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Impact Evaluation of the National Rural Livelihoods Project

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Social protection

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Executive summary

This report presents an evaluation of the National Rural Livelihoods Programme (NRLP) under the aegis of the National Rural Livelihoods Mission (NLRM). Implemented between 2012 and 2019, the NRLM is a flagship programme of the Indian government aimed at enhancing rural livelihoods and reducing poverty. The programme drew on the vast experience of the central government, as well as several state governments, in promoting financial inclusion and livelihoods through support for women's self-help groups (SHGs). It differentiated itself from previous programmes in many important ways:

- To build local capacity, the programme created a federation of community institutions that mentored and supported units in their geographical areas. This federated structure linked SHGs to village organisations (VOs) and VOs to cluster-level federations (CLFs).
- To bolster women's empowerment, the SHGs only consisted of women members.
- To overcome resource constraints while scaling up, the programme brought in mechanisms to ensure the sustainability of each tier of the federation. By promoting savings, providing grants, and linking SHGs and federations to banks, the programme sought to reduce financial constraints.
- To overcome human resource constraints, the programme promoted 'communitisation', or the recruitment and training of a community cadre that could shoulder the burden of promoting programme growth and provide continuous support to SHGs.
- Lastly, the programme attempted to establish linkages with social security schemes (a process known as convergence) and forged partnerships with different government departments to enhance livelihoods opportunities.

Objectives

The main objective of this evaluation is to examine the NRLP to understand *what works, what does not, why, how and for whom*? In order to achieve this, we: (1) analyse the impacts of the programme on a range of household- and individual-level economic, social and empowerment outcomes; (2) pay attention to heterogeneity by caste, education levels and village characteristics; and (3) assess programme implementation during the evaluation period and the quality of institutions created by the programme on the basis of their functioning against prescribed norms.

Methods

This study examines the impact of the programme in nine of India's poorest states, utilising a large sample of over 27,000 households. The states included in this evaluation are Bihar, Jharkhand, Odisha, West Bengal, Uttar Pradesh, Chhattisgarh, Madhya Pradesh, Maharashtra and Rajasthan. Data on socio-economic and livelihoods status were collected for the reference period 2018–2019 for households with SHG members as well as non-member households.

We also analyse detailed data on SHGs, VOs and CLFs collected as part of the survey, data from the central government's monitoring information system, and data from the records of individual states. All this evidence informed the impact evaluation and helped to develop a deeper understanding of how the programme works – particularly the factors that affect its functioning.

This report comprises three distinct analyses, findings from which are triangulated to explain mechanisms and provide recommendations. The report starts with a detailed descriptive analysis of SHGs, VOs and CLFs using survey and monitoring information system data for the nine states. It then presents an econometric analysis of the causal effects of the programme on household outcomes, based on data for seven states using quasi-experimental methods. Finally, a separate analysis of the programme as implemented in the state of Bihar (also known as JEEViKA) is presented, combining the data collected in 2018–2019 with a 2011 baseline survey undertaken for a prior evaluation of the programme.

To draw causal estimates of the effect of the NRLP in the states of Jharkhand, Odisha, Uttar Pradesh, Chhattisgarh, Madhya Pradesh, Maharashtra and Rajasthan, we drew on the phased implementation of the programme at block and village levels. There were two distinct phases of programme expansion: one in 2012–2013 and the other in 2015–2016. We used national and state monitoring information system data, and consulted with state and block teams to identify the blocks that were early starters (i.e. where the programme started in 2012–2013) and the late-start blocks (i.e. the programme started in 2015–2016).

There was significant variation in the SHG formation date across villages within a given block. This allowed us to identify a second level of phasing at the village level. Thus, we were able to identify ‘early-starter villages’ and ‘late villages’ even within a block. By leveraging these two levels of phasing, we were able to employ a difference-in-difference strategy to estimate the impact of 2.5 additional years (the average difference between early and late SHGs) of the NRLP on households and SHGs. We were further able to distinguish the impact of VOs from those of SHGs by a similar difference-in-difference strategy and instrumental variable approach to compare early and late VO mobilisation blocks.

The impact evaluation design for Bihar was based on a previous study by Hoffman and colleagues (2017), which used a randomised controlled trial at the *Gram Panchayat* (village council) level. By following a set of over 5,000 households included in the study by Hoffman and colleagues (2017), we were able to build a household panel that enabled us to analyse effects of the NRLP seven years after the start of the programme in Bihar.

Data

The evaluation covered 1,052 villages. The average percentage of scheduled caste and scheduled tribe households in our sample villages was 42 per cent, which is higher than the national average for rural areas. This may be reflective of the NRLP being initiated in blocks characterised by a high rate of poverty and a high proportion of households from these castes and tribes. While 46 per cent of villages report a bank located in the village, only 22 per cent report having a market in the village.

The total number of households in our sample is 27,257. By design, the proportion of SHG members is higher in our sample (18,895 households). Households included in our sample are characterised by low levels of education, with the average number of years of schooling for the most educated adult male and female in a household being 4.4 years and 1.8 years, respectively.

A total of 63 per cent of our sampled households belong to scheduled castes or tribes. Fifty-seven per cent of households report owning land and 46 per cent report productive assets. As many as 71 per cent of households report earning income from unskilled wage labour, either in the agricultural or non-agricultural sector. The proportion of households reporting earning any income from agriculture is 54 per cent. We see a high percentage of indebtedness among households, with 70 per cent having some outstanding debt, 21 per cent of which is from informal sources. Around 64 per cent of households report having some form of savings, which are largely held in non-institutional forms.

Programme implementation

There were 4,742 functioning SHGs in our sample, while 394 had ceased all activities at the time of our survey. The average age of SHGs in our sample was 51.5 months, and a typical group comprises approximately 11 members with an average of 2.84 years of schooling.

Our analysis shows that the programme has performed well in federating and ensuring that funds flow to SHGs: 79% of SHGs are linked to VOs; 75% are linked to CLFs; and 70% had received revolving funds – the initial cash grant provided to SHGs. In some respects, however, the programme displays a need for improvement. Only 34 per cent had received community investment funds and 50 per cent had received bank loans.

In terms of activities, 68 per cent of SHGs report internal lending within the past 12 months. The average amount of loans to members was INR5,466. While 48 per cent of SHG loans were used for consumption purposes, only 19 per cent were used for productive purposes. Around 40 per cent of SHGs provided support to members to access government schemes, while only 65 groups had initiated some form of group entrepreneurial activities. These data suggest that SHGs are playing an important role in financial inclusion and access to credit for members; however, they are yet to take up livelihoods promotion activities and convergence to the same extent.

There are 759 VOs and 131 CLFs in our sample. A typical VO links together 12 SHGs and a CLF links 218 SHGs (and 19 VOs). The leadership of VOs and CLFs comprises more qualified members of linked SHGs, and accordingly may present better organisational capacity than those that are non-federated. In our sample, around 47% of VO office bearers, and 64% of CLF office bearers, have at least eight years of education; in contrast, this proportion is 38% in SHGs.

VOs are expected to play an important role in monitoring SHG function and supporting their activities. Yet, we find that only 25% of SHGs linked to VOs have been graded for their performance, and only 10% of VOs have a dedicated cadre for livelihoods promotion. On the other hand, surveyed CLFs show more livelihoods and social activities than VOs. A total of 28% of CLFs have a livelihoods committee and 54% have a social action committee; 70% report helping members to access government schemes.

The impact of federation can be improved by emphasising livelihoods promotion and social action. When SHGs are federated, we see a marked improvement in their performance. Linking them to a VO and/or CLF is correlated with better financial access and use of funds. The proportion of loans from non-federated SHGs that are used for productive purposes is 13%; however, this rises to 15% and 24% when these groups are federated into VOs and CLFs, respectively. SHG loan amounts are similarly higher when groups are linked with CLFs (INR7,474, as opposed to INR3,401 without federation).

For each SHG, we calculated a score based on adherence to the five norms of *Panchsutra* (regular meetings, savings, internal lending, repayments and bookkeeping), which is required for SHGs to receive funds, as it is a measure of their quality. Adherence to *Panchsutra* is low, with an average score of 2.5 out of 5; this is lower for non-federated groups (2.2 out of 5). SHG closure rates are also lower when they are federated.

Our analysis shows interesting patterns according to SHG age. As expected, older groups were more likely to have received funds such as revolving funds, community investment funds and bank loans. However, time to receipt data suggest that early SHGs suffered delays in the receipt of funds in their early years. Older groups experienced a longer time before federation as compared to newer SHGs.

Further, we find that SHG adherence to *Panchsutra* declines with age. Looking at the distribution of internal loans, we find that older SHGs distributed loans less equally than younger groups. In summary, older groups had greater access to funds, but implementation delays and poor governance may have important implications for the impact on household outcomes.

Impacts

Regression estimates are used to determine the impact of 2.5 additional years of NRLP on SHG member households in seven states on various outcome measures. We calculated percentage changes in outcomes by dividing the impact estimate obtained from the regression by the predicted value of the outcome if the early villages were not to receive the programme. This denominator is called the base value. The impact findings are as follows:

1. Our results suggest a statistically significant effect on household income. An additional 2.5 years of membership in SHGs increases total household income by approximately INR11,000 a year – an increase of approximately 19 per cent over the base amount of INR57,000 per annum.
2. This increase in income is primarily driven by improvement in earnings from wage labour markets (INR8,000 on average) and the government's workfare programme, the Mahatma Gandhi National Rural Employment Guarantee Act.
3. We find statistically significant improvement in households' income sources due to the NRLP. Treatment households had 0.2 additional sources of income, on average, compared to the base of 2.35 income sources.
4. Our analysis shows interesting effects on labour force participation of persons aged between 20 and 60. Household males report significant increases in the number of hours worked: a 6 per cent increase in hours spent on primary occupation and a 10 per cent increase in secondary occupations. The proportion of women in a household who report a secondary occupation is higher by approximately four percentage points in treatment relative to control SHGs (with a base secondary participation rate of 58%).
5. Households in our sample are dependent on savings and, without the programme, the predicted savings or base value are negative (i.e. expenditure exceeds income). This base value of negative savings was INR60,000. The regression estimates suggest that SHG members in early-entry villages in early NRLP blocks (henceforth referred to as treatment SHGs) have approximately INR17,000 more in savings. The percentage gain in savings due to the programme is 28 per cent.

6. Households in villages that got the programme late reported comparable amounts of SHG loans as early villages (around INR6,367). Access to SHG loans among scheduled caste and scheduled tribe households increased as the programme matured. Federating groups into VOs resulted in significant increases in borrowing by women from SHGs and by men from formal sources. Moreover, these loan amounts were higher than the compulsory savings required by SHGs.
7. The programme led to a decline in informal loans. The base value of the share of informal loans in a household's five-year loan portfolio was 0.115. The share of informal loans reduced by 20 per cent as a result of the programme.
8. There are significant impacts from linkage with VOs on household productive assets and household expenditure on education and food, although SHGs alone did not make a difference to these outcomes.
9. We find significant and positive impacts of the programme on the number of social schemes used by households. The percentage increase in the number of social schemes availed by households was 6.5 per cent over the base value of 2.8 schemes.
10. Women with higher education gained confidence to engage with the community due to the programme. However, intra-household bargaining is more difficult to change, and we find no impacts of the programme on women's household decision-making.
11. There is compelling evidence of the role of VOs in enhancing women's confidence in engaging with members of the community. We find that an increase in VO age improves empowerment as measured by a confidence index. However, neither SHGs nor VOs had any impact on women's decision-making within households.
12. Our findings from the analysis of the seven states are mostly upheld by the results of the evaluation of JEEViKA, Bihar. In Bihar, we had the advantage of a randomised design, which ensured comparable treatment and control groups and a panel of households observed before and after the implementation of JEEViKA. However, we were unable to causally estimate the impact of federations in Bihar. Treatment areas participated in the programme for seven years, while control areas participated for four years. Comparing households in treatment and control areas, we find that JEEViKA led to a 9.3 per cent decline in the incidence of high-cost loans by making SHG loans available. (At baseline, almost 75% of households reported having a high-cost loan.) This improved household accumulation of productive assets and education expenditure. Unlike the results from the seven states, we do not find any impact of JEEViKA on the number of income sources.

Conclusion

We find that the NRLP had strong effects on savings and household incomes. The programme has had significant achievements in bringing poor households together into groups and federating them, facilitating access to loans and enhancing savings and incomes in rural areas. This was achieved via two pathways: first, through federation, which had a large effect on household access to loans from SHGs as well as formal sources; and second, through the impact on wage income.

Our analysis of heterogeneity in returns – according to caste, schooling levels and village access to markets and banks – identified important gains from the programme among members of scheduled castes and scheduled tribes. While caste-based inequalities have been reduced, our results suggest growing inequality in education.

Our results also indicate that federations are gradually evolving as institutions to strengthen the programme. We find that federation has an important impact on workforce participation by women, as well as women's confidence and household assets.

There is significant room for improvement in SHG function. For instance, groups experienced implementation delays, monitoring gaps and low levels of livelihood- and income-generating activities at the start of the programme. However, as the programme matures, these constraints are being addressed and alleviated.

Recommendations

Our recommendations for policymakers are as follows:

1. We recommend prolonged support to local resource persons and SHGs to build their capacity. One possible way of doing this is to ensure that experienced personnel are available to provide mentorship to local resource persons beyond the programme roll-out period. Alternatively, more resources should be provided for trainings in less-developed areas, with 'remedial' training provided to those who need it.
2. We recommend re-evaluating the *Panchsutra* to ensure they fully reflect the quality standards against which SHGs can be monitored. We found that the existing *Panchsutra* standards are extremely high and hard to achieve for most SHGs. Setting exceptionally high standards may deter their mobilisation and lead to higher failure rates. A dynamic measure with realistic standards could serve as an accountability mechanism and the basis for resource allocation.
3. We recommend paying more attention to interventions and processes that improve the distribution of programme returns. To do this, the programme may ensure that there are other returns to SHG membership apart from loans, such as increased convergence activities and investments in income-generating activities.
4. We recommend further developing off-farm and non-agricultural employment, particularly to help improve women's labour force participation. Our study attests that dependence on agriculture in rural India is declining, so opportunities for growth in incomes can only come from a focus on non-agricultural employment.
5. We find that better-educated women gained confidence from the programme. This may be because such women are likely to hold important leadership positions in VOs and CLFs. Creating opportunities and a system of support for less-educated women to take up leadership roles may help promote women's empowerment. Investments in financial literacy and life-skills trainings may be important steps forward to achieving this.

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Abbreviations and acronyms

CIF	community investment fund
CLF	cluster-level federation
CRP	community resource person
EB	early block
EV	early village
GP	Gram Panchayat
ITT	intent-to-treat
MIS	monitoring information system
NRLM	National Rural Livelihoods Mission
NRLP	National Rural Livelihoods Programme
RCT	randomised controlled trial
RF	revolving fund
SC	scheduled caste
SGSY	Sampoorna Grameen Swarozgar Yojana
SHG	self-help group
ST	scheduled tribe
VO	village organisation

1. Introduction

This report is based on an at-scale evaluation of the National Rural Livelihoods Programme (NRLP). This project was implemented under the National Rural Livelihoods Mission (NRLM), a flagship poverty alleviation programme in India. An innovative evaluation methodology – covering nine states with around 27,000 respondents and 5,000 self-help groups (SHGs) across Bihar, West Bengal, Odisha, Jharkhand, Madhya Pradesh, Chhattisgarh, Maharashtra, Rajasthan and Uttar Pradesh – assessed:

- Programme impacts on household outcomes such as financial health, incomes and livelihoods choices, and women's financial inclusion and empowerment; and
- How SHGs at hamlet or neighbourhood levels change over time and respond to federation (i.e. becoming interlinked at village level, and further at village cluster level).

Countries such as India have promoted SHGs to reduce poverty and achieve other development goals since the early 2000s. These are community institutions comprising 10–12 women residing in the same neighbourhood. The government's initial scheme, Sampoorna Grameen Swarozgar Yojana (SGSY), formed SHGs primarily to promote saving and lending within the group, improve incomes and reduce household economic insecurity. The scheme failed to deliver its intended benefits. Authorities recognised that SHGs, unless linked to the market and made sustainably scalable using local capacities, will not only remain 'institutions of the poor', but will also continue to be poor institutions.

To overcome these limitations, the Indian government, supported by the World Bank, launched the NRLM in 2012. It was initially piloted as National Rural Livelihoods Project in select parts of some of the country's poorest districts. First, the project linked all SHGs in a village into a village organisation (VO), and multiple VOs were linked to become a cluster-level federation (CLF) as they matured and met defined quality criteria. Second, it trained local women (community cadres) to run and scale up the programme. The project built both capacities and institutions; women's empowerment, alongside poverty reduction, was an explicit objective.

Community institutions have been widely evaluated, mostly focusing on their financial functions such as borrowing, lending and facilitating access to credit. These evaluations show limited and mixed results, which is partially attributable to the diversity in programmes and evaluation methods across studies. Importantly, most evaluations take place only a few years after programme initiation.

This evaluation was carried out approximately eight years after programme initiation. Aside from Bihar and West Bengal, the states did not have a uniform baseline. This was overcome by leveraging the programme's phased implementation. The blocks where the NRLP was initially piloted are called 'early blocks' and the villages within early blocks where SHGs were formed are called 'early villages'.

Similarly, the areas in which the programme was last rolled out are labelled 'late blocks' and 'late villages'. In lieu of a uniform baseline, the study developed a 'cross-sectional difference-in-difference estimator' to gauge the difference between early and late geographies. The results show how SHG quality changes over time as they are layered with periodic interventions, according to programme guidelines. The average difference

between programme initiation in early and late villages was three years; therefore, it captures medium-term programme impacts.

This method had two significant advantages. First, all respondents in the two comparison groups (early and late villages), were current or past SHG members. This provided us with direct estimates of the impact of SHG membership on household outcomes. Many earlier studies had surveyed people at baseline who never ended up joining an SHG, thereby reducing the comparable sample size. Second, SHGs took varying amounts of time to get federated into a VO. This method allowed us to accurately estimate the effect of federation on their quality.

In Bihar, we followed up on an earlier evaluation that had employed a randomised design to evaluate short-term impacts of the programme (also known as JEEViKA). The findings from Bihar are reported separately. We see many similarities in the experience of Bihar and the other states in our sample, which allow us to draw out the main findings of this study. We conduct a descriptive analysis of the rich data on SHG, VO and CLF performance to examine the implementation of the programme and are able to link this to the observed impacts.

The study's main findings are:

- The NRLP increased savings, income and livelihoods diversification. Total household incomes increased by 19 per cent as a result of the programme from a base value of INR57,000. An increase in wage income was the biggest contributor to this increase. Households participating in 'treated' SHGs were likely to have 0.2 additional income sources, compared to a base value of 2.35 income sources.
- Average effects mask interesting variations by household and village characteristics.
- The programme's role in promoting financial inclusion of poor households is the main mechanism through which this is achieved. The NRLP led to a significant increase in household savings and access to loans.
- The large variation in SHGs in our sample allows us to explore the factors underlying low average returns. Returns from SHGs increase for 5–6 years and then decline with age.
- Some indicators of SHG performance, such as adherence to the five rules of functioning (*Panchsutra*), decline with SHG age, whereas other indicators improve, such as performance in extending loans to members and enhancing their savings. Federating SHGs arrests the decline in quality that comes with age. Once federated, they also have greater adherence to *Panchsutra* and provide more total and productive loans.
- The impacts of federated SHGs are also higher as they play an important role in enhancing access to community investment funds (CIFs) and banks. Households report higher expenditure and value of productive assets when linked to VOs. Our results support the hypothesis that the federation of community institutions promoted by the NRLP strengthens SHGs, thereby improving significant aspects of household welfare.

  Our study points out significant delays in implementation, particularly in the initial years of the programme. We recommend more attention to and investment in building the capacity of SHGs and federations in order to increase programme returns.

2. Literature review

Policies intended to redress household poverty through improved financial inclusion build on a body of theoretical work that examines how institutional arrangements (specifically the poor's lack of access to financial and other markets) sustain poverty (Mookherjee and Ray 2002; Piketty 2000; Banerjee and Newman 1993). In this context, improving household welfare requires institutional arrangements that ensure households' access to financial services, while also addressing the high monitoring, information and transaction costs of servicing poor households (which predominantly reside in small and geographically dispersed villages).

Generations of government policies and programmes have attempted to address this challenge. A growing body of empirical literature provides information on their impact, and we briefly summarise this literature below. Following the history of policy initiatives, a first set of studies examined programmes that focused on credit delivery through microfinance institutions, followed by research on policies that centred on enhancing household savings.

Since SHGs and other community organisations focus on credit and savings, both areas of literature are relevant for our evaluation of the NRLP. We therefore start this section by briefly describing the findings of these studies. We then turn to a third body of literature that specifically examines the impact of SHGs.

2.1 Evidence on microfinance and improved access to credit

The effects of access to microfinance have been evaluated by several researchers utilising randomised control samples. These studies, summarised by Banerjee and colleagues (2015), suggest that the impact of microfinance access is moderately positive, but not transformative. In recent work, Meager (2019) establishes the external validity of these studies, based on a meta-analysis of their effects.

The conclusion regarding moderate returns on microfinance programmes is reinforced by systemic reviews of the evidence (Duvendack et al. 2011; Stewart et al. 2012). These also discuss the challenges of evaluating these programmes, including a lack of comparable 'control' groups and limited uptake of the programme, which adversely affects the studies' statistical power.

Meager (2019) and others, however, find evidence of considerable heterogeneity in results, with larger effects among existing business owners. This hypothesis is tested by Banerjee and colleagues (2019) based on a resurvey of households six years after the introduction of a microfinance programme. Their original evaluation revealed small effects of microfinance in the short term (two years) and medium term (four years). However, six years later, when distinguishing households by initial entrepreneurial experience, they find significant improvements amongst entrepreneurs in asset ownership and business outcomes such as profits, turnover and employment.

Their results hold important implications for policy. They suggest that programmes that seek to enhance access to income-generating credit should not attempt universal coverage but instead should focus on identifying and selecting entrepreneurs. A targeted approach may enable larger loans to entrepreneurs, with the potential of generating larger returns.

Other work in this area examines whether outcomes are sensitive to terms of the microfinance contract. Field and colleagues (2013) compare the classic microfinance contract, which requires payments to start immediately following loan disbursement, to a contract that includes a two-month grace period. They find that including a grace period increased rates of business investment and long-term profits, suggesting that the need for immediate repayment may discourage investment in some assets. However, they also find that the inclusion of a grace period increased default rates.

2.2 Evidence on savings

A separate set of studies has evaluated the effectiveness of policies intended to enhance household savings. These policies build on the assumption that enhanced savings can help households cope with risk and uncertainty, help smooth consumption over the life cycle, and serve as an alternative to credit to help households accumulate assets, both for production and consumption purposes. The need for policies to help households achieve savings goals arises if households cannot achieve these goals due to constraints on their ability to save, including behavioural constraints.

The empirical evidence on the topic suggests that this assumption is valid. Programmes that encourage savings by improving access even to non-interest-bearing bank accounts have high take-up rates and result in significant increases in household savings (Dupas and Robinson 2013b; Prina 2015). In turn, the evidence suggests that increased savings have a larger impact on investment and other household outcomes than improved access to credit. Brune and colleagues (2016) report that giving farmers the opportunity to save their post-harvest incomes increased input use in the next agricultural season.

If increased savings generate significant welfare gains for households, what prevents them from raising their savings rate? The behavioural economics literature suggests that this might reflect present-based preferences (Ashraf et al. 2006). It may also reflect difficulty in protecting savings from the demands of others in the household or the saver's social network (Platteau 2000).

The rates of return on savings accounts may also play a role: Schaner (2018) finds significant returns in terms of income and asset ownership from a programme that temporarily created large increases in interest rates on bank accounts. Providing households with a cash transfer worth the same amount did not have the same effects, suggesting that households view savings in bank accounts differently from cash holdings.

Finally, research by Gertler and colleagues (2018) suggests that savings accounts are experience goods, in that individuals without experience of such accounts may inaccurately perceive their returns to be low. Exposure to savings accounts could cause them to revise their expectations. When reporting on the results of an experiment that provided temporary incentives to open and save in formal bank accounts (i.e. a chance to win cash prizes in a lottery), they find a 43 per cent increase in the number of accounts opened in treatment areas, with households continuing to maintain and operate these accounts even five years after the experiment.

2.3 Theory and evidence on a group-based approach to savings and credit

The policy support for SHGs, or small community institutions comprising members who live in close geographical proximity to each other, is premised on the belief that economic exchange between members of such groups can overcome many of the problems that make it difficult for the poor to access formal markets (Munshi 2011). Social exchange, or transactions between people who are closely linked socially, is able to draw on social norms and sanctions to reduce the 'agency' problems that prevent formal markets from operating well. This is particularly true if exchange occurs between agents who live in close geographical proximity to each other and therefore can monitor each other's actions at low cost (Stiglitz 1990).

Kast and colleagues (2018) provide empirical support for the hypothesis that membership in SHGs significantly increases savings, with the amounts saved being large enough to mitigate the consequences of unexpected increases in household expenditure. Anderson and Baland (2002) note an additional role of groups comprising primarily women: they provide a means of saving that is protected from claims by their husbands. Linking to the literature on women's empowerment and intra-household decision-making (in which a woman's bargaining power rises with her control of income), this suggests that the returns women receive from SHG membership may also be strongly associated with improvements in their welfare within households.

However, economic theory also suggests that the effect of social exchange on income may be limited for several reasons, the first of which relates to scale. Exchange amongst a small group of relatively homogenous relatives or neighbours lacks the benefit of scale that characterises large formal financial or product markets. Lack of scale implies higher internal prices, such as implicit interest rates, thereby reducing the profitability of informal contracts (Platteau 2000). This suggests that collective arrangements will gradually yield to market exchange as the formal institutions required to monitor impersonal exchange improve (Greif 2005).

A second concern is that the group may actively discourage entrepreneurial activity or risk-taking by any one member, recognising that the group's sustainability depends on the relative socio-economic homogeneity of its members (Platteau 2000). A third concern is commitment to the contract, which remains an issue even in social exchange: any participating member could refuse to honour their loan obligations and opt out of future transactions by exiting the group. This possibility requires contractual terms to honour commitment constraints, generating outcomes that are very close to those that would be obtained if every participating member operated in autarchy (Kocherlakota 1996; Coate and Ravallion 1993; Thomas and Worrall 1988).

Using social groups (including SHGs) as financial intermediaries that link households to formal banks is one solution to the lack of scale associated with social exchange. This idea underlies India's experiments with SHGs. A growing empirical literature examines their success within India, based primarily on early variants of the NRLM in states such as Bihar and Andhra Pradesh. These studies examine the effect of SHGs on a diverse set of outcomes, including the incidence of high-cost debt (Hoffman et al. 2018; Khanna et al. 2015); ownership of productive assets (Singh et al. 2017; Deininger and Liu 2013; Prennushi and Gupta 2014); household income and income from enterprises (Singh et

al. 2017); measures of female empowerment (Desai and Joshi 2014; Prennushi and Gupta 2014; Khanna et al. 2015; Datta 2015; Brody et al. 2015); and even household consumption and nutrition (Deininger and Liu 2013).

The set of outcomes that appears to be significantly improved through SHG programmes varies across studies, and there are few consistent findings across the evidence. For example, while Deininger and Liu (2013) report improvements in household consumption, other studies do not (Singh et al. 2017; Khanna et al. 2015). Similarly, while several studies find positive impacts on productive assets and female decision-making, these findings are not universal (Datta 2015; Ban et al. 2015).

Some of the variation in results may reflect differences in households' exposure to the programme in the studies in question, given that benefits under most SHG programmes are intended to increase over time. For example, the study by Ban and colleagues (2015) examines impacts over a 1.5-year period, while Deininger and Liu's study (2013) spans 2.5 years.

Yet another reason for the difference in results could be the actual interventions that are being implemented by SHGs. For example, Hoffman and colleagues (2018) attribute their finding that the JEEViKA programme had no impact on consumption to the fact that the programme had not started convergence activities with other social schemes. On the other hand, convergence activities with public distribution systems have been discussed as a factor that led to improved nutrition outcomes in the study in Andhra Pradesh by Deininger and Liu (2013).

However, research studies also differ in their methods, and this variation in methodology contributes to variation in results (Brody et al. 2015). A small set of studies utilise random assignment of villages within a block or a district to treatment and control samples (Deininger and Liu 2013; Desai and Joshi 2014; Ban et al. 2015), with SHGs being formed in treatment but not control areas. However, in several of these studies, the contamination of the control sample is an issue (Deininger and Liu 2013).

Additionally, the randomisation of treatment may affect the programme, complicating comparisons with other studies. For example, when the programme is randomly introduced in some but not all, *Gram Panchayats* (village councils – GPs) of a block, block-level officials can concentrate their efforts (and resources) only on treatment blocks. As a consequence, even when monetary resources and programme inputs are held constant, the ability to concentrate managerial and human capital abilities on just a subset of the block may generate much larger treatment effects than one would observe from other programme designs (such as phasing in the programme over blocks). That is, different methods of implementing a programme affect evaluation results.

A different set of concerns relates to interpretation of results. Most of the available studies provide intent-to-treat (ITT) estimates of the mean effect of the programme on household outcomes in treatment relative to control areas (Khanna et al. 2015; Singh et al. 2017). It is well recognised that ITT estimates cover the response of households to the package of inputs or interventions offered by the programme, limiting their value for the design of policy. A positive effect of an SHG programme may be the consequence of a number of factors, including an impact through improved delivery of financial services or other government programmes.

There are very few estimates of the causal effect of SHG quality on household outcomes. This reflects the fact that control villages are generally selected from blocks in which the programme had not commenced at the time of the study and that lack SHGs. Consequently, SHG quality is only measured for treatment villages. Deininger and Liu (2013) is an exception, in that they compare early implementing regions to late-implementing regions, with SHGs also in existence in the latter. This allows them to estimate the effect of early versus late SHG membership on household outcomes.

Limited information on SHG quality in most studies, combined with insufficient geographical coverage, also explains the lack of evidence on some of the distinctive elements of the NRLM, such as the importance of federation or whether the attempt to address capacity constraints of programmes operating at scale through the recruitment of a community cadre is proving successful.

3. The programme

3.1 Previous programmes

While India's GDP grew at an average rate of 7.8 per cent between 1998 and 2008, poverty rates remained high. Successive governments emphasised the need for policies to tackle poverty. The SGSY initiative was launched in 1999 by restructuring and combining existing government approaches to income generation.[1] It differed from earlier programmes like the Integrated Rural Development Programme, which focused on the provision of subsidised credit to individual households.

Instead, SGSY emphasised supporting SHGs as institutions of the poor in becoming financial intermediaries, providing access to financial services and hence a means to enhance livelihoods. Half of the SHGs in any block were required to be composed of women.

Several reviews of SGSY revealed insignificant impact. The programme fell considerably short of targets for outreach, credit disbursements and savings (Ministry of Rural Development 2008). An evaluation of SGSY (Ministry of Rural Development 2009) suggested that this was a consequence of the insufficient capacity of SHGs, reflected in their inability to manage their affairs and sustain their operations. This, in turn, was attributed to a lack of enabling infrastructural architecture.

The Radhakrishna Committee was set up to review SGSY and suggest a way forward. After assessing the experiences of states with successful SHG programmes such as Andhra Pradesh and Kerala, the committee recommended a federated structure, with higher-level institutions providing the support and scale necessary to ensure sustainable SHGs.

In addition to India's experience with SGSY, valuable evidence was provided by several early state-level programmes (some of which were World Bank funded) supporting

[1] SGSY combined the Integrated Rural Development Programme with existing programmes including Training of Rural Youth for Self-Employment, Supply of Improved Tools for Rural Artisans, Ganga Kalyan Yojana, the Million Wells Scheme and Development of Women and Children in Rural Areas.

federations of SHGs. These included *Kudumbashree*, the Kerala State Poverty Eradication Mission (1998–2008); the Madhya Pradesh Poverty Initiatives Project (2000–2008); the Andhra Pradesh Rural Poverty Reduction Project (2003–2011); and rural livelihoods projects in the states of Bihar (JEEViKA) and Odisha (TRIPTI) that were initiated in 2006 and 2008, respectively.

This early experience provided evidence of the value of federations of institutions and suggested innovative methods of ensuring SHG capacity, including an intensive approach to forming groups that actively engaged the rural community in the process. Building on these early bank-financed rural livelihoods projects, in 2009 the Ministry of Rural Development proposed a more comprehensive approach to rural poverty reduction in its strategic framework paper titled 'Poverty Eradication in India by 2015: Rural Household Centred Strategy'.

This report (MoRD 2008) and the Radhakrishna Committee Report (MoRD 2009) led to a change in India's approach to livelihoods programmes and the development of the NRLM, with the objective of rural poverty reduction through the creation and strengthening of institutional platforms of the rural poor.

3.2 The NRLM and NRLP

The Radhakrishna Committee report changed India's approach to livelihoods programmes, and the NRLM was born. The programme aimed to support 700 million poor households across 600 districts. The NRLM's implementation plan (MoRD 2015b) stated its mission was:

to reduce poverty by enabling the poor households to access gainful self-employment and skilled wage employment opportunities, resulting in appreciable increase in their incomes on a sustainable basis through building strong grassroots institutions of the poor.

Following recommendations of the committee (MoRD 2009), the livelihoods approach of the NRLM or NRLP encompassed the following four interrelated goals:

1. Mobilising all rural poor households into effective SHGs and their federations;
2. Enhancing access of the rural poor to credit and other financial, technical and marketing services;
3. Building capacities and skills of the poor for gainful and sustainable livelihoods, including enhanced entrepreneurial and business activity; and
4. Converging various schemes for efficient delivery of social and economic support services for the poor.

Unlike previous programmes, the NRLM focuses on building institutions and capacities. Its federated structure has an apex 'umbrella' institution at state level, the State Rural Livelihoods Missions, which oversee a hierarchy of institutions at lower levels. Rather than state-level institutions being providers of funds, the State Rural Livelihoods Missions primarily provide high-quality technical assistance for capacity building of lower-level institutions.

At the bottom of this structure are SHGs, or institutions of the poor, which give poor individuals a collective voice and enhance their bargaining power. Unlike SGSY, these

groups have only women members. SHGs were federated into VOs, which were in turn federated into CLFs. Each block was divided into 3–4 such clusters, each of which contained approximately 8–10 GPs or 25–30 villages.

