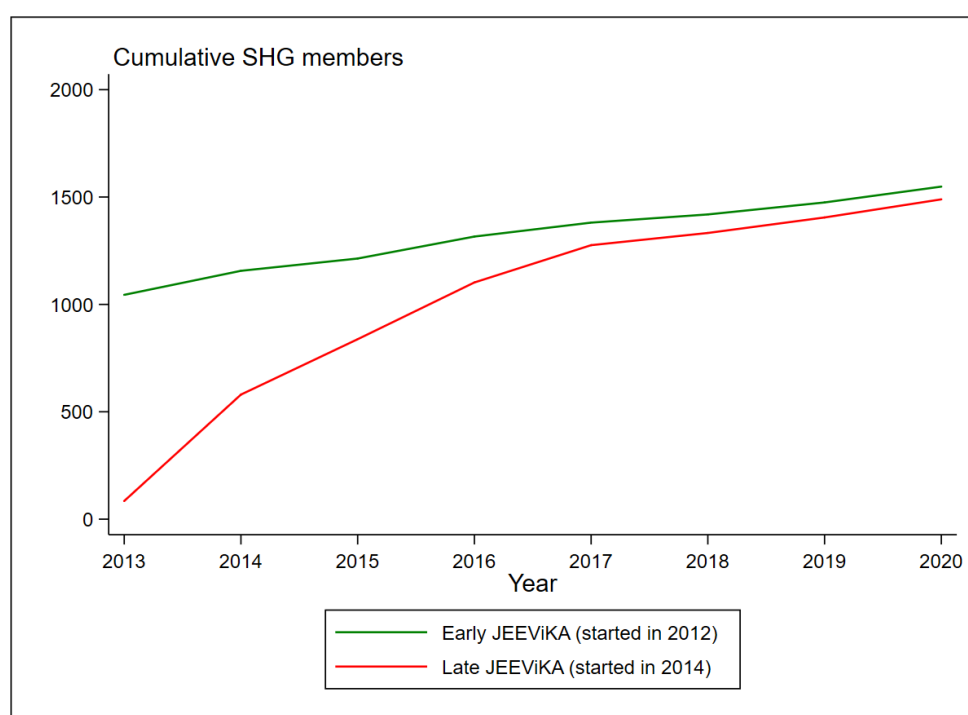
$$Y_{gt} = \beta_0 + \beta_1 \widehat{SHGMembers}_{gt} + G + T + Population_{gt} + \epsilon_{gt} \quad (3)$$

### Assessing Instrument Validity

A valid instrumental variable must satisfy the following conditions: (1) instrument relevance (or a strong first stage indicating a high predictive value of the instrumental variable); (2) independence, or conditional independence; and (3) validity of the exclusion restriction.

We start by assessing the instrument relevance in Figure 1, which suggests a strong first-stage relationship between the instrument and our treatment of interest. Our panel includes data from 2013 through 2020. As shown, early rollout GPs had much higher levels of SHG membership in 2013 and 2014. SHG membership in late rollout GPs increased steeply after 2014 up to 2017 and reached almost similar levels as the early rollout GPs beyond 2017.

**Figure 1. Instrument Relevance—Correlation Between *Jeevika* Rollout and Number of SHG Members**



Further, we found no statistically significant differences in GP characteristics, SHG membership, or MGNREGS outcomes between the treatment and control groups across almost all indicators (see Table 1, which includes summary statistics from 2013, the starting year of our analysis). The two groups differed significantly in NRLM outcomes, which is an indication of the start of the programme implementation. Late implementation GPs had a negligible number of SHG members in 2013 prior to the start of *Jeevika* in their areas. The early implementation GPs had, on average, 1,045 SHG members, compared with 85 SHG members in late implementation GPs. In general, early implementation GPs had a slightly higher population, and relatedly, a slightly higher scheduled caste population. The latter difference was statistically significant at 10% level of significance. Although we do not see a significant difference in MGNREGS outcomes, the number of MGNREGS assets was slightly higher in early implementation GPs.

Further, among the late implementation GPs, 79% had black topped roads and 26% had a power supply, compared with 86% and 20% of early implementation GPs, respectively. As described earlier, we control for all observed or unobserved time invariant differences by adding GP fixed effects in our main regression analysis.

