Bidisha Barooah
Chandan Jain
Krishna Kejriwal
Pooja Sengupta
Prerak Shah
Rohan Shah
Saumya Jain

Improving delivery and impacts of pro-poor programmes

November 2021

Working Paper 47

Social protection

3ie International Initiative for Impact Evaluation

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About this working paper

This paper, *Improving delivery and impacts of pro-poor programmes,* examines the convergence of two large poverty-alleviation programmes in India, namely the Mahatma Gandhi National Rural Employment Guarantee Scheme and National Rural Livelihoods Mission, using survey data from four Indian states. This paper has been copyedited and formatted for publication by 3ie.

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Suggested citation: Barooah, B, Jain, C, Kejriwal, K, Sengupta, P, Shah, P, Shah, R and Jain, S, 2021. *Improving delivery and impacts of pro-poor programmes*, 3ie Working Paper 47. New Delhi: International Initiative for Impact Evaluation (3ie). Available at: DOI http://doi.org/10.23846/WP0047

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Bidisha Barooah
International initiative for Impact Evaluation (3ie)

Chandan Jain
3ie

Krishna Kejriwal
3ie

Pooja Sengupta
3ie

Prerak Shah
Vrutti Livelihood Impact Partners

Rohan Shah
Vrutti Livelihood Impact Partners

Saumya Jain
Vrutti Livelihood Impact Partners

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Executive summary

Taking cognisance of the multi-dimensional nature of poverty, development practitioners call for the linkage or 'convergence' of programmes for poor populations. It is believed that such convergence will improve the delivery and impact of poverty-alleviation programmes by building efficiency. In this paper, we examine the convergence of two large poverty-alleviation programmes in India – namely, the Mahatma Gandhi National Rural Employment Guarantee Scheme (MNREGS) and the Deendayal Antyodaya Yojana-National Rural Livelihoods Mission (DAY-NRLM or NRLM) – using survey data from four states.

Specifically, we attempt to examine how convergence with MNREGS in the early stages of a self-help group (SHG)'s lifecycle influences project implementation and household outcomes. Our study bases itself on existing literature on SHGs, which is unanimous in its finding that SHGs' effectiveness is correlated with their maturity. Older SHGs typically have been found to lead to better household economic outcomes (Kochar et al. 2020; Deininger and Liu 2013b; Hoffmann et al. 2017). In their nascent stages, SHGs are less impactful, particularly on economic and women's empowerment outcomes.

Convergence with the MNREGS required that members of women's SHGs formed under the NRLM had representation in planning and monitoring of the MNREGS at *gram panchayat* (village council) level, the grassroots level of governance. Such linkages may directly improve women's employment and community engagement. However, there may be detrimental effects if one project crowds out the other.

We use data from over 5,000 households across 218 villages in 4 Indian states to examine this question. We use two types of variations in programme implementation to estimate the effects of early convergence vis-à-vis late convergence. We match the dates for roll-out of the SHG programme at village level, and implementation of convergence at block level, with our household sample. In this way, we are able to identify villages that started the SHG programme late but converged with the MNREGS within a year of SHG formation.

The other set of villages were those where SHGs were linked to the MNREGS when they were at least 2.5 years old. We compare their outcomes to those in villages with similarly aged SHGs in non-convergence blocks. We provide evidence indicating that convergence and non-convergence blocks had similar trends in observable characteristics before the NRLM commenced.

We find that villages that implemented convergence early in the SHG programme cycle reported a higher proportion of households working in the MNREGS (40% compared to 22% in similarly aged SHGs in non-convergence blocks), suggesting better delivery of the MNREGS. As a result, income from the MNREGS was higher in sampled households in the early convergence villages. We see no difference in income from other sources such as agriculture, enterprise or private sector wage work.

Total consumption expenditure was also higher in early convergence villages. Consistent with existing studies, strong gender effects are noted, with significant gains in the number of women's days of work in the MNREGS and the number of days they were paid for working in the MNREGS. Women worked more in the MNREGS and this came

with a reduction in their work in private wage employment. This supply shortage likely led to an increase in their private sector wage rates.

We see no changes in men's wages or work, although a higher number of women's paid workdays was associated with more time spent by men on unpaid domestic chores. We observe no improvement in women's social engagement such as attendance at *gram sabhas* (village general assemblies) and membership of community-based organisations in early convergence villages.

We conclude that convergence can be an effective mechanism to improve programme delivery quality. Convergence may be instrumental in improving the effectiveness of less mature SHG programmes.

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Abbreviations and acronyms

MNREGS	Mahatma Gandhi National Rural Employment Guarantee Scheme
NRLM	National Rural Livelihoods Mission
SHG	Self-help group
VO	Village organisation

1. Introduction

Social programmes may differ in their interventions, but they often have similar goals and target the same populations. In such scenarios, will promoting functional linkages between programmes with similar goals improve their efficiency and impacts? Or are there detrimental consequences of one programme 'crowding out' the other? We examine this question by using the staggered implementation of an intervention in India, through which two of the largest poverty-alleviation programmes were linked or 'converged'.

The theoretical value of linkages across social programmes can be found in the literature on institutional economics and decentralisation. Its main argument asserts that coordination and cooperation across and within organisations and layers of government will lead to economies of scale by sharing information, resources and networks (North 1990a and 1990b; North 1992). However, empirical studies examining the provision of public goods have shown that the benefits of such processes depend on the ability of organisations to successfully cooperate (Bardhan 2000; Bardhan and Mookherjee 2005; Galasso and Ravallion 2005; Saleth and Dinar 2008).[1] This, in turn, is determined by the degree of homogeneity of preference within an organisation and the alignment of incentives of its agents at different levels (Foster and Rosenzweig 2003; Banerjee et al. 2005; Banerjee and Somanathan 2007).[2]

We contribute to the literature on institutional linkages by studying the convergence of two nationally implemented programmes in India; namely, the Mahatma Gandhi Rural Employment Guarantee Scheme (MNREGS) and the Deendayal Antyodaya Yojana — National Rural Livelihoods Mission (NRLM). Specifically, we attempt to answer whether converging the two programmes alleviated the capacity constraints of less mature self-help group (SHG) programmes.

[1] Bardhan (2000), while looking at physical, institutional and socio-economic determinants of cooperation in irrigation in southern India, stresses the need for devolving authority to local farmers rather than imposing rigid external rules – particularly in the case of decision-making and rule-crafting. Bardhan and Mookherjee (2005) also maintain that decentralisation by itself is unlikely to be a solution for problems of accountability. Instead, institutional safeguards to prevent excessive capture of local governments (e.g. literacy and information campaigns, minority reservations, land reforms, monitoring by civic bodies) are likely to compel local bodies to address corruption. Even when it comes to targeting poor populations for welfare programmes, Galasso and Ravallion (2005) conclude that inequality within villages matters to the relative power of the poor in local decision-making. Hence, concerted efforts are required to raise awareness and engage the poor in such campaigns. Saleth and Dinar (2008) analyse institutional linkages and their performance implications in the context of the global water sector. Among several factors, they highlight effective conflict resolution mechanisms, legal integration, a healthy dose of centralisation, user participation policy and information development, and technology application in management as factors affecting institutional performance and linkages.

[2] Banerjee and colleagues (2005) hypothesise that social divisions impede economic growth, and go on to suggest that homogeneous societies may have an advantage as there is more contact across these communities and therefore more trust, empathy and shared interests. Nonetheless, despite social divisions across India, there has been broad convergence in access to even those public goods that remain relatively scarce in rural India. However, benefits of this expansion in public goods were unevenly distributed among the disadvantaged. For instance, Banerjee and Somanathan (2007) explain that in the 1980s the scheduled castes established a successful caste-based party and significantly increased their representation in national politics, and the study suggests that they were also able to extract public resources from the state.

Existing studies have shown that length of programme exposure impacts household welfare outcomes for beneficiaries of the MNREGS and SHGs (Kochar et al. 2020; Deininger and Liu 2013b; Hoffmann et al. 2017), emphasising the role played by programme maturity. The programmes are not likely to make a difference in the initial years of implementation but will do so after an slight lag. In such a scenario, can linking the two programmes create synergies that enhance their capacity? This question is relevant for implementing agencies that grapple to find means of scaling programmes while maintaining intervention quality.

The goal of both programmes is to alleviate poverty by providing access to livelihoods. While the MNREGS provides unskilled wage work, the NRLM focuses on self-employment and skilled work. The MNREGS is a demand-driven, rights-based programme that aims to alleviate rural poverty by guaranteeing up to 100 days of employment in unskilled wage labour work annually to every household. Unskilled workers are employed by the government to create assets that improve livelihood options for the poor, such as irrigation and soil and water conservation.

The NRLM focuses on addressing rural poverty by creating women's credit and thrift groups, or SHGs, federating these groups into village-level organisations and promoting livelihood-generating activities through them. While both programmes have been in place for almost a decade, they were operating independently with little overlap in their functions.

The two programmes were functionally linked in 2015 by an order issued by the Ministry of Rural Development. This was called convergence, a term we will use throughout the paper. Convergence required that SHG members be included in: (a) the participatory identification and enrolment of households who may have been left out of the MNREGS rolls; (b) planning of the MNREGS budget at the village level; and (c) determining asset creation and monitoring of worksites. This linkage is expected to benefit the MNREGS by making it more inclusive and participatory, and increasing the choice of livelihoods available to households under the NRLM. We discuss this in detail in section 2.

While the directive for convergence came from the federal government, implementation was carried out by state governments. Different states implemented convergence in different years. Some of the early-mover states were Jharkhand, Rajasthan, Chhattisgarh and Maharashtra, which emphasised convergence in 2015. Data from these four states are used in this paper. By creating complementarities, convergence was expected to reduce gaps in the delivery of both programmes and improve their impact.