The significant changes in institutional and organisational structure envisaged under the NRLM at the state, district and block levels required buy-in from all state governments. For this reason, the government, with support from the World Bank, initiated the NRLP, which commenced in 2011–12 in 13 high-poverty states that accounted for 85 per cent of the rural poor.[2] It was expected to:

1. Establish sensitive and effective autonomous implementation structures in participating states to facilitate the creation of the rural institutional platform;
2. Increase membership of rural women from poor households in inclusive, community-managed institutions;
3. Increase access to savings, affordable credit and financial services for rural women from poor households;
4. Increase the amount of resources and services leveraged by the poor from financial institutions, the private sector and public agencies;
5. Provide sustainable increases in productive assets and income from various livelihoods for the rural poor; and
6. Increase entrepreneurial and business activity.

The NRLP was implemented in 400 blocks across 100 high-poverty districts, covering no more than 25 per cent of the districts in any one state and 50 per cent of the blocks within any one district. State governments were responsible for programme roll-out and selection of blocks. Half of these blocks were chosen based on the proportion of the population living below the poverty line; the other half were based on the strength of existing community institutions, including the SHGs developed under SGSY. These are referred to as early blocks (EBs) henceforth.

The NRLM subsequently scaled up the programme beyond these ‘intensive blocks’ where the NRLP had already initiated activities to remaining ‘non-intensive blocks’. As activities were the same, the two essentially differed in duration of exposure to the programme.

3.3 Pathways to change

In this section, we present a simple model that depicts the causal linkages between the NRLM programme and outcomes. As mentioned in the programme mission document, its end goal is to reduce poverty. The programme attempts to do this by: (1) creating SHGs that are ‘effective’, building their capacity to self-manage and federating them; (2) enhancing women’s access to formal credit and promoting savings; (3) promoting livelihoods, with a particular focus on enterprises and skilled employment; and (4) converging with various existing schemes for efficient delivery of social and economic support services for the poor (MoRD 2015a). The approach followed is a phased implementation of the different interventions as shown in Figure 1 below.

[2] These are the states of Assam, Bihar, Chhattisgarh, Jharkhand, Gujarat, Maharashtra, Madhya Pradesh, Odisha, Rajasthan, Uttar Pradesh, West Bengal, Karnataka and Tamil Nadu.

In the first six months of SHG formation, group members are trained on the five basic norms of SHGs' functioning – namely the *Panchsutra*: regular weekly meetings, savings, internal lending, regular repayment and bookkeeping. SHG members typically contribute INR10 per person weekly to the group savings. SHG bank account creation is facilitated by mobilisers.

After 3–4 months of following the *Panchsutra*, SHGs receive the first injection of funds in the form of revolving funds (RFs) provided by the state mission. An RF is a one-time payment to SHGs of approximately INR15,000 that serves as a corpus to meet the immediate credit needs of members. Thus, in the first six months, the programme is expected to lead to an increase in household savings and access to SHG loans with a subsequent decline in dependence on informal loans.

A number of assumptions are critical for this first level of outcomes to manifest. For example, we assume that an increase in savings by women is not offset by a decline in savings by men; that members have equal access to SHG loans; and that these loan amounts are sufficient to meet the needs of members. The increase in savings and low-cost credit may lead to an increase in household consumption and a build-up of consumer and producer assets. Rather than spending the increased savings and credit entirely for consumption, households may use them to increase investments in livelihoods activities, which may lead to higher incomes. Increased investments may also lead to higher labour force participation of household members.

After 6–24 months of formation, SHGs are federated into primary-level federations at the village level, or VOs, in most states. The role of VOs varies across states; however, they generally should enable close bonding of the SHGs, with 10–20 SHGs. Their responsibilities would include: (1) bringing all left-out poor into the SHG fold; (2) providing support services such as trainings and bookkeeping to SHGs; (3) providing higher-order financial and livelihoods services; and (4) facilitating access to public services and entitlements.

After federation with VOs, SHGs can access loans through CIFs by submitting individual or group micro-investment plans. At this stage, SHGs and individuals with good credit records may approach banks for credit. While the capacity of SHGs are being built by VOs, they may be in a position to link members to existing social programmes and become more engaged in community-level social issues. These inputs and activities may lead to increased access to formal credit, which may be used to increase investments in new and existing income sources, leading to higher incomes.

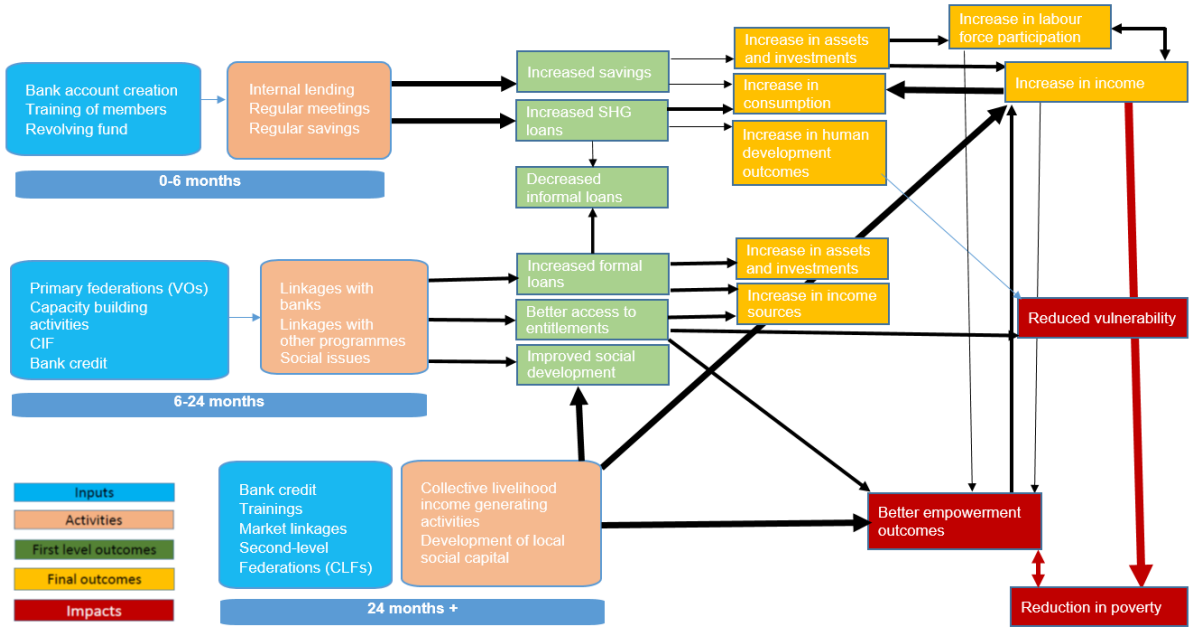
At the same time, linkages to social programmes may lead to better access to entitlements. This may lead to improved resilience to shocks and reduce households' vulnerability. Increased income may result in empowerment for women; however, social action among SHGs is perhaps the more direct channel to this outcome. The assumptions discussed earlier also hold in this stage of SHG growth. Additionally, we assume that SHGs are able to form linkages with other social programmes; that these linkages are strong; that banks are accessible to women and committed to priority sector lending; and that VOs themselves have the capacity to support SHGs.

The next phase of the programme begins after 24 months, when SHGs are expected to take up livelihoods promotion in a systematic manner. State missions may do so by supporting the promotion of specialised livelihoods institutions for deriving economies of scale; backward and forward linkages; and access to information, credit, technology, markets and collective enterprises at the SHG and federation levels.

These institutions are often the second level of federations, or CLFs. This is the stage wherein the programme invests in social capital by training members of the community to deliver livelihoods-related services. These inputs and activities may lead to diversification of income sources. The focus on enterprise and skilled work may lead to reduced dependence on subsistence agriculture. These in turn may cause significant improvement in incomes among SHG members as well as non-members, thereby raising the community out of poverty.

Key assumptions required for such impacts to manifest are: adequate demand for non-agricultural goods and services; state missions possessing the human and financial resources to support innovations and at-scale livelihoods programmes; and their ability to partner with professionals and the private sector.

Figure 1: Hypothesised pathways to change



3.4 Programme growth and implementation

The methodology we propose to examine the causal programme impacts of the NRLP makes use of its phased implementation. In the following subsections we discuss the growth of the programme in detail, which will be then used to substantiate our evaluation methodology.

3.4.1 Programme growth at the extensive margin[3]

The NRLM aimed to move *all* poor households out of poverty over the course of a decade or more. This slow process was designed to ensure the sustainability of the movement. Thus, the 'extensive' geographical growth of the NRLM – across all districts and blocks – was phased over a considerable period of time, with the programme spreading slowly from early to late blocks in each district. In general, programmes in early blocks commenced four or more years before the introduction of the programme in late blocks.

Within a block, the NRLM also advocated an intensive and slow process of covering every village, thereby requiring SHG formation teams to spend a considerable amount of time in each village to ensure solid foundations and the subsequent sustainability of these institutions. As a consequence, in the early years of the programme, it took approximately four years to cover all the villages within a cluster. Once an SHG was formed, programme rules stipulated a process of phased or layered interventions over a 7–10 year period as its capacity grew. The programme's growth therefore followed a slow, phased path, at both the extensive and intensive margins.

A team comprising an average of approximately four community resource persons (CRPs) was tasked with the process of forming SHGs. A plan was first drawn up at the block and cluster levels, which identified the order in which each village within a cluster was to be entered. This order was based on village size and remoteness, with entry occurring first in larger villages of the cluster and then slowly extending to smaller and more remote villages.

Processes to be followed in each village, after village entry, were also detailed.[4] These included the following: village-level meetings to discuss issues related to poverty and build trust amongst village households; a village mapping exercise; detailed discussions with all main village functionaries; a participatory process of identification of the poor; identification of those in the village who could be recruited for the development of a 'community cadre' to aid in the NRLM's intended extensive and intensive growth; and finally the process of forming SHGs – establishing a governance structure within each SHG and appointing a bookkeeper from amongst its members.

SHGs were exogenously formed, in that the CRP team identified hamlets or residential groupings of poor households and then worked within these to form an SHG. While women could always choose not to join, they could not choose other members of the SHG; this was done by the external team on the basis of residential groupings.

In the early years of the programme, each cluster was assigned to just one CRP team that worked its way sequentially through all the villages in the cluster. The team was required to stay in each village for 15 days to ensure SHG formation and to provide sufficient time for initial training of all members on SHG procedures, as well as training for bookkeepers and other key personnel.

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[3] Implementation details are provided in MoRD 2012; 2015b.

[4] This process is specified in community operation manuals. First developed by the ministry, each state subsequently issued its own manuals, which differed only in minor respects such as the names assigned to CRPs and differences in institutions.

Programme guidelines stipulating the number of days to be spent in a year in conducting rounds for the formation of SHGs implied that the process of covering all villages within a cluster required four years or more.[5] This process accelerated in later years with the growth of the locally recruited community cadre. The more educated and skilled members of this cadre were identified as CRPs who could be entrusted with the task of forming SHGs in other villages of the block. This enabled the simultaneous deployment of multiple teams within any cluster for the process of SHG formation.

3.4.2 Programme growth at the intensive margin

After formation of SHGs, interventions were introduced at different points in time, with each requiring certain 'milestones' to be met prior to implementation (section 3.3). We focus on the process of VO formation in this section. The process of federating SHGs into a VO also occurred incrementally over time, following a similar phasing pattern across blocks and villages within a block. Initial plans called for the formation of VOs 6–12 months after the formation of an SHG. However, delays in constituting the teams required for the formation of VOs and shortages in their number – particularly in early years of VO formation – resulted in significant delays of variable length before early SHGs were linked to VOs.

This delay occurred because VOs were formed by teams that differed from those used for SHG formation. VO rounds were conducted by senior CRPs, drawn from the most experienced members of the community cadre. This meant that the initiation of operations in any given block came several years after that of SHG rounds.[6] Following the formation of senior CRP teams, the order of VO formation across villages in the cluster followed that of SHGs, commencing in those villages in which SHGs had first been formed.

SHGs were required to be of a certain 'grade' – initially attested to by CRPs – to be eligible for federation into a VO. Federation significantly enhanced the benefits of SHG membership, particularly access to institutional loans. VOs determined their grading (and hence their eligibility for bank loans) and also aided them in preparation of micro-investment or credit plans that formed the basis for decisions regarding loan amounts. Loan amounts increased incrementally following subsequent rounds of grading.

Federation also provided other benefits. VOs were the interface between SHGs and government programmes, providing the help needed to engage with government and other institutions. Thus, it was at this level that individual SHGs were able to exercise their collective voice to ensure their rights and access to entitlements.

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[5] A round of entry into a village with SHG formation and related training activities was intended to be completed in 45 days, with a one-month period between rounds. Five rounds were intended in a year. Programme guidelines also suggested that 15 days be set aside for each village, though this number varied considerably in practice (due to field discussions).

[6] The dependence of VO formation on senior CRP rounds, and the delay this caused in the formation of VOs in early villages of early blocks, is detailed in the annual action plans of most state governments, and confirmed through discussions with senior members of the state livelihoods missions. For example, Rajasthan's restructuring plan notes the delay in formation of senior CRP teams, with very few teams formed until December 2015 (Government of Rajasthan 2015).

Figure 2 shows histograms for the year of formation of both SHGs and VOs in early villages of early blocks. While SHG formation in these villages was concentrated within the period 2012–2015, VO formation was far more staggered. This variation is even more pronounced when we restrict our focus to SHGs formed in a given year. Figure 3, for example, shows VO start years for SHGs formed in 2013. This variation in VO formation year across SHGs of the same age enables the identification of VO age even in regressions that control for the determinants of SHG age.

Figure 2: Histograms of SHG and VO start year in early villages of early blocks

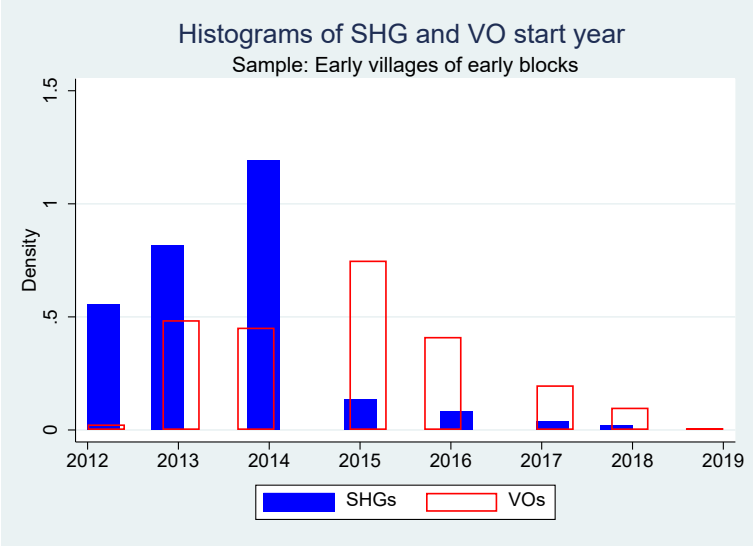
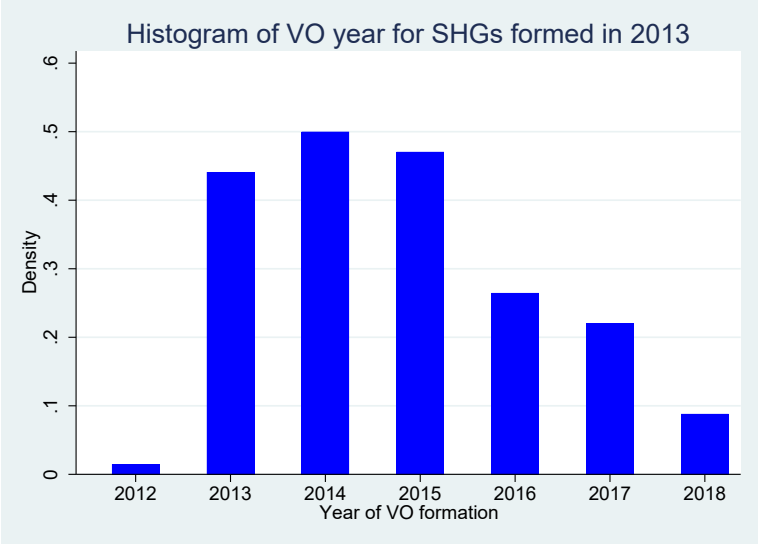


Figure 3: Histogram of VO start year for SHGs formed in 2013



3.4.3 Scaling the programme

Clearly, the ability of the programme to scale up over time, and to monitor and ensure the growth of each SHG, required a significant increase in capacity to overcome the constraints posed by a lack of local human capital. These limits had plagued other programmes similarly intended to be implemented at scale, including the NRLM's predecessor, SGSY.

One of the most innovative aspects of the NRLM is its attention to local capacity development, embodied in a process referred to as ‘communitisation’, or the development of local social capital in the form of a community cadre at the level of the cluster, village and hamlet. Members of this community cadre would increasingly assume the challenge of the NRLM’s growth at both the extensive and the intensive margins. Thus, while the first rounds of SHG formation were undertaken by ‘external’ CRPs drawn from states with a history of successful SHG programmes (such as Andhra Pradesh, Kerala and Bihar) and from ‘resource blocks’ within each state, later rounds were to be conducted by ‘internal’ CRPs drawn from the community cadre, who were viewed as the NRLM’s ‘external’ drivers.

Similarly, the intensive growth of each SHG was to be overseen by the NRLM’s ‘internal’ drivers – members of the community cadres recruited from within a village and working with VOs to ensure the quality of each SHG. These internal drivers would ensure the continuous monitoring of SHGs and facilitate training of their members in areas such as financial literacy and livelihoods, including the adoption of productivity-enhancing techniques in agriculture, livestock and other sectors.

To develop the community cadre, when entering any village the initial external CRP team charged with SHG formation also invested time in the development of community social capital, identifying potential candidates for the community cadre, known as ‘active women’. Potential candidates had to satisfy a minimum education requirement of at least eight years of formal education. They were then intensively trained both through formal training processes and – in the case of those identified for internal CRPs who would help in the formation of SHGs in other villages and clusters of the block – through a process of shadowing existing CRP teams.

Before deployment, each member of the community cadre was also required to satisfy a minimum participation criterion, defined in terms of the number of weeks of SHG membership (approximately 1.5 years). Thus, after village entry, the development of the community cadre took approximately two years. The size of the community cadre increased with the geographic scale of the programme, enabling faster SHG growth within villages in later years of the programme, as well as the faster coverage of villages within a cluster.

4. Methodology

We use a modified difference-in-difference methodology to evaluate the NRLP, which is outlined in section 4.1 of this chapter. A significant contribution of our empirical analysis is the attention we pay to the impact of scaling the programme over time, which is discussed in section 4.2. The basic regression equation underlying the empirical analysis of this paper is explained in section 4.3. Section 4.4 discusses an extension of the difference-in-difference regression that enables identification of the effect of VOs. We supplement our findings from the difference-in-difference method with an instrumental variable approach described in this section.

4.1 Cross-sectional difference-in-difference

A traditional difference-in-difference methodology evaluates programme effects as the difference in outcomes between endline and baseline surveys in treatment units after subtracting the same difference in control units.[7] The underlying assumption is that the change in outcomes in treatment units would have been identical to that in control units in the absence of the programme. If this assumption is valid, then any additional change in outcomes in treatment units can be attributed to the programme.

Since baseline data is unavailable,[8] we implement a cross-sectional difference-in-difference methodology that derives from the implementation of the programme, specifically its two-level phasing feature (discussed in the previous section): first, across blocks in any given district, with these early blocks being identified by state-level teams; and second, across villages within a selected block. In so doing, we follow other studies that implement difference-in-difference regressions using just one cross-section of data, exploiting variation in exposure and programme intensity within the cross-section.[9]

As described in the previous section, the first level of phasing (across early and late blocks) occurred with a lag of approximately four years, so that a comparison of outcomes across the SHGs in early blocks versus their counterparts in late blocks identifies the effect of approximately four years of the programme. But this effect includes that of pre-existing differences between early and late blocks. Because blocks with poorer socio-economic conditions were purposely selected for the initial phase of the programme, this purposive selection would suggest that the difference in outcomes between early and late blocks at any given time would underestimate the programme's impact.

As in a standard difference-in-difference methodology, the pre-existing difference between early and late blocks can be eliminated if there exists a set of control villages in both early and late blocks with minimal exposure to the programme at the time of our survey. The second level of phasing of the NRLP (across villages within a cluster) provides such a sample; in both early and late blocks there exists a sample of late villages with limited exposure to the programme relative to that of early villages.

These two levels of phasing, across and within blocks, allows us to identify the effect of the programme as the difference in outcomes across early villages in early blocks,

[7] A seminal reference is Card and Krueger (1993).

[8] While baseline studies were undertaken in each state, differences in their survey design and in the questionnaires made it impossible to pool those studies to form a viable baseline for a standard difference-in-difference methodology.

[9] Duflo (2001)'s study of a school construction programme utilises variation in exposure across cohorts and in programme intensity across regions to implement a difference-in-difference regression based on one cross-section. Similarly, Jacoby (2002) evaluates a school feeding programme by comparing participants and non-participants on school days relative to non-school days. A larger number of studies utilise a variant of the difference-in-difference methodology, replacing the discrete variables that form the basis of this approach with interactions of continuous variables. For example, Bertrand and colleagues (1998) used interactions of measures of network quality and quantity to test for network effects, on the assumption that the ability to control for region and group fixed effects addressed selection bias.

relative to late blocks, minus this same difference for late villages. Put differently, data for treatment and control blocks, as well as for early and late villages in each of these blocks, allow us to control for the selection of early blocks as well as that of early villages, eliminating bias caused by purposive programme placement along both dimensions.

In traditional applications of the difference-in-difference methodology, treated samples would have been exposed to the programme for one or more years at the time of the endline survey, while control samples are typically excluded from the programme in both survey rounds. This generates the difference in exposure duration between survey rounds for treatment versus control samples. In our context, the relevant difference in exposure is that between early and late villages in early blocks, relative to late blocks.[10]

As revealed in Table 1, in comparison to the four-year difference in programme exposure between early and late villages of early blocks, this same difference averaged one year in late blocks.[11] With this difference, our methodology estimates the impact of being an SHG member for approximately three years.

Identification of programme effects in difference-in-difference regressions builds on the assumption that the change in variables of interest in treatment units would have been similar to that in control units prior to the initiation of the programme. If so, any post-programme difference in growth rates can be ascribed to the programme.

In the context of this study, the identifying assumption is that the difference between early and late villages in early programme blocks would have been identical to the difference between early and late villages in late blocks. Testing this assumption requires pre-programme data. We use village-level census data to examine the trends in some indicators of village and household characteristics between 2001 and 2011.

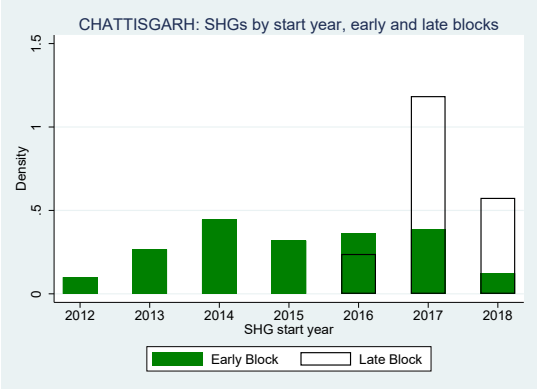
Our analysis shows that outcomes are very close to parallel for early and late blocks across the entire distribution of cluster rank, lending strong support to the assumption that there is no statistically significant difference between outcomes in early villages across early and late blocks, relative to this same difference for late villages (Appendix 3).

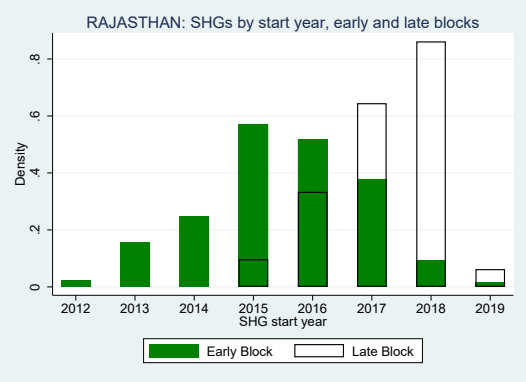
Figure 4 graphs the variation in SHG formation year, across early and late blocks, for selected states in our sample for which monitoring information system (MIS) information was available. These graphs depict the start year for all SHGs in all blocks of our survey district, a sample of 342,158 SHGs, not just those in our regression sample. This graph shows that their formation was faster in the late blocks compared to early blocks. Thus, along with the differences between early and late blocks, our methodology will account for scale.

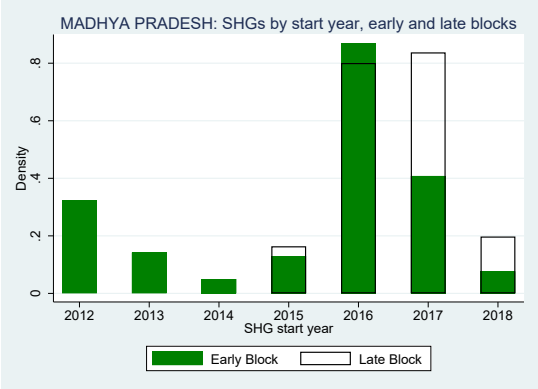
[10] We discuss the potential for bias caused by this reduction in time in section 4.2.

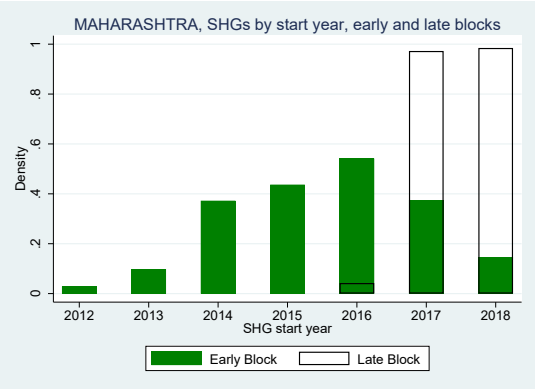
[11] Had this difference remained the same, any identified programme effect would merely reflect a non-linearity in the relationship between programme outcomes and SHG age.

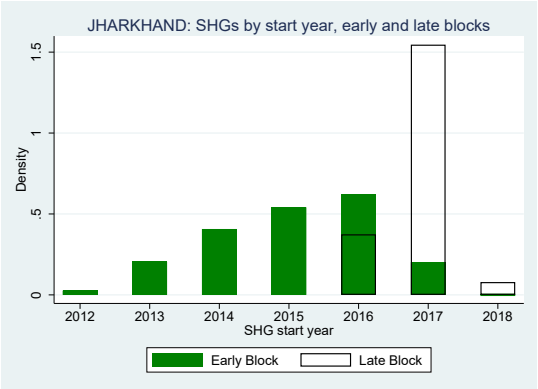
Figure 4: Variation in SHG formation year, across early and late blocks in selected survey states











4.2 The importance of scale effects

The evaluation of programmes that operate at scale presents unique challenges, particularly for methodologies that utilise different phases of the programme for the construction of treatment and control samples, and evaluate benefits over the medium term (generally a period of more than two years). This is because an increase in the programme's scale will generally affect the human capital (capacity) and resource constraints to which programmes are subject.

As programmes scale, the 'quality' of the personnel charged with implementation at local level may be adversely affected by the extension of the programme into areas characterised by poorer socio-economic conditions. Additionally, rapid growth in the number of SHGs or any other treatment units may adversely affect oversight and

monitoring; even if resources are available to fund an increase in monitoring capacity, additional staff with the necessary levels of education and expertise may be difficult to recruit. Binding capacity constraints would also affect the intensity and quality of the training provided to SHG members.

These challenges suggest significant differences in the **initial conditions** that early and late implementers face in programmes that operate at scale. This in turn implies that the initial experience of late implementers does not accurately reflect those of SHGs that entered into the programme in its early years, rendering invalid estimates of the benefits of exposure to the programme based on a comparison of outcomes across early and late implementers. Any bias could be in either direction: the previous scale of the programme may benefit late entrants, reducing identified effects; or, alternatively, early entrants could benefit from a better resource condition at the start of the programme.

This point has been forcibly made in the context of the NRLP by Majumdar and colleagues (2017). The authors examine the programme in Bihar (JEEViKA). Their starting point is the available quantitative evaluations of the first phase of JEEViKA (commencing in 2006) and second phase (commencing in 2011).

Taken together, these two studies reveal a significant decline in benefits from the programme over time for financial outcomes such as savings and loans, and particularly for measures of women's empowerment, including mobility and input in decisions relating to children's education. Using four years of qualitative studies, the authors attribute this to a drop-off in implementation between the first and second phases of the programme, which was caused by a massive increase in scale between the two phases.

Because we confine our analysis to SHGs that were formed under the NRLP, fewer concerns arise relating to the amount of time spent in their formation in early versus late stages of the programme. All teams charged with the formation were bound by the same set of rules regarding processes to be followed at village entry and the amount of time (15 days) to be spent in each village.

However, the implementation **did significantly change** as the programme scaled. Indeed, as described in the previous section, the NRLP was uniquely designed to incorporate changes in implementation over time by recruiting and investing in local human capital in the form of the community cadre to face the challenge of tightening human capital constraints as the programme scaled.

The process of recruiting the NRLP's internal drivers charged with oversight and training of SHGs occurred at the village level, upon entry into a village, and remained the same for early and late SHGs. While there may well be changes in the quality of local recruits between early and late blocks, and between early and late villages of any block, these differences are captured in regressions through the indicator variables for early blocks and villages, respectively. Estimates of programme benefits will, however, be affected by the growing use of external drivers (internal CRPs) entrusted with the process of scaling up SHG formation.

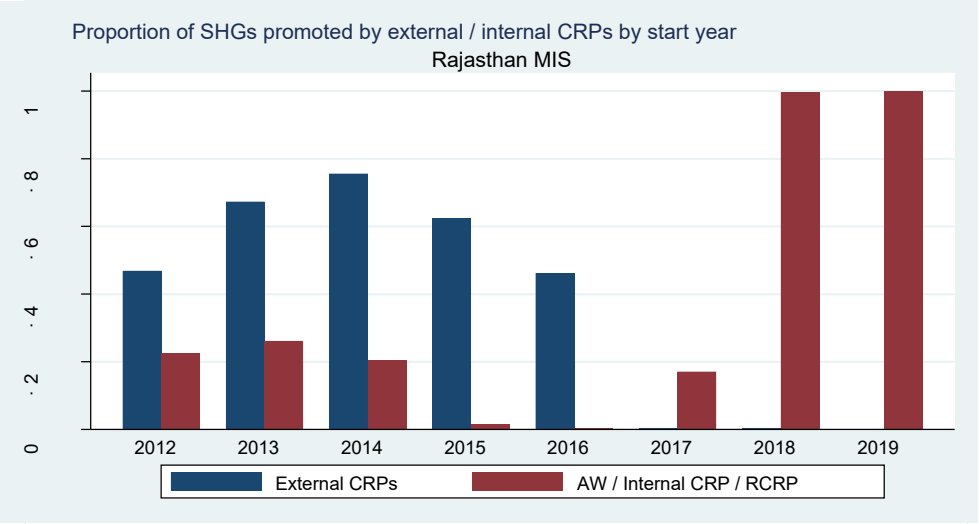
As noted by Majumdar and colleagues (2017), differences in the type of functionaries responsible for SHG formation could significantly affect the initial experience of its members and the quality of the training they received on topics such as bookkeeping,

managing internal lending, weekly meetings, the importance of adherence to SHG rules, and, more generally, the importance of formality. This in turn could cause persistent differences in the quality of early and late SHGs, though the direction of such change is difficult to predict.

The greater experience of external CRPs through their involvement in older SHG programmes in states such as Andhra Pradesh, Bihar and Kerala may have generated benefits for the early SHGs that they helped to form. Conversely, the unfamiliarity of external CRPs with village conditions and households, as well as language barriers, could impact communication with households, thereby imparting an advantage to SHGs formed by local CRPs. Our detailed discussions with those charged with implementing the programme at all levels suggest that the latter is more likely to be the case, suggesting that the failure to control for such differences could result in an underestimation of programme benefits.

We use data for the state of Rajasthan to illustrate the extent of the difference in this aspect of SHG formation over time. The state's MIS data identified the team that was responsible for the formation of all SHGs in the state.[12] Figure 5 shows the proportion of these formed by external versus internal CRPs (including the cadre of active women). The figure clearly reveals the difference in the nature of the team used to develop early versus late SHGs. While early SHGs were almost exclusively developed by teams of external CRPs, later SHGs were almost exclusively developed by teams of internal CRPs.

Figure 5: Variation in promotion source for early and late SHGs, Rajasthan



Note: AW = active women; CRP = community resource person; RCRP = resource community resource person.

As discussed in the previous section, the pace at which teams of external CRPs were replaced with internal CRPs reflected the geographic scale of the programme. The two-year period required to train a CRP meant that, for any given village, the pool of internal CRPs available for SHG formation in that village depended on the number of villages in which formation had been initiated in that block, and in other blocks of that district two years previously.

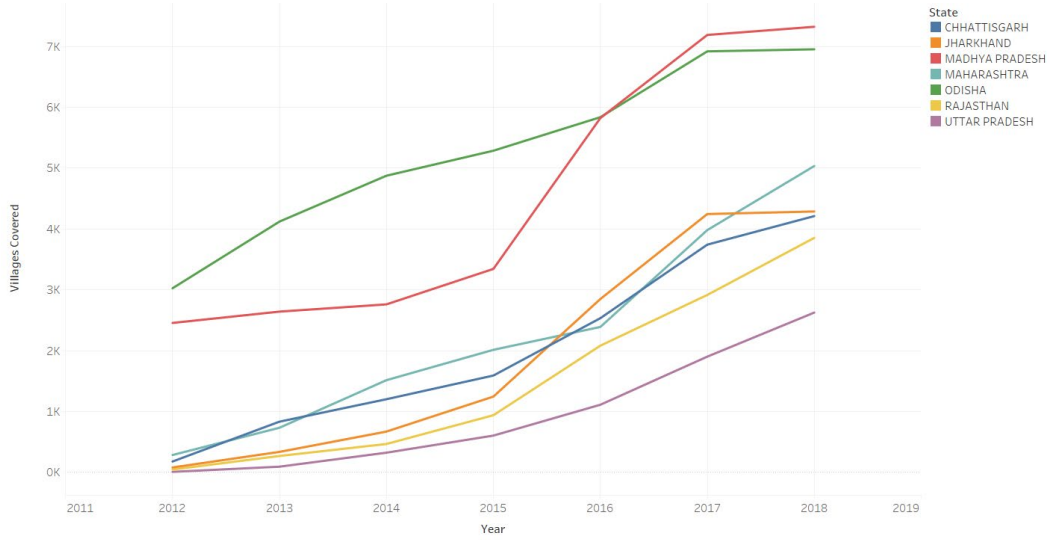
[12] Unfortunately, such comprehensive MIS data are not available for other states.