**Table 1. Baseline Summary Statistics—2013**

	Mean Late implementation GPs	Mean Early implementation GPs	Difference	Std. Error
<b>GP characteristics</b>				
Total population	5560.29	6553.03	-992.740	628.44
Number of households	1105.08	1283.89	-178.820	130.04
Total SC population	1031.52	1279.74	-248.23*	141.57
Total ST population	62.27	43.65	18.620	33.25
Literate population	2512.95	2967.47	-454.520	302.49
Number of primary schools	2.86	3.33	-0.470	0.42
Number of middle schools	1.39	1.45	-0.060	0.21
Black topped (pucca) road	0.79	0.86	-0.080	0.07
Power supply for all users	0.26	0.20	0.060	0.07
<b>Jeevika and MGNREGS outcomes</b>				
Cumulative SHG member count	84.62	1044.61	-959.99***	48.37
Cumulative SC member count	17.81	289.66	-271.85***	15.56
Cumulative ST member count	0.61	9.45	-8.84***	2.46
Number of job cards applied for	1866.88	1852.96	13.930	98.34
Number of job cards issued	1840.88	1824.91	15.970	98.26
Number of active job cards	484.49	507.22	-22.730	35.66
All MGNREGS assets	10.55	7.34	3.21*	1.77
Observations	69	67		

Note. GPs = Gram Panchayats; MGNREGS = Mahatma Gandhi National Rural Employment Guarantee Scheme; SC = Scheduled Caste; ST = Scheduled Tribe; std = standard.

Finally, interpretation of 2SLS estimates as causal effects of SHG membership requires that the instrument satisfies the exclusion restriction. Our instrument would fail to satisfy the exclusion restriction if *Jeevika* rollout could affect MGNREGS outcomes through channels other than SHG membership.

Although the exclusion restriction cannot be formally tested, we argue that this assumption holds in the context of this study because of the randomised implementation timing. *Jeevika* is

implemented through SHG formation, and therefore cannot plausibly affect individual outcomes through other channels. Yet other factors that changed at the same time as *Jeevika* implementation may result in the violation of the exclusion restriction. This concern is largely alleviated because of randomised implementation timing, however.

To further examine the exclusion restriction, we also show findings using time since start of *Jeevika* rollout as an instrument. As shown in Figure 1, SHG membership increased over time after the rollout of *Jeevika*. Therefore, we employ four dummy variables indicating pre-*Jeevika* period, 1–2 years post-rollout, 3–4 years post-rollout, and 5+ years post-rollout as instrumental variables. This approach adds an additional dimension of variation in the instrument; instead of only comparing early versus late GPs, we also look at time since rollout within each of the two groups.

## 5. Results

### OLS Regressions With Fixed Effects

OLS regressions assessing the relationship between MGNREGS outcomes and SHG membership at the GP level indicate that an increase in SHG membership was statistically significantly associated with increases in MGNREGS outcomes for all employment-related variables. We found no statistically significant relationship between the number of SHG members and community-level asset creation through MGNREGS, however. Specifically, an increase of 100 SHG members in the GP was associated with an increase of 26 job card applications, 24 job cards issued, 15 households that demanded employment, and 12 households that were provided employment. Table 2 shows these results.

**Table 2. OLS Association Between Number of SHG Members and MGNREGS Outcomes**

	(1)	(2)	(3)	(4)	(5)
Variables	Number of job cards applied for	Number of job cards issued	Employment demanded—HHs	Employment provided—HHs	All assets
No. of SHG members	0.26*** (0.09)	0.24*** (0.09)	0.15*** (0.06)	0.12** (0.05)	0.00 (0.01)
Observations	1,088	1,088	1,088	1,088	1,088
R-squared	0.60	0.54	0.45	0.43	0.48
Number of GPs	136	136	136	136	136
Dep. Var. Mean	2282	2173	535.6	432.5	35.06

Note. Dep. Var. mean = Dependent Variable Mean; GPs = Gram Panchayats; HHs = Households; MGNREGS = Mahatma Gandhi National Rural Employment Guarantee Scheme; OLS = Ordinary Least Squares; SHG = self-help group.

Robust standard errors in parentheses.

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

## Instrumental Variable Regressions With Fixed Effects

We next used an instrumental variable approach to correct for potential endogeneity of SHG membership. We first show the first-stage regressions in Table 3. In addition to the impact of overall SHG membership, we assessed the impact of SHG membership for different caste groups. We hypothesise heterogeneous effects for different caste groups because both public programmes target the most economically and socially vulnerable groups, and because of preexisting differences in access to MGNREGS for different caste groups before the expansion of *Jeevika*.