Convergence was first targeted at some of the poorest administrative clusters of villages (called blocks) in 2015. All villages within a block were expected to start convergence activities around the same time. Within a block, however, some villages had started SHG formation under the NRLM before 2015, while others did so after. Early SHG villages, therefore, converged late in their SHG programme cycle, while late villages started the SHG programme alongside convergence. Due to the late introduction of convergence in early villages, they had only partial exposure to convergence during their programme lifecycle, while late villages had full exposure.

We examine if this difference in convergence exposure may lead to differential programmatic outcomes for the MNREGS and NRLM. The question is important

because the Indian government is increasingly emphasising convergence of the NRLM and MNREGS in a bid to increase efficiency. Yet it is not clear at what stage of programme maturity mutual benefits start to appear. For example, early SHG villages have more mature SHGs and SHG federations, which may be able to consolidate convergence more efficiently than those in late villages. However, SHGs in late villages benefit from integration with the MNREGS from the outset by having access to a 'guaranteed' source of livelihood. They may therefore be able to gain from the established MNREGS institutions.

In this paper, we examine the difference in programme outcomes between early and late SHG villages in blocks that started convergence of the MNREGS and NRLM in 2015 and 2016. The data we use were collected by a team of researchers, including the lead authors of the paper to study the impact of the NRLM. It is a cross-sectional dataset collected for the year 2018–2019 for eight states. We use data from more than 5,000 households and 400 SHGs in 4 states – Jharkhand, Rajasthan, Chhattisgarh and Maharashtra – that started convergence in 2015.

Seventeen out of a total of 25 blocks in our sample initiated convergence in 2015. The remaining blocks did not do so until 2019. Within and across these blocks, some villages initiated the SHG programme before 2015, while others did so after 2015. Comparing early and late villages within a block still leaves the problem posed by the difference in duration of SHG exposure. We therefore identify early and late SHG villages in blocks that did not start convergence in 2015–2016. By subtracting observed difference in outcomes between early and late villages of non-convergence blocks from convergence blocks, we are able to measure the relative benefit of late versus early exposure to convergence.

We take into consideration that the blocks that undertook convergence first (in 2015) had poorer socio-economic conditions than those that took up convergence immediately. An important assumption we make is that while convergence and non-convergence blocks may have been different, they displayed parallel trends in socio-economic characteristics and programme implementation in the years before convergence. Thus, in the absence of convergence, these blocks would have shown similar trends from 2015–2016 to 2018–2019. Here, we are challenged by the absence of pre-programme survey data. We instead combine our dataset with census data to test if the parallel trends assumption holds for important observables such as men's and women's labour force participation. We find that it does.

We find that early exposure to convergence in the SHG lifecycle (i.e. in late SHG villages) improved the availability of MNREGS jobs and number of workdays at household level compared to late exposure to convergence. Correspondingly, household income from the MNREGS increased. Household expenditure on food and non-food items increased as well. We find significant reduction in household poverty as measured by an index of women's reproductive health, household hunger, education of adults and children, and household sanitation, fuel and housing.

We report strong gender effects of early convergence. Women's MNREGS participation in late SHG villages increased compared to early SHG villages. This was not true for men. Women worked a greater number of days in the MNREGS and accordingly were paid for a higher number of days, suggesting efficient payment in convergence blocks. This is important, given that the limited impact of the MNREGS has been attributed to

delayed payments and leakages. We find that women reduced their time in private sector casual labour work with convergence. Consistent with expectations, wage rates for casual labour increased for women.

Findings from our study are consistent with existing evidence on the MNREGS and SHGs. Broadly, there is agreement that the MNREGS has been successful in increasing employment levels in rural India and that this effect has been profound for women (Khera and Nayak 2009; Dasgupta and Sudarshan 2011). The programme's labour market impacts have also received much attention. Studies have shown that the MNREGS shifts labour away from private markets and pushes up wage rates in this sector (Imbert and Papp 2015). Studies on general equilibrium effects of the MNREGS attest non-programme welfare gains such as an increase in consumption and poverty reduction (Klonner and Oldiges 2014).

Non-programme gains are significant due to wage effects (Muralidharan et al. 2017). Almost all of these studies conclude that the MNREGS is effective when it is well implemented. Concerns about the efficiency of the programme abound in light of delayed payments and leakages (Narayanan et al. 2017; Niehaus and Sukhtankar 2013a, 2013b). Some empirical work has shown promising impacts of biometric smart cards and bank accounts on reducing payment delays and leakages from the programme (Muralidharan et al. 2016; Banerjee et al. 2016). We contribute to this literature by substantiating that convergence installed a system of participatory planning and monitoring of the MNREGS by involving female SHG members, which in turn led to an increase in paid MNREGS employment days for women.

SHG programmes in India have been evaluated in many studies; yet evaluations of the NRLM programme are limited. The importance of institutional linkages has gained prominence in recent research but has not been backed by evidence. Desai and Joshi (2014) study the programme in Rajasthan and report an improvement of women's labour force participation in non-farm jobs that included the MNREGS.

In another study, households linked to SHGs reported greater access to the MNREGS than households in control areas (Joshi et al. 2015). Deininger and Liu (2013a), in their study of the SHG programme in Andhra Pradesh (a star-performing state), highlight the role of linking SHGs to public distribution of food supplies in improving food and calorie consumption of poor households. Hoffmann and colleagues (2017) see a positive impact of the programme in Bihar on household loans but not on income and women's work. They attribute this lack of impact on incomes to the delay in establishing linkages at the time of the endline study.

Kochar and colleagues (2020) – the study whose data we use – find that villages with more mature SHGs experienced significant impacts on income and livelihoods compared to those with newly formed SHGs. Indeed, the increasing returns to SHG age has been the finding of most impact evaluations of SHGs in India. However, these studies do not have sufficient information on linkages. We show that convergence has the potential to strengthen newly formed SHGs.

The rest of the paper is structured as follows. In section 2, we discuss the NRLM and MNREGS programmes and their convergence. Section 3 describes our data. Sections 4 and 5 are devoted to elaborating our empirical methodology and testing our identifying assumptions. Section 6 presents the results of our analysis and section 7 concludes.

2. The programmes

The NRLM programme differs from typical microfinance programmes in that it provides livelihood support beyond facilitating access to credit, such as skills and business training, enterprise promotion, and establishing linkages between SHGs and local institutions and connecting them to existing social programmes. This process of linking SHGs with social support programmes is called convergence. The NRLM improves upon microfinance programmes of the past by institutionalising a system of federating 10–20 SHGs from the same village into village organisations (VOs) and a number of VOs into cluster-level federations. These federations play an important role in the convergence process, as we discuss in later paragraphs.

The formation of SHGs and federations follows a phased process that is explained in Figure 1. SHG formation starts with the mobilisation of 10–12 women, ideally living in the same neighbourhood, by programme resource persons. In the first six months, group members meet and save regularly (often weekly). They engage in intra-group lending of small credit amounts. During this period, SHG bank account creation is facilitated by programme resource persons and group members are trained in the five basic norms of SHG function: regular weekly meetings, savings, internal lending, regular repayment and bookkeeping. These norms are called the *Panchasutras* and are used to assess the quality of SHG function.

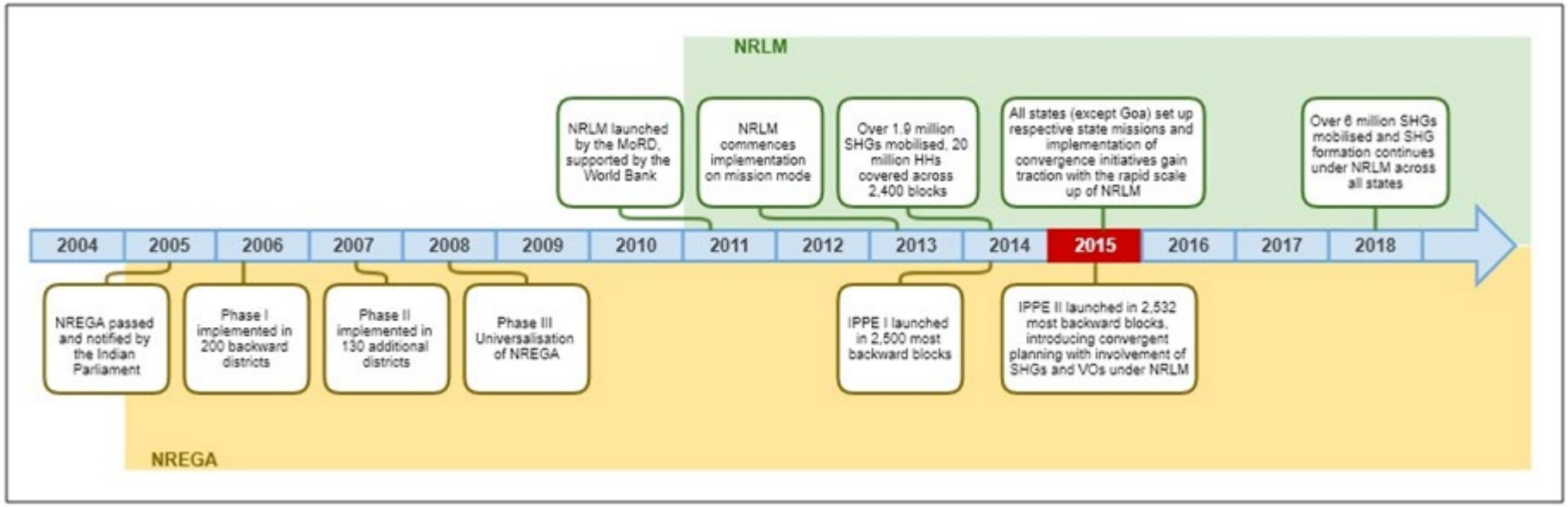
At formation, the SHG receives the first injection of funds in the form of Revolving Funds, which are a one-time payment to SHGs of around INR15,000 that serves as a corpus to meet the immediate credit needs of members. Between 6 and 24 months, SHGs should be federated into VOs. The role of VOs varies across states. However, generally, they:

> should enable close bonding of the SHGs, with 10–20 SHGs. Their responsibilities include: (1) bringing all left-out poor into the SHG fold; (2) providing support services like trainings, bookkeeping, etc. to SHGs; (3) providing higher order financial and livelihood services; and (4) facilitating access to public services and entitlements. (MoRD 2017)

The next phase of the programme commences after 24 months, when SHGs are consolidated into second-level federations called cluster-level federations and are expected to take up livelihoods promotion in a systematic manner.