The availability of MIS data for the census of all SHGs, which provide information on the year of formation for each SHG (i.e. the year of village entry), allows us to control for such scale effects. Specifically, we construct the following variables for each SHG: for each block, the number of villages entered two years prior to entry into the block in question in *other* blocks of the district (*distr_vill*); and for each SHG, the number of villages entered two years prior to its formation year in clusters of the same block other than the cluster in which the SHG is located (*block_vill).*

These variables capture the growth in the community cadre in the block as well as in the district, since community cadre members are recruited at the time of village entry from the village population, not from each SHG. These are local measures because internal CRPs are rarely drawn from other districts; their employment generally is located in the same block in which they reside. We also include a variable that measures the number of SHGs in the district, as this is likely to affect (financial) resource constraints over time: the number of SHGs formed in *other* blocks of the district two years prior to block entry for the SHG in question (*distr_SHG*).[13]

These scale variables vary across SHGs and blocks since they are defined relative to the year of SHG formation or to the year of entry in the block in question. Figures 6 and 7 demonstrate the considerable variability in these variables over states and over blocks in a state. Figure 6 plots the number of villages entered, by year, across the seven main sample states of this study (excluding Bihar). Figure 7 does the same, but for every block of the state of Jharkhand.

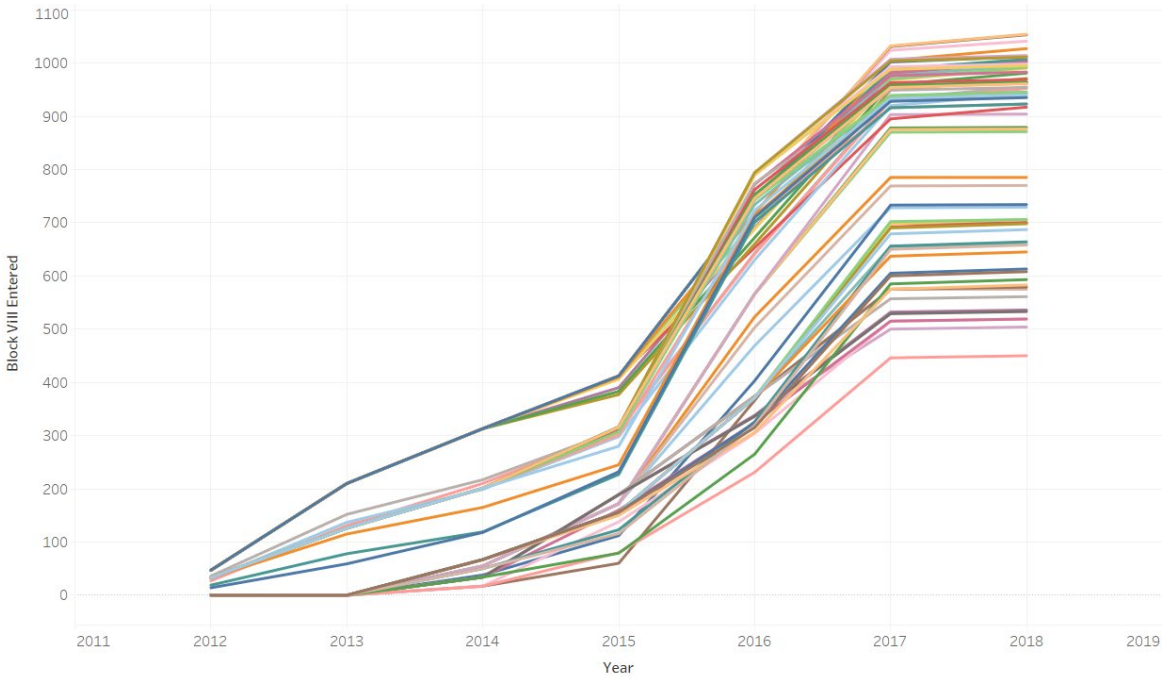
Figure 6: Increase in the number of villages (in '000s) covered by state and year



Source: MIS data.

[13] Unfortunately, we do not have the same quality of MIS data for Bihar as we do in the remaining states. The construction of these variables therefore differs for Bihar. In this state, because our sample is drawn from the randomised controlled trial that was implemented earlier, we use the fact that treatment started in 2011, while control GPs entered into the programme from 2016 onwards. For the treatment sample, the variables are defined by the number of villages entered (or SHGs formed) before 2010 in the district or block. For the control sample, they measure the number of villages and SHGs formed before 2016, excluding the number formed in the block in question (for *distr_vill* and *distr_SHG*), and in the GP in question (for *block_vill*).

Figure 7: Increase in the number of villages covered by block and year, Jharkhand



Source: MIS data.

Because our scale measures exclude the number of villages and SHGs in the block or cluster in which the SHG is located, concerns of possible correlations with attributes of the village or SHG in question are reduced. And, because they measure the scale of the programme at the time that the SHG in question was formed, they reflect the set of initial conditions that, if omitted, would generate biased estimates of programme benefits.

To accommodate differences in initial capacity across states that would mediate the effects of programme scale, all regressions include interactions of state dummy variables with this set of three scale variables. In Appendix Table A2, we validate the use of the proposed scale variables by examining how the probability of being formed by an internal CRP in the earliest villages in early blocks is affected with and without scale variables. We find that without scale variables, the impact coefficient will not adequately capture the programme impact.

4.3 Estimating equation

In this section, we lay out the regression equation we will use to estimate the impact of the NRLP. This reflects the difference-in-difference method explained earlier, and we include scale variables to account for the difference in programme scale in late blocks and villages.

Let EB_b take the value 1 for early blocks and 0 otherwise; and let EV_v be a similarly defined indicator for an early village. Our proposed difference-in-difference estimator to examine the impact of the programme on outcome *Y* for household *i*, member of SHG *j* residing in village *v* of block *b* (ignoring indexation by clusters, and other explanatory variables), is:

$$(1)\ Y_{ijvbs} = \beta_0 + \beta_1 EV_{vbs} * EB_{bs} + \beta_2 EV_{vbs} + \beta_3 EB_{bs} + (S_s \otimes Z)'\beta_4 + X'_{ijvbs}\beta_5 + u_{ijvbs}$$

In equation (1), S_s is a vector of indicator variables for each of the states in our sample, Z is the vector of scale variables and X is a vector of additional controls. We keep these to a minimum, including only the district, block and village population, as well as the number of villages in the district, block and cluster. Controlling for the number of villages in a cluster addresses bias caused by eliminating those with very few villages from consideration in the construction of the sample.[14]

The indicator variables for early block (*EB*) and early village (*EV*) control for the purposive selection of these blocks and villages. To control for general forms of heteroscedasticity in the cross-section, all regressions report heteroscedasticity-consistent robust standard errors. Running this regression on the set of SHG member households (treated households), the coefficient β_1 provides an estimate of the average treatment effect of SHG membership of approximately 2.5 years' duration on outcome Y for treated households.

4.4 The value of federation: identifying the effect of VOs

A distinguishing feature of the NRLP is the federation of SHGs into VOs. This institutional arrangement linked SHGs to each other, allowing them the benefits of scale including access to bank finance and improved access to government programmes. In equation (1), the benefits of federation into VOs are subsumed in the coefficient on *EV* * *EB*; this coefficient identifies the effect of SHG age, including integration into a VO and the additional access to institutional finance and assistance that this integration brings.

To separately identify the effect of federation, which is critical for an evaluation of the distinguishing features of the NRLP, one requires a source of independent variation in VO age. If the process of federating SHGs into VOs had always occurred six months after their formation, as stipulated in programme guidelines, then the set of early blocks from the viewpoint of SHG formation would also be the set of early blocks from the viewpoint of VO formation. This would make it impossible to separately identify VO age in regressions that also condition on SHG age.

However, as noted earlier, there has been considerable variation in the start date of VO operations within early blocks; the age of any VO reflects the age of its associated SHGs, but also the interval between the start of SHG and VO rounds in any cluster. The longer this lag, the shorter the duration of exposure of the SHG in question to the benefits of federation. Variation in this interval provides the means to identify the effects of federation, even in regressions that control for SHG age. It also suggests that the estimation of equation (1) may underestimate the returns to SHG age, if there are significant returns to VO formation, since the sample of early SHGs will include those for whom federation into VOs occurred late.

We identify the effects of VO age employing the same methodology used to identify SHG age, exploiting the fact that the process of VO formation replicated that used for SHGs. Specifically, as with SHGs, VOs in each cluster were formed by teams of 'senior' CRPs who moved sequentially from one village to another until all villages in the cluster had

[14] Clusters in the seven major states of our survey (across all blocks of NRLP districts) averaged 19 villages. We removed from consideration those clusters with nine or fewer villages (approximately 25% clusters).

been covered. This implies that the date of initiation of VO rounds, combined with information on the order of village entry, identifies VO age.

We define early VO blocks (*EVOBs*) as the set of blocks in which VO formation started before the median year of formation for the sample of all VOs in survey districts, using MIS data to obtain the year of formation for the census of all VOs in survey districts.[15] Of the set of blocks that were classified as early blocks from the point of view of SHG formation (*EB*), approximately 36 per cent constitute late VO blocks. Once the process of VO formation was initiated in any given block, the order of entry into villages followed that adopted for the formation of SHGs. Thus, the set of early villages as defined for SHG formation also constitutes the set of early villages from the point of view of VO formation.

An expanded difference-in-difference regression for identifying the effects of SHG and VO age would therefore include both interacted terms, *EV * EB* and *EV * EVOB*. However, it is difficult to interpret the magnitude of SHG or VO age from the coefficients on either of these terms. This is because a VO's age is strongly influenced by the age of associated SHGs. Correspondingly, the interacted term *EV * EB* will determine both SHG age and VO age. To the extent that it does, the coefficient on *EV * EB*, δ_1, will represent its combined effect on VO and SHG age. Similarly, if *EV * EVOB* affects both VO and SHG age, δ_2 will represent a similar combined effect.[16]

Results in Appendix Table A3 from the estimation of equations (1) and (2), with SHG and VO age as the dependent variables, attest to the positive effect of *EV * EB* on both SHG and VO age. The second regression reveals that *EV * EVOB* also affects both SHG and VO age. But, while it has a positive effect on SHG age, its effect on VO age is negative and larger.

One reason for this negative effect of *EV * EVOB* on age is that the coefficient δ_2 reflects the *additional* explanatory power of *EV * EVOB* on VO age, after controlling for SHG age. This additional effect in turn captures the lag between SHG and VO formation. The results suggest that the time between SHG and VO formation was longer in early villages, as suggested by the discussion in of chapter 6. But it is also possible that this negative effect does not reflect the influence of VO age but instead reflects declining returns to SHG age.

4.4.1 Instrumental variable estimates of the effects of SHG and VO age

Given the discussion above, the importance of SHG and VO age for any outcome is best addressed through an instrumental variable regression that treats both SHG age and VO c

[15] While the implementation of the programme defined early and late blocks, and hence early blocks for the purpose of SHG formation, no such division is made for VOs. This is similar to Duflo (2001) where regions of high and low programme intensity were defined by the speed of programme implementation, with high-intensity regions being those in which the residual of a regression of the number of schools on the number of children was positive. Because MIS data at the level of SHGs and VOs are not available for Bihar, the analysis of VO effects was not done for this state.

[16] If VO formation starts relatively late in a block in which SHG formation started early, SHGs in that block are likely to be the youngest from amongst the sample in early blocks.

(3) $Y_{jvbs} = \alpha_0 + \alpha_1 shg\_age_{jvbs} + \alpha_2 shg\_age^2_{jvbs} + \alpha_3 vo\_age_{vbs}$

$$+(S \otimes Z)'\alpha_4 + X'_{vbs}\alpha_5 + v_{jvbs}$$

Equation (3) uses *PEV * EB* and *PEV * EVOB* as the basis for instruments to identify the effects of SHG and VO age. Support for the validity of this instrument set comes from the earlier regressions and graphical analysis implemented to validate the simple difference-in-difference regressions of equation (1) (Table A1) where we show that these variables do not significantly affect pre-programme outcomes.

However, the difference between early blocks and early VO blocks may still bring in biases. We repeat the examination of pre-programme trends in Appendix A2. Both the regression analysis and the graphical analysis suggest that there was no difference between early and late villages, in early versus late SHG and VO blocks.

We report results from the estimation of equation (2) and from a simpler regression that regresses outcome *y* only on SHG and VO age, dropping PEV^2 and interacted terms from the instrument set.

4.4.2 Limitations

The limitation of any causal analysis is that it is limited in scope. Our methodology is designed to evaluate the impact of exposure to SHGs (or SHG age) with the variation in the formation of VOs across early villages of early blocks enabling the identification of the duration of VO membership. However, CLFs may be important drivers of the total programme effect. Since CLFs were generally formed after 2015, there is no significant variation in this outcome across our 'treatment' group of early villages of early blocks to enable the separate identification of cluster-level effects.

While we are unable to separate the causal effect of CLFs, we use descriptive analysis to examine consistent patterns that emerge. Similarly, we are unable to provide causal estimates of the effect of SHG quality, as summarised in adherence to *Panchsutras*, on loan and other outcomes. The descriptive analysis is more valuable here; it uses analytic reasoning based on programme implementation rules to assess a number of questions.[17]

Table 1: A 2 x 2 table of proposed difference-in-difference estimator

Type of block/village	Mean SHG age in months		Difference in age between early and late villages
	Early village	Late village	
Early block	82.8	36.2	46.6 months (approx. 4 years)
Late block	36.6 months	23.6 months	13 months (approx. 1 year)
Difference	46.6 months	13 months	3 years

[17] For example, we make the argument that delays in certification cannot fully explain the variation in time to receipt of funds, since certification was required even for allocations from RFs, which were provided in a timely fashion.

5. Sampling and data

Our study sample is based on 9 of the 13 states that were initially included in the NRLP. Appendix Table A5 details the states and districts in our survey, as well as sample sizes by district. In two of these states, Bihar and West Bengal, we departed from our difference-in-difference estimator. For Bihar, this was due to the existence of a prior evaluation of the state-level programme, JEEViKA, based on a randomised controlled trial (RCT) and two previous rounds of data collection.

Because of this strong pre-existing evaluation design, we conducted a follow-up survey of the initial evaluation. In West Bengal, the implementation of the programme did not follow the same phasing pattern as in other states, making it ill-suited to our methodological approach. We therefore resurveyed households that had been surveyed earlier in the baseline study. The discussion in this chapter hence relates to the sample of seven states, excluding Bihar and West Bengal.

5.1 Selection of districts and blocks

Within each of the seven states, we restricted our choice to early programme districts that included both early and late blocks. We found that the number of early blocks in each district was relatively small. Initial programme plans had mandated an early implementation in just four districts of each state, with four blocks in each of these districts being selected as early blocks. In practice, however, most states had more than four districts with early blocks.

Within each district, we selected (early and late) blocks in which we could identify at least two clusters with significant phasing across villages.[18] Since most blocks were divided into just three or four clusters, this frequently dictated our choice of both early and late blocks (and of clusters within these blocks). In those districts with two or more early and late blocks that met our criterion, we surveyed two blocks, resulting in larger sample sizes in some districts of Rajasthan, Maharashtra and Jharkhand.

In Madhya Pradesh, based on discussion with the State Rural Livelihoods Mission, blocks characterised as late were included in the first round of programme; therefore, while sampling for the evaluation, we did not have an equivalent of early NRLP blocks in Madhya Pradesh as in other states. Based on consultation with the Madhya Pradesh State Rural Livelihoods Mission and the World Bank, we decided to circumvent the problem by selecting blocks in phase two of the Madhya Pradesh District Poverty Initiatives Project (wherein areas where implementation started in 2009 were considered early blocks, and intensive blocks in which the NRLM was implemented in 2015 were considered late blocks). Table 2 summarises the sample from the seven states.

5.2 Selection of villages

The government's MIS provided data on the universe of all SHGs in each state, including information on formation date and the block, cluster and village in which they were

[18] This was limited in clusters with relatively few villages, as well as late blocks in which SHG formation had started just prior to our endline survey.

located.[19] This allowed us to identify early and late villages in each cluster. In general, as recommended in programme implementation guidelines, early villages were amongst the largest in the cluster, though the presence of smaller villages in this set suggested that the phasing of the programme across villages within a cluster was also based on other criteria.[20]

We therefore used a common rule to select the set of early and late villages for inclusion in our survey, based on their population rank within the cluster. Specifically, we ranked villages within the cluster by population size, and then selected the two villages with the earliest start date for SHGs and the two with the latest. Thus, survey villages in early blocks were matched to those in late blocks on the basis of village population size, enhancing the likelihood of satisfying the difference-in-difference assumption of equal pre-programme differences between early and late villages in early blocks compared to late blocks.

5.3 Selection of SHGs

In each village, we selected two SHGs formed at the time of (first) village entry and administered the household survey to its members. Our SHG module was canvassed on these two ('index') SHGs and on four additional SHGs randomly selected from the set of village groups. While we were always able to select at least two SHGs in each village, in smaller villages with a limited number of them, the additional four were selected either from the other early or late village in the cluster, or from other villages in the same GP.

The fact that we were able to survey SHGs is an important distinguishing feature of our study – one that is possible only because it is based on just one round of data collection performed after the process of SHG formation had largely been completed. Reliance on a baseline conducted prior to the initiation of the programme would have required us to use households as the unit of analysis, given the absence of SHGs at baseline.

This, in turn, would normally generate the low take-up rates endemic to other evaluations of SHGs and microfinance (Banerjee et al. 2015), limiting the statistical power of the study to identify programme effects. Though in principle it should be possible to retroactively survey SHGs joined by target households, this would require a baseline design that selected households not just on the basis of their potential for joining, but also on the likelihood of their joining the same one. For the Bihar sample, we retrospectively surveyed six SHGs in each village, but this allowed us to match only approximately half of the baseline sample of households to SHGs.

[19] This database included information on SHGs that had been formed prior to NRLP, particularly in states such as Odisha. They were 'co-opted' into the NRLP model, with implementation guidelines changed by the teams tasked with SHG formation in order to make them consistent with the NRLP framework. Our household sample is restricted to new NRLP SHGs. However, our larger sample that includes four additional SHGs also includes co-opted SHGs.

[20] Regressions of SHG age on the village's population rank within the cluster and other socio-economic determinants (including the proportion of households from scheduled castes and tribes, female literacy rate and distance to the block capital) revealed that the primary determinant was the village's population rank. The other socio-economic determinants generally had a statistically insignificant effect. Discussions with programme officers at different levels suggested that factors such as proximity to the largest village also played a role in village-level phasing.

The ability to match households to SHGs allows us a unique opportunity to directly relate household outcomes to SHG age, and therefore provide causal evidence of effects. This also allows us an unparalleled opportunity to study heterogeneity in outcomes across members of any given SHG.

The selection of SHGs for our survey was based on the government's MIS data. With the onset of field work for the study, it became apparent that a number of selected SHGs, after several years of existence, had become defunct, while others existed only on paper. In all cases where they had once existed, it was possible to identify member households from available records. Our survey includes such members. While data on the current operations of the SHG were not available, information on SHG age was available from MIS records.

5.4 Selection of households

Our survey design called for the inclusion of all members of index SHGs in the household survey. In practice, the absence of key household members from the village at the time of the survey meant that, on average, five members per SHG were surveyed, with three or more members surveyed in approximately 80 per cent of SHGs. The total sample of households linked to an SHG is 14,641 (excluding the sample from Bihar and West Bengal).

In addition to households that were members of the identified SHG, we also surveyed five randomly selected households from within the neighbourhood or hamlet in which most SHG households live, in order to understand participation choices and to examine spillover effects. Since these five households were randomly selected from the neighbourhood of any given SHG, they may include members of other SHGs, including those that are co-opted or not part of the NRLP. Of a total of 5,284 households in this sample (excluding Bihar and West Bengal in which the sample was predetermined by the baseline sample), 60 per cent were not members of any SHG, and the remaining 40 per cent were members of a different SHG.

5.5 Data

In our impact evaluation, we developed five comprehensive modules from which to collect data: the integrated household module (which contains a 'women's module), the village module, the SHG module, the VO module and the CLF module. Given the significant role of federations in the NRLM, previous impact evaluation studies have been limited in their scope as they did not collect any information on village-level federations. Our study, on the other hand, builds on existing impact evaluations by incorporating detailed information on village-level federations, collected through a primary survey, with household-level information on different outcomes that might be affected by the NRLM programme.

The village module captures different characteristics of the sampled village such as physical and demographic details, infrastructure and amenities, presence of financial institutions, and NGO and government welfare schemes that may have been implemented in the village. **The integrated household module** is a standard module used in large-scale socio-economic surveys. This module has two parts. The first is the household module, which was administered to the most knowledgeable member living in

the household in order to collect detailed information on household members and variables such as their education and primary and secondary activities.

The most knowledgeable member of the household was determined through preliminary interactions with an adult household member and was nominated by the household member. We also collected information on the household's livelihoods portfolio, productive and consumption assets, land ownership, detailed income and expenditure, as well as their current savings and loan details.

The second part of the integrated household module consists of a women's module, administered to a married female household member between 18 and 50 years. This module collected information on the women's political and social engagement and the diversity of their diet, and asked questions related to women's empowerment including intra-household decision-making.

As alluded to earlier, our evaluation has the unique characteristic of collecting data on village-level federations, which are an integral part of the NRLM project. Consequently, we collected detailed information from members of SHGs, VOs and CLFs. For the SHG module, we collected data through interviews with members and verification of the organisations' record books. This module captured the socio-economic, demographic, and savings and loan details for all members of each SHG in the sample, as well as detailed financial records for the SHG.

We also collected data on parameters related to SHG functioning and quality, focusing on the *Panchsutra.* All these variables allow us to gather much more detailed information as to what happens within an SHG. The VO module maps all SHGs linked to a VO and collects detailed information of their financial records. Similar to this module, the CLF questionnaire lists details of member VOs linked to a CLF. It aims to map and list details of community cadres that are part of the CLF, and to capture details of its detailed financial transactions.

Another significant feature of our study is its combination of household- and institutional-level information with additional information on SHGs and VOs from the administrative dataset (MIS) of state rural livelihoods missions. MIS data are the foundation for designing the sampling strategy and identifying sample SHGs. We used SHG and VO formation dates as reported in the MIS to draw our sample of villages and blocks.

The phasing of the NRLP in each district, block and cluster was identified based on the larger list of SHGs in each state. This list has been validated at the state level by the evaluation team through discussions with state-level mission officials and block-level officials. This process ensured that the selection of sample SHGs was reliable and effective.

One feature that sets the NRLP impact evaluation apart is that it was designed using state- and national-level MIS programme data. Initially, we used the national-level MIS, which provided detailed data on implementation status for districts and blocks in each state (including a complete list of all SHGs operational in each state, information on their formation dates, associated VOs, and the block and village in which they were located). This information was a key input in identifying early and late villages – a critical part of the study design.

Once we received the MIS data for SHGs, what followed was a very detailed verification process involving rigorous discussion with state, district and block staff. At the same time, we also collected data on clusterisation of blocks, something that was crucial for the identification strategy but not earlier available in the MIS. The verification process was a critical step because the identification strategy for the impact evaluation was contingent upon the implementation phase of the blocks and villages.

During the verification process with the state team, we further narrowed the sample for the evaluation to blocks where the programme was implemented as per NRLP guidelines. We also relied on the 2011 census during the design and analysis stage of this evaluation. We also used habitation data from the Ministry of Drinking Water and Sanitation.

In our analysis, we examine the impact of the NRLP on household finances, labour force participation, livelihoods choices and income, drawing on the programme's theory of change. The main outcomes of interest and their descriptions are available in Appendix Table A6.

Table 2: Sample sizes

States	Blocks	Villages	Households	SHGs	VOs
Rajasthan	14	118	3,346	665	95
Uttar Pradesh	10	92	2,398	440	29
Jharkhand	12	115	2,858	556	83
Odisha	12	97	2,794	562	81
Chhattisgarh	12	99	2,801	561	80
Madhya Pradesh	12	121	2,877	580	66
Maharashtra	12	100	2,851	569	47
Total	84	742	19,925	3,933	481

6. Summary statistics and descriptive analysis

We start this section by describing the main features of households and the community institutions of the NRLP comprising SHGs, VOs and CLFs. We then provide a descriptive analysis of the function of these institutions. In so doing, we distinguish between SHGs by a broad measure of their age, dividing them into old and young according to their year of formation (2014 and earlier; and after 2015).

The regression analysis of the next section addresses the endogeneity of SHG age through the difference-in-difference methodology previously described. Because this chapter focuses on a descriptive analysis based on summary statistics, we similarly do not address the endogeneity of the membership of SHGs in VOs and CLFs, but merely assess differences in outcomes across these three groups (those that are not yet linked to Vos; those that are linked just to Vos; and those linked to CLFs).

This analysis should thus be viewed as complementary to our causal analysis of programme effects and SHG age in the next chapter. That analysis, by definition, is far narrower in scope. In this chapter, we take a much broader perspective, providing data on SHG resources, capacity and performance, as well as factors that affect these three outcomes. SHG performance is in turn examined through the lens of its activity (lending

as well as convergence activities), equity concerns and quality as reflected primarily in *Panchsutra* scores. The last section of this chapter concludes and discusses the findings.

6.1 Socio-economic profile of survey villages and households

Detailed information on summary statistics for villages and households is presented in Appendix Tables A7 and A8. They document the wide range of socio-economic conditions across villages and households in our survey. The average size of a village in our survey is 2,320 people. The proportion of scheduled caste (SC) and scheduled tribe (ST) households in our sample is relatively high, 0.42, reflecting the fact that the NRLP was initiated in blocks characterised by a high rate of poverty and a high proportion of households from these castes and tribes. A total of 46 per cent of villages report having a bank in a village, while 22 per cent report having a market in the village.

Appendix Table A8 provides information on household socio-economic characteristics. The average size of households in our sample is 5.2 members. The proportion of households from SCs (32%) and STs (31%) is high in our sample. This is to be expected because SC and ST households were prioritised during SHG mobilisation. The relatively poor socio-economic status of our survey households is also represented in low levels of schooling. The average number of years of schooling for adult household members (18 years or older) with the most education is 4.4 years for males and 1.8 years for females.

As many as 71 per cent of our sample report earning some income from unskilled wage labour, either in the agricultural or non-agricultural sector. Suggesting a declining dependence on agriculture, the proportion of households reporting earning any income from agriculture is 54 per cent. A total of 18 per cent of sample households report some income from salaried occupations, while 12 per cent report earning income from a non-agricultural enterprise. In terms of productive assets, mirroring the proportion of households reporting income from agriculture, 57 per cent report owning land and 46 per cent report owning other productive assets. Average household expenditure in our sample is INR1,24,000 while household income, at INR75,000 is far less. This suggests a high rate of dependence on savings.[21]

Household female labour force participation rates average 0.29 for the sample. This is lower than the rate of 0.58 for rural Bihar from the 2011–2012 National Sample Survey study,[22] supporting assertions of declining female labour force participation rates in the country over the past decade (Pande et al. 2019).[23]

As shown in Table 3, average outstanding debt amongst sample households is high (INR38,307), with 70 per cent of households reporting such debt. A total of 36% of sample households report outstanding loans from SHGs, with corresponding percentages for loans from relatives and friends, the informal sector and the formal sector being 23%, 21% and 16%, respectively.

[21] This is confirmed by the data reported in Table A8.
[22] The data are drawn from https://niti.gov.in/state-statistics.
[23] Considering the country as a whole, female labour force participation rates fell from 36.7 per cent in 2005 to 26 per cent in 2018 (Deloitte 2019).

However, while a large proportion of the sample report loans from SHGs, the average amount of outstanding debt to this sector is relatively low (INR5,000). Average outstanding formal debt (INR14,000) far exceeds this amount, followed by the average amount on loans from relatives and friends (INR9,700) and the informal sector (INR9,500). Average annual interest rates for informal loans are very high (39%) and underlie the high proportion of households that report high-cost loans (14%).

Table 3: Households indebtedness

	Total	Formal	Informal	Relatives	SHGs
Proportion of households with any outstanding loan	0.697 (0.460)	0.162 (0.369)	0.210 (0.407)	0.234 (0.424)	0.361 (0.480)
Average amount of debt per household (INR)	38,307.107 (94,455.0)	13,994.092 (66,983.5)	94,71.679 (40,767.0)	9,713.148 (40,627.9)	5,128.189 (14,479.7)
Average annual rate of interest for indebted households (%)	22.730 (20.33)	15.529 (16.39)	39.008 (29.80)	15.027 (24.65)	20.333 (5.442)
Proportion of households reporting high-cost loan	0.141 (0.348)	0.006 (0.0794)	0.102 (0.303)	0.040 (0.196)	0.000 (0.0182)
Sample size	27,257	27,257	27,257	27,257	27,257

Source: Survey data.

Note: Standard deviations in parentheses. High-cost loans are those with a monthly interest rate of 4% or more. Proportions are in relation to the total number of households in the sample.

Information on household savings is outlined in Table 4.[24] A total of 64 per cent of households report savings in institutional sources, including banks, SHGs and other financial institutions. Of the sample, 41 per cent report savings in SHGs, while as many as 59 per cent report some savings in banks. The average amount in an SHG account, at INR1,712, is significantly smaller than the average amount in a bank savings account (INR7,100). All households also hold savings in non-institutional forms such as cash holdings and stocks of food grains. Of these, food grain stocks are the most significant, amounting to an average of INR9,900. Households report approximately INR1,600 in the form of cash holdings.

Table 4: Household savings

	Total institutional savings	Savings in banks	Savings in SHGs	Savings in other institutions	Non-institutional savings
Proportion of households reporting any savings	0.635 (0.481)	0.590 (0.492)	0.408 (0.491)	0.086 (0.280)	0.984 (0.127)
Average savings amount for reporting households (INR)	9,241.042 (29,494.8)	7,108.224 (27,030.2)	1,711.812 (10,848.5)	421.006 (3,505.7)	15,861.625 (63,969.0)
Sample size	27,257	27,257	27,257	27,257	27,257

Source: Survey data

Note: Standard deviations in parentheses. 'Other institutions' include organisations such as post offices. 'Non-institutional savings' include savings with traders, relatives, keeping cash at hand and savings in stocks.

[24] These statistics include non-SHG households, which are particularly prevalent in Bihar and West Bengal, states for which our sample used the baseline sample with lower levels of SHG participation to be surveyed for endline.

6.2 SHG access to resources from RFs, CIFs and banks

We start by discussing SHGs' current resource position, as reflected in their access to RFs and CIFs provided through the NRLP, as well as the loans that SHG members have received from banks. For this purpose, we primarily use data from our SHG module that provide information on approximately six SHGs per village. These data reflect the *current* resource position of these groups as of the date of our survey. The analysis of this section is restricted to SHGs that are currently functioning.[25]

The figures below graphically depict SHGs' reported access at the time of the survey to these three funding sources, according to their year of formation. In all graphs, the x-axis represents year of formation, so that older SHGs are reflected to the left of the graph and younger ones to the right. Figures 8 and 9 graph the proportion of reporting SHGs that have received funds from these sources, and the amount received (per receiving SHG) for functioning SHGs. Figures 10 and 11 replicate these plots separately for each state.

Figure 8: Proportion of SHGs reporting access to funds by source, by SHG formation year

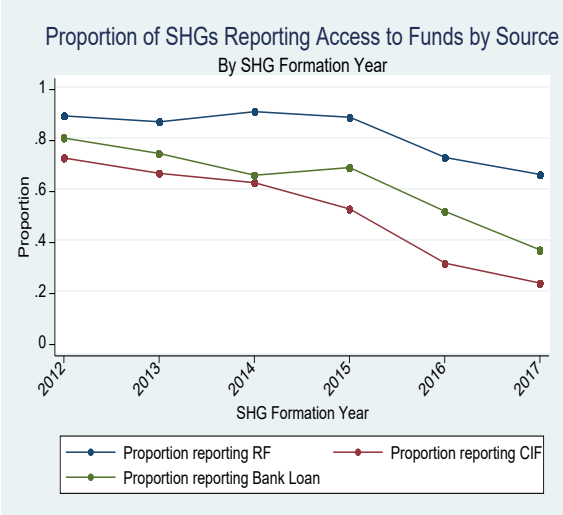
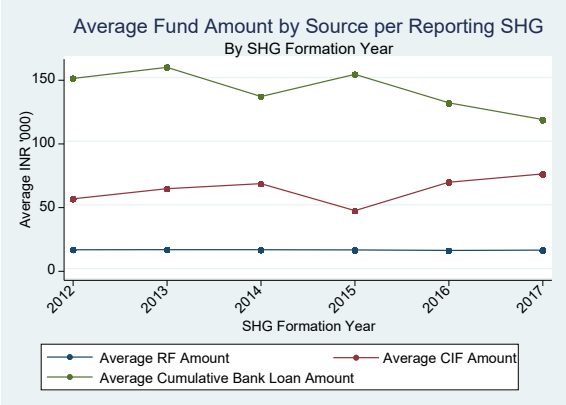


Figure 9: Average fund amount by source per reporting SHG, by SHG formation year



[25] We discuss defunct SHGs at the end of this chapter.