Our first-stage regressions show a strong positive relationship between *Jeevika* expansion and SHG membership for the overall population as well as for specific caste groups. Post-*Jeevika* years saw an increase of 620 SHG members annually, which includes 189 scheduled caste/scheduled tribe members, 237 Other Backward Caste (OBC) members, and 194 members from other caste groups. The F-statistics for the excluded instrument range from 65 to 193, rejecting weak identification against Stock and Yogo critical values for F-statistics with a single endogenous regressor (16.38 to take the most conservative estimate) (Stock & Yogo, 2002).

**Table 3. All First-Stage Regressions and F-Stats**

	(1)	(2)	(3)	(4)
Variables	All SHG members	SC/ST SHG members	OBC SHG members	Other (non-SC/ST/OBC) SHG members
Post- <i>Jeevika</i> year	620.0***	189.1***	236.9***	194.0***
	(44.62)	(17.08)	(25.36)	(24.04)
Observations	1,088	1,088	1,088	1,088
R-squared	0.766	0.650	0.682	0.588
Number of GPs	136	136	136	136
<b>Weak IV test F-stat</b>	193.3	122.7	87.31	65.14

Note. GPs = Gram Panchayats; IV = instrumental variable; OBC = Other Backward Caste; SC = Scheduled Caste; SHG = self-help group; ST = Scheduled Tribe;

Robust standard errors in parentheses.

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Second-stage regressions suggest that SHG membership had a strong positive impact on MGNREGS outcomes related to employment. Similar to the OLS estimates, however, the impact estimates do not suggest changes in the number of assets created under MGNREGS. Additionally, our IV estimates suggest an impact magnitude very similar to the OLS estimates. To some extent, this is expected, because SHG membership (our treatment) is the key characteristic of *Jeevika* expansion (the instrument). Our results confirm that SHG membership outside of *Jeevika* rollout years was negligible.

**Table 2. IV 2SLS Results—Impact of Number of SHG Members on MGNREGS Outcomes**

	(1)	(2)	(3)	(4)	(5)
Variables	Number of job cards applied for	Number of job cards issued	Employment demanded: HHs	Employment provided: HHs	All assets
No. of SHG members	0.26** (0.12)	0.23** (0.11)	0.16* (0.09)	0.14* (0.07)	0.01 (0.01)
Observations	1,088	1,088	1,088	1,088	1,088
Number of GPs	136	136	136	136	136
Dep. Var. Mean	2282	2173	535.6	432.5	35.06

Note. 2SLS = two stage least squares; Dep. Var. mean = Dependent Variable mean; GPs = Gram Panchayats; HHs = Households; IV = instrumental variable; SHG = self-help group.

Robust standard errors in parentheses.

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

We next examine the impact of the SHG membership of different caste groups to assess whether SHG membership of marginalised populations may have larger effects on MGNREGS outcomes. Our results suggest that SHG membership of individuals from scheduled caste/scheduled tribe groups had the highest impact on GP-level MGNREGS outcomes. As shown in Table 5, an increase of 100 scheduled caste or scheduled tribe SHG members led to an increase of 85 job card applications, 74 job cards issued, 52 households that demanded employment, and 45 households that were provided employment.

**Table 5. IV 2SLS Results—Impact of Number of SC/ST SHG Members on MGNREGS Outcomes**

	(1)	(2)	(3)	(4)	(5)
Variables	Number of job cards applied for	Number of job cards issued	Employment demanded—HHs	Employment provided—HHs	All assets
No. of SC/ST SHG members	0.85** (0.40)	0.74** (0.37)	0.52* (0.29)	0.45* (0.24)	0.04 (0.03)
Observations	1,088	1,088	1,088	1,088	1,088
Number of GPs	136	136	136	136	136
Dep. Var. Mean	2282	2173	535.6	432.5	35.06

Note. 2SLS = two stage least squares; Dep. Var. mean = Dependent Variable mean; GPs = Gram Panchayats; HHs = Households; IV = instrumental variable; SC = Scheduled Caste; SHG = self-help group; ST = Scheduled Tribe.

Robust standard errors in parentheses.

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Tables 6 and 7 show the same results for OBC SHG members and SHG members from other caste groups, indicating slightly smaller effects for OBC and other caste groups. An increase of 100 OBC SHG members increased job card applications by 68, while an increase of 100 members from other caste groups increased job card applications by 85. Other MGNREGS



outcomes show similar trends with slightly smaller effects. We did not find impacts on community-level assets created through the MGNREGS programme, however.