The roll-out of the NRLM took place at the block level within a district and happened in two distinct phases. The first phase of programme implementation was in 2012–2013 while the second took place from 2016 onwards. The first phase was targeted at the deprived blocks in terms of scheduled caste and/or scheduled tribe populations. Within a block, villages were assigned to four clusters based on their geographical proximity. Within each cluster, villages were ranked in descending order of their population and the programme was first launched in the more populous villages. This meant that there were two main types of phasing: at the block level, and within blocks at the village level.

Figure 1: MNREGS and NRLM timeline



Source: Authors' own diagram.

Notes: MoRD = Ministry of Rural Development; HH = household; IPPE = intensive participatory planning exercise.

Following the stepwise process of SHG formation, it may have been expected that SHGs and VOs would be able to actively take up the role of convergence after six months. Yet this did not happen. The initial years of NRLM implementation were marked by delays in reaching project milestones or 'triggers'. This has been noted by Kochar and colleagues (2020), who show that the earliest SHGs (those formed in 2012–2014) took much longer to receive funds and be federated than newer SHGs.

The same study notes that in the initial years, the programme's emphasis and main mechanism for impacting household welfare was through financial inclusion. This changed in May 2015 when, via a circular by the Indian government (GoI 2015), guidance was provided to all states to commence the process of 'integrating, coordinating and converging' major poverty alleviation schemes at *gram panchayat* (village council) level. Particular attention was to be paid to four programmes to be linked to the NRLM: the MNREGS, a housing scheme, a skills training programme and a toilet construction programme.[3]

The MNREGS is one of the largest workfare programmes in the world. It legally provides every household with 100 days of work on demand per year. It has been in operation for over 13 years since 2006. The programme was implemented in three distinct phases. The first came into effect in early 2006 in the 200 lowest-income districts of the country. The second phase of the programme started in 2007, wherein the MNREGS was extended to an additional 130 districts. The remaining districts were included during the third phase in 2008.

The MNREGS is currently under implementation in 701 districts and 7,080 blocks. A total of 35 per cent of workers under the scheme belong to the scheduled caste and/or scheduled tribe population, while 55 per cent are women. MNREGS wage rates are determined by states and are currently about INR200 per day. On average, the MNREGS provided 48 days of employment per household in 2019–2020.

Decentralised planning is an important element of the MNREGS. Planning and decision-making regarding the nature of works undertaken are supposed to be done in open assemblies, where decisions are taken in the presence of the *gram panchayats*. Social audits have been included as part of the programme to improve accountability of its performance. Yet data suggests that such audits are few (Afridi and Iversen 2014). Figure 1 depicts the timelines of the NRLM and MNREGS programmes.

2.1 Convergence of the MNREGS and NRLM

The goal of convergent planning or convergence of the NRLM and MNREGS is to address multi-dimensional poverty in a direct and sustainable manner. Key to successful convergence of the MNREGS and NRLM is participatory planning of *gram panchayat* budgets. An intensive participatory planning exercise was started in 2015 in 2,500 of the poorest blocks, for the financial year 2016–2017. The exercise, conducted in 2015–2016, reported participation from women's SHGs in large numbers (GoI 2015. It increased the role of women's groups in planning and implementation of the MNREGS.

[3] These programmes were rolled out at different stages and are not correlated with MNREGS implementation.

Specifically, it required VOs to mobilise women and excluded poor households into planning MNREGS budgets, to participate in the selection of assets to be created and to ensure employment of women in worksites. VOs were expected to provide human resources for identification of the excluded poor, monitor worksites and assess assets created. The expected outcomes of convergence for the MNREGS are: improved assessment of demand for work, an inclusive workforce and better access to livelihood assets by women and poor households. The expected outcomes for the NRLM are: diversified livelihood options, productive assets and enhanced social capital for poor households and women.

3. Data

The data used in this study come from a large cross-sectional survey of households, SHGs and VOs in four Indian states. The data were used for an impact evaluation of the NRLM almost eight years after the programme's implementation. This evaluation exploited the phased implementation of the NRLM across blocks and villages within blocks to examine the impact of the NRLM on household economic and women's empowerment outcomes. We use survey data from four states – Jharkhand, Rajasthan, Chhattisgarh and Maharashtra – that were early implementers of convergence and for which we were able to obtain block-level data on MNREGS convergence from implementing agencies.

The sampling strategy for the survey was adapted to the evaluation strategy proposed for the NRLM impact evaluation. For the sample selection, we relied on national- and state-level programme management information systems and consultation with state authorities. First, we selected two early and two late blocks within a district, with early blocks being those that were entered in the first phase of the programme and late blocks being those that were entered in the second phase.

In the next step, we identified clusters within a block and selected the first two clusters where SHG formation was started. We then selected four villages from each cluster: two villages where SHG formation started in the first year of the programme and two where SHGs were formed in the last year in the cluster. Thus, we selected eight villages in a block. Within each village, we selected two SHGs formed in the first year and administered the household survey to all members of those SHGs (around 20 SHG members).

Additionally, we randomly selected five households from the village that may or may not have been SHG members. The advantage of this method was that it allowed us to map SHG activities to household impacts when we needed to. With appropriate weights to member and non-member households, we were able to generate village-level estimates of the programme. We collected SHG data from the two selected SHGs, as well as four other randomly selected SHGs from the village. If the SHGs had been federated into a VO, we collected VO data.

For every block in our sample, we were able to obtain the year and month when MNREGS-NRLM convergence started. Our data for the study, therefore, consisted of 218 villages from 172 *gram panchayats* in 25 blocks. The household sample consisted of 5,000 households. SHG and VO information was gathered from 942 SHGs and 169 VOs. Out of the 942 SHGs, 87 per cent were federated into VOs.

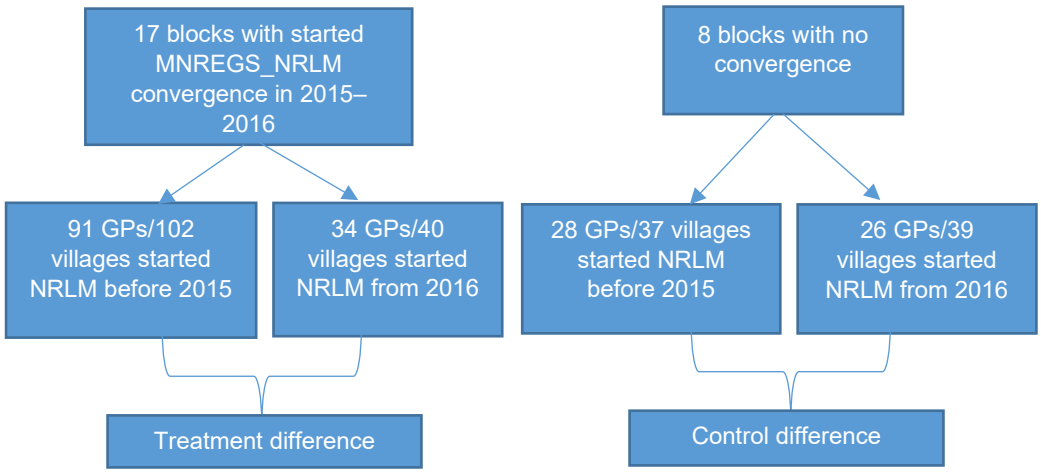
4. Empirical strategy

Our empirical strategy relies on the phased implementation of convergence at the block level. Figure 2 shows the distribution of our sample: 17 of 25 blocks started convergence in 2015–2016, while the rest did so in 2019–2020, after the survey data were collected. Within a block, we have the date of starting the NRLM for all sampled villages. Thus, for convergence blocks, we have a set of villages where the NRLM was started before convergence (early villages) and some where the NRLM was started after convergence with the MNREGS (late villages).

In late villages, SHGs were converged with the MNREGS early in their lifecycle, while in the early villages this happened late in the SHG's life. Any difference observed by comparing the outcomes of early and late villages in this case is the combined effect of the duration of the NRLM at the village level and initiation of convergence at the block level. We cannot rule out the effect of the duration of the NRLM and the MNREGS separately by simply comparing early and late NRLM villages within convergence blocks.

The following factors confound such a comparison. First, comparison of early and late villages within a convergence block does not take into account the impact of duration of SHG age. Second, we have not controlled for the singular impact of the MNREGS on all blocks. Third, villages in convergence blocks may be systematically different from those in non-convergence blocks.

Figure 2: Sample distribution



Note: GP = gram panchayat.