Figure 10: Proportion of SHGs reporting access to funds by source, by SHG formation year, by state

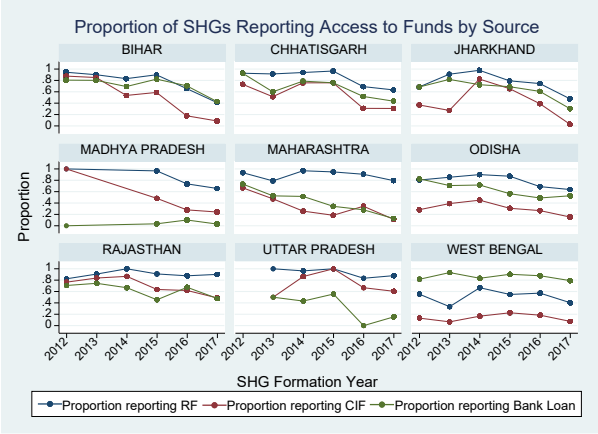


Figure 11: Average fund amount by source per reporting SHG, by SHG formation year, by state

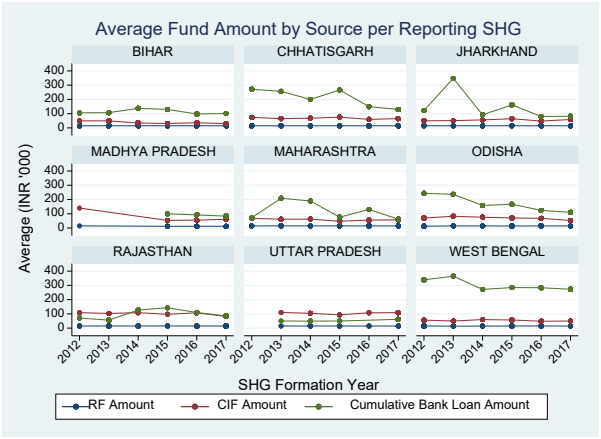


Figure 8 reveals that the proportion of older SHGs reporting funds from all three sources (RF, CIF and bank loans) is very high. For SHGs formed in 2012, these percentages are 89%, 73% and 81%, respectively. However, access to these funds falls off significantly for SHGs formed after 2015, particularly access to CIF and bank loans. Because these graphs reflect current access to resources, it is not surprising that older SHGs are more likely to have received RF, CIF and bank loans.

What is noteworthy is the relatively low proportion of younger SHGs that report receipt of these funds. This low percentage remains even though we restrict this analysis to groups formed by 2017, and hence were approximately two years of age at the time of our survey. Since programme guidelines called for funds from all three sources to be provided to SHGs within the first year, the low percentage of young SHGs (formed after 2015) reporting such funds suggests reason for concern. Before discussing this in more detail, we describe patterns across states and examine the data on the amount of funding received by SHGs from these different sources.

Figure 10 (replicating Figure 8 by state) reveals significant variation in performance across states. All states, with the exception of West Bengal, reveal the same pattern of decline in the proportion of SHGs reporting access to CIF loans. This is also true

regarding access to bank loans, with the exception, again, of West Bengal and Madhya Pradesh – a state where the level of bank borrowing is very low. The picture is more mixed for RFs, with states such as Maharashtra, Rajasthan and Uttar Pradesh revealing access rates that are relatively constant across SHGs of different ages. In other states, such as Bihar, Chhattisgarh and Rajasthan, the proportion of SHGs reporting access to RFs declines with SHG formation year.

The data on loan amounts (Figures 9 and 11) suggest that the variation across early and late SHGs is primarily in terms of access: for those reporting access to bank, CIF and RF loans, the amounts received show little variation by SHG age. The vast majority of groups report receiving the stipulated level of RF loans, with the average amount being INR14,665 (average RF amount received across all functioning SHGs). The average CIF amount per receiving SHG is INR70,749.

The data on bank loans in this graph represents the (average) cumulative loans received by reporting SHGs since their formation. This cumulative figure exceeds the average CIF amount. Figures 12 and 13 provide a picture of bank loans in the three most recent years before the survey. These graphs show a decline in loan amounts amongst younger SHGs, but this is unsurprising, since bank availability is related to the accumulated savings of SHGs and hence is positively correlated with SHG age.

Figure 12: Average yearly bank loan (Apr 2016–Dec 2018), by SHG formation year

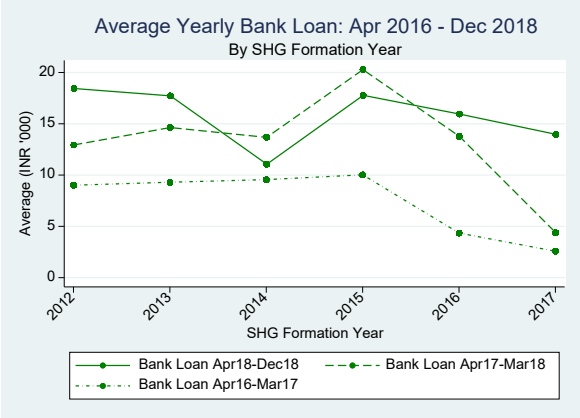
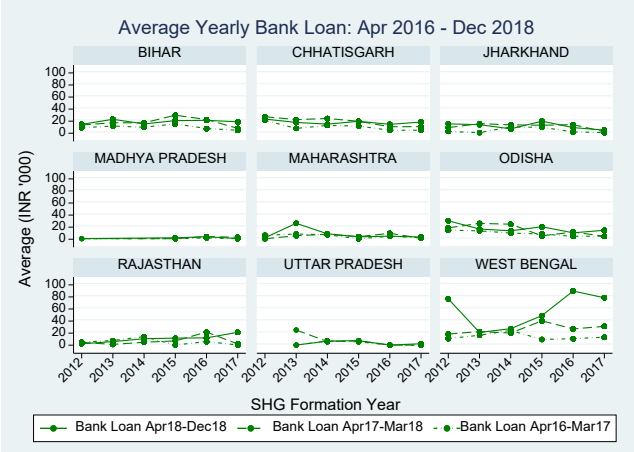


Figure 13: Average yearly bank loan (Apr 2016–Dec 2018), by SHG formation year, by state



Taken together, these graphs suggest a weak resource position of younger SHGs, particularly with respect to CIF and bank loans. It is worth repeating, however, that the graphs depict the *current* resource position of SHGs. It is very likely that older SHGs also experienced delays in receipt of funds in the first few years of their formation, with funds being provided sometime between the year of formation and our survey date.

Data on the date on which each SHG received RF and CIF resources allows us to examine whether this is the case. Figures 14 and 15 plot the number of months to the receipt of funds by source and SHG formation date. The data are censored, in that we do not have information for SHGs that have not yet received funds. For these, we follow the empirical literature on duration analysis by defining the time to receipt as their age (in months) at the time of our survey. This likely underestimates the time to receipt for the youngest SHGs.

The following figures reveal significant delays in receipt of funds that characterised the early years of the NRLP; older SHGs suffered from long wait times before they received critical resources. Those formed in 2012 and 2013, on average, reported the receipt of RFs after 30 months, even though funds from this source were to be received within the first three months of SHG formation.

There is, however, significant state-level variation in early-stage implementation, with states such as Bihar and Madhya Pradesh, both with significant experience with similar programmes, doing notably better. Other states have managed significant improvements in the time taken to provide funds. For our empirical analysis, however, the delays in receiving funds experienced by early SHGs suggest that the advantage of being an early implementer may be low and that, correspondingly, differences between early and late SHGs may be muted.

Figure 14: Average time to access funds, by SHG formation year

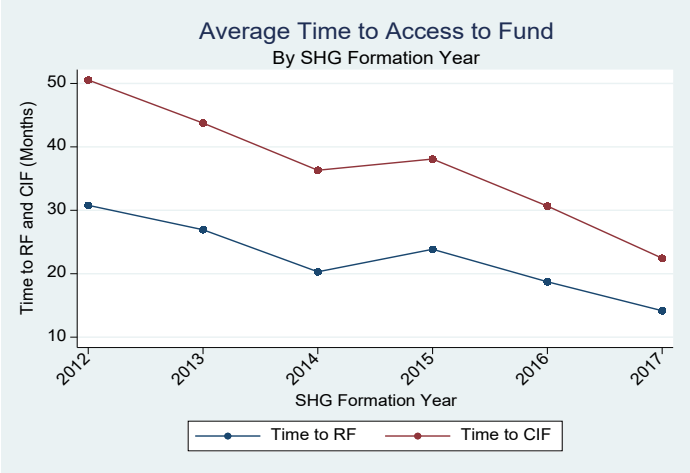
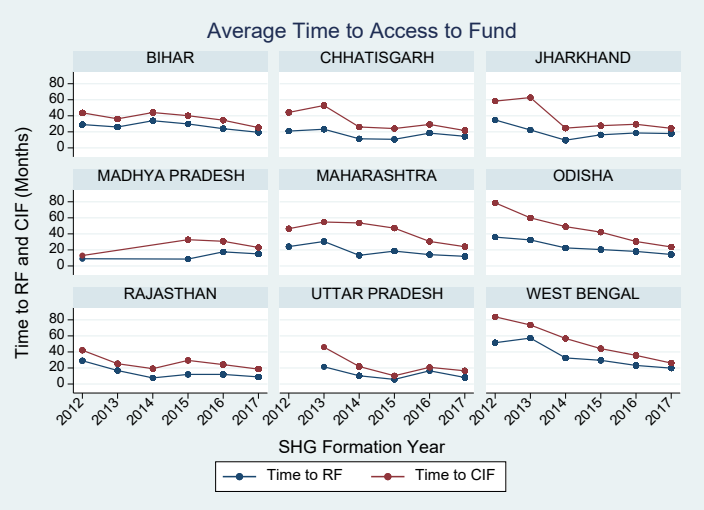


Figure 15: Average time to access funds, by SHG formation year, by state



Since the NRLP intended SHGs to receive funds from all three sources within their first year, these figures suggest significant delays in fund provision to all groups, with perhaps even greater delays for older SHGs formed in the NRLP's early years. This could be accurate for several reasons. Funds from all three sources are intended to be provided only after stipulated requirements or 'triggers' have been met. Of these, a primary requirement is that the SHG achieve a grading of 'A'. In early years of the programme, prior to the development of VOs, grading was to be performed by project staff. This responsibility was to pass to VOs once the process of federation was initiated.

Delays in receipt of funds could therefore reflect several factors. These include delays in *certification,* or the process of grading SHGs particularly before federation; *quality* issues reflected in the failure of SHGs to qualify for funds; or delays in *fund provision*, even to qualified SHGs.

It is likely that all these factors may play a role. We address the quality of SHGs later in this chapter. At this stage, we only note that the data suggest that delays in certification and low quality alone cannot explain the data; other implementation factors relating to the process of fund provision must also play a role. This is because the requirement that funds be provided only to grade-A SHGs applies to RF, CIF and bank loans.

The fact that the proportion of SHGs reporting receipt of RFs, even amongst recently formed SHGs, exceeds the proportion reporting receipt of CIF and bank loans is therefore informative. It suggests that either the norms that link fund access with SHG quality are not fully complied with, particularly for the provision of RFs, or that there are significant delays in the provision of CIF and bank loans, even for qualifying SHGs.

In the remainder of this section we provide evidence of the process of certification, and the role of federation in this process. Because VOs took on the task of certifying SHGs once they were formed, delays in the process of VO formation could explain delays in the receipt of funds by SHGs.

Figures 16 and 17 examine this hypothesis.[26] They reveal a pattern similar to that of the previous set of graphs on the time to receipt of RF and CIF funds: early SHGs experienced significant delays in the formation of VOs and CLFs, with the time to federation falling significantly with time. As previously noted, this reduces the advantages of being an early SHG.

Figure 16: Average time to VO and CLF formation, by SHG formation year

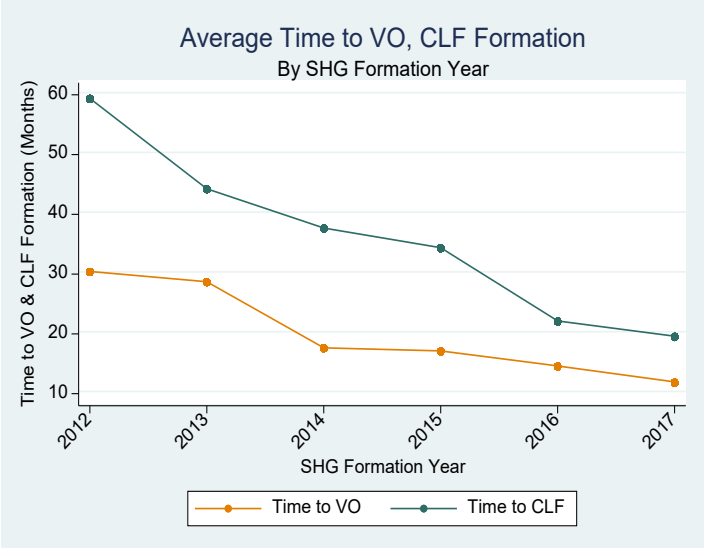
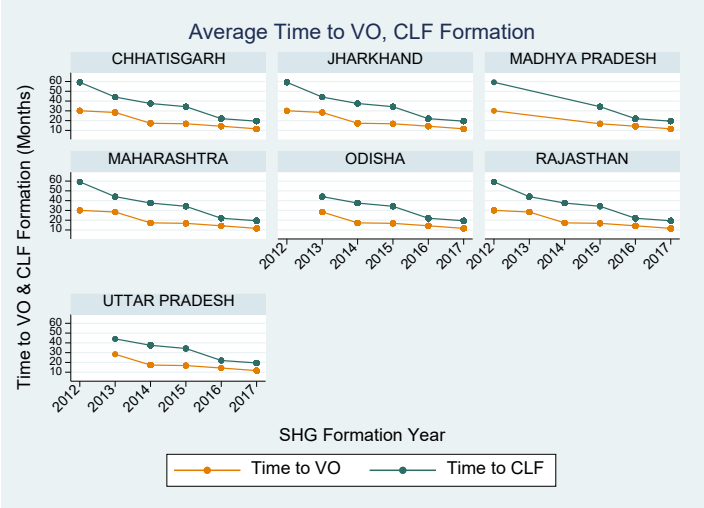


Figure 17: Average time to VO and CLF formation, by state



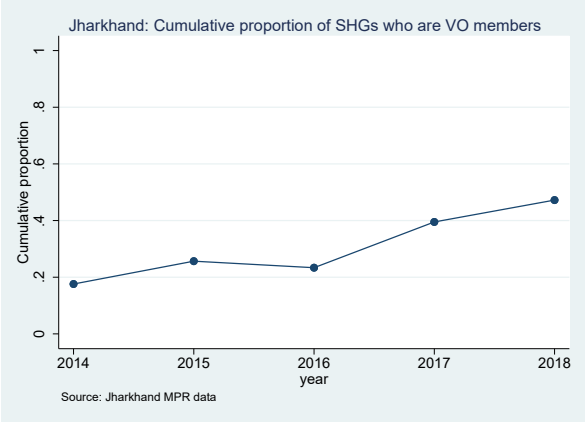
Note: Time to VO formation is based on VO join date from the survey data. Due to a lack of similar information on CLFs, the time to CLF is based on the reported formation year in MIS statistics for the CLF associated with the SHG in question. MIS data are not available for Bihar and West Bengal.

[26] The data refer to year of the SHG joining a VO (from our survey data) and year of formation of the CLF with which the SHG is affiliated. As with the analysis of time to receipt of funds, time to federation has also been defined as the age of the SHG if it has not yet been federated. This likely underestimates the time to federation for the youngest groups.

Verification of slow implementation in the early years of the programme is also reflected in data from official records of various states. Detailed data from monthly performance reports for Jharkhand (Figure 18) reveal the low percentage of SHGs that were VO members in early stages of the programme, and the low initial growth in this number.[27]

The proportions graphed in this figure reflect the proportion of SHGs that are VO members, relative to the total number of SHGs (in each year) that have been in existence for six months or more. These data are not as informative as our survey data, since they present the cumulative picture for the state as a whole, while our survey data provide details for each SHG. That is, the data from monthly progress reports reflect the combined outcomes of early and late SHGs; they do not provide information on trends according to their age. However, the low numbers in early years of the programme *are* reflective of slow implementation in this period.

Figure 18: Cumulative proportion of SHGs that are members of a VO, Jharkhand



This slow progress in the process of VO formation and in the disbursement of funds to SHGs has been noted in several State Rural Livelihoods Mission reports. The primary reason stated for this relates to capacity constraints; that is, the lack of necessary personnel, at early stages of the project. For example, Rajasthan's Restructuring Plan (Government of Rajasthan 2015) noted a delay in recruitment of approximately 1.5 years due to factors such as 'restrictions on contractual appointments'.

It explained that the very slow progress in forming VOs was a consequence of the lack of senior CRP teams (which were to have been provided to the state from the Society for Elimination of Rural Poverty in Andhra Pradesh) for the early round of VO formation, as well as the fact that existing (internal) CRPs had not received the necessary training required of senior CRPs.

A final point relates to the role of federations in resource availability. Delayed development of VOs can only explain an SHG's resource position if VOs help SHGs to access funds. As previously noted, the NRLP included provisions for RF and CIF funds to be directly paid to SHGs prior to the formation of VOs – with this responsibility passing to VOs only in later stages of the project. Technically, then, the process of federation may have no impact on RF and CIF funds.

[27] We use data from Jharkhand because of the availability of annual data from monthly progress reports.

Similarly, VOs are only intended to help promote linkages between SHGs and banks; they do not directly receive bank loans. However, VOs do bear the responsibility of monitoring the performance of SHGs, specifically of ensuring the rotation of CIF funds. Additionally, VOs are required to grade SHGs, and it is this grade that determines their eligibility for bank loans. For these reasons, federations may enhance the resource position of SHGs. We provide simple descriptive evidence of this through a set of figures that examine the proportion of SHGs reporting RF, CIF and bank loans for non-federated SHGs, those federated to VOs but not CLFs, and those federated with both VOs and CLFs.

Figures 19, 20 and 21 clearly demonstrate the importance of federation for the RF and CIF funds that come through the project. Regardless of the age of the SHG, federation with VOs and CLFs significantly improves the probability of the SHG reporting access to these funds. And, while SHGs that are only federated with VOs do benefit, relative to those that are yet to be federated, the improvements are largest for those whose VOs have in turn been federated with CLFs. The picture is less clear with regard to bank loans: federation helps to improve access, but it is federation with CLFs that significantly enhances access to bank loans.

Figure 19: Proportion of SHGs reporting access to RFs, by SHG formation year

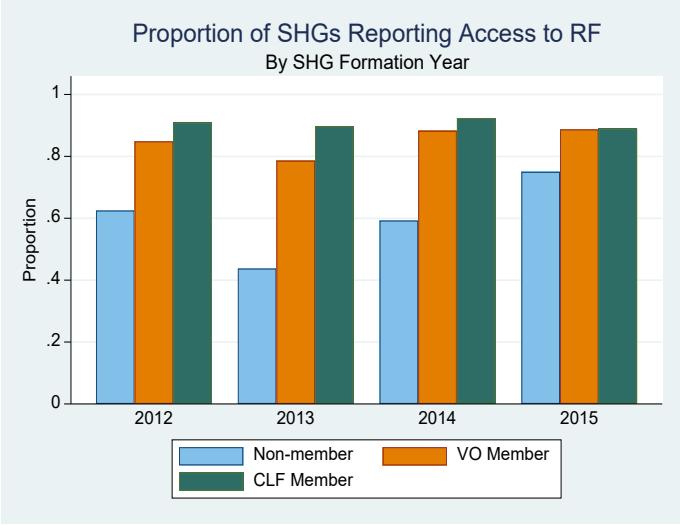


Figure 20: Proportion of SHGs reporting access to CIFs, by state

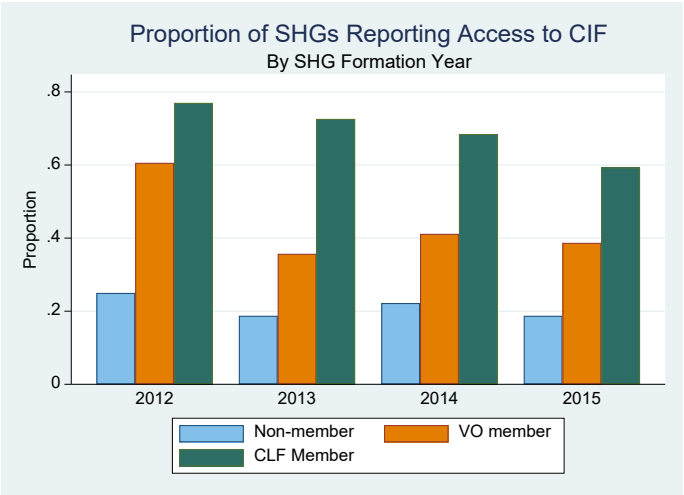
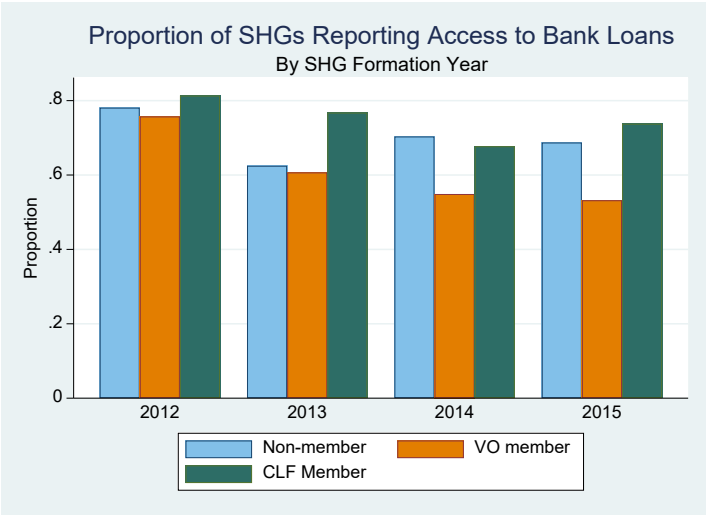


Figure 21: Proportion of SHGs reporting access to bank loans, by SHG formation year



6.3 Capacity constraints

As noted earlier, the failure of the NRLP's predecessor, SGSY, to substantially impact poverty rates was believed to reflect its inability to ensure the capacity of the SHGs it created. Consequently, a primary focus of the NRLP was to ensure the capacity of these institutions of the poor.

This had previously proved a challenge because the programme's primary objective was to reach India's poorest households – those with the lowest levels of schooling. To facilitate collective action, SHGs were designed to be homogeneous, drawing together women who lived in close geographical proximity to each other. This meant that the initial capacity of many SHGs was extremely low; the strong ties that facilitate collective action can inhibit economic growth for groups with initially low levels of schooling (Granovetter 1983). Expanding the size of networks by combining SHGs across a village or GP would increase the numbers of educated women in the network, thereby providing the potential for generating human capital spillover that would benefit the poorest SHGs.

Thus, the federated structure was intended to serve as a means of enhancing the capacity of the poor. For example, each CLF was required to form several committees, such as social action committees and livelihoods committees that oversee the functioning of SHGs in their defined areas. Additionally, recruiting and training those with eight or more years of schooling into a community cadre that could be situated at the VO and CLF level would help to complement the direct efforts of VOs and CLFs to ensure SHG quality.

The training provided to VO and CLF community cadres was critical for this process of capacity development, as was the direct training provided to SHGs. At formation, for example, every SHG was to receive training in basic concepts and management skills, and each was to identify a bookkeeper to help ensure the maintenance of proper records. Training of bookkeepers was to be conducted as part of the 'village entry' processes.

The previous section's discussion, combined with state-level data and statements from state reports, suggest that initially weak levels of capacity among SHG members was one of the primary challenges confronted by the NRLP in its early years. The reason for this is evident in Table 5, which provides information on the caste composition and education levels of SHGs, differentiated by age and federation status.

Sixty per cent of members from survey SHGs are from SCs and/or STs, reflecting the success of the programme in targeting the poor. We find a very low number of schooling years among members – an average of just 2.8 years. This increases from 2.4 in older SHGs to three years in those formed after 2014, reflecting the very rapid growth of schooling in the economy in recent years. Over one quarter of SHGs report no member with eight or more years of schooling – the cut-off level that is generally required for community cadre positions. Classifying SHGs by federation reveals higher mean level of schooling amongst those that are yet to be federated, perhaps because federation status closely follows age, with younger groups less likely to be federated.

Table 5: Capacity of SHGs

	Full sample	**By year of formation**		**By federation status**		
		SHGs formed in 2014 or earlier	**SHGs formed after 2014**	**Not federated**	**Federated with VO**	**Federated with CLF**
Total members	11.38 (1.49)	11.39 (1.46)	11.38 (1.51)	11.39 (1.67)	11.60 (1.51)	11.31 (1.43)
Prop. SC/ST	0.61 (0.43)	0.61 (0.43)	0.61 (0.43)	0.57 (0.44)	0.57 (0.45)	0.63 (0.42)
Mean schooling years	2.84 (2.26)	2.42 (2.19)	3.04 (2.26)	3.46 (2.26)	2.99 (2.22)	2.61 (2.23)
Proportion of SHGs with educated members (8 or more years of schooling) equal to:						
0	0.27 (0.44)	0.36 (0.48)	0.22 (0.41)	0.17 (0.38)	0.21 (0.41)	0.31 (0.46)
> 1	0.73 (0.44)	0.64 (0.48)	0.78 (0.41)	0.83 (0.38)	0.79 (0.41)	0.69 (0.46)
≥ 2	0.53 (0.50)	0.45 (0.50)	0.58 (0.49)	0.64 (0.48)	0.59 (0.49)	0.49 (0.50)
Sample size	4,742	1,564	3,178	838	944	2,960

Source: Survey data, SHG module roster of all SHG members.
Note: Prop. = proportion. Information relates to functioning SHGs only. Standard deviations in parenthesis.

Success in overcoming these capacity constraints would require: successful recruitment of bookkeepers and community cadre members; trainings at all levels of the federation; and oversight of SHG activities by VOs and CLFs. In this section we examine the data on these inputs. At the level of the SHG, we focus on the availability of a bookkeeper and the trainings they report receiving.

Turning to VOs, we provide information on their monitoring of SHGs and on the number of community cadres associated with them. At the CLF level, in addition to data on community cadre members, we also examine the formation of different committees and the frequency of their meetings. Our analysis of CLFs is based on a relatively small sample of 131 CLFs, which were interviewed as part of this study. As was the case with the data we presented on the resource position of SHGs, the information provided in this section is indicative of the *current* capacity of SHGs at the time of our survey.

Table 6: SHG-level inputs affecting SHG capacity

	Full sample	**By year of formation**		**By federation status**		
		SHGs formed in 2014 or earlier	**SHGs formed after 2014**	**Not federated**	**Federated with VO**	**Federated with CLF**
Proportion of SHGs with bookkeeper	0.537 (0.499)	0.426 (0.495)	0.592 (0.492)	0.631 (0.483)	0.553 (0.497)	0.505 (0.500)
Proportion that received training on:						
SHG concepts and management	0.183 (0.387)	0.183 (0.387)	0.183 (0.387)	0.204 (0.403)	0.200 (0.400)	0.172 (0.377)
Financial literacy, microcredit planning	0.030 (0.170)	0.036 (0.186)	0.027 (0.162)	0.032 (0.177)	0.016 (0.125)	0.034 (0.181)
Livelihoods	0.059 (0.236)	0.093 (0.290)	0.042 (0.202)	0.067 (0.250)	0.032 (0.176)	0.066 (0.248)
Sample size	4,742	1,564	3,178	838	944	2,960

Source: Survey data

Note: Standard deviations are in parentheses.SHG statistics are for functioning SHGs.

As shown in Table 6, for the sample as a whole, slightly over half of all SHGs report having a bookkeeper. This figure is low, given that the NRLM's master circular states that each SHG should have its own bookkeeper. This person should either be an SHG member with seven or more years of schooling, or someone from the community if no member is available. The proportion is, surprisingly, lower for older SHGs.

Low capacity of SHGs is also suggested by the very low proportion reporting receiving training. This is true even of the standard training that all SHGs should have received at formation on SHG concepts and training (18% of the sample). But it is particularly true of 'higher-order' trainings on financial literacy (3% of the sample) and livelihoods (6%). There is little difference in these numbers across older and younger SHGs, with the exception of livelihoods training. Though this percentage is higher for older SHGs (9%), it is still very low.

Table 7 gives details of community cadre members associated with 759 VOs linked to our sample SHGs, first for the full sample of VOs and then dividing VOs by the year of their formation into early (formed before 2015) and late VOs. Given that VO formation started relatively late, the sample of early VOs is small (196). This should be kept in mind in interpreting the data.

Table 7 reveals that the VOs to which early SHGs are linked are larger (15 SHGs per VO as opposed to 11). However, the differences in terms of the availability of master bookkeepers is slight (12% in early SHGs versus 9% in late). There are larger differences in terms of numbers with social mobilisers (28% versus 14%), and the livelihoods cadre (15% versus 9%), but the overall numbers remain small. In general, these data suggest low levels of capacity in terms of the availability of community cadre members. Reflecting this, VOs report that only an average of 25 per cent of their member SHGs were graded.

Table 7: VO inputs affecting SHG capacity

	Full sample	**Early VOs**	**Late VOs**
Average number of federated SHGs	11.954	14.934	10.917
	(5.728)	(6.260)	(5.146)
Proportion of SHG members that have ever been graded	0.254	0.340	0.226
	(0.386)	(0.419)	(0.371)
Proportion of VOs with CC: social mobilisation	0.177	0.281	0.140
	(0.382)	(0.450)	(0.348)
Proportion of VOs with CC: master bookkeeper	0.099	0.117	0.092
	(0.299)	(0.323)	(0.290)
Proportion of VOs with CC: CRP	0.065	0.066	0.064
	(0.246)	(0.249)	(0.245)
Proportion of VOs with CC: livelihood –*krishi sakhi, pashu sakhi, udyog sakhi, matsya sakhi*	0.109	0.148	0.096
	(0.312)	(0.356)	(0.295)
Sample size	759	196	563

Source: Survey data.

Note: CC = community cadre. Standard deviations in parentheses. ‘Early VOs' refers to those formed before 2015. Data on grading are based on a sample size of 700 VOs (169 early and 531 late) with non-missing observations.

As before, we substantiate these numbers using data from Jharkhand’s monthly progress reports. Figure 22 shows the number of active women, bank *mitras* (correspondent agents), SHGs with basic training and SHGs with bookkeepers over the 2014–2015 to 2018–2019 period. It also graphs the total number of SHGs in intensive blocks in this period as a point of reference. The figure clearly reveals the low rate of growth of relevant community cadres and the low level of training imparted to SHGs.

While Jharkhand’s reports do not provide information on community cadre members who are entrusted with work on livelihoods, they do contain data on the number of households covered under different livelihoods projects. These data, in Figure 23, similarly reveal a very low level of involvement in livelihoods projects.

Figure 22: Jharkhand: cumulative number of SHGs in intensive blocks with basic training, SHGs with bookkeepers, number of active women and bank mitras

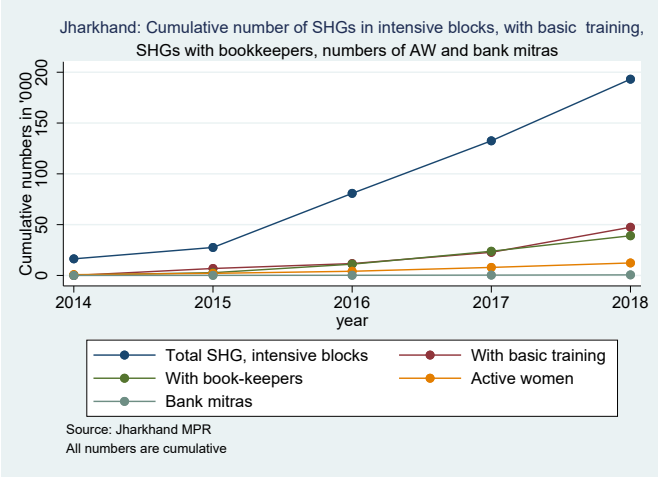
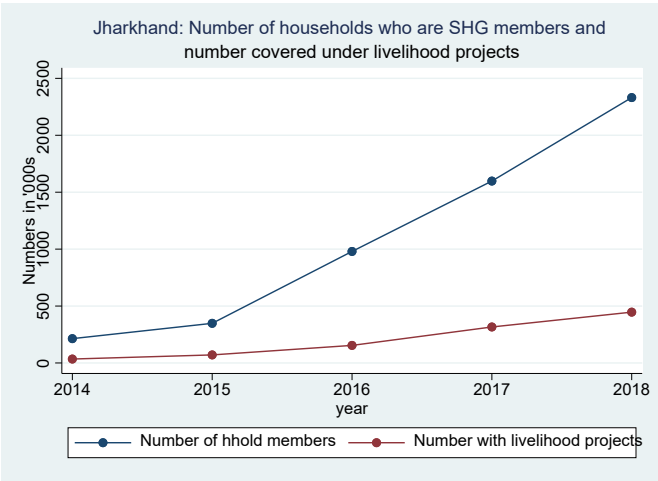


Figure 23: Jharkhand: number of households that are SHG members and number covered under livelihoods projects

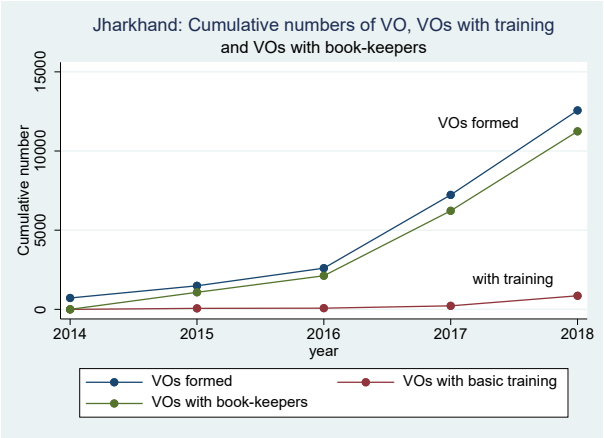


Source: Jharkhand monthly progress report data.

We also use the Jharkhand monthly progress report data to assess training provided to the VO.[28] Figure 24 plots the cumulative numbers of: VOs for each year, VOs with trained bookkeepers, and VOs that received training on basic management concepts. These data suggest a low incidence of training for VOs, similar to what we observe for SHGs. Though almost all VOs report having a bookkeeper, the number receiving training on basic concepts is very low, barely rising with time.

[28] We did not collect data on VO trainings in our survey.

Figure 24: Jharkhand: cumulative number of VOs



Source: Jharkhand monthly progress report data.

Our data on CLFs, presented in Table 8, reveal that older CLFs are larger, comprising 23 VOs and 302 associated SHGs, while younger CLFs cover 18 VOs and 190 SHGs. Not surprisingly, given this size difference, older CLFs have a higher number of community cadre members associated with them (seven, as compared to four). The process of committee formation is also more advanced in older CLFs: they are also more likely to have formed both social action committees (73% versus 48%) and livelihoods committees (39% versus 24%).