Our results imply that, despite having the lowest share in the population, an increase in the membership of scheduled caste and scheduled tribe members had the largest effect on MGNREGS outcomes. For context, the average share of scheduled caste and scheduled tribe households in the GPs in our sample is around 28%, the average share of OBC households is 40%, and the average share of other caste groups is 32%. The larger effect sizes may reflect the stronger focus of MGNREGS on scheduled caste and scheduled tribe households. Individuals from scheduled caste and scheduled tribe groups in Bihar, like in the rest of India, are overrepresented in MGNREGS participation. In 2018–2019, the share of scheduled caste and scheduled tribe employment generated under MGNREGS across the country was 21% and 17%, respectively (MORD, 2021), compared to their national population shares of 16% and 8% (as per the 2011 Census).

**Table 6. IV 2SLS Results—Impact of Number of OBC SHG Members on MGNREGS Outcomes**

	(1)	(2)	(3)	(4)	(5)
Variables	Number of job cards applied for	Number of job cards issued	Employment demanded—HHs	Employment provided—HHs	All assets
No. of OBC SHG members	0.68** (0.32)	0.59** (0.30)	0.42* (0.24)	0.36* (0.20)	0.03 (0.02)
Observations	1,088	1,088	1,088	1,088	1,088
Number of GPs	136	136	136	136	136
Dep. Var. Mean	2282	2173	535.6	432.5	35.06

Note. 2SLS = two stage least squares; Dep. Var. mean = Dependent Variable mean; GPs = Gram Panchayats; HHs = Households; IV = instrumental variable; OBC = Other Backward Caste; SC = Scheduled Caste; SHG = self-help group; ST = Scheduled Tribe. Robust standard errors in parentheses.

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

**Table 7. IV 2SLS Results—Impact of Number of Other Caste SHG members on MGNREGS Outcomes**

	(1)	(2)	(3)	(4)	(5)
Variables	Number of job cards applied for	Number of job cards issued	Employment demanded—HHs	Employment provided—HHs	All assets
No. of Other Caste SHG members	0.83** (0.39)	0.73** (0.37)	0.51* (0.29)	0.44* (0.24)	0.04 (0.03)
Observations	1,088	1,088	1,088	1,088	1,088
Number of GPs	136	136	136	136	136
Dep. Var. Mean	2282	2173	535.6	432.5	35.06

Note. 2SLS = two stage least squares; Dep. Var. mean = Dependent Variable mean; GPs = Gram Panchayats; HHs = Households; SHG = self-help group.  
Robust standard errors in parentheses.  
\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

## Heterogeneous Effects

Although we do not have access to key MGNREGS outcomes for each caste group, we accessed data on the number of active and registered workers by scheduled caste and scheduled tribe status for the year 2020. These data are overwritten every year and were therefore unavailable for previous years at the time of our data extraction. To assess whether participation of scheduled caste and scheduled tribe populations in *Jeevika* improved MGNREGS outcomes specifically for these groups, we ran a cross-sectional regression analysis. We used a cross-sectional analysis because the outcomes do not show variation over time, and because both early and late rollout GPs had implemented *Jeevika* in 2020. For this reason, we were also unable to employ the instrumental variable analysis, indicating that we should exercise some caution in interpreting the results.

We find a large and statistically significant relationship between SHG membership of scheduled caste and scheduled tribe members and the number of registered and active scheduled caste and scheduled tribe MGNREGS workers. In addition, increases in other SHG members were associated with a larger number of MGNREGS workers from other castes. The regressions control for population by caste group to ensure that the relationships are not reflective of the difference in populations at the GP level. We also see a potential crowding-out effect, where an increase in other caste SHG members was associated with a decrease in scheduled caste and scheduled tribe registered workers, while an increase in scheduled caste and scheduled tribe members was associated with a decline in registered workers from other castes. One potential explanation for this crowding-out effect is that an increase in the number of SHG members for a specific caste group may enable that caste group to ensure job cards for their group in particular, thus reducing the availability of job cards for other castes in the presence of rationing of job cards.