To untangle the effects of SHG age from those of convergence, we subtract the difference in outcomes of early and late NRLM villages in convergence blocks from the same outcomes in non-convergence blocks. Our assumption is that in the absence of convergence, early and late NRLM villages would be comparable because the decision rule of implementing the NRLM within a cluster remained the same across all blocks.

As discussed, within a block, the NRLM was rolled out in larger villages and those with high scheduled caste and/or scheduled tribe populations first. While in convergence blocks, we can easily identify villages where the NRLM started before and after

convergence, this is a challenge in non-convergence blocks. To overcome this, we set 2015–2016, when convergence was officially announced, as the cut-off date for identifying early and late villages. All villages where SHGs were started after 2015 are treated as late villages.

We next attempt to control for block-level differences. The roll-out rule of both the MNREGS and NRLM was to target the poorest blocks in the poorest districts first. Thus, the year that the programmes were started at the block level are predictors of the systematic differences between blocks. We include fixed effects for the year in which the NRLM was started to compare early and late villages in similarly aged blocks.

Thus, our most basic equation (1) is:

$$Y_{ivbs} = \beta_0 + \beta_1 Convergence_b + \beta_2 Late_v$$

$$+ \beta_3 (Late_v * Convergence_b) + \gamma_s + \mu_b + \gamma_s * \mu_b + Phase1_v + Z_{vbs} + e_{ivbs}$$

where Y_{ivbs} is the outcome of household i in village v in block b in state s. $Convergence_b$ takes a value of 1 if a block is a convergence block and 0 otherwise. A convergence block is one wherein convergence between the NRLM and MNREGS was rolled out prior to 2019. $Late_v$ takes a value of 1 if a village started the NRLM after 2015 (the year of convergence) and 0 if before 2015. γ_s is state fixed effects and μ_b is NRLM block entry year fixed effects.

To control for the independent impact of the MNREGS, we include a dummy variable ($Phase1_v$) that indicates that a village started the MNREGS in 2006. Z_{vbs} is a vector of variables that capture the scale of the NRLM programme. This vector includes, for each block, the number of villages entered two years prior to entry into other blocks of the district. For each SHG, it includes the number of villages entered two years prior to its formation year in other clusters of the same block. We also include the number of SHGs formed in other blocks of the district two years prior to block entry for each SHG.

In this specification, β_1 is the effect of convergence without controlling for NRLM programme duration. β_2 captures NRLM programme duration, as it is the effect on late NRLM villages without controlling for convergence. β_3 estimates the effect of convergence in late villages (early convergence) and is our coefficient of interest. This coefficient can be interpreted as the difference in outcomes between early and late villages in blocks where convergence between the MNREGS and NRLM had been implemented. Specifically, it provides an estimate of the effect of convergence during the early stage of SHG formation. It should be noted that we have included the NRLM starting year fixed effects. Thus, our coefficient can be interpreted as the effect of convergence in late NRLM villages within similarly aged NRLM blocks.

4.1 Summary data

The household sample consists of 5,906 households from 218 villages in 25 blocks. Full sample summary statistics are displayed in Table 1. Our sample villages have poor socio-economic conditions, as depicted by the high percentage of scheduled castes and scheduled tribes. The maximum years of education for male household members is seven, compared to five for female members. A total of 92% of households have a ration

card, 77% of which are priority ration cards; approximately 78% of the sample of households are SHG members, but MNREGS prevalence is low, with only 27% having availed themselves of the scheme in the past 12 months.

Next, the sample is divided into four village types based on whether SHGs were formed early or late, and whether the village underwent NRLM convergence or not. Means of the household characteristics for each type are presented in Table 1. In the last column, we present the simple difference-in-difference of household characteristics, which captures the concept of our estimation strategy. The difference-in-differences are insignificant for most variables except demographic features such as caste and education of adults. This supports the rule that convergence was first targeted at more socio-economically deprived blocks.

Table 1: Summary statistics

	Full sample (N = 5,906)		Early village with convergence (N = 2,858)	Late village with convergence (N = 1,112)	Difference in means	Early village with no convergence (N = 1,054)	Late village with no convergence (N = 882)	Difference in means	Difference-in-difference
	Mean	SD	Mean	Mean		Mean	Mean		
SC/ST households	0.63	0.48	0.66	0.71	0.05	0.55	0.54	-0.01	0.06***
Household size	5.15	2.05	5.04	5.18	0.14	5.19	5.41	0.22	-0.08
Female-headed households	0.14	0.35	0.13	0.15	0.02	0.16	0.15	-0.01	0.03
Maximum years of education of adult male	6.93	4.76	7.16	6.18	-0.98	7.12	6.84	-0.28	-0.70**
Maximum years of education of adult female	4.88	4.93	5.18	4.32	-0.86	4.70	4.80	0.10	-0.96***
SHG membership	0.78	0.41	0.76	0.75	0.00	0.86	0.81	-0.05	0.05
Ration card holders	0.92	0.27	0.92	0.94	0.01	0.91	0.92	0.01	0.00
Priority ration card holders	0.71	0.45	0.74	0.68	-0.06	0.70	0.68	-0.02	-0.04
MNREGS job card	0.68	0.47	0.71	0.72	0.01	0.61	0.64	0.03	-0.02
Earned income from MNREGS	0.25	0.43	0.27	0.30	0.03	0.17	0.19	0.02	0.01

Notes: SC/ST = scheduled caste/scheduled tribe; SD = standard deviation. *** p < 0.01, ** p < 0.05, * p < 0.1

4.2 Identifying assumptions

A critical assumption we made in our empirical strategy is that, in the absence of convergence, the observed difference between early and late villages would be comparable between similarly aged convergence and non-convergence blocks. In the absence of a baseline, we use data from the 2001 census[4] to compare our sample villages in a year when neither the MNREGS nor the NRLM were implemented. To do this, we estimate equation (1) with only state and block entry year fixed effects.

The coefficient on *Late* is negative for village population, attesting that, within a block, the NRLM was first started in more populous villages. Important differences are observed between convergence and non-convergence blocks. Looking at crucial indicators of deprivation such as literacy, caste and occupation, we find support for the rule that convergence was first targeted at blocks with lower socio-economic outcomes.

To test our assumption that differences in early and late villages across similarly aged blocks would have been comparable in the absence of convergence, we examine the coefficient on *Late * Convergence*. If our assumption holds, we expect the coefficient to be insignificant. Indeed, this coefficient is insignificant for most village characteristics except village population. This is presented in Table 2.

[4] Government of India 2001. Census. Office of the Registrar General & Census Commissioner, Ministry of Home Affairs.

Table 2: Comparison of sample villages using 2001 census data (pre-MNREGS and pre-NRLM)

	Village population (persons)	Male literacy rate (%)	Female literacy rate (%)	Village population (persons – SC)	Village population (persons – ST)	Total workforce participation (%)	Male workforce participation (%)	Female workforce participation (%)
Late	-1,048***	-8.77e-05	-0.0140	0.0259	0.0386	0.0249	0.00668	0.0182
	(230.6)	(0.0420)	(0.0358)	(0.0702)	(0.0341)	(0.0328)	(0.0171)	(0.0213)
Convergence	-256.3	-0.128***	-0.130***	0.181***	0.122***	0.0141	0.0119	0.00220
	(250.8)	(0.0361)	(0.0324)	(0.0555)	(0.0324)	(0.0358)	(0.0177)	(0.0218)
Late * Convergence	571.0**	-0.0560	-0.0103	-0.00680	-0.0451	-0.0385	-0.0169	-0.0217
	(284.4)	(0.0588)	(0.0487)	(0.0945)	(0.0432)	(0.0453)	(0.0228)	(0.0294)
Constant	1,672***	0.755***	0.401***	0.668***	0.517***	0.345***	0.231***	0.114***
	(232.7)	(0.0355)	(0.0355)	(0.0549)	(0.0353)	(0.0345)	(0.0156)	(0.0229)
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Block entry year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	217	217	217	217	217	217	217	217
R-squared	0.206	0.166	0.316	0.151	0.184	0.142	0.080	0.172

Notes: SC = scheduled caste; ST = scheduled tribe. *** p < 0.01, ** p < 0.05, * p < 0.1

The 2001 census data provide support for the comparability of early and late villages by convergence at the block level. We present additional support for our assumption that these villages displayed parallel trends before the programmes began. We do so by combining data from the 2001 and 2011 census rounds to test for the possibility of any differential pre-programme trends across the sample villages. In 2011, the MNREGS was started in some districts, while the NRLM was not started in our sampled blocks. We therefore include state and NRLM block entry year fixed effects. We estimate the following specification using the census village panel:

$$Y_{tvbs} = \beta_0 + \beta_1 Convergence_b + \beta_2\, Late_v + \beta_3\, t + \beta_4\, (Late_v * Convergence_b) + \beta_5\, (Late_v * t) + \beta_6\, (Convergence_b * t) + \beta_7\, (Late_v * Convergence_b * t) + \gamma_s + \mu_b + \gamma_s * \mu_b + Z_{tvbs} + e_{tvbs}$$

The results from the same are presented in Table 3. The estimated coefficient on the triple interaction term $(Late_v * Convergence_b * t)$ indicates whether there are any differential trends for the late villages in convergence blocks in comparison to the other sample villages, after controlling for block-level, time-invariant characteristics. We expect the estimated coefficient to be insignificant if there is no difference in the change in the outcome over time across these villages.

Similarly, the estimated coefficients of the double interaction terms $(Late_v * t)$ and $(Convergence_b * t)$ will indicate if there are any differential trends across the early and late villages and villages in convergence and non-convergence blocks, respectively. We find that the estimated coefficient for the triple interaction term is insignificant for all the outcome variables presented in Table 3 except for one outcome.