The low percentage of CLFs reporting livelihoods committees (28% for the full sample) suggests that promotion of livelihoods under the NRLP was limited in this first stage of the programme. It is, however, the focus of the follow-up National Rural Economic Transformation Project initiated in 2019–2020.

Table 8: CLF inputs affecting SHG capacity

	Full sample	Early CLFs	Late CLFs
Number of associated VOs	18.969	23.091	17.582
	(13.00)	(18.78)	(10.12)
Number of associated SHGs	218.634	302.242	190.480
	(164.9)	(228.4)	(126.8)
Number of associated SHG members	2,515.733	3,498.758	2,184.714
	(1973.5)	(2759.0)	(1506.4)
Number of CCs associated with CLF	4.885	7.152	4.122
	(4.013)	(4.266)	(3.639)
Proportion of CLFs that have a social action committee	0.542	0.727	0.480
	(0.500)	(0.452)	(0.502)
Number of meetings of the committee in the last year	3.214	3.788	3.020
	(6.670)	(4.642)	(7.237)
Proportion of CLFs that have a livelihoods committee	0.275	0.394	0.235
	(0.448)	(0.496)	(0.426)
Number of meetings of the committee in the last year	1.344	1.879	1.163
	(3.902)	(4.859)	(3.534)
Sample size	131	33	98

Source: Survey data.

Note: CC = community cadres. Standard deviations are in parentheses. ‘Early CLFs’ refers to CLFs formed before 2015.

6.4 SHG performance

Given their current resources and capacity, how are SHGs functioning? We provide information on three related sets of outcomes. First, we examine performance in terms of outcomes reflecting the core components of the programme, specifically financial indicators, livelihoods interventions and activities relating to convergence and entitlements.[29] We examine how these outcomes vary by SHG age, and across federated SHGs and those that are yet to be federated.

Second, we turn to distributional concerns, examining inequality in the distribution of loan amounts across SHG members. We also consider the characteristics of office bearers at each level of the federated structure. Finally, we analyse the performance of SHGs in terms of the criteria used within the programme to evaluate their readiness for higher-level interventions – that is, their adherence to the *Panchsutras*. We also provide evidence on defunct or non-functioning SHGs by determining the proportion of SHGs that report their members exiting.

6.4.1 Internal lending

Older SHGs would naturally have provided more loans to their members over their lifetime than their counterparts. And, since older SHGs are more likely to be federated, they will similarly have extended more loans over their life cycle. To assess the relative performance of old and young SHGs, as well as those that have been federated and those that have not, Table 9 provides data on loans given in the last 12 months, and therefore over a common period of time.

[29] Other core components include social mobilisation and livelihoods. NRLM's monitoring systems provide the best evidence on social mobilisation, suggesting a coverage rate of 49 per cent of poor and marginal households as of 2019–2020. This data is available at: https://nrlm.gov.in/MobilizationHouseholdsAction.do?methodName=showDetail&reportVar=total. Since our survey was targeted at SHG members, we cannot add to this information, except through the data for the Bihar sample. This information is provided in chapter 8.

Table 9: Summary statistics, internal lending, loans in last 12 months

	All SHGs	By SHG year of formation		By federation		
		SHGs formed in 2014 or earlier	SHGs formed after 2014	Not federated	Federated with VO	Federated with CLF
Number of internal loans, last 12 months	0.843 (1.417)	0.362 (0.726)	1.083 (1.605)	1.001 (1.474)	1.299 (1.895)	0.650 (1.155)
Proportion of loans for productive purposes	0.185 (0.389)	0.301 (0.459)	0.165 (0.371)	0.126 (0.332)	0.146 (0.353)	0.236 (0.424)
Proportion of loans for consumption purposes	0.476 (0.499)	0.178 (0.383)	0.530 (0.499)	0.562 (0.496)	0.548 (0.498)	0.395 (0.489)
Proportion of loans for health expenses	0.156 (0.363)	0.173 (0.378)	0.153 (0.360)	0.162 (0.369)	0.163 (0.370)	0.148 (0.355)
Average amount of loans for members who borrowed	5,466.018 (10,062.6)	12,823.842 (16,205.8)	4,237.944 (7,986.5)	3,401.527 (7,542.3)	3,741.383 (6,416.4)	7,474.764 (12,314.9)
Sample size	45,957	7,038	38,919	9,409	14,160	22,388

Source: Survey data

Note: Standard deviations in parentheses. ‘SHG statistics are for functioning SHGs.

The data reveal very low levels of financial activity by older SHGs: the average number of loans extended to their members in the last 12 months is just 0.4. For these groups, however, a larger proportion of loans is used for productive purposes (30%). In contrast, the data suggest more lending activity amongst younger SHGs, but with only approximately 16 per cent used for productive purposes.

The data reveal that, of loans borrowed in the last year, 53 per cent were for financing regular household consumption. The comparative percentage for older SHGs is just 18 per cent. In addition to loans for regular consumption requirements and production, both old and new SHGs report significant loans for health expenditures (17% of loans taken by members of older groups and 15% by those of younger groups).

By federation, lending activities are lower for SHGs federated with CLFs, most likely reflecting their older age. However, a greater proportion of loans amongst this class of SHGs is extended for productive purposes. While 24% of loans by SHGs federated with a CLF were used for productive purposes, the corresponding percentage for those that are not federated, and those federated just with a VO, are 15% and 13%, respectively.

6.4.2 Livelihoods interventions

Our survey of CLFs reveals significant involvement in livelihoods activities. Almost all older CLFs (97%) report undertaking livelihoods activities. The percentage of new CLFs reporting these activities is significant but smaller (51%). However, the impact of livelihoods interventions on households appears to be low. Though loans provided by

SHGs may directly impact livelihoods, our survey suggests that few members benefitted from trainings and other inputs that could also help improve incomes.

The data on trainings received by SHG members (Table 6) reveals that an average of just 6 per cent of SHGS reported receiving training on livelihoods. We also asked the women we interviewed in the women's module about any training that they had received from SHGs, and, separately, to list the services that SHGs had provided to them. Just 8 per cent of women reported receiving trainings related to livelihoods, while 3 per cent reported benefitting from the provision of agricultural inputs and/or technology.

The data in our survey conform with data available in state annual action plans, which suggest that livelihoods interventions started relatively late and were initially implemented as pilots with limited coverage. For example, Bihar's Annual Action Plan for 2015–2016 reveals that, at the start of 2015, just 71,394 members had been linked to livelihoods projects, though the number of households mobilised into SHGs was approximately 657,000. In most states, the pace of implementation for livelihoods interventions accelerated after 2015, with the formation of CLFs.

6.4.3 Convergence activities

In this section, we provide statistics from survey data on the convergence activities of each level of the federated structure. As previously noted, these activities comprise one of the four core components of the NRLP. They serve to connect the programme to the government's main welfare programmes and thereby enhance their functioning, while simultaneously increasing the returns to SHG membership.

Our survey asked SHGs, VOs and CLFs whether they helped their members to access any government programmes and, if so, which ones. For this purpose, we listed a set of 27 programmes, which included all state-specific programmes of importance. Because we asked this question of all levels of federation, we can compare the responses of CLFs and VOs to those received from SHGs. Table 10 provides responses at the SHG level, while Table 11 reports the same for VOs and CLFs.[30]

Table 10 reveals that the majority of SHGs have not yet helped their members to access government schemes: only 40 per cent report having done so. As expected, this proportion is higher for older SHGs and those linked to CLFs. It is lowest (31%) for SHGs that have not yet been linked to VOs, but this is also unsurprising, since convergence activities fall within the domain of VOs and CLFs.

Thus, while the evidence suggests delays in initiating these activities, it also finds that higher-order institutions are increasingly taking up this work. Broadly classifying government programmes into different subject groups, the focus of efforts appears to have been on programmes that are relevant for women (Janani Sureksha Yojana, widow pensions schemes, the Integrated Child Development Services scheme and Sukanya Samridddhi Yojana) and two of the current government's flagship programmes, Swachh Bharat Mission and Pradhan Mantri Ujjwala Yojana.

[30] SHGs were asked if they helped to facilitate access to government schemes for their members. The question posed to VOs was: 'Does the VO facilitate convergence activities?' A similar question was asked of CLFs.

As Table 11 illustrates, the proportion of SHGs that state they have helped their members access government programmes (0.4) is similar to the proportion of VOs that report facilitating access for their member SHGs to government programmes (0.36). The VO data clearly demonstrate the role of CLFs: 40 per cent of VOs linked to CLFs report convergence activities, while this ratio is just 20 per cent for those for those not yet linked. This number, however, is significantly lower than the proportion of CLFs that report engaging in these activities, suggesting over-reporting at the CLF level.

Taken together, the data suggest that although the pace of convergence activity take-up has been slow (even amongst VOs linked to CLFs), there is clear evidence that the federated structure allows for impacts on women's access to their entitlements, and that it has the potential to improve the delivery of benefits to poor households from government schemes.

Year-to-year details of the activities undertaken by State Rural Livelihoods Missions are reported in their annual action plans. Examination of these plans for the states in our sample confirms that most initiated convergence activities in 2015, primarily through pilot programmes, and that the pace at which they have grown has been relatively slow. For example, in Maharashtra by 2015 the 2,095 SHGs that reported having achieved 100% coverage under the public distribution system represented only 10% of the total NRLP SHGs that existed in the state at that time (20,073); and just 37% of VOs reported at least 75% of their members attending a village assembly (*Gram Sabha)*.[31]

[31] Maharashtra Annual Action Plan 2014–2015.

Table 10: Convergence programmes reported by SHGs

	All SHGs	By SHG formation year		By federation		
		2014 or earlier	2015 or later	Not federated with VO	Federated with VO	Federated with VO and CLF
Proportion reporting helping members access any scheme	0.40 (0.49)	0.48 (0.50)	0.35 (0.48)	0.31 (0.46)	0.37 (0.48)	0.43 (0.49)
Number of schemes for which help was provided	2.21 (4.03)	2.62 (4.01)	2.01 (4.03)	1.87 (3.90)	2.38 (4.54)	2.25 (3.89)
Scheme type						
Schemes oriented to women	0.29 (0.47)	0.33 (0.44)	0.27 (0.45)	0.25 (0.43)	0.29 (0.45)	0.30 (0.46)
Swachh Bharat Mission	0.24 (0.42)	0.27 (0.44)	0.22 (0.41)	0.20 (0.40)	0.24 (0.43)	0.25 (0.43)
Pradhan Mantri Ujjwala Yojana	0.24 (0.42)	0.27 (0.44)	0.22 (0.41)	0.20 (0.40)	0.24 (0.43)	0.25 (0.43)
Nutrition-related schemes	0.20 (0.40)	0.24 (0.43)	0.18 (0.38)	0.18 (0.38)	0.19 (0.39)	0.21 (0.40)
Health insurance-related schemes	0.15 (0.35)	0.18 (0.38)	0.13 (0.34)	0.10 (0.30)	0.14 (0.35)	0.16 (0.37)
MNREGA	0.13 (0.34)	0.17 (0.38)	0.11 (0.32)	0.11 (0.32)	0.14 (0.34)	0.14 (0.34)
Sample size	4,742	1,564	3,178	838	944	2,960

Source: Survey data.

Note: MNREGA = Mahatma Gandhi National Rural Employment Guarantee Act. This table provides data only for a subset of the total 27 schemes, omitting schemes for which the SHG federations have not played a significant role. ‘Women-oriented schemes’ are Janani Sureksha Yojana, widow pensions, the Integrated Child Development Services scheme and Sukanya Samriddhi Yojana. ‘Nutrition-related’ schemes are the Public Distribution System and Mid-day meals. ‘Health insurance-related’ schemes include Aam Aadmi Bima Yojana, Pradhan Mantri Sureksha Beema Yojana and Pradhan Mantri Jeevan Jyoti Beema Yojana.Standard deviations are in parenthesis.

Table 11: Convergence programmes reported by VOs and CLFs

	All institutions	By institution's year of formation		By federation	
		2014 or earlier	2015 or later	Not federated with CLF	Federated with CLF
VOs					
Proportion reporting helping members access any scheme	0.36 (0.48)	0.49 (0.5)	0.31 (0.46)	0.20 (0.4)	0.40 (0.49)
Number of schemes for which help was provided	4.22 (7.17)	5.67 (7.77)	3.71 (6.89)	2.43 (5.86)	4.71 (7.42)
Sample size	759	196	563	163	596
CLFs					
Proportion reporting helping members access any scheme	0.70 (0.46)	0.79 (0.42)	0.67 (0.47)	--	--
Number of schemes for which help was provided	10.63 (9.72)	12.70 (9.5)	9.93 (9.74)	--	--
Sample size	131	33	98	--	--

Source: Survey data.

Note: 'Institution's year of formation' refers to year of formation of VO for data relating to VOs, and year of formation of CLFs for the last two rows. Standard deviations are in parenthesis.

6.4.4 Distributive concerns

The distribution of gains from SHG membership

In this section we provide evidence on inequality in the distribution of loans amongst SHG members. We do this by ranking SHG members by their share of total accumulated internal loan amounts and constructing the ratio of loan amounts received by the top quintile of borrowers (by amount) relative to the lowest quintile. If equal numbers and amounts of loans were provided to all members, then this ratio would equal 1. More frequent and larger loans to the top quintile, representing a more unequal distribution of internal funds, would be reflected in ratios in excess of 1.

Greater inequality in the distribution of funds through loans need not reflect a process of elite capture.[32] It may well be the case that SHGs are better able to screen members for their likelihood of default, resulting in the provision of loans only to those with a high repayment probability. This would generate inequality in loan disbursements. Evidence that the distribution of loans changes with SHG characteristics, such as age, or with federation, is more informative. However, even here, rising equality over time may reflect either improvements in the bargaining power of previously 'weak' SHG members or a gradual improvement in their repayment capacity over time. Given these difficulties in interpretation, our focus is on the evidence, leaving interpretation to later research.

Given that the average SHG has 11 members, the data in Table 12 suggest that two members of the average SHG received 40 per cent of the total loans disbursed by the

[32] Stronger evidence of elite capture would come from an analysis of the characteristics of those members who receive the majority of loans. The homogeneity of SHG groups renders such an analysis difficult, particularly as it relates to educational status or caste.

SHGs. Conversely, the two members who received the fewest loans received just 14 per cent of the total amount. Thus, for the average SHG, households in the top quintile of the distribution of loan amounts received almost three times as much in loans as households in the bottom quintile.

When comparing old and young SHGs, our index of inequality averages 3.8 for older SHGs and 2.5 for younger SHGs. This difference is driven by changes in the share of loans that accrue to households in the middle of the distribution relative to those at the bottom; in both old and young SHGs, approximately two households at the top of the distribution receive 40 per cent of the amount of internal loans. In young SHGs, formed in later years of the programme, the data suggest a more equal distribution of loans across the bottom four quintiles of the distribution. For older groups, however, the share received by the households at the bottom of the distribution is low (approximately 10%), with households in quintiles two through four gaining at their expense.

We see a similar pattern when SHGs are divided by federation status. Inequality in loan distribution rises over the course of federation and is largest in SHGs that are federated at the CLF level. Again, this represents a decline in the share of funds that are received by the two households at the bottom of the distribution of loan amounts, with this decline representing more funds accruing to households in the middle of the distribution. As previously noted, the similarity in the two distributions reflects the fact that the incidence of federation increases with SHG age.

Table 12: Inequality in distribution of internal loans by SHG age and federation status

	All SHGs	By SHG formation year		By federation		
		2014 or earlier	2015 or later	Not federated with VO	Federated with VO	Federated with VO and CLF
Top quintile	0.401 (0.171)	0.399 (0.157)	0.402 (0.179)	0.399 (0.184)	0.413 (0.167)	0.397 (0.169)
Bottom quintile	0.142 (0.186)	0.105 (0.116)	0.161 (0.211)	0.194 (0.247)	0.157 (0.221)	0.124 (0.150)
Ratio of top to bottom quintile	2.829	3.787	2.494	2.057	2.630	3.206
Sample size	4,611	1,528	3,083	806	924	2,881

Note: Standard deviations are in parentheses. Members of each SHG are ranked by the total amount of loans received (since group formation). The top quintile of members is those in the top 20 per cent of loan amounts received; the bottom quintile is households in the bottom 20 per cent of this distribution. All SHGs with fewer than 10 members (1.98% of the sample) are excluded from the analysis.

As previously noted, SHGs were formed to ensure a high degree of homogeneity amongst members, with geographically proximate households from the same hamlet. Indeed, our data do suggest a high degree of homogeneity amongst groups.[33] This in

[33] The degree of caste fractionalisation amongst SHG members is 0.19, suggesting low heterogeneity based on caste. This index is calculated as $D_i = (1 - \sum s_i^2)$, where s_i equals the share of each caste category in the SHG. D_i ranges between 0 and 1 such [contd. on p.54]

turn suggests that the distribution of loanable funds across SHG members may be driven by variables other than caste or education, such as differences in income sources and the availability of a steady source of income.[34]

Nevertheless, we can divide SHGs by the incidence of members with relatively high levels of schooling (eight or more years). Data in Table 13 suggest that more homogeneous SHGs with low average schooling – defined as those with none or just one member with eight or more years of schooling – are characterised by higher inequality, as reflected in a lower share of loan amounts provided to members at the bottom of the loan distribution.

In contrast, as the number of educated members in an SHG increases, the share of loans (at least amongst the bottom four quintiles of the population) is more equally distributed, with those at the bottom quintile receiving 16 per cent of total loans, close to their 20 per cent share of membership. This suggests that inequality does not just reflect the degree of homogeneity of groups; capacity, as measured by mean levels of schooling, is also important.

It is worth noting, however, that we are defining homogeneity here by just one attribute: levels of schooling. As we noted earlier, it may well be the case that groups that are homogeneous with respect to schooling differ substantially in other ways, including husbands' schooling and sources of income. The fact that SHGs are formed by drawing on geographically contiguous households that reside in close proximity to each other suggests that levels of homogeneity across all household attributes are likely to be relatively high.

These findings should be viewed as preliminary. There has been little prior analysis of the distribution of outcomes amongst members of an SHG since data on outcomes for all members of an SHG have rarely been collected. We intend to do a more detailed analysis of this topic in forthcoming research.

Table 13: Inequality across SHGs distinguished by schooling capabilities

	Number of members with 8+ years of education		
	0	**1**	**≥ 2**
Top quintile	0.385	0.393	0.411
	(0.163)	(0.160)	(0.179)
Bottom quintile	0.121	0.127	0.157
	(0.130)	(0.156)	(0.216)
Loan share ratio	3.174	3.096	2.613
Sample size	1,215	924	2,472

Note: Standard deviations are in parentheses. All SHGs with fewer than 10 members (1.98% of the sample) are excluded from the analysis. The last row represents the ratio of loan share of the top quintile to the bottom quintile.

that larger values reflect greater caste diversity.

[34] In field work, while probing why the majority of loans went to a few members, this was frequently related to the members' repayment capacity due to steady income from a salary-earning member, remittances, or the husband's occupation such as ownership of a non-agricultural business.

6.4.5 Socio-economic characteristics of office bearers

Inequality within an SHG could also be reflected in the socio-economic characteristics of office bearers, the president, vice president and treasurer. The NRLM's master circular states that office bearers should be chosen by consensus, for a tenure of 1–3 years, with the duration of tenure to be determined by the SHG. It also notes that frontline workers, CRPs and active women should help to ensure that 'vulnerable groups' are represented amongst office bearers. Table 14 provides details of office bearers for SHGs, VOs and CLFs.

To provide a point of reference, the top row of Table 14 repeats information on the (mean) proportion of SC and ST members of SHGs for the sample as a whole, and for SHGs distinguished by age and federation status (Table 5). The second row adds data on the mean proportion of members in each SHG with eight or more years of schooling. Reflecting the low mean level of schooling of SHG members (Table 5), this proportion averages just 0.19.

Table 14: Socio-economic characteristics of office bearers in SHGs, VOs and CLFs

	All institutions	**By institution's year of formation**		**By federation**		
		Early institutions	**Late institutions**	**Not federated with VO**	**Federated with VO**	**Federated with VO and CLF**
SHG						
Mean prop. SC/ST members	0.61 (0.43)	0.61 (0.43)	0.61 (0.43)	0.57 (0.44)	0.57 (0.45)	0.63 (0.42)
Mean prop. members ≥ 8 years schooling	0.19 (0.19)	0.16 (0.17)	0.21 (0.19)	0.23 (0.19)	0.21 (0.19)	0.18 (0.19)
Prop. of SC/ST office bearers	0.600 (0.455)	0.599 (0.450)	0.600 (0.458)	0.558 (0.467)	0.564 (0.469)	0.623 (0.446)
Prop. office bearers ≥ 8 years schooling	0.380 (0.364)	0.294 (0.345)	0.423 (0.366)	0.456 (0.354)	0.406 (0.360)	0.351 (0.37)
Sample size	4,741	1,564	3,177	838	944	2,959
VO						
Prop. of SC/ST office bearers	0.504 (0.39)	0.468 (0.39)	0.516 (0.39)	--	--	--
Prop office bearers ≥ 8 years schooling	0.472 (0.36)	0.408 (0.36)	0.495 (0.35)	--	--	--
Sample size	759	196	563			
CLF						
Prop. of SC/ST office bearers	0.553 (0.33)	0.470 (0.34)	0.581 (0.33)	--	--	--
Prop. office bearers ≥ 8 years schooling	0.635 (0.06)	0.639 (0.04)	0.634 (0.06)	--	--	--
Sample size	131	33	98			

Source: Survey data.

Note: Prop. = proportion. Standard deviations are in parentheses. Early institutions refer to those formed before 2015. SHG statistics are for functioning SHGs. Standard deviations are in parenthesis.

6.5 SHG quality

How have programme efforts to ensure the capacity and resource position of SHGs affected their quality? We evaluate SHG performance in several different ways. First, we assess the impact on the criteria used by the programme to grade SHGs; that is, its adherence to the *Panchsutras.* We also provide data on the proportion of defunct SHGs,[35] defined as those that were once functioning but were no longer doing so at the time of our survey. As above, these data are provided by SHG age and whether the SHG is federated with higher-order institutions.

Finally, we also provide data on the proportion of SHGs reporting the exit of some members. This outcome does not constitute a measure of SHG quality; members will exit for a variety of reasons including life cycle changes, which may reduce their demand for the financial services provided by SHGs.

Member exit is particularly likely given that NRLP SHGs are 'exogenously' formed by project facilitators through recruitment drives. Thus, there is a greater likelihood of some households joining without a full understanding of the returns and costs to membership. Nevertheless, information on member exit provides some information on closure rates, and we accordingly include a brief discussion of it in this section.

6.5.1 Panchsutra scores

The *Panchsutra* score we use in this analysis has a maximum total of five. The data in Table 15 thus suggest relatively weak adherence to norms that relate interventions to SHG adherence to *Panchsutras*, in both young and old SHGs. However, the data also suggest that federation with a VO and a CLF improves this score, suggesting that these higher-level institutions do monitor and help to improve SHG performance, at least in this regard.

The proportion of SHGs reporting members permanently leaving the group is higher amongst older (34%) relative to younger SHGs (26%). Looking across federated SHGs and those that are yet to be federated, these percentages are marginally higher for those that have been federated. Similarly, the percentages of defunct SHGs is roughly similar across federated and non-federated SHGs. The lack of variation in the proportion of SHGs reporting member exit, and in the proportion of defunct SHGs across those that are federated and those that are not, suggests that household characteristics and economics may play a relatively large role in these decisions.

[35] As previously noted, our selection of SHGs for the sample was based on MIS data. At the time of data collection, some of these SHGs were found to be defunct.

Table 15: Measures of SHG quality

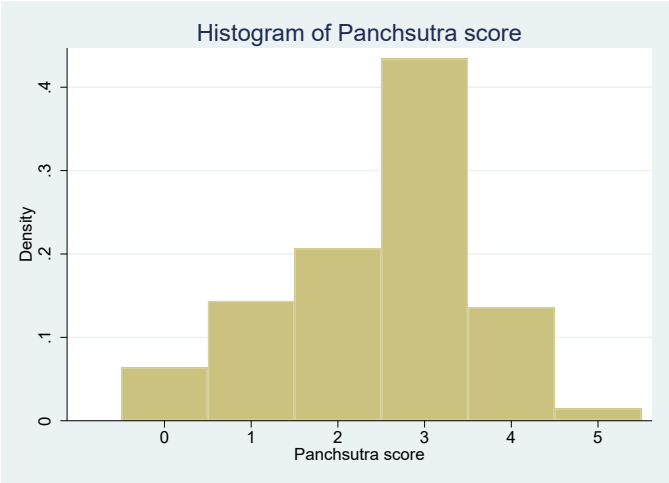
	Full sample	By year of formation		By federation status		
		SHGs formed in 2014 or earlier	SHGs formed after 2014	Not federated	Federated with VO	Federated with CLF
Adherence to *Panchsutras*	2.48 (1.13)	2.20 (1.18)	2.62 (1.08)	2.26 (1.18)	2.88 (0.92)	2.42 (1.15)
Proportion reporting exit of some members	0.29 (0.45)	0.34 (0.47)	0.26 (0.44)	0.25 (0.43)	0.25 (0.44)	0.31 (0.46)
Proportion defunct	0.08 (0.96)	0.10 (1.08)	0.06 (0.85)	0.20 (1.24)	0.04 (0.72)	0.05 (0.87)
Sample sizes	4,742	1,564	3,178	838	944	2,960

Source: Survey data Standard deviations are in parenthesis.

The low average adherence to *Panchsutra* scores returns us to the question of whether the delays in receipt of funds recorded for both young and old SHGs in their initial years reflected adherence to NRLP stipulations that such funds should only be provided to grade-A SHGs. As documented in the NRLP's master circular, an SHG's grade is determined by its adherence to *Panchsutras*: its assigned grade is the *lowest score* obtained in any one of the five parameters that constitute the *Panchsutras*. Thus, only SHGs obtaining an A grade in all five parameters will receive an overall grade of A.

For each parameter, a grade of A requires a compliance rate of 90 per cent or more. A histogram of *Panchsutra* scores (Figure 25) reveals that a negligible share of survey SHGs receive this overall grade. This in turn suggests that programme stipulations relating to the quality standards that must be achieved in order to trigger access to funds are not being complied with; if they were, the resource position of SHGs would be exceptionally low.

Figure 25: Histogram of *Panchsutra* scores



Figures 26 and 27 relate the receipt of CIF and the amount of CIF funds (for receiving SHGs) to *Panchsutra* scores. The data reveal that higher-quality SHGs *are* more likely to

receive CIF funding and in larger amounts. But even SHGs with scores of just two and three report relatively high rates of access. And, amongst those that do receive CIF funding, the amount is relatively invariant to the quality of the SHG.

Figure 26: Proportion of SHGs reporting receipt of CIF funding, by *Panchsutra* score

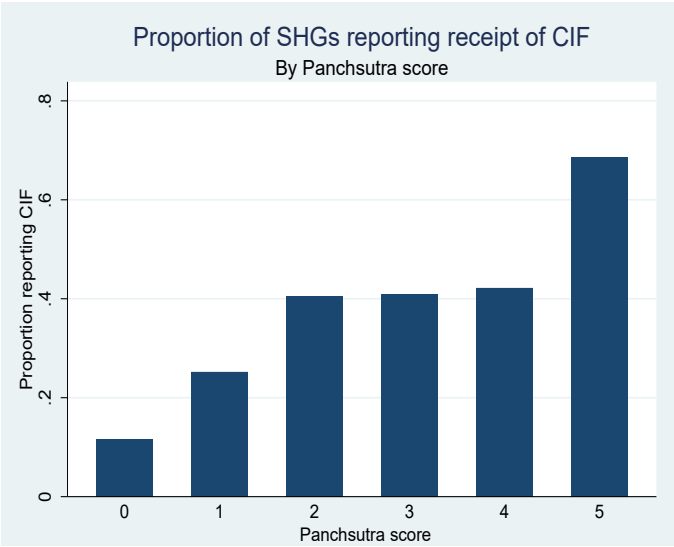
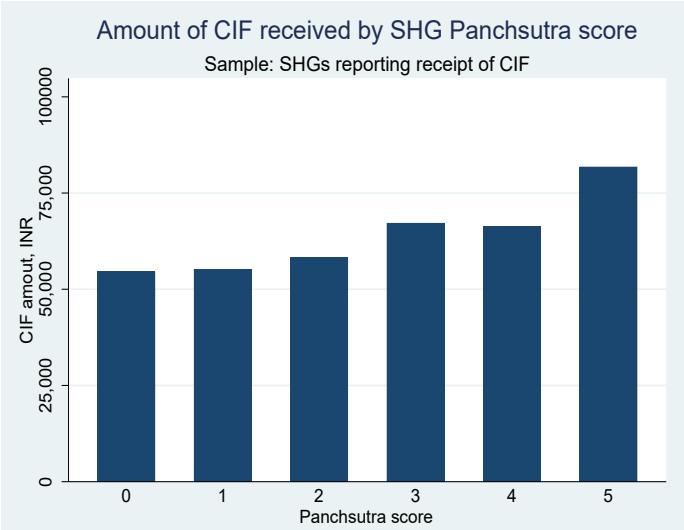


Figure 27: Amount of CIF funding received by SHGs, by *Panchsutra* score



6.5.2 Defunct SHGs

Defunct SHGs are those that had been formed but were not functioning at the time of our survey, in that they had completely ceased all operations. Our data reveal that defunct SHGs are primarily older; on average they were formed 61 months prior to our survey date. Additionally, they are concentrated in the states of Maharashtra (18%) and Madhya Pradesh (29%). In Madhya Pradesh and Maharashtra, the high percentage of defunct SHGs reflects the fact that our sample is drawn from the significantly older blocks.

The evidence we presented on low performance of SHGs in early years suggests one explanation for higher rates of failure amongst the older groups, particularly those located in states with older programmes: members may have received scant benefits in

the first few years of formation. Low rates of provision of funds such as CIFs, limited engagement in ensuring entitlements and access to welfare programmes, and the minimal scale of livelihoods programmes in early years may all have contributed to very low returns on participation among SHGs that were initiated into the programme in its early years. Poor implementation in the early years of a programme carries significant costs.

Defunct SHGs can alternatively be viewed as those in which *all* members collectively agree to exit. As such, it is closely related to the decisions of individual members to terminate their membership. Most SHGs report losing members and, reflecting the pattern of a higher incidence of defunct SHGs with age, exit rates are highest amongst older groups. For our sample of SHGs (for which we have records), 27 per cent report at least one member having left, with this percentage being highest (34%) among the oldest SHGs – those in early villages of early blocks.

Our SHG module included information on the reasons underlying exit from membership. In most SHGs, popular explanations for why members leave include the refusal of a husband or other family member to allow the woman to continue as a member (cited as an explanation by 23% of groups that had lost members) and lack of agreement on group norms (cited by 21%). But, amongst the oldest SHGs, the reasons cited most often were old age and/or death (cited by 25%) and migration (cited by 21%). This suggests that life cycle explanations also play a role in explaining withdrawal; a defunct SHG need not always be a 'failed' one.

Data from our Bihar study allow some additional insights into the reasons underlying members' decisions to leave an SHG. The survey included a baseline and a midline survey, with the midline forming the basis for the prior evaluation of the programme in this state. As described in more detail in our analysis of the programme in Bihar, the baseline was conducted prior to the formation of SHGs in the state. Hence, a negligible fraction (0.5%) of households reported SHG membership at the time. By the midline study, this had increased to 60 per cent, but dropped to approximately 50 per cent by the time of our survey.

An analysis of characteristics of households that left their SHGs between the midline and endline surveys – based on their baseline characteristics and hence by their circumstances prior to their involvement in SHGs – provides useful information. However, we note the small size of the sample, and hence treat this evidence as suggestive.

The results from this analysis (Appendix Table A10) suggest that between 2015 and 2019, members from treatment SHGs were less likely to have exited, contrary to the evidence from our larger survey. Our examination of the determinants of the probability of exiting SHGs supports the view that household characteristics and returns from SHGs play a role. The two household characteristics that significantly explain exit are women's education levels and the incidence of high-cost debt at baseline. Exit rates are higher for women with primary or higher levels of schooling, and lower amongst those with high-cost debts, suggesting that exit was higher amongst those for whom the return to membership was the least.

6.6 Conclusions and discussion

The analysis of this section discusses the resource position and capacity of SHGs and their performance in terms of internal lending and equity issues. It then provides evidence on overall measures of SHG quality, specifically adherence to *Panchsutras* and rates of closure (defunct SHGs).

For SHGs that report receipt of funds from different sources (RF, CIF and bank loans), our data reveal little variation in the amount of funding across young and old SHGs, but substantially lower access amongst the former. Data on time to receipt suggest that early groups also suffered delays in receipt of funds in their early years. When probing into the causes of these delays, the data and descriptive material from state records suggest that older SHGs in their early years may have been affected by the low initial capacity of institutions and the programme – a feature that in turn resulted in significant delays in the process of federation.

However, our data on inputs intended to ensure improvements in capacity suggest that progress has been slow, even after the initial few years. Thus, young SHGs still suffer from considerable delays in the receipt of funds and in the time to formation of VOs. Our survey data, supported by data from the MIS of various states, suggest that training provided to SHGs remains limited, and that the growth of the community cadre has not been at the level required to ensure capacity of SHGs and other layers of the federation.

These capacity constraints likely play a role in explaining the relatively low quality of the average SHG, as reflected in a low level of adherence to *Panchsutras* (the quality measure defined by the programme as constituting the 'essence' of SHGs). This in turn may help to explain the declining loan activity and greater concentration in loan disbursals that we observe amongst older groups.

The analysis of this section suggests trade-offs that the programme must confront, which are created by the weak (initial) capacity of SHGs and perceived inability to substantially improve on this (as reflected in low adherence to *Panchsutras* at the time of our survey). One way to ensure quality is to tightly link access to funds to adherence to *Panchsutras*; if compliance standards were strictly maintained, all levels of the federation might put more effort into ensuring these standards.

This suggests a vicious cycle: SHG capacity is low because of a lack of monitoring and adherence to quality standards. But it is the low capacity of the federation and programme functionaries, particularly in our survey region covering India's poorest households, which prevents closer monitoring and supervision.