**Table 8. Placebo Tests—Regressions on 2020 Outcomes by Caste Groups**

	(1)	(2)	(3)	(4)
Variables	Registered workers SC/ST	Active workers SC/ST	Registered workers—Others	Active workers— Others
Cumulative SC/ST member count	1.47*** (0.21)	0.59*** (0.08)	-0.82* (0.48)	0.50* (0.28)
Cumulative non-SC/ST member count	-0.25*** (0.08)	-0.05 (0.03)	1.61*** (0.24)	0.59*** (0.13)
Observations	136	136	136	136
R-squared	0.38	0.37	0.31	0.21
Dep. Var. Mean	951.7	212.6	3249	1164

Note. Dep. Var. mean = Dependent Variable mean; SC = Scheduled Caste; ST = Scheduled Tribe.  
Robust standard errors in parentheses.  
\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Finally, we used the same 2020 data on registered and active workers to assess differences by sex, specifically looking at male and female workers. Similar to outcomes by caste, these data were unavailable for previous years. For these analyses, we regressed the effect of the number of registered and active female and male workers under MGNREGS on total SHG members (note that all SHG members under *Jeevika* are women), while controlling for GP-level population rates.

As shown in Table 9, increases in SHG membership were associated with similar increases in registered and active workers across genders. Specifically, an increase of 100 SHG members was associated with an increase of 59 registered workers and 33 active members among women, and 61 registered workers and 34 active workers among men. These findings indicate that women's SHG membership benefits both men and women in terms of access to MGNREGS. This is likely reflective of the process by which households register for job cards. Specifically, the MGNREGS job card is issued to households, and each job card may include multiple adult members of the household who are willing to register themselves for unskilled work under MGNREGS. Therefore, in the current context, a woman's SHG membership can improve MGNREGS access for all adult household members and not only for women SHG members themselves.

**Table 9. Placebo Tests—Regressions on 2020 Outcomes by Gender**

	(1)	(2)	(3)	(4)
Variables	Registered workers—women	Active workers—women	Registered workers—men	Active workers—men
Cumulative SHG member count	0.59*** (0.13)	0.33*** (0.06)	0.61*** (0.13)	0.34*** (0.05)
Observations	136	136	136	136
R-squared	0.23	0.20	0.24	0.22
Dep. Var. Mean	1813	738.4	2387	637.7

Note. Dep. Var. mean = Dependent Variable mean; SHG = self-help group.  
Robust standard errors in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

## Nonlinear Relationship Between SHG Membership and MGNREGS Outcomes

Finally, we examine the nonlinear relationships between the number of SHG members and MGNREGS outcomes using OLS regressions. Because the instrumental variable is always 1 (that is, after *Jeevika* rollout) for any non-zero levels of SHG membership, we were unable to employ this instrument to test the impact of high versus low levels of SHG membership. Although we considered using time since rollout as another potential instrument, our first-stage

regressions did not show a strong enough positive relationship between *Jeevika* expansion and SHG membership for the subsample analyses to apply an instrumental variable regression analysis.

Nonetheless, the evidence indicates that the relationship between the number of SHG members and MGNREGS outcomes is primarily driven by GPs with a larger number of SHG members. This evidence for nonlinear effects may suggest that increases in the number of SHG members only result in improvements in MGNREGS outcomes after SHG members gain sufficient political bargaining power to obtain job cards for their group or after SHGs are sufficiently mature to start the formation of Village Organizations and Cluster-Level Federations.

**Table 10. Nonlinear Relationship Between NRLM and MGNREGS**

	(1)	(2)	(3)	(4)	(5)
Variables	Number of job cards applied for	Number of job cards issued	Employment demanded—HHs	Employment offered—HHs	All assets
868 to 1208 SHG members (2nd quantile)	39.19	42.54	-7.38	-12.97	-9.46*
	(56.52)	(50.04)	(41.03)	(34.80)	(4.79)
1209 to 1484 SHG members (3rd quantile)	102.05	95.68	40.43	12.11	-16.80**
	(79.74)	(72.47)	(55.08)	(46.52)	(7.71)
1485 to 3883 SHG members (4th quantile)	309.29***	267.43***	154.69*	95.06	-2.16
	(109.17)	(100.38)	(78.49)	(66.40)	(11.73)
Observations	1,088	1,088	1,088	1,088	1,088
R-squared	0.60	0.54	0.44	0.44	0.43
Number of GPs	136	136	136	136	136
Dep. Var. Mean	2282	2173	535.6	535	432.5

Note. Dep. Var. mean = Dependent Variable mean; GPs = Gram Panchayats; HHs = Households. Robust standard errors in parentheses.

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

### Robustness Check: Using Time Since Rollout as IV

As a robustness check to our main results, we employed a categorical variable indicating time since the beginning of *Jeevika* rollout in GPs to instrument for SHG membership. Our previous estimates do not change appreciably after changing the instrument, and impact estimates in fact increase a little once we leverage the additional variation over time. Specifically, the estimates indicate that increasing SHG membership by 100 women led to 33 new card applications, 29 new job cards issued, 23 new households that demanded employment, and 19 new households that were provided employment. Results are shown in Table 11.