The case for the other two interaction terms is similar; the estimated coefficients are insignificant for the majority of village characteristics, including those related to financial inclusion and work force participation. Only in the case of two outcomes do we find that the estimated coefficient for $(Late_v * t)$ is significant; these are the likelihood of a secondary school and a post office in the village.[5]

[5] The above analysis, using census data, was limited to those villages included in our primary survey. Herein, we extend the above analysis to include all villages in our sample blocks to test the possibility of any differential trends across all villages in convergence and non-convergence blocks. The results are presented in Table A1. As above, the estimated coefficient for the triple interaction variable is insignificant for a majority of the village characteristics, and it is negative and significant only for the following variables: workforce participation by females (significant at 10%) and availability of a bus service, schools (primary and middle) and a post office.

Table 3: Results using 2001 and 2011 census data: sample villages only

	Village population (persons)	Male literacy rate (%)	Female literacy rate (%)	Village population (persons – SC)	Village population (persons – ST)	Male workforce participation (%)	Female workforce participation (%)	Total workers	Total male workers	Total female workers	Village geographical area
Late	-1,151.01***	-1.31	-1.99	-147.12**	-423.71***	0.57	5.38	-472.74***	-293.42***	-179.32***	-338.97***
	(218.69)	(4.14)	(3.61)	(61.77)	(116.57)	(1.64)	(4.31)	(84.62)	(52.70)	(39.10)	(71.95)
Convergence	-180.56	-10.78***	-10.08***	-98.61*	308.09**	2.79*	13.83***	32.58	-33.43	66.01	-29.31
	(222.38)	(3.49)	(3.22)	(59.60)	(123.15)	(1.47)	(3.74)	(89.90)	(53.41)	(42.56)	(94.13)
Year_2011	310.00	9.22***	16.37***	54.35	87.05	2.20	7.31*	198.76	103.54	95.22*	-31.14
	(305.72)	(3.26)	(3.47)	(78.66)	(155.52)	(1.39)	(3.97)	(122.18)	(77.35)	(51.75)	(94.51)
Late * Convergence	536.74**	-6.31	-2.44	78.80	98.28	-0.39	-7.51	174.50	128.72**	45.78	172.53
	(257.58)	(5.79)	(4.83)	(65.25)	(145.12)	(2.14)	(5.30)	(108.96)	(63.38)	(51.83)	(104.87)
Late * Year_2011	-195.08	1.61	0.20	-26.27	-55.16	1.72	-2.69	-132.45	-59.80	-72.65	23.65
	(336.24)	(5.21)	(4.79)	(94.57)	(163.08)	(2.22)	(6.06)	(131.99)	(85.11)	(55.07)	(99.43)
Convergence * Year_2011	-2.55	0.32	-0.96	-34.92	94.85	-3.23*	-10.77**	-70.70	-26.37	-44.32	48.29
	(331.24)	(4.02)	(4.02)	(81.72)	(179.16)	(1.67)	(4.30)	(137.64)	(84.52)	(60.05)	(117.24)
Late * Convergence * Year_2011	55.19	3.86	3.42	26.18	-119.82	-2.92	7.28	79.70	19.68	60.02	-62.17
	(396.33)	(7.01)	(6.19)	(99.69)	(207.09)	(2.79)	(7.11)	(169.22)	(101.66)	(75.53)	(146.86)
Constant	2,013.70***	75.19***	39.09***	157.29***	1,135.67***	47.76***	33.46***	845.57***	496.59***	348.97***	653.57***
	(224.81)	(3.58)	(3.65)	(54.17)	(146.79)	(1.49)	(4.27)	(94.25)	(53.88)	(47.45)	(97.56)
Observations	434	434	434	434	434	434	434	434	434	434	434
R-squared	0.31	0.21	0.42	0.18	0.35	0.18	0.12	0.36	0.34	0.36	0.34

Notes: The above results use the combined village-level data from the 2001 and 2011 rounds of the census. The sample consists of those villages included in the primary survey. In addition to the variables presented above, the specification also controls for: (1) state fixed effects; (2) year of SHG entry in blocks; and (3) interaction of state fixed effects with the year of SHG entry in the block. Robust standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1

Results using 2001 and 2011 census data: sample villages only (contd.)

	Bank facility	Bus facility	Primary school	Middle school	Secondary school	Primary health centre	Post office	Distance to nearest town
Late	-0.11**	-0.20**	-0.28***	-0.47***	-0.10**	-0.06	-0.25***	6.80
	(0.05)	(0.08)	(0.09)	(0.09)	(0.05)	(0.04)	(0.08)	(4.41)
Convergence	-0.06	-0.06	0.03	-0.14	0.07	-0.01	-0.04	14.61***
	(0.07)	(0.08)	(0.06)	(0.09)	(0.07)	(0.04)	(0.09)	(4.64)
Year_2011	0.14	0.08	0.03	0.32***	0.30***	0.05	-0.16*	3.84
	(0.09)	(0.08)	(0.06)	(0.10)	(0.08)	(0.06)	(0.09)	(4.21)
Late * Convergence	0.02	0.17	0.23**	0.25**	-0.08	0.02	0.10	-7.94
	(0.07)	(0.11)	(0.10)	(0.11)	(0.07)	(0.04)	(0.11)	(6.76)
Late * Year_2011	-0.14	-0.00	0.05	-0.07	-0.22**	-0.05	0.16*	7.73
	(0.09)	(0.12)	(0.12)	(0.13)	(0.09)	(0.06)	(0.10)	(6.76)
Convergence * Year_2011	-0.03	0.06	-0.01	0.01	-0.15	-0.02	0.03	-9.60*
	(0.10)	(0.10)	(0.06)	(0.12)	(0.10)	(0.07)	(0.11)	(5.22)
Late * Convergence * Year_2011	0.05	-0.32*	-0.10	-0.16	0.12	0.04	-0.11	-5.27
	(0.11)	(0.17)	(0.14)	(0.17)	(0.13)	(0.07)	(0.13)	(9.15)
Constant	0.20***	0.64***	0.95***	0.70***	0.30***	0.03	0.35***	25.82***
	(0.07)	(0.09)	(0.06)	(0.10)	(0.08)	(0.04)	(0.09)	(5.17)
Observations	434	414	434	434	434	432	418	434
R-squared	0.12	0.39	0.17	0.34	0.21	0.07	0.11	0.13

Notes: The above results use the combined village-level data from the 2001 and 2011 rounds of the census. The sample consists of those villages included in the primary survey. In addition to the variables presented above, the specification also controls for: (1) state fixed effects; (2) year of SHG entry in blocks; and (3) interaction of state fixed effects with the year of SHG entry in the block. The outcome variable measures the availability of facility at the village level and it takes a value of 1 if the village has the facility and 0 otherwise. Robust standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1

5. Results

5.1 Impact on programme delivery

In this section, we present the main findings of our regression estimation. We first examine if convergence met its programmatic goals of improving the delivery of the MNREGS and NRLM in Tables 4, 5 and 6. The coefficient of interest to identify the effect of convergence on late villages is that on *Late * Convergence*. We see that convergence led to improvement in the likelihood of households participating in the MNREGS as well as reporting income from it.

In Table 5, we see no impact of the convergence on men's MNREGS participation, but significant positive impacts on women's participation. Within a household, the proportion of women who worked in the MNREGS increased. Convergence improved women's participation in terms of: (1) the number of days worked; and (2), the number of days worked they received payment for.

Convergence was expected to benefit the NRLM by increasing the participation of women in community decision-making, especially in MNREGS planning, thereby improving their social capital. Looking at some indicators of social capital in Table 6, we see mostly no impact of convergence. The impact on an index of women's confidence is positive and significant at 10 per cent. We see no significant increase in: women's decision-making within the household; their attendance in *gram sabhas* (village assemblies) and *mahila sabhas* (village-level meetings of women of the *gram sabhas*) and networks as measured by number of friends; their membership in community organisations other than SHGs; and their mobile phone ownership. However, we see a negative impact of convergence on women's overnight travel outside their villages.[6]

[6] Travel outside their village may be determined by remoteness. If villages are close to towns or blocks, there may not be a reason for women to take overnight journeys. Once we explicitly control for distance of village, we find that the impact of convergence was higher in remote villages.