An additional constraint is that, particularly in early stages, strict adherence to the standards that prescribe the quality of those SHGs that can receive programme funds would eliminate financial activities for many of them. This creates problems at household and programmatic levels. At the level of households, if receipt of benefits is tied to the slow process of training and enhancing the quality of SHGs, exit rates are bound to be high. Poor households have high discount rates and are less likely to continue devoting weekly time to programmes in which returns are slow to materialise.[36] At the programme level,

[36] The NRLP, in fact, does more than other programmes in attempting to deliver funds such as RF

even for those such as the NRLP that operate within a long window (10 years), the need to show progress each year suggests that such standards may be difficult to maintain.

One option is to substantially increase the financial and human resources earmarked for the development of capacity, particularly among the weakest SHGs. This may require rethinking one of the fundamental tenets of the programme: its 'local' nature and its dependence on a community cadre serving SHGs that are located within their village and GP.

The difficulties of this approach stem from geographic concentrations of poverty. As previously discussed, a federated approach and reliance on more educated members of the community to help 'lift up' the very poorest SHGs requires minimum numbers of educated women (with eight or more years of schooling) in each GP. This is particularly necessary in GPs that are primarily populated by weak SHGs.

Whether this condition is satisfied or not depends on the degree of heterogeneity among households (by caste and education) within a village and GP. That is, federation can only help 'weak' SHGs composed of homogenous members from poor socio-economic backgrounds to overcome initial disadvantages if villages and GPs are significantly heterogeneous. The success of any programme whose functioning relies on local capacity ultimately turns on questions of economic geography – namely, how households of different socio-economic backgrounds are dispersed across the community.

India's economic geography, particularly in its poorest states, plays a role in explaining disappointing returns to grassroots programmes. To demonstrate this, we divide SHGs into low- and high-capacity groups based on members' education levels. We then examine the characteristics of the village and GP in which low- and high-capacity SHGs are located. The question we seek to address is: are low-capacity SHGs located in sufficiently higher-quality villages and GPs? That is, do they have access within the community to a pool of more advantaged members from other groups in the same neighbourhood, those that they are likely to be connected to through VOs and CLFs?

The box plots in Figure 28 provide relevant information. We define a low-capacity group as one with one or no members with schooling above elementary level (eight years). Low-capacity groups are located on the left of the graph, while high-capacity groups are on the right. For each grouping, the first box (in blue) represents the mean and variance in education for the average SHG in this group, while the second box provides the same information for the village. The last box provides the relevant data for the GP.

We can thus easily compare the characteristics of the SHG to that of the village and the GP in which it is located, and therefore assess the degree of heterogeneity in these larger networks into which SHGs are federated. For weak SHGs, a high return to a federated structure that operates within the geographic space of a GP requires a relatively high level of heterogeneity within this space.

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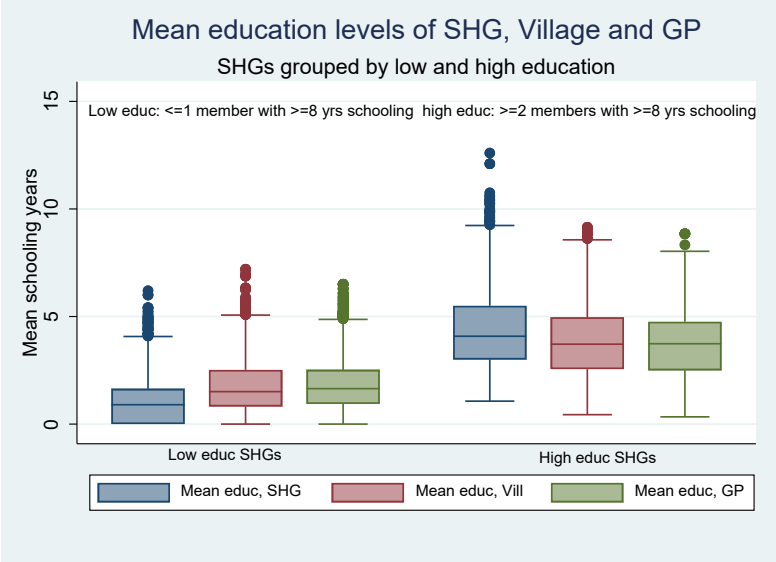
within three months of SHG formation. However, the delivery of even these relatively small funding amounts (INR15,000) requires some administrative capacity. Delays in the receipt of even RF payments were significant. Without external funds, weekly savings of INR10–20 would generate loanable funds of only INR5,000–10,000 after one year of operation.

Reflecting broad geographical concentrations of schooling, the gains to federation appear to be low for the poorest SHGs. As the figure demonstrates, the villages and GPs in which SHGs with the lowest capacity are located are characterised by equally low levels of schooling. Thus, there is little heterogeneity *within* the catchment area from which the federations they will join are drawn. Instead, heterogeneity exists primarily *across* GPs. This reduces the spillover benefits normally associated with membership in networks. Correspondingly, federations in these environments will face greater challenges in forging a pathway out of poverty for their members.

This does not mean that community-driven programmes are doomed to failure. What it *does* mean is that these constraints must be kept in mind while designing such programmes. We defer a discussion on the policy implications of these patterns of economic geography to our concluding chapter.

Figure 28: Mean education levels of SHG, village and GP



7. Results from the difference-in-difference equation

In this chapter, we present results from the difference-in-difference regressions described in chapter 4. The descriptive analysis of the preceding chapter examined outcomes by SHG year of formation and federation status. Because of the purposive phasing of the programme across early and late blocks, and across villages in those blocks, SHG age is endogenous, as is SHGs' federation status. Thus, the results of that chapter should be interpreted as correlations that provide suggestive evidence of potentially causal effects.

In contrast, the analysis of this chapter is intended to address the endogeneity of SHG and VO age, providing causal estimates of the impact of the duration of membership in SHGs and VOs. The ability to separately identify the effects of membership is important; it contrasts with the analysis of the previous chapter, in which federation effects bundled together the 'pure' effect of federation with that of SHG age, as was noted in several points of the discussion. Finally, as mentioned in our discussion of scale effects, the regression analysis of this chapter allows us to control for changes in programme implementation as the programme scaled, which would otherwise affect results.

We commence this chapter by discussing results from regressions that evaluate the effect of the programme on some of the measures of SHG quality used in chapter 6.[37] We then turn to results for a wide range of household outcomes. In addition to providing evidence on the aggregate impact of the programme, we also examine heterogeneity in returns by caste, education and measures of village infrastructure. A last set of regressions evaluates the impact of VOs using instrumental variable regressions described in chapter 4. These regressions provide causal estimates of the effect of SHG age on household outcomes.

7.1 Regression results regarding programme impact on SHG quality

The descriptive evidence of the last chapter suggested declining performance of SHGs over time with respect to certain indicators, notably adherence to *Panchsutras* and the number of loans extended in the last year (though there was an increase in the share of loans for productive purposes). In this section we substantiate those results using our difference-in-difference regression to provide causal evidence of the impact of the programme on these measures of SHG quality. The results are based on equation (1) in chapter 4.

These results, reported in Table 16, confirm that SHG, age or duration of exposure to the programme, have a declining impact on *Panchsutra* scores and loan activity, and a negligible impact on inequality in loan disbursements. This last result also accords with the descriptive analysis of chapter 5.

The last column of this table also reports the results of programme effects on the probability of SHG closure, as indicated by whether the group was revealed to be defunct during field work, in that it had ceased to exist and all operations had stopped. These regression results are weaker, in that we lack detailed information on members of these SHGs and on whether they were federated prior to closure. Thus, the regressions do not include our measures of capacity at either the SHG or VO level, but only the total size of the SHG, GP literacy rates and measures of village connectivity.[38]

It is also worth repeating that this outcome reflects household choices to leave an SHG and should not be interpreted as reflecting SHG performance alone. The results reveal that treatment had a positive effect on the probability of closure, but this is statistically insignificant. The point estimate is large enough to warrant concerns that closure affects regression results. We address this issue later in the chapter, providing robustness tests to support our main results.

In order to assess determinants of SHG quality, the regression also includes a measure of its education level or capacity, its total number of members, a measure of VO quality and female literacy rates in the GP. Following our discussion in the previous section, the measure of SHG capacity is an indicator variable that takes the value 1 if the group had two or more women with schooling levels of eight years or more.

The measure of VO quality is similarly defined, but focuses on the schooling of VO office bearers, measuring the proportion with eight or more years of schooling. A second

[37] Please refer to Appendix Table A14 for indicators of the NRLP project assessment documents.
[38] We do, however, have details regarding membership size when the SHG was initially formed.

regression extends this set of variables to include the distance of the village from a bank branch, the distance from a market, the village population and the number of hamlets into which this population is divided.

These regressions confirm an important role for the capacity or schooling level of SHG members. Those with at least a few members with relatively high levels of schooling perform much better in terms of adherence to programme rules and norms and in terms of lending activity. The positive effect of SHG capacity on outcomes does not extend to the measure of VO quality that we utilise. However, we refrain from reading too much into this result, since we only had available data on approximately four office bearers of the VO, not data on all its members.

SHG quality increases with its total membership, and with the general GP schooling level. The very strong positive effect of the GP's socio-economic characteristics on SHG quality confirms the hypothesis of chapter 5: that quality is considerably higher in more economically advanced regions.

The second regression, which includes indicators of village remoteness, confirms this statement, particularly regarding bank access. Greater distance to banks also reduces *Panchsutra* scores and lending activity. We interpret this finding as the effect of remoteness rather than financial access, given that distance to banks is likely also closely correlated with access to other services.

The regressions in Table 17 suggest that the SHG characteristics we consider have little impact on lending inequality, perhaps because of the relatively high degree of homogeneity among SHG members. Of the variables we consider, the female literacy rate in the GP has the largest effect, with inequality being highest in more developed GPs. This accords with the hypothesis underlying the Kuznets curve – that improvements in economic conditions initially heighten inequality before reducing it in later stages. The evidence we present, however, is open to a variety of interpretations. A detailed analysis of the distributive impact of SHGs will be taken up in later stages of this project.

7.2 Regression results regarding programme impact on household outcomes

Results from estimation of the difference-in-difference in equation (1) for the outcomes discussed in this chapter are outlined in Table 18. This table reports the regression coefficient on the interacted variable *EV * EB*, which, as previously discussed, measures the impact of being an SHG member for approximately three years, after it has been in operation for a two-year period.

The table also reports regression coefficients on the indicator variables for early villages and early blocks. Statistically significant coefficients on these latter two variables imply that early blocks (villages) differ from late blocks (villages), requiring methodologies that can control for the purposive selection of early blocks and villages as does our difference-in-difference specification. The mean predicted value of outcome variables for the households in *EB * EV* if these were without the programme is also reported in this

table.[39] This serves as a base for calculating the percentage change in the outcome of interest attributable to the programme.

The last column presents the percentage change over this base calculated as the reported coefficient of *EB * EV* over the mean predicted values. This chapter primarily presents the main results; detailed tables with additional robustness checks are in the appendix. A discussion of the results is at the end of this chapter.

7.2.1 Savings and loans

We commence our description of the results with an analysis of the effect of the programme on household savings. Not unexpectedly, regression results suggest an increase in savings held in SHGs, with the coefficient on *EB * EV* being positive and statistically significant at conventional levels. The estimates suggest that SHG members in early-entry villages in early NRLP blocks (henceforth referred to as treatment SHGs) have approximately INR17,000 more in savings as measured by the difference between income and expenditure.

Based on the 2.5-year difference in age between treatment and control SHGs, this suggests that households are on average able to save INR570 per month. This figure implies weekly savings of just over INR10, consistent with the weekly savings requirements of most SHGs.[40] Households in our sample are dependent on savings and, without the programme, the predicted savings are negative in that expenditure exceeds income in *EB * EV* by INR60,000. Thus, the percentage gain in savings is calculated to be 28 per cent.

To analyse the contribution of SHGs to this increase in savings, Table 18 provides estimates of the effect of the programme on savings held in SHGs and banks. Not unexpectedly, increased exposure to the programme increases SHG savings. The coefficient of *EB * EV* suggests that SHG savings per household in treatment groups are higher by about INR500. Given that treatment SHGs have been exposed to the programme for approximately 2.5 additional years compared to control groups, this translates to savings of INR16 per month, within the range of monthly savings reported by survey SHGs.

The fact that total household savings also increase implies that the growth in SHG savings is not achieved by transferring savings from one type of savings asset to another. This is verified by the finding that bank savings by both men and women is unaffected by the programme. The coefficient on bank savings by both male and female family members is positive but statistically insignificant.

The negative savings of average households reflects relatively high levels of indebtedness. Though positive, the increments in SHG savings constitute a small percentage of total household savings (3%), with the statistics of the previous section suggesting that most households keep savings primarily in the form of cash, stocks of food grain and inventories.

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[39] We calculate the predicted value of EB * EV as: (LB * EV – LB * LV) + EB * LV. [Contd. on p.65] Under the assumptions of difference-in-difference, without the programme: EB * EV – EB * LV = LB * EV – LB * LV. (LB = late block; LV = late village; EV = early village; LV = late village.)

[40] Mean savings reported by SHGs in our survey are INR16 per month, with a median of INR10.

Turning to loans, the estimates of *EB * EV* suggest an insignificant effect on loans from all sources, including those from SHGs to female members of the household. These data relate to household loans that were currently outstanding at the time of the survey, for which we collected information identifying the recipient.

However, the programme has had an effect on the incidence of high-cost informal loans (4% monthly interest rate). The regression results suggest a significant decline in the proportion of households reporting high-cost informal debt, and that 32% fewer households (of those with outstanding debt) report high-cost loans. Reflecting this, informal annual interest rates declined by five percentage points, although this decline is insignificant, perhaps due to the relatively low number of households with outstanding informal debts (N = 1,912).

We also collected data at the household level on loans that had been paid off in the last five years. Supporting the evidence of a decline in high-cost debt, these data reveal a decline in the share of loans from the informal sector relative to total loans. This decline exists over both the short term (last two years) and medium term (last five years). The similarity in the short- and medium-term responses reflects the fact that the majority of loans, including from the formal sector, are of relatively short duration.

7.2.2 Labour force participation and livelihoods

Our analysis suggests a nuanced effect on the labour force participation of adults aged 20–60 years. First, the proportion of women in a household who report a secondary occupation is higher by approximately four percentage points in treatment relative to control SHGs (with a base secondary participation rate of 58%). This indicates an increase of 6 per cent, but is weakly significant.

We do see some improvements in the average number of months (in the past year) and hours (in the past month) of work reported by women in productive activities, but these increases are statistically insignificant. This contrasts with a significant increase in men's hours of work in primary activities in treatment SHGs. Our estimates reveal a 6 per cent increase, over a base of 161 hours, in the average work hours reported for household males in primary activities. The average hours of work in the past month by men in secondary activities increased by 10 per cent, from a base of 97 hours.

Our results suggest a statistically significant effect on household income. An additional 2.5 years of SHG membership increases total household income by approximately INR11,000 a year, an increase of approximately 19 per cent over the base amount of INR57,000 per annum. This is primarily driven by improvements in earnings from casual wage labour markets (INR8,000 on average), with a small percentage also reflecting increased income from the government's workfare programme, the Mahatma Gandhi National Rural Employment Guarantee Act (MNREGA). With no significant increase in the number of households working within the programme, increased income from MNREGA suggests a rise in the number of workdays among households under the programme.

We also find small but significant improvements in income diversity, as reflected in the number of income sources reported by sample households. Treatment households were likely to have 0.2 additional sources of income, with this increase primarily reflecting greater involvement in wage work, but reduced engagement in non-agricultural

enterprises. Although households were more likely to have earned some income from agriculture in the treatment SHGs (11.8% higher likelihood), the total income from this source was statistically no different from the control SHGs.

7.2.3 Expenditure

Table 18 also reports results of the programme's impact on different items of household expenditure. We find no significant effect of the programme on average household spending, reflecting the sum of expenditure on food and non-food items in a year. This suggests little impact on this measure of household welfare. Additionally, we find a *positive* effect of the programme on the share of food within total household expenditure (7%, from a base of 0.38), despite our finding that the programme increased household income. In general, increases in income are accompanied by declining food shares, as households increase the share of non-food items in their expenditure. This paradoxical result is driven by increased consumption from home stocks of food grain.

Despite the increase in share of food, there appears to be a small but statistically significant improvement in the index of household food diversity, and a decline in the proportion of households that report going hungry because of a lack of resources. This latter effect is small, reflecting the fact that only about 10 per cent of the sample report this condition.

7.2.4 Consumer and producer assets

Mirroring the decline in household expenditure, our analysis finds an insignificant but negative effect of the programme on the value of both productive and consumer assets. Our descriptive analysis of the previous section suggests that improvements in productive assets have accompanied the federation of SHGs into VOs and particularly CLFs. Federation at the CLF level, however, has picked up only recently.

7.2.5 Indices of women's empowerment and access to entitlements

An important objective of the programme is to improve women's bargaining positions, both within and outside of the household, and to help empower them. Table 18 reports estimates of the programme's impact on indices of women's decision-making roles within households and confidence levels in dealing with local government officials and community leaders. Definitions of these outcomes are provided in Appendix Table A6.

We find no average effects of the programme on either of our two indices of empowerment (the decision-making index and the confidence index). Treatment households do report greater use of government programmes, with the effect being statistically significant at a 5 per cent level. Our results suggest that treatment households availed themselves of approximately three schemes while, in the absence of the programme, households would have used only 2.8 schemes.[41]

We examined the impacts on the full sample of households that includes non-members, and on non-members alone. We see no impacts or negative impacts for non-members. However, we refrain from comparing these impacts to those of SHG members due to inherent differences in household characters of members and non-members. These results are available on request.

[41] We present Romano-Wolf p-values to adjust for the possibility of finding false positives due to multiple hypothesis testing. Our results are consistent with adjusted p-values (Appendix Table A13)

7.3 Heterogeneity in results by caste and female education

The results above relate to programme effects on the average household. Our descriptive analysis of the previous section suggests considerable heterogeneity in the programme's impact across households. Thus, these averages may mask important differences in the programme's effect on different groups of households. Our first set of heterogeneity results explores differences in programme effects across households from SCs and STs, and in the education years of the prime-age woman in the household. We then turn to an analysis of the heterogeneity in results based on the distance of the village from markets and banks. The detailed regression tables are in the appendix and our discussion focuses on the main results of these regressions.

7.3.1 Heterogeneity by caste

Table 19 explores the heterogeneity in programme estimates across members of SCs and STs. Table results report the coefficient on SC and ST indicators, as well as coefficients on the interaction of *EV* EB* with these indicators. The coefficients on SC and ST indicators without the interaction with *EV * EB*, reflect (mean) differences in outcomes for members of SCs and STs relative to other households in the absence of the programme.

These indicators suggest higher savings among SC and ST households and, correspondingly, smaller amounts of borrowing. They also suggest greater dependence by SC and ST households on wage income as well as agricultural income, less engagement in livelihoods enterprises, and a poorer asset position as reflected in the value of the productive assets they hold.

The interaction of indicators for SC and ST households with *EV * EB* finds that the programme improved their access to loans, as reflected in a positive coefficient of this expanded interaction term on the amount of SHG loans. ST households also report greater programme effects on the number of income sources relative to other households and on savings with SHGs.

Because savings are compulsory, with a uniform rate that applies to all members of the SHG, this suggests a higher savings rate in SHGs in which members from STs predominate.[42] A detailed analysis of the results suggests that the relative increase in the number of income sources reported by ST households reflects increased engagement in agriculture and livestock.

Furthermore, although the regressions reveal a decline in household expenditures and value of productive assets, these declines have been smaller for members of SCs and, to a lesser extent, for members of STs. This likely reflects their increased engagement in agriculture and livestock enterprises, as noted above. Thus, in terms of access to loans and impact on savings, the programme has been successful in targeting the poorest households. This targeting explains the improvements in the relative position of SC and ST households in treatment villages as regards household expenditures, income diversity and the value of productive assets.

[42] Though there is a provision for any member to save at a higher rate, this is rarely exercised.

Our indices of women's empowerment suggest significantly lower mean levels of confidence for women from STs in the absence of the programme. The interaction of indicators for women from SCs and STs with treatment (*EV * EB*) reveals that treatment did reduce these differences, but the effect is not statistically significant at conventional levels. A similar lack of heterogeneity is demonstrated in regressions on the number of welfare programmes accessed by women. Though women from SCs and STs report significantly higher mean access, treatment does not generate additional (relative) improvements for these relatively poorer women.

7.3.2 Heterogeneity by schooling

Our analysis of heterogeneity with respect to schooling is based on the highest level of schooling of adult females and males in the household. Table 20 reveals that, as expected, the coefficient on these variables is a strong significant effect on total incomes, and particularly on wage incomes, with a correspondingly strongly significant positive effect on household expenditure and asset holdings.

However, as found in other studies, the coefficient on women's education suggests declining female labour force participation rates as schooling levels of women increase. In terms of savings and loans, more educated families report lower savings and higher dependence on loans. This accords with the findings on SCs and STs reported above, which suggest that poorer households save more and borrow less.

The interactions of schooling measures with programme effects (*EV * EB*) suggest that the programme increased the difference in borrowing from SHGs between educated and other households. This, however, reflects a strong positive effect of male schooling on SHG loan amounts: in treatment areas, loan amounts are highest for households with men of relatively high levels of schooling.

Our descriptive analysis of the distribution of gains from SHGs in the previous section suggested considerable heterogeneity in returns, despite the relative homogeneity of households with respect to caste and female schooling. Our regression analysis suggests that one important variable explaining such diversity is male schooling. In general, there is far more variation and heterogeneity in male (relative to female) schooling levels.

Reflecting our earlier finding of lower mean values of confidence among women from STs in the absence of the programme, the regressions that explore heterogeneity with respect to schooling find much higher levels of confidence amongst educated women. Additionally, these differences are *augmented* as a consequence of the programme. This is not surprising, given that the opportunities for increased interaction with local community leaders offered by the programme primarily accrue to office bearers in VOs and CLFs. Our descriptive analysis in the previous section finds that the schooling of these office bearers significantly exceeds that of the average SHG member.

7.3.3 Heterogeneity with respect to village remoteness

The descriptive analysis of chapter 6 emphasised the role of the attributes of villages and GPs in which SHGs are located on SHG performance. Building on that discussion, in this section we discuss the heterogeneity of programme impacts by village characteristics, specifically their distance from the nearest bank branch and from a market (Table 21).

As before, the coefficients on these variables for market distance (*MKT_DIST*) and nearest bank branch (*BK_DIST*) reflect the impact of remoteness on households in the absence of the programme. The coefficient on *EV * EB* is the average effect of the programme, while the further interaction of market distance and bank distance with *EV * EB* (*EV * EB * MKT_DIST* and *EV * EB * BK_DIST*) reflects the incremental impact of the programme as market and bank distance increases.

As one would expect, we find that more households are likely to be involved in agriculture and MNREGA as their remoteness increases, while their involvement in wage work and enterprises declines, as indicated by the coefficients of market distance and bank distance. Such households also have fewer income sources.

The regression results confirm the high cost of remoteness on incomes, with total household income significantly lower in villages that are more distant from markets and banks. This is true of income earned through agriculture, livestock and wages. Female labour force participation rates, however, are higher in more remote villages that are less connected to markets and banks. Households in remote villages tend to borrow more from informal sources and, correspondingly, have less savings compared to well-connected villages.

The programme impact estimate, as indicated by the coefficient *EB * EV*, is positive and significant for the outcome variables of total income, MNREGA income and wage income, and this impact is the same across remote and well-connected villages. As before, we see insignificant average programme impact on agricultural income. However, the impact of the programme appears to have increased agricultural incomes in remote villages.

The coefficients on interactions of market and bank distance with *EV * EB* reveal heterogeneity in programme impacts on loans and savings from SHGs. The increase in SHG savings and loans reported in treatment households is larger in villages that are more distant from markets. However, the opposite is true for distance from a bank: programme returns have been lower in villages that are more distant from banks.

Additionally, while the overall effect of the programme on female labour force participation rates was insignificant, there is a positive significant effect on villages that are more distant from markets. This reflects a positive impact of the programme on women's participation in wage labour markets in this set of villages. Women's engagement in wage labour markets, however, is negatively associated with the distance to banks.

Turning to women's empowerment, the coefficients on market and bank distance (that reflect the mean values of our indices in the absence of the programme) reveal that village remoteness affects not just income but also women's welfare. Women report lower involvement in household decision-making, and less confidence, in villages that are more distant from markets and banks.

Encouragingly, however, the difference between villages that are more distant from banks and those that are closer appears to be reduced by the programme. Mean values, in the absence of the programme, suggest little effect of remoteness on women's reported access to government programmes. The results suggest, however, that treatment improves access in more remote villages.

These results, therefore, do suggest that the programme has helped overcome the effect of distance with regard to measures of women's empowerment. This is an important positive finding. The larger challenge appears to be overcoming the consequences of remoteness for incomes.

7.4 The role of defunct SHGs

Our sample includes members of currently defunct SHGs that report no savings or loans from them. The regression results on SHG quality reported at the start of this chapter suggest weak treatment effects on the probability of an SHG closing. We therefore provide results from a robustness check, rerunning our main regressions omitting data from Madhya Pradesh and Maharashtra, the two states with the highest proportion of defunct groups(Appendix Table A9).[43]

Excluding these two states results in larger programme impacts on savings and loans. Compared to the 6.4 per cent increase in SHG loans observed for the 7 states, the 5 states with very low proportions of defunct groups reported an increase of 15 per cent. Thus, while regressions on the full sample of households from seven states generated no programme impact on loan amounts borrowed from SHGs or on total household borrowings, regressions for the five-state sample suggest that the programme significantly increases the amount that women borrow from these groups.

The impact of the programme on wage incomes is also larger. However, there is little effect on other outcome variables, including asset ownership and measures of female empowerment.

7.5 Effects of VO membership

A final set of regressions explores the effects of linking SHGs to VOs using the instrumental variable regressions described in equation (2) of chapter 4. These regressions report the results of increases in SHG and VO age on outcomes, allowing the effect of SHG age to change over time through the inclusion of a squared term in SHG age. Thus, these regressions allow us to examine whether the impact of these groups increases or decreases over time.

However, we also present results from a simpler regression of outcomes just on SHG age and VO age. This specification imposes a linear trend, so that the effect of SHGs on outcomes remains constant over time. Regression results from both equations are in Appendix Table A10. Our discussion in this section combines both sets of results.

The results suggest that the primary effect of linking SHGs to VOs is on loan outcomes. This contrasts with the simple difference-in-difference regressions, which revealed little impact of the programme on loans. A first result is that federation with VOs results in statistically significant increases in borrowing by women from SHGs. While the results suggest that the amount of SHG loan received by the woman also increases with the SHG's age, the effect is weaker and tapers off with time.

[43] In other states, the incidence of non-functional SHGs is less than 5 per cent.

Figure 29 plots the predicted values of SHG loans by SHG age, with and without any effects of VO age. For the plot with VO age, this is predicted as one year (12 months) less than the age of the SHG; this estimates the amount of SHG loans if it was linked to a VO one year after its formation.

Figure 29: Predicted SHG loan amounts, with and without VOs

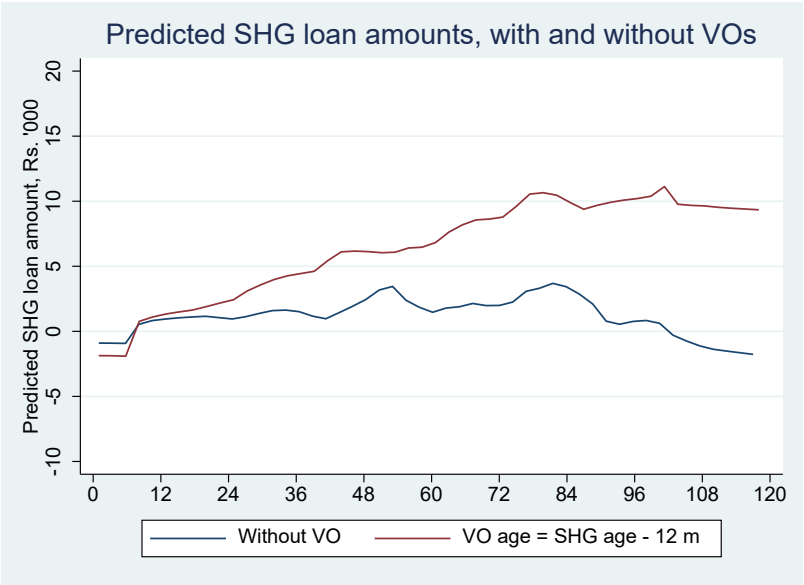
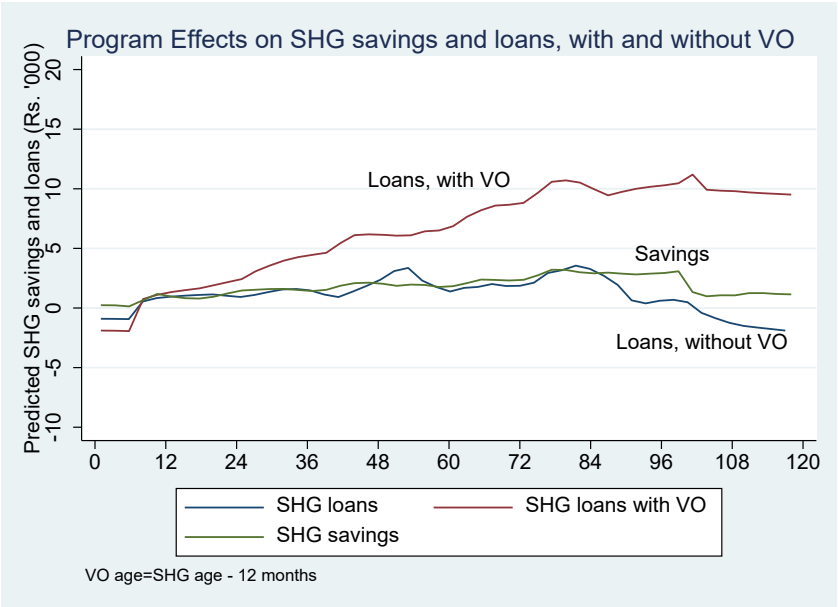


Figure 30 outlines the predicted effect of SHGs on household savings. This plot, which combines the programme effect on loans and savings from SHGs clearly reveals that households, through SHGs, are able to access more in loans than the compulsory savings that they are required to make; the net effect on household resources is large. As the figure demonstrates, this increase reflects the benefits of federation. Without VOs, the amounts borrowed from SHGs are similar in magnitude to the amounts that they save with VOs, yielding no overall impact on financial resources.

Figure 30: Predicted SHG savings, with and without VOs



Exposure to VOs additionally affects loans from other sources, a result that is also in contrast to the results from simple difference-in-difference regressions. The amount borrowed by male members of the household from informal sources increases with the duration of VO membership. Controlling for this effect, an increase in SHG age reduces informal loan amounts.

For many of these outcomes, including loans from the formal sector, the results support the simpler regression of outcomes on SHG and VO age, in that the coefficient on the square of SHG age is not statistically significant. Results from this simpler specification suggest that an increase in VO age also increases formal loan amounts. These 'indirect' effects of the programme on borrowings from the informal and formal sectors suggest an effect of the programme on credit markets, a point that we take up in the discussion of the results.

Consistent with these effects of VOs on loan amounts, regression results also reveal a strong positive effect of VOs on productive assets and their value. In contrast, the effect of SHG age on these assets is negative. These results can be compared to those reported in the descriptive analysis of chapter 6. That analysis noted that though there was a decline in the number of loans extended by SHGs to its members amongst older SHGs, average loan amounts increased, as did lending for productive purposes.

These same results were replicated in the comparison between SHGs that had been federated with VOs and CLFs, and those that had not; the strong correlation between SHG age and federation status implied an inability to identify whether the correlations presented reflect effects of the federation or increased years of membership in VOs. Our analysis of this section confirms that effects on loan amounts and lending for productive purposes are a consequence of federation with VOs, not that of a sustained period of membership in SHGs.

Our results reveal, however, that the effects of VOs on total income is minimal, reflecting our discussion in chapter 6 that documented little activity by CLFs in the area of livelihoods. The additional effect of VO age – after controlling for SHG age and SHG age squared – on wage income is insignificant, suggesting that the increment we found earlier is driven by SHG membership. VOs do have a positive effect on the number of income sources, reflecting a positive effect on the number of households that report engaging in agriculture and in livestock operations; however, this does not translate to higher incomes. This increase may explain the positive effect of VOs on productive assets.

Additional results of interest relate to the positive effect of VOs on educational expenditures and food diversity. Increased investment in schooling and in food diversity suggest welfare gains to the household and a positive effect of federation on household well-being.

A final set of results relate to the effects of VO federation with measures of women's empowerment. Supporting women to access their entitlements and improve their bargaining power through collective action is an important mission of the NRLP, one in which VOs and CLFs were intended to play major roles. Our results find that an increase in VO age improves empowerment as measured by the confidence index, while the

effect of SHG age, in regressions that also control for VO age, is negative. That is, it is federation that improves women's capacity to deal with 'outside' agents, or members of the local community.

In contrast, federation has no effect on decision-making, which more closely relates to a woman's bargaining power inside her home. The results suggest that an increased duration of membership in SHGs reduces women's decision-making ability, but that this effect is reduced over time.

These results contrast with the lack of any identified effect of the programme on women's decision-making ability in the simple difference-in-difference regressions; however, they are consistent with the regressions that examine heterogeneity in outcomes in women's education. These latter regressions suggest treatment effects on women's confidence among more educated women.

In our discussion of these results, we determined that they might be a consequence of the fact that opportunities for women to engage with community leaders and others typically arise at the VO and CLF levels. We also noted the finding of our descriptive analysis that leadership roles at these levels favoured more educated women. Our results from of this section confirm that the positive effects on women's empowerment reflect federation with VOs.

7.6 Discussion of results

The analysis of this chapter builds on our earlier descriptive analysis. Our first set of regressions on measures of SHG quality confirm some of the findings of chapter 5. Specifically, we find negative treatment effects on the indicators of SHG performance previously considered, such as adherence to *Panchsutras*, internal lending activities and the distributional benefits of loans. This evidence suggests that SHG performance declines over time. However, our results also indicate a positive role for levels of SHG capacity, as reflected in members' schooling levels. In most cases, high-capacity SHGs are able to overcome the negative effects of age on their quality.

Our analysis of the programme's causal effects on household outcomes reveals strong effects on SHG savings and on household income, driven primarily by improvements in wage income. We also show that federation with VOs enhances the returns to SHGs, particularly with respect to increased access to loans, but also the value of household assets. Finally, our analysis of heterogeneity in returns suggest that the programme has been successful in reducing caste-based inequalities. There is evidence, however, of an increase in inequalities based on schooling.