Table 11. IV 2SLS Results—Impact of Number of SHG Members on MGNREGS Outcomes

	(1)	(2)	(3)	(4)	(5)	(6)
Variables	Number of job cards applied for	Number of job cards issued	Employment demanded—HHs	Employment provided—HHs	All assets	SHG membership
No. of SHG members	0.33** (0.14)	0.29** (0.13)	0.23** (0.10)	0.19** (0.08)	0.01 (0.01)	
Observations	1,088	1,088	1,088	1,088	1,088	
Number of GPs	136	136	136	136	136	
Dep. Var. Mean	2282	2173	535.6	432.5	35.06	
<b>First-stage</b>						
1-2 years post rollout (v/s. pre-Jeevika)						489.5*** (41.13)
3-4 years post rollout (v/s. pre-Jeevika)						399.6*** (47.29)
5+ years post rollout (v/s. pre-Jeevika)						335.2*** (48.41)
Combined F-stat						58.16

Note. Dep. Mean. Var. = Dependent Variable mean; GPs = Gram Panchayats; HHs = Households; IV = instrumental variable; SHG = self-help group; v/s = versus.

Robust standard errors in parentheses.

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

## 6. Conclusion

This paper contributes to the literature on convergence between different social protection programmes by examining the impact of the number of SHG members on access to MGNREGS job cards and jobs in Bihar, India. We combined a cluster RCT with administrative MIS data from the DAY-NRLM and MGNREGS to demonstrate positive effects of the number of SHG members on MGNREGS outcomes. Specifically, we found that an increase of 100 SHG members resulted in 26 MGNREGS job cards applied for and 14 new MGNREGS jobs when we used an instrumental variable regression analysis in which we used the random assignment of GPs to early implementation of the *Jeevika* programme as an instrumental variable for the number of SHG members. We provide evidence for the relevance, conditional independence, and validity of the instrumental variable, suggesting a positive causal relationship between the number of SHG members and access to MGNREGS job cards and jobs. We also found some evidence that the positive effects are larger for scheduled caste and scheduled tribe households, indicating that convergence between the DAY-NRLM and MGNREGS is particularly important for marginalised populations. However, we did not find differential effects for men and women.

The results show the importance of setting up social protection systems and stimulating convergence between programmes to improve coherence and ensure coordination of intersectoral efforts. Most impact evaluations of social protection programmes still focus on the effects of single interventions with limited emphasis on how different social protection programmes interact with each other. The evidence we present shows the importance of accounting for mechanisms through which different social protection programmes may influence each other's implementation or the take-up of interventions.

For India in particular, the results show the potential to focus even more strongly on the convergence between DAY-NRLM and MGNREGS. Barooah and colleagues (2022) already show how the introduction of a convergence policy can strengthen the effects of DAY-NRLM and MGNREGS on income in the states of Jharkhand, Chhattisgarh, Maharashtra, and Rajasthan. This study contributes to this literature by demonstrating a causal relationship between the number of SHG members and access to MGNREGS job cards and jobs in the state of Bihar.

We also provide some evidence for a nonlinear relationship between the number of SHG members and access to MGNREGS job cards and jobs. It appears that the positive relationship is primarily driven by GPs with a larger number of SHG members. This finding suggests that increases in the number of SHG members may only result in positive effects on access to MGNREGS job cards and jobs after SHG members gain sufficient political power to bargain for MGNREGS job cards for their group or after the formation of Village Organizations and Cluster-Level Federations, which often happens after SHGs are more mature and have a larger number of members. This finding also indicates the importance of triangulating findings on SHGs from the economics and political science literature. Although economic studies have examined the effects of SHGs on women's intra-household decision making, income, asset ownership, and consumption (e.g., Brody et al., 2015; Hoffmann et al., 2021; Kochar et al., 2020), recent political science literature has emphasised the importance of SHGs for political participation (Prillaman, 2021). Combining these two distinct literatures can help increase our understanding of the mechanisms through which SHGs can achieve improvements in women's empowerment and economic outcomes.

Future research could focus on examining the effects of convergence between different social protection programmes. The current study shows the promise of leveraging administrative data to determine the impact of convergence between different social protection programmes. We encourage other researchers to examine similar opportunities to combine administrative data from other social protection programmes to examine how to strengthen social protection systems in low-and middle-income countries.

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