Table 4: Impact of convergence on MNREGS delivery indicators

	Household has a job card		Household worked in the MNREGS in past 12 months		Household earned an income from the MNREGS in past 12 months	
Late	0.056	0.054	0.005	-0.006	0.003	-0.003
	(0.057)	(0.057)	(0.047)	(0.047)	(0.040)	(0.040)
Convergence	0.062	0.079	-0.006	-0.021	0.010	-0.003
	(0.054)	(0.056)	(0.036)	(0.038)	(0.027)	(0.030)
Late * Convergence	0.031	0.028	0.176***	0.198***	0.249***	0.261***
	(0.061)	(0.062)	(0.056)	(0.058)	(0.052)	(0.053)
Constant	0.718***	0.585***	0.219***	0.469***	0.207***	0.443***
	(0.057)	(0.167)	(0.049)	(0.149)	(0.042)	(0.128)
Additional controls	No	Yes	No	Yes	No	Yes
Observations	5,780	5,780	5,780	5,780	5,780	5,780
R-squared	0.151	0.155	0.213	0.220	0.302	0.308
Outcome mean	0.646		0.234		0.202	
Outcome SD	0.478		0.424		0.401	

Notes: SD = standard deviation. Robust standard errors in parentheses. All regressions include: (1) state fixed effects; (2) NRLM block entry year fixed effects and their interactions; (3) an indicator for the MNREGS phase; and (4) scale variables. Additional controls include village population, number of villages in the district, block and cluster. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 5: Impact of convergence on days worked in the MNREGS

	Proportion of men who worked per HH		Number of days worked by men per HH		Number of days men were paid		Proportion of women who worked per HH		Number of days worked by women per HH		Number of days women were paid	
Late	0.077***	0.069**	1.891	1.619	2.202	1.947	-0.032	-0.033	-2.144	-2.278	-1.978	-2.061
	(0.029)	(0.029)	(1.742)	(1.755)	(1.567)	(1.569)	(0.042)	(0.042)	(2.141)	(2.191)	(1.538)	(1.576)
Convergence	-0.042*	-0.056**	-1.717	-1.907	-1.886	-2.081	0.031	0.022	1.154	1.686	0.813	1.138
	(0.025)	(0.027)	(1.345)	(1.429)	(1.548)	(1.665)	(0.024)	(0.027)	(1.310)	(1.602)	(0.974)	(1.277)
Late * Convergence	0.039	0.055	2.238	2.825	1.769	2.282	0.243***	0.247***	7.949***	8.636***	5.889**	6.346***
	(0.039)	(0.040)	(1.891)	(2.051)	(1.677)	(1.785)	(0.057)	(0.058)	(3.039)	(3.124)	(2.363)	(2.426)
Constant	0.076***	0.283***	4.202***	7.325	3.693***	6.760	0.183***	0.410***	7.158***	6.111	7.238***	7.108
	(0.028)	(0.099)	(1.477)	(5.140)	(1.375)	(4.965)	(0.043)	(0.147)	(2.366)	(6.832)	(1.961)	(5.575)
Additional controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780
R-squared	0.175	0.181	0.075	0.077	0.078	0.080	0.250	0.254	0.222	0.225	0.186	0.188
Outcome mean	0.121		4.029		3.523		0.188		7.138		5.790	
Outcome SD	0.370		15.66		13.95		0.425		20.43		17.20	

*Notes: HH = household; SD = standard deviation. Robust standard errors in parentheses. All regressions include: (1) state fixed effects; (2) NRLM block entry year fixed effects and their interactions; (3) an indicator for the MNREGS phase; and (4) scale variables. Additional controls include village population, number of villages in the district, block and cluster. *** p < 0.01, ** p < 0.05, * p < 0.1*

Table 6: Impact of convergence on NRLM outcomes

	Attended *gram sabha*		Attended *mahila sabha*		Decision-making index		Confidence index		Number of friends		Community-based org. membership		Travelled overnight in past month		Owns a personal mobile phone	
Late	-0.069	-0.081*	-0.000	-0.004	-0.733	-1.119	1.300	-1.006	0.565*	0.584*	-0.001	-0.003	0.026	0.039	0.036	0.054
	(0.045)	(0.045)	(0.019)	(0.019)	(3.603)	(3.635)	(4.784)	(4.789)	(0.310)	(0.308)	(0.007)	(0.007)	(0.037)	(0.037)	(0.043)	(0.042)
Convergence	-0.020	-0.038	-0.027*	-0.045***	0.952	0.170	8.007*	7.104	-0.536**	-0.392	-0.005	-0.014	0.018	0.016	0.025	0.062
	(0.040)	(0.043)	(0.014)	(0.016)	(3.645)	(3.781)	(4.265)	(4.466)	(0.259)	(0.274)	(0.010)	(0.010)	(0.034)	(0.036)	(0.050)	(0.049)
Late * Convergence	-0.065	-0.038	-0.006	0.003	-2.007	-0.767	4.587	9.760*	0.432	0.349	-0.009	-0.006	-0.090**	-0.098**	0.017	-0.018
	(0.050)	(0.050)	(0.022)	(0.021)	(4.226)	(4.439)	(5.193)	(5.270)	(0.395)	(0.397)	(0.011)	(0.012)	(0.045)	(0.046)	(0.062)	(0.061)
Constant	0.221***	0.326**	0.014	0.150**	20.957***	25.084***	60.021***	60.484***	2.901***	2.303**	0.030	0.135***	0.172***	0.283**	0.934***	0.585***
	(0.046)	(0.128)	(0.010)	(0.062)	(3.985)	(9.686)	(5.100)	(14.212)	(0.306)	(1.035)	(0.020)	(0.049)	(0.038)	(0.135)	(0.049)	(0.148)
Additional controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	5,777	5,777	5,780	5,780	5,776	5,776	5,763	5,763	5,777	5,777	5,779	5,779	5,779	5,779	1,586	1,586
R-squared	0.055	0.062	0.053	0.064	0.050	0.055	0.157	0.173	0.128	0.137	0.019	0.031	0.057	0.066	0.071	0.110
Outcome mean	0.298		0.0833		17.43		53.98		3.206		0.0302		0.206		0.901	
Outcome SD	0.457		0.276		28.67		40.41		3.461		0.171		0.404		0.298	

Notes: SD = standard deviation. Robust standard errors in parentheses. All regressions include: (1) state fixed effects; (2) NRLM block entry year fixed effects and their interactions; (3) an indicator for the MNREGS phase; and (4) scale variables. Additional controls include village population, number of villages in the district, block and cluster.
*** p < 0.01, ** p < 0.05, * p < 0.1

5.2 Impact on household outcomes

With increased participation of women in the MNREGS, one may expect shifts in household income sources. We examine this in Table 7, where we present the results of equation (1) on income sources. We do not see any such impacts for convergence households. The coefficient on *Late * Convergence* for the proportion of households earning income from cultivation, livestock, wages and enterprises, and salaries is insignificant, suggesting that although households engaged in the MNREGS have increased, shifts out of traditional occupations were not achieved.

In order to explore whether these aggregate household non-impacts mask intra-household occupational changes, we examine programme impacts on men's and women's time. In Tables 8 and 9, we examine convergence impacts on adult men's and women's months of work. Here we see some interesting patterns. There are no impacts found on men's months of work, except that they reported spending more time in unpaid domestic work.

Women, however, increased the number of months spent on their own agriculture, while reducing time in all forms of private casual labour. This, along with the finding that convergence led to an increase in women's MNREGS work, suggests that women's work force participation was positively impacted by convergence.

However, this did not translate to higher total household income (Table 10). Only household income from the MNREGS increased as a result of convergence. We see no significant impact on private sector wage incomes, enterprise or salary incomes, or income from agriculture and livestock.

Convergence emphasized reducing multidimensional poverty and improving welfare, not only income improvements. In Table 11, we present the estimated impacts of convergence on three measures of welfare: household consumption expenditure; an indicator for households experiencing hunger; and an index of poverty.[7] We see better welfare outcomes as a result of convergence. Household expenditure increased significantly, while incidence of hunger and poverty declined significantly.

[7] The poverty index combines the following indicators: (1) whether the household was hungry even once in the past 12 months; (2) if the index woman lost a child in the past five years; (3) household has no adults with more than five years of schooling; (4) household has one or more children between ages 6–14 not currently enrolled in school; (5) household practices open defecation; (6) household uses solid fuels; (7) household has no electricity; (8) household has muddy floors, walls or ceilings; and (9) household does not own any consumer assets. The weight for the first five indicators is 1/6 and the rest is 1/18.

Table 7: Impact of convergence on household livelihood choices

Dependent variable: households earning income	Own agriculture		Livestock		Male casual wages		Female casual wages		Enterprise and salaries	
Late	0.051	0.041	0.145**	0.149**	-0.012	-0.014	0.022	0.020	-0.063	-0.052
	(0.061)	(0.060)	(0.061)	(0.062)	(0.062)	(0.062)	(0.049)	(0.049)	(0.054)	(0.054)
Convergence	0.053	0.110*	0.051	0.074	0.081	0.077	0.081*	0.055	-0.168***	-0.096**
	(0.056)	(0.058)	(0.055)	(0.057)	(0.056)	(0.058)	(0.042)	(0.044)	(0.047)	(0.049)
Late * Convergence	-0.098	-0.095	-0.137**	-0.169**	-0.025	-0.033	-0.037	-0.028	0.046	0.035
	(0.070)	(0.071)	(0.068)	(0.070)	(0.069)	(0.070)	(0.056)	(0.056)	(0.059)	(0.059)
Constant	0.537***	0.137	0.415***	0.321*	0.551***	0.554***	0.042	0.352**	0.319***	-0.477***
	(0.064)	(0.182)	(0.064)	(0.180)	(0.063)	(0.176)	(0.043)	(0.151)	(0.051)	(0.139)
Additional controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780
R-squared	0.058	0.101	0.078	0.105	0.083	0.086	0.242	0.245	0.060	0.082

Notes: robust standard errors in parentheses. All regressions include: (1) state fixed effects; (2) NRLM block entry year fixed effects and their interactions; (3) an indicator for the MNREGS phase; and (4) scale variables. Additional controls include village population, number of villages in the district, block and cluster. *** p < 0.01, ** p < 0.05, * p < 0.1