In this section, we turn to a discussion of one of the main findings of this chapter: the effect of the programme on wage income. This increase seems paradoxical, given that the programme's primary direct effect on households appears to have been through improved access to SHG loans. How have these loans resulted in increases in wage incomes? To address this issue, we explore the distribution of SHG loans across households, and then relate this to similar patterns in the distributive effects of the programme on wages.

If the effects on wage income are experienced by the same households that benefit most from SHG loans, then we would conclude that the effect on wages is a ‘direct’ effect of the programme through changes in the households’ financial situations. If the increases in wage income accrue to a different set of households, then ‘indirect’ programme effects on wage markets are a more likely explanation.

Our analysis of the determinants of SHG loans and heterogeneity regarding the effect of treatment reveal that a primary determinant of the loan amount is the schooling level of male household members. Accordingly, we regress the loan amount on male schooling, using the same variable used in our regression analysis (the highest level of schooling reported by an adult male member of the household). However, rather than use a continuous measure, we divide levels of schooling into eight groups and use indicator variables for each group.

Figure 31 plots how SHG loan amounts vary according to these levels of schooling attainment across treatment and control villages. In these groupings, five corresponds to eight years of schooling, with each consecutive level corresponding to one additional year of schooling. The highest code of eight corresponds to schooling levels beyond grade 10.

The graph clearly demonstrates the increased treatment effect on loan amounts for more educated households, with households with the highest level of education receiving the most loans. There are, however, also local ‘peaks’ at levels of three (primary schooling) and five (eight years of schooling).

Figure 31: Treatment effects on SHG loan amounts by male schooling levels

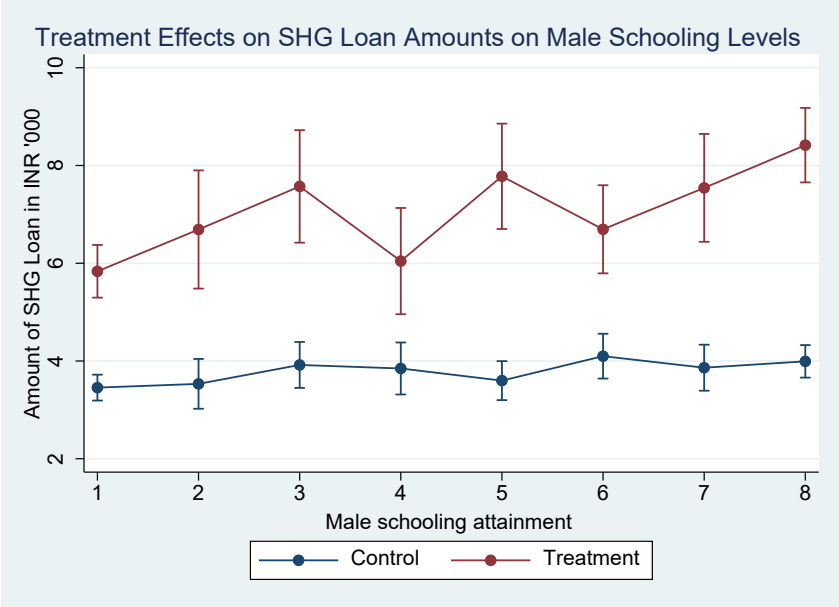
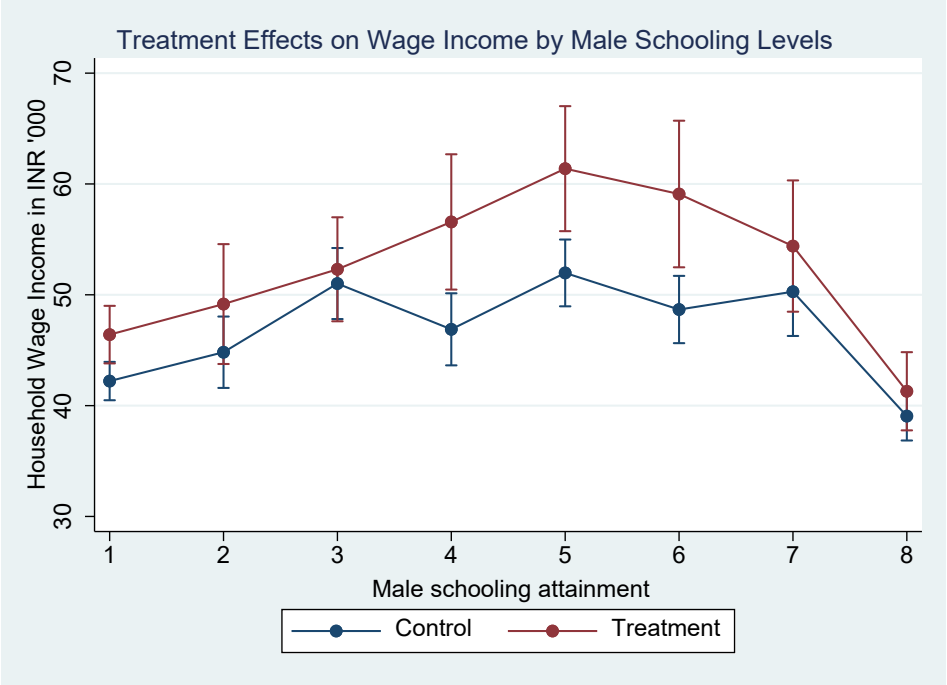


Figure 32 replicates this graph, but considers treatment effects on household wage income. The graph shows a clear peak at eight years of schooling, with a steady decline in wage incomes in households with higher levels of schooling. This is in sharp contrast to the previous graph, which found the largest loan amounts amongst the most educated households. Taken together, this evidence suggests that programme-induced effects on wage incomes represent an ‘indirect’ effect, in that the strengthening of financial markets may have indirectly strengthened labour markets as well.

Figure 32: Treatment effects on wage income by male schooling levels



This accords with a literature that finds large 'general equilibrium' effects of programmes that operate on scale on labour markets (Buera et al. 2017). Muralidharan and colleagues (2017) provide an example of improvements in the efficiency of credit markets impacting the operation of MNREGA due to improvements in the payment process. More work is required to fully understand this mechanism, though the findings of our descriptive analysis, and the regressions of this chapter revealing a positive effect of federation on productive assets, suggest a potential pathway. Increased investment in productive assets, even if undertaken by just a few SHG members, may increase the demand for labour from other households, creating larger spillover effects.

Alternatively, while evaluations typically focus on the impact of the programme on target beneficiaries such as SHG members, at-scale programmes such as the NRLP that create significant employment opportunities for community members may also have large direct impacts on local labour markets. The expansion of NRLP activities has gone hand in hand with increased employment for women, as well as men. Our data reveal that 17 per cent of community cadre positions in VOs and CLFs were filled by men; the hiring of men in other administrative positions may have been higher.

Even if all employment was restricted to women, the expansion of the market for educated women workers would have strong effects for males. It would raise wages and hence hours of work for all, even if the direct impact of the NRLP on the economic position of SHG members was negligible. The employment effects of community-driven programmes that create significant local job opportunities are typically ignored in evaluation studies.

Table 16: Difference-in-difference estimates for SHG quality

	EV	EB	EV × EB	Total members	VO quality	GP female lit rate	Observations
SHG *Panchsutra*	0.231***	-0.054	-0.164	0.032***	-0.075	0.746***	3,286
	(0.061)	(0.092)	(0.100)	(0.012)	(0.052)	(0.194)	
SHG loans (last year)	-0.153	-0.748	-4.610***	0.849***	0.134	6.228***	3,286
	(1.047)	(1.567)	(1.462)	(0.123)	(0.570)	(1.862)	
SHG loans inequality	2.752**	2.719	-5.682	0.086	-0.221	14.440***	2,936
	(1.222)	(3.401)	(4.743)	(0.191)	(1.038)	(5.588)	
SHG defunct	0.024*	-0.017	0.034	-0.005*		-0.046	3,548
	(0.013)	(0.019)	(0.022)	(0.003)		(0.041)	

Note: Lit = literacy. In addition to regressors above, all regressions include interactions of state dummy variables with scale variables: district, block and village population, and number of villages in the district, block and cluster. Robust standard errors are in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.

Table 17: Difference-in-difference estimates for SHG quality (additional estimates)

	EV	EB	EV × EB	Total members	VO quality	GP female lit rate	Bank dist	Market dist	Village pop. (HHs)	No. Hamlets
SHG *Panchsutra*	0.206***	-0.081	-0.154	0.032***	-0.079	0.655***	-0.007***	0.001	-0.002***	0.009
	(0.063)	(0.094)	(0.102)	(0.012)	(0.052)	(0.201)	(0.002)	(0.003)	(0.001)	(0.006)
SHG loans (last year)	-0.244	-0.646	-4.911***	0.850***	0.187	5.947***	-0.059**	0.059*	0.003	-0.062
	(1.081)	(1.626)	(1.506)	(0.126)	(0.584)	(1.953)	(0.027)	(0.032)	(0.006)	(0.082)
SHG loans inequality	2.504**	2.734	-5.860	0.021	0.055	14.597**	0.091*	-0.116**	0.007	-0.034
	(1.244)	(3.425)	(4.735)	(0.196)	(1.043)	(6.061)	(0.051)	(0.049)	(0.012)	(0.096)
SHG defunct	0.028**	-0.015	0.035	-0.005		-0.015	0.001	0.001	-0.000***	0.001
	(0.014)	(0.020)	(0.022)	(0.003)		(0.044)	(0.001)	(0.001)	(0.000)	(0.002)

Note: Lit = literacy; dist = distance; HH = household. In addition to regressors above, all regressions include interactions of state dummy variables with scale variables: district, block and village population, and number of villages in the district, block and cluster. Robust standard errors are in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.

Table 18: Estimation results from difference-in-difference (seven states)

Variable	(1) EV × EB	(2) EB	(3) EV	(4) Predicted mean (EV × EB = 1)	(5) Percentage change (beta/abs(predicted mean)
Savings (in '000s)					
Total savings of HH	16.924***	-4.804	-4.576	-60.81	27.824
	(4.584)	(4.376)	(2.884)		
Bank savings	-0.073	-2.182***	0.038	5.708	-1.286
	(0.477)	(0.443)	(0.310)		
Bank savings – male	0.057	-1.591***	-0.194	3.133	1.835
	(0.341)	(0.320)	(0.218)		
Bank savings – female	0.062	-0.604***	-0.053	1.740	3.569
	(0.175)	(0.166)	(0.110)		
SHG savings – female	0.522***	0.385***	0.256***	2.032	25.689
	(0.091)	(0.078)	(0.050)		
HH loan amounts, current outstanding loans (in '000s)					
Total HH loan amount	-0.764	-4.095**	4.657***	28.41	-2.689
	(2.077)	(1.927)	(1.373)		
Bank/formal HH loan amount	-1.064	-1.546	1.118	7.288	-14.599
	(1.052)	(0.979)	(0.726)		
Informal HH loan amount	-0.273	-0.020	0.441	3.803	-7.179
	(0.615)	(0.571)	(0.428)		
Relatives/friends HH loan amount	-0.402	-1.119	0.847*	5.986	-6.716
	(0.775)	(0.726)	(0.498)		
SHG HH loan amount	0.410	1.444***	0.858***	6.367	6.439
	(0.366)	(0.314)	(0.181)		
HH loan amount (by gender, in '000s)					
Total male loan amount	-1.513	-3.133*	2.785**	17.60	-8.597
	(1.925)	(1.809)	(1.307)		
Total female loan amount	0.778	-0.886	1.906***	10.81	7.197

Variable	(1) EV × EB	(2) EB	(3) EV	(4) Predicted mean (EV × EB = 1)	(5) Percentage change (beta/abs(predicted mean)
	(0.774)	(0.677)	(0.442)		
Total female SHG loan amount	0.398	1.505***	0.829***	6.356	6.262
	(0.366)	(0.315)	(0.179)		
Total male bank loan amount	-1.246	-0.214	1.124	5.806	-21.461
	(0.984)	(0.918)	(0.693)		
Total female bank loan amount	0.125	-1.296***	0.128	1.531	8.165
	(0.353)	(0.323)	(0.235)		
Total male informal loan amount	-0.161	0.101	0.366	3.408	-4.724
	(0.602)	(0.554)	(0.422)		
Total female informal loan amount	-0.131	-0.072	0.102	0.458	-28.603
	(0.121)	(0.128)	(0.064)		
Total male relative loan amount	-0.704	-0.520	0.720	5.307	-13.265
	(0.750)	(0.706)	(0.477)		
Total female relative loan amount	0.132	-0.509**	0.086	0.820	16.098
	(0.228)	(0.199)	(0.137)		
Informal loans and high-cost debt					
Share of informal loans to all loans in last 5 years	-0.023**	0.014	0.022***	0.115	-19.826
	(0.011)	(0.010)	(0.007)		
Share of informal loans to all loans in last 2 years	-0.022**	0.021**	0.023***	0.107	-20.374
	(0.010)	(0.009)	(0.007)		
Amount of high-cost loan (calculated for informal loans)	-97.795	-1,264.576**	386.420	909.6	-10.752
	(553.553)	(641.775)	(273.783)		
Indicator for high-cost loan (calculated for informal loans)	-0.020*	-0.014	0.009	0.0613	-32.463
	(0.011)	(0.011)	(0.007)		
Interest rate on informal loans	-5.325	2.199	0.974	35.21	-15.124
	(4.106)	(4.281)	(1.900)		

Variable	(1) EV × EB	(2) EB	(3) EV	(4) Predicted mean (EV × EB = 1)	(5) Percentage change (beta/abs(predicted mean)
Labour force participation					
Labour force participation rate (female)	0.016	0.045***	-0.006	0.795	2.025
	(0.015)	(0.014)	(0.010)		
Labour force participation rate (male)	0.007	0.006	0.000	0.949	0.779
	(0.008)	(0.007)	(0.005)		
Labour force participation rate (female, primary status)	-0.006	0.021	0.007	0.335	-1.893
	(0.018)	(0.017)	(0.011)		
Labour force participation rate (female, secondary status)	0.037*	0.016	-0.012	0.588	6.293
	(0.020)	(0.019)	(0.012)		
Labour force participation rate (male, primary status)	-0.007	0.016*	0.007	0.939	-0.696
	(0.010)	(0.009)	(0.006)		
Labour force participation rate (male, secondary status)	-0.005	0.109***	-0.026**	0.650	-0.697
	(0.020)	(0.019)	(0.013)		
Average hours in productive work (females, primary status)	-3.520	9.680	2.977	154.7	-2.275
	(5.747)	(5.889)	(3.517)		
Average hours in productive work (females, secondary status)	5.134	0.170	0.812	90.06	5.701
	(3.433)	(2.968)	(1.948)		
Average hours in productive work (males, primary status)	9.742**	-8.558**	1.444	161.8	6.021
	(4.028)	(3.814)	(2.390)		
Average hours in productive work (males, secondary status)	9.969**	2.227	1.835	97.65	10.209
	(4.361)	(4.036)	(2.571)		
Income and livelihoods (incomes in '000s)					
Total income	11.035***	-15.396***	1.067	57.42	19.227
	(3.234)	(2.917)	(2.095)		

	(1)	(2)	(3)	(4)	(5)
Variable	**EV × EB**	**EB**	**EV**	**Predicted mean (EV × EB = 1)**	**Percentage change (beta/abs(predicted mean)**
Agricultural income	0.701	1.282	-0.185	-11.55	6.069
	(1.048)	(0.910)	(0.737)		
Livestock income	0.335	-1.719**	-0.757	1.276	26.254
	(0.856)	(0.745)	(0.610)		
MNREGA earnings	0.496***	0.056	-0.212***	0.515	96.311
	(0.141)	(0.129)	(0.080)		
Wage income, casual labour market	8.087***	-7.406***	-0.743	34.94	23.145
	(2.078)	(1.891)	(1.332)		
Total wage income	9.623***	-13.316***	0.959	51.08	18.839
	(3.036)	(2.758)	(1.895)		
Enterprise income	1.075	-6.524	-0.495	10.61	10.132
	(4.511)	(4.770)	(2.821)		
Number of female-owned enterprises	-0.070***	0.062***	0.011**	0.107	-65.234
	(0.013)	(0.012)	(0.005)		
Number of sources of income	0.215***	0.008	-0.005	2.355	9.130
	(0.059)	(0.056)	(0.033)		
HH involved in cultivation	0.007	0.069***	-0.012	0.688	1.054
	(0.020)	(0.018)	(0.013)		
HH involved in livestock occupation	0.003	0.016	-0.017	0.612	0.435
	(0.021)	(0.019)	(0.013)		
HH involved in enterprises	-0.050***	0.037**	0.017*	0.206	-24.126
	(0.016)	(0.014)	(0.009)		
HH involved in MNREGA	0.020	0.081***	-0.011	0.142	13.944
	(0.015)	(0.015)	(0.008)		
HH involved in occupation involving wages and salaries (male and female)	0.035**	0.002	0.005	0.840	4.202

Variable	(1) EV × EB	(2) EB	(3) EV	(4) Predicted mean (EV × EB = 1)	(5) Percentage change (beta/abs(predicted mean)
	(0.016)	(0.015)	(0.010)		
HH has transfer income	0.057***	-0.068***	0.011	0.198	28.737
	(0.019)	(0.018)	(0.012)		
HH has other income	0.003	-0.002	0.001	0.00967	32.678
	(0.005)	(0.005)	(0.002)		
Earned income from agriculture	0.063***	0.015	-0.021	0.538	11.803
	(0.022)	(0.021)	(0.014)		
Earned income from livestock	0.028	-0.036*	0.008	0.412	6.845
	(0.023)	(0.021)	(0.013)		
Earned income from enterprises	-0.041***	0.034**	0.011	0.183	-22.514
	(0.015)	(0.014)	(0.009)		
Earned income from MNREGA	0.021	0.077***	-0.013	0.130	16.154
	(0.015)	(0.015)	(0.008)		
Earned income from wages and salaries (male and female)	0.054***	-0.012	-0.009	0.757	7.133
	(0.018)	(0.018)	(0.011)		
Earned income from transfers	0.057***	-0.068***	0.011	0.198	28.737
	(0.019)	(0.018)	(0.012)		
Number of HH members who migrated	-0.028	0.047	0.065***	0.350	-7.886
	(0.032)	(0.031)	(0.018)		
Expenditure					
HH expenditure (including expenditure on durables and education) (in ’000s)	-6.244	-11.554***	5.701**	119.7	-5.216
	(4.042)	(3.979)	(2.399)		
Food share of HH expenditure	0.027***	-0.009	-0.016***	0.384	7.031
	(0.007)	(0.007)	(0.004)		

Variable	(1) EV × EB	(2) EB	(3) EV	(4) Predicted mean (EV × EB = 1)	(5) Percentage change (beta/abs(predicted mean)
Went hungry	-0.023*	-0.005	0.026***	0.110	-20.455
	(0.013)	(0.012)	(0.008)		
HH education expenditure (in '000s)	-1.659***	-0.256	0.253	7.228	-22.952
	(0.491)	(0.466)	(0.306)		
Food diversity index	0.030*	-0.055***	-0.009	0.128	23.281
	(0.016)	(0.015)	(0.010)		
Expenditure on all food items	103.485	-452.267**	-134.469	3520	2.940
	(206.854)	(213.492)	(121.446)		
Expenditure on non-food items (monthly)	-28.290	-369.683***	-7.537	2307	-1.226
	(91.641)	(82.770)	(60.909)		
Expenditure on non-food items (annually)	-12,016.863***	-666.782	8,475.412***	49023	-24.513
	(3,345.802)	(3,144.726)	(2,047.457)		
Any expenditure on agricultural land improvement	0.015	-0.009	-0.002	0.0701	20.827
	(0.012)	(0.011)	(0.007)		
Any expenditure on improvement of buildings	0.004	0.003	0.013***	0.0315	12.381
	(0.007)	(0.006)	(0.004)		
Expenditure on durables	-2,518.017	265.072	1,093.645	6798	-37.040
	(1,575.997)	(1,439.248)	(874.849)		
Expenditure on cereals – PDS (rice and wheat)	0.787	2.453***	-0.848	39.69	1.983
	(0.908)	(0.867)	(0.599)		
Expenditure on cereals – home produce (rice, wheat, pulses and other cereals)	215.467***	-125.229***	-13.105	304.3	70.818
	(46.996)	(37.725)	(19.613)		
Expenditure on cereals – market value (rice, wheat, pulses and other cereals)	-118.531	-31.909	-27.108	942.5	-12.573
	(108.878)	(126.317)	(57.393)		

Variable	(1) EV × EB	(2) EB	(3) EV	(4) Predicted mean (EV × EB = 1)	(5) Percentage change (beta/abs(predicted mean)
Expenditure on other food – market value (milk, oil, sugar, vegetables and fruits)	-4.325	-149.436	-84.181	1530	-0.283
	(137.562)	(137.491)	(90.197)		
Expenditure on other food – home produce (milk, oil, sugar, vegetables and fruits)	-31.780	-103.208***	-16.593	351.1	-9.052
	(35.148)	(33.163)	(22.541)		
Expenditure on eggs, meat and fish – home produce	-7.819	16.939*	0.108	41.20	-18.978
	(9.228)	(9.552)	(4.802)		
Expenditure on non-food items (fuel, mobile phone, rent, transport, etc.)	10.156	-217.911***	27.757	1411	0.720
	(67.054)	(58.950)	(42.456)		
Assets					
Value of productive assets (in '000s) (including livestock and agricultural land)	-80.565*	-40.567	69.669***	570.1	-14.133
	(42.494)	(39.932)	(26.597)		
Value of consumer assets (in '000s)	-11.761	-29.611***	4.865	115	-10.226
	(8.123)	(7.264)	(5.074)		
Indicator for HH owning any productive assets (including livestock and agricultural land)	0.015	0.019	-0.020*	0.804	1.816
	(0.017)	(0.016)	(0.011)		
Value of agricultural land	-76,773.227*	-25,879.150	66,413.008***	510302	-15.045
	(40,667.086)	(38,397.586)	(25,542.516)		
Whether HH owns agricultural land	-0.066	-0.154	-0.075	1.721	-3.823
	(0.264)	(0.287)	(0.084)		
Index for housing quality (higher score indicates lower quality)	0.198***	0.137***	-0.016	0.988	20.040
	(0.042)	(0.040)	(0.024)		

Variable	(1) EV × EB	(2) EB	(3) EV	(4) Predicted mean (EV × EB = 1)	(5) Percentage change (beta/abs(predicted mean)
Empowerment					
Decision-making index – standardised	-0.034	0.000	0.087***	0.128	-26.797
	(0.046)	(0.042)	(0.028)		
Confidence index	-2.404	-0.358	1.688	56.14	-4.282
	(1.749)	(1.645)	(1.071)		
Number of social security schemes availed	0.183**	0.131*	-0.110**	2.815	6.501
	(0.084)	(0.078)	(0.050)		
Food shares					
Share of grains in total expenditure	0.022***	-0.004	-0.008***	0.111	19.550
	(0.004)	(0.004)	(0.002)		
Share of pulses in total expenditure	0.005**	-0.003	-0.001	0.0365	14.849
	(0.003)	(0.003)	(0.001)		
Share of fruits and vegetables in total expenditure	0.002	-0.003	0.000	0.0805	2.820
	(0.002)	(0.002)	(0.001)		
Share of dairy in total expenditure	0.000	-0.008***	-0.001	0.0453	0.340
	(0.003)	(0.003)	(0.002)		
Share of eggs, meat and fish in total expenditure	0.000	0.009***	-0.001	0.0425	0.341
	(0.002)	(0.002)	(0.001)		
Share of other food in total expenditure	-0.001	-0.000	-0.005**	0.0728	-1.937
	(0.004)	(0.004)	(0.002)		

Note: HH = household; PDS = public distribution system. In addition to regressors above, all regressions include interactions of state dummy variables with scale variables: district, block and village population, and number of villages in the district, block and cluster. Robust standard errors are in parentheses.
*** p < 0.01, ** p < 0.05, * p < 0.1.

Table 19: Heterogeneity results (by caste)

Savings	EV	EB	SC	ST	EV * EB	EV × EB × SC	EV × EB × ST
Total savings of household	-12.124***	-13.611**	17.644***	13.584***	24.165***	-10.659	-9.240
	(4.548)	(5.543)	(4.989)	(4.288)	(6.765)	(9.710)	(8.154)
SHG savings – female	0.317***	0.413***	0.119	0.077	0.401***	0.019	0.318**
	(0.077)	(0.097)	(0.079)	(0.075)	(0.126)	(0.188)	(0.155)
Loans							
Total household loan amount	2.654	2.942	-6.773***	-15.378***	-3.308	6.078	3.752
	(2.326)	(2.923)	(2.575)	(2.181)	(3.411)	(5.030)	(3.921)
Bank/formal household loan amount	-1.533	-0.441	-3.892***	-7.430***	-0.243	-0.888	-0.733
	(1.310)	(1.535)	(1.413)	(1.270)	(1.787)	(2.605)	(2.017)
Total female SHG loan amount	1.618***	2.685***	0.564**	1.346***	-0.625	1.366*	1.707***
	(0.275)	(0.395)	(0.244)	(0.249)	(0.535)	(0.734)	(0.633)
Share of informal loans to all loans in last 2 years	0.034***	0.039***	0.014	0.017**	-0.040***	-0.026	0.046**
	(0.010)	(0.013)	(0.012)	(0.009)	(0.015)	(0.024)	(0.018)
Income							
Total income	1.958	-14.670***	14.876***	-3.319	11.951**	8.487	-1.732
	(3.518)	(4.103)	(3.975)	(3.120)	(5.139)	(7.485)	(5.995)
Agricultural income	-0.558	-2.110	6.758***	7.472***	3.184*	-3.601	-3.351
	(1.335)	(1.477)	(1.323)	(1.178)	(1.861)	(2.309)	(2.087)
Livestock income	-2.542**	-3.354***	-5.150***	-4.438***	2.075	-2.414	-2.185
	(1.144)	(1.206)	(1.331)	(1.039)	(1.434)	(2.125)	(1.789)
Total wage income	0.949	-9.355**	16.090***	1.126	7.053	9.289	4.043
	(3.191)	(3.978)	(3.613)	(2.965)	(4.647)	(7.017)	(5.517)
Number of sources of income	-0.067	-0.013	-0.225***	-0.051	0.101	0.108	0.241**
	(0.049)	(0.069)	(0.059)	(0.051)	(0.079)	(0.113)	(0.096)
Earned income from agriculture	-0.049**	-0.007	-0.222***	-0.033	0.001	0.037	0.115***
	(0.021)	(0.026)	(0.024)	(0.020)	(0.031)	(0.046)	(0.037)
Earned income from livestock	-0.022	-0.046*	-0.119***	-0.053***	-0.021	0.069	0.091**
	(0.020)	(0.027)	(0.024)	(0.021)	(0.031)	(0.046)	(0.038)
Earned income from enterprises	0.011	0.061***	-0.009	-0.067***	-0.032	0.021	-0.022

Savings	EV	EB	SC	ST	EV * EB	EV × EB × SC	EV × EB × ST
	(0.015)	(0.019)	(0.017)	(0.012)	(0.023)	(0.033)	(0.026)
Earned income from wages (male)	-0.006	-0.024	0.132***	0.142***	0.048	-0.002	0.041
	(0.021)	(0.027)	(0.024)	(0.020)	(0.031)	(0.045)	(0.038)
Earned income from wages (female)	-0.008	-0.013	0.084***	0.109***	0.020	-0.061	0.040
	(0.019)	(0.024)	(0.022)	(0.019)	(0.028)	(0.041)	(0.034)
Earned income from MNREGA	0.005	0.070***	0.032**	0.034**	0.008	0.002	0.034
	(0.012)	(0.018)	(0.014)	(0.014)	(0.019)	(0.026)	(0.025)
Earned income from salaries (male)	-0.013	-0.050***	-0.032*	-0.058***	0.006	0.060*	0.015
	(0.016)	(0.019)	(0.018)	(0.014)	(0.023)	(0.035)	(0.027)
Earned income from transfers	-0.018	-0.069***	-0.036*	-0.021	0.065**	-0.063	0.009
	(0.018)	(0.023)	(0.021)	(0.018)	(0.027)	(0.040)	(0.033)
Expenditure							
Household expenditure (including expenditure on durables and education) (in '000s)	14.111***	-1.338	-3.060	-17.354***	-13.383**	19.471**	9.400
	(3.750)	(4.810)	(4.080)	(3.413)	(5.713)	(8.117)	(6.868)
Food share of household expenditure	-0.024***	-0.028***	-0.009	0.011	0.035***	-0.014	-0.016
	(0.007)	(0.009)	(0.007)	(0.007)	(0.010)	(0.015)	(0.012)
Labour force participation rate (female)	-0.021	0.021	-0.030	0.061***	0.019	-0.026	0.004
	(0.016)	(0.019)	(0.018)	(0.013)	(0.023)	(0.035)	(0.025)
Labour force participation rate (male)	0.001	-0.004	-0.002	0.006	0.014	-0.027	-0.006
	(0.007)	(0.010)	(0.009)	(0.007)	(0.011)	(0.017)	(0.013)
Food diversity index	-0.010	-0.049**	-0.034*	-0.061***	0.046*	0.001	-0.029
	(0.016)	(0.020)	(0.018)	(0.016)	(0.024)	(0.034)	(0.028)
Assets							
Value of productive assets (in '000s) (including livestock and agricultural land)	-17.754	-29.447	-268.667***	-340.293***	-158.748**	264.864***	41.468
	(47.166)	(58.555)	(46.252)	(46.231)	(67.954)	(87.575)	(81.686)
Value of productive assets (in '000s) (excluding livestock and agricultural land)	-9.473***	-2.955	-14.788***	-15.343***	0.732	3.574	-4.786
	(3.469)	(4.273)	(3.826)	(3.638)	(4.778)	(6.720)	(5.900)
Empowerment							

Savings	**EV**	**EB**	**SC**	**ST**	**EV * EB**	**EV × EB × SC**	**EV × EB × ST**
Decision-making index (using percentage) – standardised	0.124***	0.062	0.002	0.019	-0.061	0.128	-0.007
	(0.044)	(0.054)	(0.049)	(0.042)	(0.067)	(0.098)	(0.082)
Confidence index (using percentage)	1.740	2.020	1.679	-2.721	-4.251*	1.309	4.607
	(1.641)	(2.090)	(1.934)	(1.656)	(2.440)	(3.625)	(3.009)
Number of social security schemes availed	-0.128*	0.084	0.225**	0.458***	0.085	0.106	0.175
	(0.074)	(0.101)	(0.092)	(0.077)	(0.116)	(0.171)	(0.144)

Note: EV = early village; EB = early block. In addition to regressors above, all regressions include interactions of state dummy variables with scale variables: district, block and village population, and number of villages in the district, block and cluster. Robust standard errors in parentheses.