Table 8: Impact of convergence on men's time

Dependent variable: number of months household adult men spent at least some time working	Agriculture and livestock		Wage labour		Enterprises and salaried work		Domestic unpaid work	
Late	0.562	0.469	-0.484	-0.430	-0.182	-0.130	-0.801*	-0.738*
	(0.424)	(0.415)	(0.516)	(0.520)	(0.531)	(0.531)	(0.425)	(0.433)
Convergence	0.533	0.683*	-0.465	-0.748	-1.349***	-0.838*	-1.283***	-1.028**
	(0.353)	(0.368)	(0.457)	(0.479)	(0.437)	(0.457)	(0.393)	(0.403)
Late * Convergence	0.453	0.522	-0.282	-0.400	-0.071	-0.058	1.282**	1.362***
	(0.503)	(0.502)	(0.604)	(0.613)	(0.576)	(0.584)	(0.510)	(0.517)
Constant	3.488***	4.563***	4.645***	7.245***	2.307***	-3.518**	3.186***	2.378
	(0.427)	(1.243)	(0.537)	(1.528)	(0.477)	(1.373)	(0.488)	(1.461)
Additional controls	No	Yes	No	Yes	No	Yes	No	Yes
Observations	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780
R-squared	0.160	0.209	0.054	0.060	0.062	0.075	0.389	0.396

Notes: robust standard errors in parentheses. All regressions include: (1) state fixed effects; (2) NRLM block entry year fixed effects and their interactions; (3) an indicator for the MNREGS phase; and (4) scale variables. Additional controls include village population, number of villages in the district, block and cluster.
*** p < 0.01, ** p < 0.05, * p < 0.1

Table 9: Impact of convergence on women's time

Dependent variable: number of months household adult women spent at least some time working	Agriculture and livestock		Wage labour		Enterprises and salaried work		Domestic unpaid work	
Late	0.224	0.256	-0.025	-0.027	-0.212	-0.127	0.335	0.302
	(0.476)	(0.471)	(0.299)	(0.306)	(0.273)	(0.282)	(0.286)	(0.284)
Convergence	0.226	0.322	0.493**	0.236	-0.206	-0.122	-0.597**	-0.801***
	(0.412)	(0.432)	(0.220)	(0.246)	(0.279)	(0.284)	(0.252)	(0.269)
Late * Convergence	1.045**	0.869*	-0.911**	-0.791**	-0.071	-0.257	0.402	0.432
	(0.512)	(0.510)	(0.372)	(0.372)	(0.344)	(0.351)	(0.333)	(0.333)
Constant	4.808***	6.631***	0.013	2.362**	0.754**	-0.218	10.028***	12.331***
	(0.432)	(1.232)	(0.224)	(0.974)	(0.328)	(0.898)	(0.320)	(0.683)
Additional controls	No	Yes	No	Yes	No	Yes	No	Yes
Observations	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780
R-squared	0.133	0.172	0.220	0.231	0.018	0.022	0.129	0.135

Notes: robust standard errors in parentheses. All regressions include: (1) state fixed effects; (2) NRLM block entry year fixed effects and their interactions; (3) an indicator for the MNREGS phase; and (4) scale variables. Additional controls include village population, number of villages in the district, block and cluster. *** p < 0.01, ** p < 0.05, * p < 0.1

Table 10: Impact of convergence on household income (INR ’000)

	MNREGS		Casual labour		Agriculture and livestock		Enterprise and salaries		Total	
Late	0.076	-0.005	-10.107*	-7.842	8.687**	9.436**	7.838	8.504	-11.851	-6.504
	(0.323)	(0.324)	(5.527)	(5.430)	(4.050)	(4.001)	(13.163)	(12.961)	(10.088)	(10.064)
Convergence	-0.013	0.088	-10.733**	-9.878**	-0.303	0.955	-22.408**	-13.844	-18.754***	-6.011
	(0.140)	(0.170)	(4.421)	(4.682)	(2.422)	(2.401)	(9.867)	(10.146)	(6.785)	(6.964)
Late * Convergence	0.531	0.740**	8.345	3.650	1.112	-0.259	-13.910	-14.053	-3.753	-12.240
	(0.352)	(0.356)	(6.418)	(6.436)	(5.060)	(4.590)	(14.986)	(15.272)	(11.341)	(11.529)
Constant	1.056***	0.315	37.254***	44.044***	-3.853	-16.850**	31.881***	-73.028**	79.567***	-39.389
	(0.270)	(1.003)	(4.881)	(16.874)	(2.884)	(7.713)	(8.829)	(29.808)	(7.562)	(24.663)
Additional controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,780	5,630	5,630
R-squared	0.164	0.169	0.057	0.067	0.061	0.063	0.041	0.050	0.060	0.091
Outcome mean	1.301		42.02		-10.12		26.41		67	
Outcome SD	4.023		52.33		35.30		168.3		77.52	

Notes: SD = standard deviation. Robust standard errors in parentheses. All regressions include: (a) state fixed effects; (2) NRLM block entry year fixed effects and their interactions; (3) an indicator for the MNREGS phase; and (4) scale variables. Additional controls include village population, number of villages in the district, block and cluster. *** p < 0.01, ** p < 0.05, * p < 0.1

Table 11: Impact of convergence on household welfare outcomes

	Total household consumption expenditure (INR)		Poverty index		Household ever went hungry in past 12 months	
Late	-37,171.309***	-35,396.784***	0.018	0.023	-0.076**	-0.058
	(11,943.464)	(12,008.197)	(0.015)	(0.015)	(0.037)	(0.037)
Convergence	-24,536.308**	-19,312.447	0.037***	0.031**	0.001	0.004
	(11,239.890)	(11,861.979)	(0.014)	(0.015)	(0.033)	(0.034)
Late * Convergence	27,340.591**	24,389.753*	-0.029*	-0.038**	-0.041	-0.071*
	(13,490.169)	(14,033.171)	(0.017)	(0.017)	(0.039)	(0.038)
Constant	152,956.711***	97,301.533***	0.194***	0.316***	0.075**	0.160
	(13,484.950)	(33,832.200)	(0.016)	(0.044)	(0.035)	(0.102)
Additional controls	No	Yes	No	Yes	No	Yes
Observations	5,670	5,670	5,779	5,779	5,779	5,779
R-squared	0.134	0.137	0.106	0.119	0.057	0.070
Outcome mean	122,045		0.199		0.114	
Outcome SD	94,590		0.115		0.318	

Notes: SD = standard deviation. Robust standard errors in parentheses. All regressions include: (1) state fixed effects; (2) NRLM block entry year fixed effects and their interactions; (3) an indicator for the MNREGS phase; and (4) scale variables. Additional controls include village population, number of villages in the district, block and cluster. *** p < 0.01, ** p < 0.05, * p < 0.1

5.3 Mechanisms

In the previous subsection, we showed that convergence led to an increase in the number of days women worked and were paid in the MNREGS. This led to an increase in household income from the MNREGS, but total income remained unchanged. In this subsection, we examine other mechanisms that could explain the insignificant impacts on wage and agricultural income.

Specifically, we study the impact of convergence on private sector casual wage rates (Table 12). We find that convergence led to significant increases in women's wage rates in the private sector when we restrict the sample to women who have worked as casual workers. Convergence did not lead to any changes in men's wages. This is consistent with the findings of existing studies that have shown that the entry of the government into labour markets has the effect of raising wages.

One of the priority sectors of MNREGS construction is building irrigation assets. While we do not have information on irrigation assets at the village or household level, we can examine the percentage of crops that are irrigated by cultivator households. In doing this, we see that convergence led to an increase in irrigated crops in the *rabi* season (October–March) but not *kharif* season (July–October). However, almost half of the households in our sample do not cultivate *rabi* crops. In summary, convergence impacted the wage labour market for women but not men.

Table 12: Impact of convergence on inputs and wages

	Share of irrigated crops (*kharif*)		Share of irrigated crops (*rabi*)		Total household savings		Labour wage rates (men)		Labour wage rates (women)	
Late	-0.036	-0.023	0.019	0.038	-3,716.461***	-3,672.897***	-60.966***	-62.187***	-29.913**	-27.398*
	(0.051)	(0.050)	(0.065)	(0.064)	(1,322.096)	(1,347.809)	(22.477)	(23.566)	(13.846)	(14.045)
Convergence	-0.113***	-0.107***	-0.206***	-0.182***	-5,566.515***	-4,824.121***	-54.216**	-57.842**	-6.679	-8.113
	(0.042)	(0.041)	(0.057)	(0.064)	(1,251.396)	(1,268.334)	(21.403)	(23.253)	(18.316)	(19.156)
Late * Convergence	0.000	-0.004	0.130*	0.142*	4,185.608***	4,263.574***	38.468	38.609	32.560**	29.770*
	(0.054)	(0.054)	(0.077)	(0.077)	(1,459.808)	(1,497.679)	(27.642)	(27.558)	(16.055)	(17.395)
Constant	0.109***	0.122	1.066***	0.794***	9,468.151***	2,055.235	279.459***	292.370***	177.056***	230.394***
	(0.036)	(0.143)	(0.048)	(0.213)	(1,728.112)	(3,532.188)	(19.460)	(56.041)	(30.767)	(53.526)
Additional controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	4,513	4,513	2,053	2,053	5,780	5,780	3,689	3,689	1,938	1,938
R-squared	0.166	0.176	0.183	0.197	0.063	0.067	0.043	0.044	0.212	0.228

Notes: robust standard errors in parentheses. All regressions include: (1) state fixed effects; (2) NRLM block entry year fixed effects and their interactions; (3) an indicator for the MNREGS phase; and (4) scale variables. Additional controls include village population, number of villages in the district, block and cluster. *** p < 0.01, ** p < 0.05, * p < 0.1

6. Conclusion

This study attempts to shed light on an important question on optimising the benefits of public programmes. Taking the case of two major rural poverty alleviation programmes in India, the MNREGS and the NRLM, we examine if integrating their planning and implementation at grassroots level through convergence was successful in reducing the relative disadvantage of less mature programmes.

The MNREGS is a programme that entitles poor households to demand and receive up to 100 days of paid work in a year. The programme provides wage employment by undertaking public works to create public goods. The NRLM is a livelihoods programme that mobilises rural women into savings-credit groups and promotes income-generating activities by providing access to financial capital and human resources development for wage (skilled and unskilled) employment and entrepreneurial activities. The programme is targeted exclusively at women, whose empowerment is an important goal of the NRLM.

We take advantage of the initiation of the two programmes' convergence in 2015 in a phased manner to examine the differential impact of convergence on villages by their SHGs' maturity status.

In this study, we use data from over 5,000 households and 200 villages across 4 states that began convergence during 2015. All blocks and villages in our sample had participated in the MNREGS for at least 7–10 years. However, there was variation within blocks in NRLM implementation. While early NRLM villages were exposed to the programme at least 6 years ago, late villages were exposed about 2.5 years ago. Convergence was a fairly recent initiative.

We compare villages which started the NRLM before convergence (early, i.e. 2015) and those which started after convergence (late). SHGs in late villages, therefore, started alongside convergence, while SHGs in early villages were exposed to convergence late. Early SHGs, being older, may already be well functioning due to their age, while late SHGs may take time to stabilise.

To separate the effect of convergence from that of SHG age, we employ two methods. First, we difference out the change in outcomes of interest between NRLM early and late villages in non-convergence blocks from the same difference in convergence blocks. Second, in our regression we control for the year in which a block started the NRLM. To separate the effect of the MNREGS alone, we control for the phase in which a village started the MNREGS. The effect of convergence on late SHG-implementing villages is given by the coefficient on the interaction between a dummy indicating a late NRLM village (or treatment village) in a convergence block.

Our findings indicate that early convergence was successful in reducing poverty and increasing welfare. Household consumption expenditure was higher by 22 per cent due to convergence in villages with less mature SHGs. This increment was from a sample mean of around INR120,000. An index of multidimensional poverty – which included indicators for household hunger, infant mortality, education of adults, school enrolment of children, fuel choice, lighting, sanitation and housing conditions – showed a significant decline in treated villages by 14 per cent. Household income from the MNREGS

increased substantially by 50 per cent. However, total household income did not increase significantly, perhaps due to the offsetting of wage income by MNREGS income.

Convergence was more beneficial for the MNREGS than the NRLM in late villages, leading to an increase in the likelihood of a household being engaged in MNREGS work and earning income from the programme. Seventeen per cent more households reported having worked in the MNREGS in villages that received convergence with SHGs over the sample average of 23 per cent. This was driven by substantial increases in women's participation in the MNREGS.

Convergence ensured that women were paid for days worked; it did not lead to a shift out of traditional occupations at the household level – an outcome for NRLM. However, it did lead to women increasing the number of months worked on their own farms while reducing time spent in casual labour, excluding the MNREGS. Further, we see significant positive impacts on women's savings. Expansion of the MNREGS through convergence had impacts on wages. We find indications of significant increases in women's casual wages due to convergence, although the sample size for this assessment is low.

We conclude that convergence of the NRLM and MNREGS was effective in reducing poverty, and it has been particularly beneficial for women in contexts where SHGs are fledgling. However, our results should be interpreted keeping in mind that our sample includes relatively poorer households than the standard rural population in India. In this sense, our results are in the upper boundary of programme estimates. We recommend that equal investment be directed towards convergence of the NRLM with initiatives for small and medium rural enterprise development and skills trainings to enhance incomes from the non-farm sector. For researchers, we recommend examination of whether convergence can lead to better use of resources and a reduction in implementation costs.

Appendix A

Table A1: Results using 2001 and 2011 census data

	Village population (persons)	Male literacy rate (%)	Female literacy rate (%)	Village population (persons – SC)	Village population (persons – ST)	Male workforce participation (%)	Female workforce participation (%)	Total workers	Total male workers	Total female workers	Village geographical area
Late	-571.42***	-10.63***	-8.53***	-104.80***	-96.76***	2.04***	2.18**	-235.48***	-140.07***	-95.41***	-157.49***
	(67.00)	(1.08)	(1.07)	(12.05)	(27.63)	(0.48)	(1.09)	(26.04)	(16.52)	(10.83)	(25.33)
Convergence	84.82	-10.80***	-9.39***	8.25	201.47***	1.07**	6.06***	97.90***	34.32**	63.59***	-10.61
	(64.29)	(0.93)	(0.96)	(12.75)	(29.58)	(0.44)	(0.95)	(26.43)	(16.19)	(11.33)	(26.71)
Year_2011	277.14***	5.96***	12.49***	44.36***	76.09**	3.34***	4.95***	177.88***	95.41***	82.47***	-11.66
	(83.86)	(1.00)	(1.06)	(16.01)	(37.34)	(0.49)	(1.14)	(35.63)	(21.65)	(15.16)	(31.08)
Late * Convergence	93.82	6.78***	4.79***	16.28	-47.51	-2.21***	-3.11**	7.30	9.40	-2.10	-11.88
	(84.03)	(1.38)	(1.28)	(15.13)	(36.21)	(0.61)	(1.27)	(34.40)	(21.21)	(14.65)	(32.52)
Late * Year_2011	-209.67**	6.57***	4.68***	-28.01	-70.09*	-0.78	4.13***	-113.90***	-66.64***	-47.26***	-21.93
	(94.91)	(1.35)	(1.33)	(17.64)	(41.79)	(0.65)	(1.43)	(39.79)	(24.36)	(16.86)	(34.41)
Convergence * Year_2011	-6.51	2.31**	0.47	-16.48	54.26	-3.06***	-6.80***	-64.69	-21.69	-43.00**	17.38
	(100.32)	(1.16)	(1.19)	(19.76)	(43.22)	(0.55)	(1.23)	(42.28)	(26.21)	(17.53)	(36.25)
Late * Convergence * Year_2011	7.67	-2.64	-0.02	9.33	-41.98	1.32	-3.02*	22.31	11.01	11.30	6.72
	(120.92)	(1.70)	(1.62)	(22.43)	(54.25)	(0.82)	(1.69)	(50.74)	(31.06)	(21.49)	(43.57)
Constant	1,221.05***	77.86***	41.60***	85.23***	645.54***	47.63***	37.76***	510.13***	293.11***	217.02***	524.56***
	(59.70)	(0.95)	(1.04)	(10.42)	(31.47)	(0.44)	(1.00)	(24.74)	(14.97)	(10.84)	(26.28)
Observations	7,169	7,157	7,154	7,169	7,169	7,157	7,154	7,169	7,169	7,169	7,150
R-squared	0.20	0.19	0.38	0.20	0.20	0.16	0.15	0.24	0.23	0.24	0.19

Notes: SC = scheduled caste; ST = scheduled tribe. The above results use combined village-level data from the 2001 and 2011 rounds of the census. The sample consists of all villages in the blocks. The specification also controls for: (1) state fixed effects; (2) year of SHG entry in blocks; and (3) interaction of state fixed effects with the year of SHG entry in the block. The outcome variable measures the availability of facility at the village level and it takes a value of 1 if the village has the facility and 0 otherwise. Robust standard errors in parentheses.
*** p < 0.01, ** p < 0.05, * p < 0.1

	Bank facility	Bus facility	Primary school	Middle school	Secondary school	Primary health centre	Post office	Distance to nearest town
Late	-0.05***	-0.03	-0.23***	-0.16***	-0.05***	-0.05***	-0.12***	5.95***
	(0.02)	(0.02)	(0.03)	(0.03)	(0.01)	(0.01)	(0.02)	(1.10)
Convergence	-0.02	0.08***	0.06***	0.05*	0.04***	0.00	-0.06***	13.91***
	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)	(0.01)	(0.02)	(1.30)
Year_2011	0.04*	0.10***	0.01	0.25***	0.12***	0.01	-0.09***	0.11
	(0.02)	(0.03)	(0.02)	(0.03)	(0.02)	(0.01)	(0.03)	(1.06)
Late * Convergence	0.02	0.03	0.14***	0.06*	-0.03	0.02	0.07***	-8.79***
	(0.02)	(0.03)	(0.03)	(0.03)	(0.02)	(0.01)	(0.03)	(1.66)
Late * Year_2011	-0.03	-0.09***	0.06*	-0.10**	-0.09***	-0.01	0.03	3.81***
	(0.02)	(0.03)	(0.03)	(0.04)	(0.02)	(0.02)	(0.03)	(1.39)
Convergence * Year_2011	-0.00	0.02	0.00	0.08**	-0.01	0.04**	0.09***	-6.00***
	(0.02)	(0.03)	(0.03)	(0.04)	(0.03)	(0.02)	(0.03)	(1.40)
Late * Convergence * Year_2011	0.01	-0.14***	-0.11***	-0.08*	0.05	-0.02	-0.06*	2.09
	(0.03)	(0.04)	(0.04)	(0.05)	(0.03)	(0.02)	(0.03)	(2.04)
Constant	0.07***	0.32***	0.84***	0.31***	0.13***	0.05***	0.21***	35.69***
	(0.01)	(0.03)	(0.02)	(0.03)	(0.02)	(0.01)	(0.02)	(1.33)
Observations	7,138	6,713	7,155	7,155	7,155	7,109	6,989	7,150
R-squared	0.05	0.31	0.16	0.18	0.10	0.03	0.04	0.15

Notes: The above results use combined village-level data from the 2001 and 2011 rounds of the census. The sample consists of all villages in the blocks. The specification also controls for: (1) state fixed effects; (2) year of SHG entry in blocks; and (3) interaction of state fixed effects with the year of SHG entry in the block. The outcome variable measures the availability of facility at the village level and it takes a value of 1 if the village has the facility and 0 otherwise. Robust standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1

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