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

Table 20: Heterogeneity results (by schooling)

Savings	EV	EB	EV × EB	Education (male)	Education (female)	EV × EB × educ (male)	EV × EB × educ (female)
Total savings of household	-5.967	-4.759	20.764***	-0.933*	-0.948**	-0.187	-0.394
	(4.691)	(5.502)	(6.588)	(0.477)	(0.467)	(0.874)	(0.879)
SHG savings – female	0.229***	0.385***	0.601***	0.018**	0.008	-0.006	-0.004
	(0.083)	(0.097)	(0.138)	(0.007)	(0.008)	(0.016)	(0.016)
Loans							
Total household loan amount	3.476	-7.492***	2.394	0.706***	0.364*	-0.277	-0.164
	(2.213)	(2.543)	(3.076)	(0.230)	(0.217)	(0.419)	(0.406)
Bank/formal household loan amount	2.180*	-0.709	-1.931	0.450***	0.229**	0.148	-0.021
	(1.152)	(1.354)	(1.571)	(0.126)	(0.115)	(0.217)	(0.212)
Total female SHG loan amount	0.894***	1.166***	0.058	0.049**	0.043*	0.157**	-0.122*
	(0.294)	(0.384)	(0.517)	(0.025)	(0.024)	(0.065)	(0.065)
Share of informal loans to all loans in last 2 years	0.032***	0.015	-0.011	0.000	-0.001	-0.001	-0.000
	(0.011)	(0.013)	(0.017)	(0.001)	(0.001)	(0.002)	(0.002)
Income							
Total income	-4.209	-18.487***	15.558***	1.572***	1.117***	-0.445	0.023
	(3.218)	(3.758)	(4.628)	(0.336)	(0.360)	(0.633)	(0.647)
Agricultural income	-1.889*	0.486	0.989	-0.517***	-0.540***	0.163	-0.307
	(1.052)	(1.294)	(1.530)	(0.113)	(0.121)	(0.216)	(0.204)
Livestock income	-2.120**	-1.381	0.963	0.137	0.103	-0.079	0.005
	(0.987)	(1.124)	(1.273)	(0.110)	(0.102)	(0.176)	(0.174)
Total wage income	0.493	-17.960***	16.434***	2.045***	0.734**	0.143	-1.259**
	(2.942)	(3.443)	(4.175)	(0.333)	(0.355)	(0.600)	(0.625)
Number of sources of income	0.058	0.010	0.151*	0.034***	0.012**	0.002	0.018*
	(0.056)	(0.071)	(0.085)	(0.005)	(0.005)	(0.010)	(0.010)
Earned income from agriculture	0.007	0.027	0.074**	0.009***	0.003	-0.001	0.001
	(0.024)	(0.028)	(0.035)	(0.002)	(0.002)	(0.004)	(0.004)
Earned income from livestock	0.039*	0.014	0.005	0.007***	0.004*	0.002	0.003
	(0.023)	(0.029)	(0.035)	(0.002)	(0.002)	(0.004)	(0.004)

Savings	EV	EB	EV × EB	Education (male)	Education (female)	EV × EB × educ (male)	EV × EB × educ (female)
Earned income from enterprises	0.006	0.016	-0.043**	0.005***	0.005***	-0.000	0.003
	(0.014)	(0.017)	(0.021)	(0.001)	(0.001)	(0.003)	(0.003)
Earned income from wages (male)	0.005	0.006	0.045	-0.009***	-0.006***	-0.001	0.003
	(0.022)	(0.027)	(0.033)	(0.002)	(0.002)	(0.004)	(0.004)
Earned income from wages (female)	-0.011	-0.033	0.046	-0.011***	-0.005***	-0.008**	0.004
	(0.021)	(0.026)	(0.032)	(0.002)	(0.002)	(0.004)	(0.003)
Earned income from MNREGA	-0.012	0.041**	0.007	-0.001	-0.002	0.004	-0.003
	(0.014)	(0.020)	(0.022)	(0.001)	(0.001)	(0.003)	(0.003)
Earned income from salaries (male)	-0.001	-0.080***	0.047**	0.014***	0.002	-0.001	-0.002
	(0.014)	(0.016)	(0.020)	(0.001)	(0.002)	(0.003)	(0.003)
Earned income from transfers	-0.015	-0.042*	0.031	0.003*	0.001	0.002	0.005
	(0.019)	(0.024)	(0.029)	(0.002)	(0.002)	(0.003)	(0.003)
Expenditure							
Household expenditure (including expenditure on durables and education) (in '000s)	0.839	-15.508***	-3.481	2.568***	2.070***	-0.438	0.298
	(3.719)	(4.572)	(5.348)	(0.367)	(0.364)	(0.698)	(0.716)
Food share of household expenditure	-0.006	0.001	0.014	-0.004***	-0.001	-0.000	0.003**
	(0.008)	(0.009)	(0.011)	(0.001)	(0.001)	(0.001)	(0.001)
Food diversity index	-0.020	-0.059***	0.007	0.001	0.003**	0.003	0.001
	(0.017)	(0.020)	(0.024)	(0.002)	(0.002)	(0.003)	(0.003)
Labour force participation							
Labour force participation rate (female)	0.006	0.039**	0.016	-0.003*	-0.009***	-0.003	0.003
	(0.016)	(0.019)	(0.023)	(0.001)	(0.001)	(0.003)	(0.003)
Labour force participation rate (male)	0.008	0.004	0.006	-0.006***	0.001	-0.000	0.000
	(0.007)	(0.009)	(0.011)	(0.001)	(0.001)	(0.002)	(0.001)
Assets							
Value of productive assets (in '000s) (including livestock and agricultural land)	145.875***	25.357	-118.508*	27.106***	19.550***	4.852	3.637
	(43.545)	(52.087)	(61.461)	(4.235)	(4.007)	(8.281)	(7.953)
Value of productive assets (in '000s) (excluding	6.108*	-4.195	-4.751	1.344***	0.568*	0.730	-0.158

Savings	EV	EB	EV × EB	Education (male)	Education (female)	EV × EB × educ (male)	EV × EB × educ (female)
livestock and ag land)							
	(3.629)	(3.781)	(4.556)	(0.363)	(0.336)	(0.616)	(0.587)
Empowerment							
Decision-making index (using percentage) – standardised	0.004	-0.021	-0.042	-0.002	-0.009**	-0.008	0.011
	(0.042)	(0.049)	(0.063)	(0.004)	(0.004)	(0.008)	(0.007)
Confidence index (using percentage)	2.884	-1.010	-4.055	0.176	1.012***	-0.282	0.768**
	(1.821)	(2.199)	(2.688)	(0.168)	(0.166)	(0.316)	(0.303)
Number of social security schemes availed	-0.032	0.036	0.170	0.000	0.008	-0.003	0.013
	(0.085)	(0.105)	(0.128)	(0.008)	(0.008)	(0.015)	(0.015)

Note: Educ = education. In addition to regressors above, all regressions include interactions of state dummy variables with scale variables: district, block and village population, and number of villages in the district, block and cluster. Robust standard errors are in parentheses.
*** p < 0.01, ** p < 0.05, * p < 0.1.

Table 21: Heterogeneity by village remoteness

Savings	EV	EB	Market distance	Bank distance	EV × EB	EV × EB × market dist	EV × EB × bank dist
Total savings of household	-12.768***	-16.194***	-1.071***	-0.503**	21.954***	0.087	0.130
	(4.551)	(5.597)	(0.328)	(0.248)	(6.339)	(0.638)	(0.468)
SHG savings – female	0.253***	0.367***	0.001	-0.007**	0.695***	0.047***	-0.069***
	(0.083)	(0.101)	(0.005)	(0.003)	(0.124)	(0.011)	(0.009)
Loans							
Total household loan amount	13.654***	-0.785	0.494***	-0.138	-3.148	-0.090	0.137
	(2.194)	(2.580)	(0.173)	(0.095)	(3.023)	(0.307)	(0.224)
Bank/formal household loan amount	2.964**	-1.612	0.070	-0.024	-0.653	-0.164	0.051
	(1.212)	(1.328)	(0.092)	(0.048)	(1.511)	(0.141)	(0.100)
Total female SHG loan amount	0.521*	1.623***	-0.041*	0.008	1.059**	0.091*	-0.189***
	(0.294)	(0.396)	(0.022)	(0.022)	(0.500)	(0.048)	(0.040)
Share of informal loans to all loans in last	0.040***	0.018	0.001	0.001	-0.052***	0.001	0.004***

Savings	EV	EB	Market distance	Bank distance	EV × EB	EV × EB × market dist	EV × EB × bank dist
two years							
	(0.010)	(0.013)	(0.001)	(0.001)	(0.015)	(0.002)	(0.001)
Income							
Total income	-0.979	-19.359***	-0.786***	-0.558**	15.351***	-0.174	-0.168
	(3.494)	(4.155)	(0.232)	(0.221)	(4.862)	(0.438)	(0.363)
Agricultural income	-2.399**	-0.593	-0.052	-0.187***	0.048	0.510***	-0.111
	(1.086)	(1.329)	(0.071)	(0.054)	(1.566)	(0.151)	(0.114)
Livestock income	-0.360	-2.327**	-0.138**	0.052	0.718	-0.072	0.024
	(1.061)	(1.170)	(0.062)	(0.046)	(1.443)	(0.113)	(0.092)
Total wage income	0.005	-13.749***	-0.571***	-0.305	11.366**	-0.048	-0.295
	(3.347)	(3.933)	(0.220)	(0.207)	(4.605)	(0.411)	(0.335)
Number of sources of income	0.038	0.115	0.012***	-0.005**	0.110	0.001	0.008
	(0.053)	(0.071)	(0.004)	(0.002)	(0.080)	(0.008)	(0.006)
Earned income from agriculture	0.010	0.065**	0.003*	0.004***	-0.016	0.002	0.005**
	(0.022)	(0.027)	(0.002)	(0.001)	(0.031)	(0.003)	(0.002)
Earned income from livestock	-0.003	-0.069**	0.001	-0.003***	0.035	-0.002	0.001
	(0.022)	(0.028)	(0.002)	(0.001)	(0.032)	(0.003)	(0.002)
Earned income from enterprises	0.016	0.050***	0.000	-0.001	-0.047**	0.000	0.000
	(0.015)	(0.019)	(0.001)	(0.001)	(0.022)	(0.002)	(0.002)
Earned income from wages (male)	-0.069***	-0.027	-0.001	-0.003**	0.108***	-0.003	-0.002
	(0.022)	(0.027)	(0.002)	(0.001)	(0.031)	(0.003)	(0.002)
Earned income from wages (female)	-0.022	0.037	0.000	-0.001	-0.001	0.006**	-0.004*
	(0.020)	(0.025)	(0.001)	(0.001)	(0.028)	(0.003)	(0.002)
Earned income from MNREGA	0.022*	0.139***	0.005***	0.001	-0.004	-0.001	0.002
	(0.013)	(0.018)	(0.001)	(0.001)	(0.020)	(0.002)	(0.002)
Earned income from salaries (male)	0.013	-0.037*	0.002	-0.001	0.018	-0.002	0.000
	(0.016)	(0.019)	(0.001)	(0.001)	(0.022)	(0.002)	(0.002)
Earned income from transfers	0.058***	-0.051**	0.002	0.000	-0.000	0.004	0.004**
	(0.019)	(0.024)	(0.001)	(0.001)	(0.027)	(0.003)	(0.002)
Expenditure							

Savings	EV	EB	Market distance	Bank distance	EV × EB	EV × EB × market dist	EV × EB × bank dist
Household expenditure (in '000s) (including expenditure on durables and education)	11.113***	-4.997	0.188	-0.050	-5.810	-0.364	-0.333
	(3.725)	(4.836)	(0.271)	(0.156)	(5.397)	(0.532)	(0.370)
Food share of household expenditure	-0.019***	-0.037***	-0.000	0.001***	0.040***	-0.000	0.001
	(0.007)	(0.009)	(0.001)	(0.000)	(0.010)	(0.001)	(0.001)
Food diversity index	0.052***	-0.040*	0.000	0.002**	0.001	0.005**	-0.000
	(0.016)	(0.021)	(0.001)	(0.001)	(0.023)	(0.002)	(0.002)
Labour force participation							
Labour force participation rate (female)	0.018	0.065***	0.003***	0.002**	-0.015	0.004**	0.000
	(0.016)	(0.019)	(0.001)	(0.001)	(0.022)	(0.002)	(0.001)
Labour force participation rate (male)	-0.003	-0.001	0.000	-0.000	0.003	0.001	0.000
	(0.008)	(0.009)	(0.001)	(0.000)	(0.011)	(0.001)	(0.001)
Assets							
Value of productive assets (in '000s) (including livestock & agricultural land)	164.606***	-73.286	-0.166	3.809	-61.364	-4.719	1.239
	(44.530)	(53.496)	(2.774)	(2.542)	(61.554)	(5.805)	(5.093)
Value of productive assets (in '000s) (excluding livestock & agricultural land)	2.770	2.289	0.584**	0.308	2.910	-0.189	-0.817**
	(3.243)	(3.902)	(0.272)	(0.192)	(4.406)	(0.490)	(0.373)
Empowerment							
Decision-making index (using percentage) – standardised	0.123***	-0.013	-0.007**	-0.001	-0.004	-0.010	0.004
	(0.047)	(0.055)	(0.003)	(0.003)	(0.065)	(0.006)	(0.005)
Confidence index (using percentage)	0.602	0.317	-0.165	-0.211**	-5.806**	0.065	0.363*
	(1.725)	(2.138)	(0.133)	(0.099)	(2.418)	(0.244)	(0.185)
Number of social security schemes availed	-0.012	0.321***	0.001	0.005	0.022	0.024**	0.000
	(0.080)	(0.105)	(0.006)	(0.004)	(0.118)	(0.012)	(0.009)

Note: Dist = distance. In addition to regressors above, all regressions include interactions of state dummy variables with scale variables: district, block and village population, and number of villages in the district, block and cluster. Robust standard errors are in parentheses.
*** p < 0.01, ** p < 0.05, * p < 0.1.

8. The evaluation of JEEViKA, Bihar

Our analysis of Bihar's livelihoods programme, JEEViKA, builds on an earlier evaluation (henceforth referred to as the original study) based on a randomised roll-out of the programme across 180 treatment and control GPs in select blocks of the state (those that had not been entered as of mid-2011). In these 16 blocks of 7 districts, GPs were randomly assigned to treatment and control; implementation in control GPs was delayed until after the endline survey was conducted (July–September 2014).[44]

The availability of a baseline study adds considerable value to the current evaluation, since the programme impact can be assessed by comparing changes over time for the same set of households, rather than through cross-sectional variation in programme duration across blocks and villages, as in our main study. It thus serves as an important check on our results. The baseline also provides information on other questions that we are unable to address through our larger study, such as an analysis of the determinants of SHG membership. Finally, the availability of baseline data also extends our analysis of heterogeneous impacts, providing measures of baseline values of variables for use in this analysis.

As is always the case, however, concerns regarding external validity should be kept in mind when drawing broader conclusions from this study. For example, as we detail below, implementation of the RCT changed the phasing of the programme within treatment blocks, which in turn likely affected implementation in both treatment and control GPs. Though we control for observable differences in phasing as in our larger study, these differences suggest that the interpretation of results may be affected by the possibility that treatment itself caused changes in behaviour unrelated to the programme, which may affect outcomes.

Given the existence of the original study based on the same baseline data, it is important to be clear on what we estimate and how our estimates relate to those of the former study (Datta 2015). Our results cannot be construed as measures of the long-run impact of the programme, despite the fact that our endline survey measures outcomes seven years after programme initiation. This is because our identification of treatment effects is dictated by the difference in exposure between treatment and control villages in the original study.

As we discuss later, control villages received the programme quite rapidly after the original study, and the difference in years of exposure remains almost the same in our study as well. The difference in results between the original study and ours lies in timing. While the original evaluation identifies the effects of approximately two years of programme exposure starting from the year of an SHG's formation, our analysis identifies the effect of this same length of exposure on in mature SHGs – those that are approximately seven and five years old.[45]

[44] The study first selected the set of 180 GPs. Following the baseline survey, GPs were stratified on the 16 administrative blocks and the *Panchayat*-level mean of outstanding high-cost debt (with a monthly interest rate of ≥ 4%). Cells comprising two GPs with similar debt were then constructed and randomly placed in treatment and control. On average, the survey covered 50 households per GP.

[45] This requires an assumption that the economic environment remains the same, so that differences between treatment and control can be fully attributed to the programme.

If programme effects are linear, in that they grow at the same rate, then our evaluation should generate similar results to the baseline study. Effects could be expected to be greater for those outcomes that may take time to change. Measures of women's empowerment could conceivably fall into this category. Declining effects may also exist for outcomes whose returns fall over time.

The regression estimates of programme effects based on the treatment indicator correspond broadly to the coefficient on the *EV*EB* interaction in the larger study, but with some important differences. Both estimates measure the impact of approximately two years of the programme on mature SHGs. Results in the larger seven-state study are based on a difference of approximately 2.5 years of operation, with estimates reflecting the incremental impact of the programme after SHGs had completed two years of operation.

In contrast, the Bihar sample provides estimates at a point when control SHGs had been functioning for approximately five years. More importantly, the Bihar analysis utilises the baseline sample drawn from treatment and control villages prior to the implementation of the programme and therefore provides ITT estimates, whereas the large study focuses on SHG members and therefore identifies treatment-on-treated effects. Because of our limited ability to match households to SHGs in the Bihar sample, we focus on ITT estimates and do not attempt the causal analysis of the effect of SHG age undertaken in the larger study.

We start this chapter by discussing the construction of the data for this study. We then briefly summarise the findings of the earlier RCT evaluation before describing our research methodology and results from our analysis.

8.1 Constructing comparable baseline and endline data

As stated above, the original study covered 8,988 households divided across 180 GPs in 16 blocks. Budgetary concerns restricted our survey to 5,872 of the original households drawn from the same set of blocks, but distributed over a smaller sample of 137 GPs, omitting treatment and control pairs of GPs from blocks with (initially) high GP samples.[46]

Our study is based on a comparison between of outcomes in our 2019 survey (henceforth referred to as the endline survey) and the baseline study conducted in 2011.[47] We did not use the original questionnaire from the Bihar RCT, but instead used the same survey tool implemented in the remaining eight states of the 2019 survey. This change in the survey instrument has implications for our study, since the analysis could only be conducted on those variables that were common to both surveys.

The original RCT contains very few details of income and, consequently, our current analysis is unable to probe the programme's effect on income. Conversely, the original

[46] The reduction was primarily in the districts of Saharsa, Supaul, Madhepura and Muzaffarpur. We verified that the balance of the original sample was maintained. Details are available in our draft report.

[47] Budget considerations made it impossible to resurvey all households in the original survey. We utilise the baseline study alone because of difficulties in matching samples from the 2014 survey to our endline. In later work, we propose to also include an analysis of the 2014 survey.

RCT provided far more information on women's empowerment and social outcomes than the 2019 survey, thereby limiting our ability to address these issues relative to the original evaluation study.

The variables that are most easily comparable are those relating to loans (by source), labour force participation rates, indices of house quality, and counts of specific production and consumer assets.[48] These latter counts are restricted to assets for which information is available in both surveys. In addition to these variables, we constructed measures of household expenditure and asset ownership that were common to both surveys. For example, although both surveys collected data on roughly the same set of food items, they differed in their coverage of non-food items. Our measure of household expenditure is thus based only on this common set of items, and hence is far less extensive than the measure used in our larger study.

Finally, we also arrived at two common indices of women's empowerment, based on women's role in decision-making within the household. The first index measures whether women have any say in the process (referred to as *wemp_say*) while the other is based on follow-up questions to determine the primary decision maker for different items.

The second index measures whether women were the primary decision maker (*wemp_dm*). These indices thus constitute a 'low-level' and a 'high-level' indicator of empowerment.[49] In general, the common set of variables we constructed are far less extensive than those used either in the original study or in our study, and this limitation needs to be kept in mind when interpreting the results.[50]

Since the original baseline study was conducted prior to programme implementation, an SHG module was not possible. Our study includes an SHG module based on those with members from survey households. Thus, we are able to link approximately 2,244 households to SHGs but lack baseline SHG information for this sample.

8.2 Summarising the results of the original RCT study

The design of the RCT study required the programme to be initiated in treatment GPs between January and April 2012, after completion of the baseline study (July–October 2011). Entry into control GPs was to commence only after the follow-up study (July–September 2014). This should theoretically have generated a 2.5-year difference

[48] Data on loan amounts and expenditure are converted into constant 2011 figures, using the consumer price index for rural Bihar.

[49] As for all the other variables, these indices are constructed on the subset of decisions that were common to both surveys: decisions on expenditures on durables (such as TVs), women's clothing, loans and schooling.

[50] In addition to constructing a set of common variables, differences in survey definitions of who could be considered a resident member of the household also required revising these definitions to ensure comparability of the surveys. While the original surveys defined household members as those resident in the house for at least one month of the year, our endline survey considered a member to be resident only if they lived in the house for a period of at least six months. Fortunately, the original study also provides information on the number of months that each household member resided in the household in the last year. We use these variables to construct comparable measures of household size and counts of members in different age-gender groupings.

between treatment and control samples, allowing for an evaluation of outcomes after three years of SHG membership. However, as noted in the study report (Hoffman, et al. 2018), implementation within treatment GPs was delayed, reducing the difference in exposure to the programme in treatment GPs at the time of the endline survey.

The study included a qualitative and a quantitative analysis, with the qualitative analysis based on multiple rounds of interviews in six villages, including two in the first phase of JEEViKA's roll-out that commenced in 2006. The quantitative study revealed strong effects on SHG membership: 60 per cent of households in treatment GPs had joined SHGs by 2014, compared to just 10 per cent in control GPs. This is not surprising, given that the programme had not entered control GPs at the time of the second survey.

The study found that the strongest programme impact was on borrowing, with a significant increase in loans from SHGs matched by a decline in informal borrowing. Because SHG loans carried a monthly interest rate of 2 per cent, this shift away from informal loans is reflected in a reduced incidence and amount of high-cost debt (loans carrying a monthly interest rate of 4% or more).

The impact on productive and consumer assets, livelihoods, expenditure and other measures of household well-being were more muted. Though the authors found slight improvements in production and consumption assets for landless households, these effects were insignificant when calculated over the entire sample. Similarly, there were no significant effects on other outcomes such as access to entitlements and household expenditures.

These results contrasted with stronger effects, particularly on women's entitlements, suggested by the qualitative study. The intensive qualitative study provides important insights into the results. The authors note that the more intensive approach utilised in Phase 1 – with far more attention paid to ensuring 'buy-in' by members of the village community, building trust, and gaining the support of intended beneficiaries – had a significant return.

In contrast, implementation was far more rapid in later phases, highlighting an important trade-off between scale and programme effectiveness. Unlike the implementation of Phase 1, later phases were far more concerned with reaching programme targets. Therefore, the programme became more susceptible to elite capture (e.g. in regard to the appointment of community cadre members).

The authors also point out the significant improvement in overall levels of income and welfare in the study region, in both treatment and control GPs. The high rate of economic growth witnessed in Bihar in this period raises the possibility that higher incomes, and associated improved rates of return to core income-earning activities, may have affected the overall impact of the programme, particularly on measures such as the diversification of income-earning occupations amongst household members. Finally, they note that a slow pace of implementation at the start of the programme reduced the difference in exposure between treatment and control GPs, so that their estimates identify a short-term programme impact.

Conditions unique to Bihar may also play a role. The majority of blocks and GPs in the survey were drawn from Bihar's Kosi region, which is prone to devastating floods on a

recurring basis from the Kosi river, known as ‘the sorrow of Bihar’. The damage from these floods, most recently in 2018 and 2019, wreaks havoc in villages, causing widespread damage to property. These conditions likely explain the unwillingness of households to invest significantly in home improvement and construction, consumer durables and perhaps even productive assets.

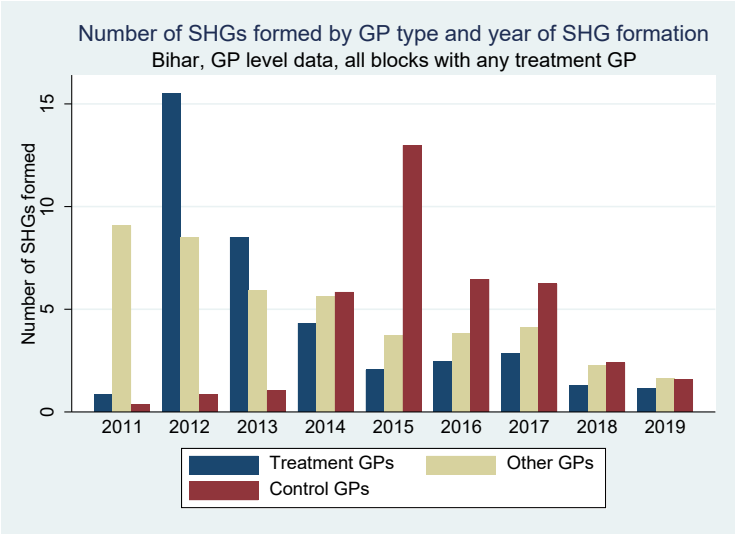
One of the primary coping mechanisms in this, and other areas of Bihar, is migration. Our endline survey reveals that the number of migrants reported by the average household in the Bihar sample is 0.53. The corresponding figure for the remaining eight states is approximately half this number (0.28). Correspondingly, transfers received by the average household in Bihar (INR11,943) far exceed those received by the average household in the remaining states (INR3,550). As we discuss in more detail below, migration likely affects all household outcomes, including measures of female empowerment.

8.3 Implementation of the programme (2011–2019)

To understand the impact of the programme, we start with a brief discussion of its implementation between the first study and our 2019 survey. For this, we draw on MIS data with information on SHG formation and entry for all GPs and all blocks of the survey districts. Figure 33 plots the year-wise number of SHGs in treatment, control and ‘other’ GPs of ‘treatment blocks’ (those with treatment GPs). ‘Other GPs’ are defined as those omitted from both the treatment and control samples.

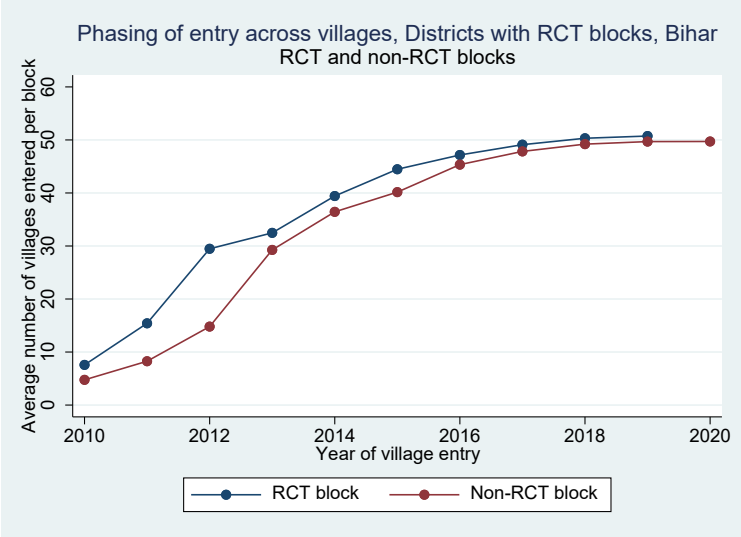
The data reveal broad adherence to the original evaluation design, with programme entry in treatment GPs commencing only in 2012, and most programme entry into control GPs occurring in 2015 or later. However, the growth of SHGs in treatment GPs was staggered, with a large number commencing operations only after 2012. Similarly, a significant proportion of SHGs in control areas were functioning in 2014, prior to the 2019 survey. Using data on exact month of entry, the average difference in SHG age between treatment and control samples is one year and seven months, less than the planned difference of 2.5 years.

Figure 33: Phasing of the programme across GPs (2011–2019)



Source: JEEViKA MIS data (2020)

Figure 34: Phasing of programme entry across villages, treatment and control blocks



Source: JEEViKA MIS data (2020)

Comparing the phasing of the programme in RCT blocks to that in other blocks of the same districts (those without any treatment or control GPs and hence original RCT) also suggests that implementation of the RCT affected programme phasing. Figure 34 plots the cumulative number of villages entered by year, comparing the average for treatment blocks to the average for non-treatment blocks.[51] If non-RCT blocks can be taken as indicative of the 'normal' phasing of the programme, then the figure suggests a more intensive approach to SHG formation in RCT blocks. Thus, in treatment blocks, 60 per cent of villages were entered in the period 2010–2012 in RCT blocks compared to 20 per cent in non-RCT blocks.

Therefore, the RCT itself may have played a role in the fast pace of implementation and the 'less intensive' approach to SHG formation noted in the evaluation study by Hofffman and colleagues (2018) – subsequently affecting the limited estimated impacts on 'downstream' outcomes, including measures of household wealth.

The 'bundling' of the effects of implementation with the 'pure' effects of the programme is common to all evaluation studies. This complicates the comparison of results across studies, as they are likely to reflect differences in implementation as well as in household responses to the provision of programme inputs. It is worth noting that our analysis of Bihar as well as our larger seven-state study attempt to control for any impact of phasing on implementation through the inclusion of 'scale' variables. Thus, comparing our results to others reflects this difference in regression controls.

8.4 Evidence on participation

Data on SHG membership at the time of our survey reveal no statistically different effects between treatment and control samples, with 58 per cent of households in treatment

[51] This average is the number of villages entered in the year divided by the total number of villages in the block.

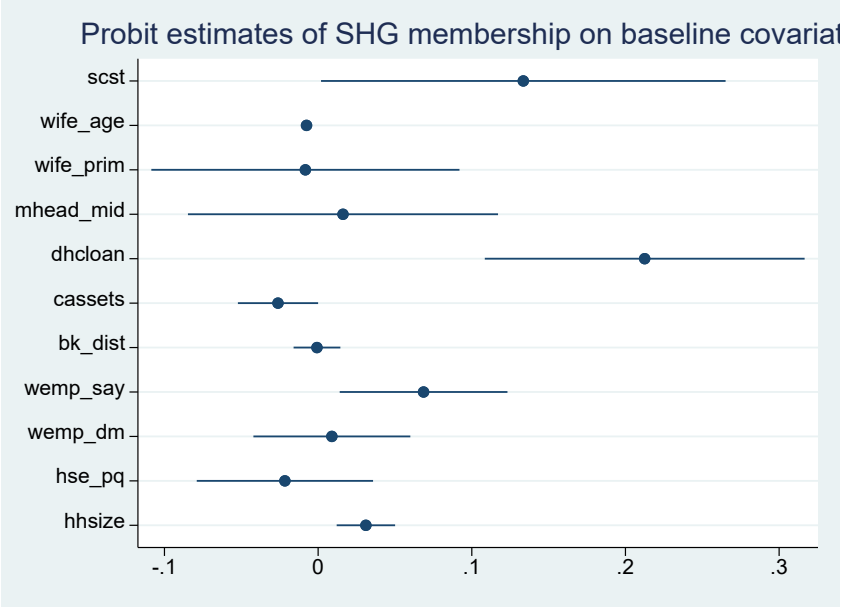
GPs and 56 per cent in control GPs reporting SHG membership.[52] This is not surprising, given that the programme had been in operation in control areas for four years at the time of our survey.

At the time of the baseline survey in 2011, however, coverage was minimal in both treatment and control areas (0.08% and 0.05%, respectively). Thus, the availability of the baseline sample provides a means of assessing the determinants of participation. We use the following baseline measures: caste membership (*scst*, an indicator variable for households from SCs or STs); indicators of the household head earning income from own enterprises including salary income (*head_own*); measures of the head and his wife's education (*head_mid* and *wife_prim* for heads with ≥ 8 years and wives with ≥ 5 years of schooling); wife's age (*wife_age)* and empowerment (*wife_say* and *wife_dm*); an indicator variable for whether the household had any high-cost debt at baseline (*dhcloan*); indicators for a 'poor-quality' house *(hse_pq*)[53] and counts of consumption assets; household size; and measures of village remoteness (distance to the block capital *[dist bl hq]* and to the nearest bank branch).

Baseline values of these measures are outlined in Table 22, which reports regression results from our main analysis of the effect of the programme on household outcomes.

We estimate a probit regression on membership in an SHG, clustering standard errors at the level of the GP. The results are graphically displayed in Figure 35 below.

Figure 35: Regression estimates from probit regression of participation on baseline covariates



[52] The Bihar government has a target of 80 per cent saturation rate for 'poorest of the poor' households. Because survey households were drawn from the poorest hamlets of survey villages, it is likely that the coverage rates revealed in our survey fall short of this target (Datta 2015) reports a much higher coverage rate of 90 per cent for Phase 1 villages covered in earlier studies.
[53] This is defined as a house built with poor-quality (mud, thatch, grass) material for roofs, walls and floors.

These results suggest that the programme succeeds in enrolling poorer members of the community, with the probability of membership being higher for members of SCs and STs, and for households with fewer consumer assets. Need for access to low-cost credit also likely plays a role, with membership greater amongst households with high-cost debt at baseline (75% of baseline households), and amongst larger households.

Participation is importantly driven by caste, wealth and the household's financial position, but also by baseline levels of women's involvement in low-level decision-making – that is, in whether they have some say in household decisions. This last finding suggests that women who join SHGs may already be empowered to some extent, relative to other women in the sample.

This may help to understand the finding of other evaluations of limited impact on measures of women's empowerment. However, we note again that this is a very low level of women's empowerment, based on a question in the baseline study that asked women if they had any input in decisions relating to seven defined category groups. In the baseline sample, only 27 per cent of women reported that they did not have a say in one or more of these groups.

8.5 Methodology for evaluating programme impact at endline

Our evaluation of JEEViKA's impact is based on a standard difference-in-difference regression that utilises the baseline of the original survey in combination with our endline survey, and exploits the randomisation into treatment of the original study.[54] The difference-in-difference regression controls for the small differences in baseline outcomes between treatment and control samples, imposing only the condition that growth rates in treatment and control GPs, would have been identical over this period in the absence of the programme. Because the assignment of treatment was randomised through a centralised computer and blinded across GPs within a block, this assumption is likely to be met.

We estimate the following equation:

(4) $Y_{ipt} = \beta_0 + \beta_1 Treat_p * Post_t + \beta_2 Treat_p + \beta_3 Post_t + X_{ipt}^{'}\beta_4 + (Z * Post_t)'\beta_5 + e_{ipt}$

In this equation, Y_{ipt} is the value of outcome *Y* for household *i* in GP *p* in time *t* (*t* = 0,1); $Post_t$ takes the value 0 for baseline and 1 for the endline study; and $Treat_p$ takes the value 1 if a GP was assigned to the treatment group at baseline, and 0 if control. All loan amounts and measures of household expenditure are in constant 2011 INR, based on the 2019 consumer price index for rural Bihar.

The regression includes a set of control variables (*X*) as well as the scale variables (*Z*) utilised in the analysis of our larger study and defined in equation (1). These variables are obtained from JEEViKA's MIS and reflect the scaling of the programme across survey blocks and districts using data on all SHGs in these areas. They are based on data on all SHGs in the block and district, including those from 'other' GPs (that were neither control nor treatment GPs in the earlier study). Given the potential impact of the

[54] We do not include observations from the 2014 survey (the endline of the original study) because of difficulties in constructing comparable variables to our survey from this study.

number of treatment GPs on outcomes, we also include the number of control GPs in each block, and the number of villages within these control GPs.[55]

In addition to these scale variables, *X* also includes the GP mean high cost loan amount at baseline as well as the rank of the GP in baseline high-cost debt across all GPs in the block. The original assignment to treatment was based on a stratification of GPs within a block on the basis of high-cost debt, suggesting the need to include these measures in the regression equation. Finally, to allow for differences in demographic outcomes over time, the regressions include household size and indicators of the age profile of members of the household, as well as an indicator of whether the head of household was occupied in their 'own' business at baseline.[56]

The coefficient of interest is β_1, which shows the impact of approximately two years of the programme, seven years after it commenced in treatment villages. This coefficient is therefore similar to the coefficient on the interacted variable *EV * EB* from our analysis of the NRLP based on the larger seven-state sample. As in the original study, we base regressions on the entire sample, not just SHG members, so that the regression coefficients represent ITT estimates. All standard errors are clustered at the level of the unit of randomisation, that is, at the level of the GP.

8.6 Performance of SHGs in treatment and control GPs

Our earlier descriptive analysis of SHGs includes those from Bihar. In this section, we extract information on SHGs from the state to examine whether the results from that analysis also apply to Bihar. Table 22 provides summary statistics for SHG characteristics and outcomes across treatment and control surveys, as well as *t* tests for statistical difference in the mean values of these estimates across treatment and control samples. The table reveals that these two groups of SHGs are similar in characteristics, such as the total number of members with (maximum) levels of schooling being marginally smaller for treatment households relative to control.

However, as with old and young SHGs in our full sample, these differ significantly in their access to resources such as CIF and bank loans. For example, despite the fact that the formation of SHGs in control GPs commenced in 2015, four years before our survey, only 35 per cent of groups report receiving these funds, compared to 77 per cent in the treatment sample. There is also a large difference in amounts: among SHGs that received funds, the average amount was INR48,050 in treatment groups but only INR31,803 for those in control groups. SHG members in treatment GPs are also more likely to report bank loans (0.75 versus 0.66 in control).

Mirroring our findings from the analysis of SHGs across all nine states, the Bihar SHG sample also finds that despite this significantly higher resource base, older treatment

[55] At baseline, the number of treatment GPs in a block equalled the number of control GPs. By endline, the division of some GPs meant that this was not the case. Thus, the endline survey includes the additional GPs caused by this division.

[56] As previously noted, this is defined as an indicator variable that takes the value 1 if the head reports occupation in own-account agriculture, non-agricultural business or employment in a salaried position. The indicators for household composition are the number of adult men and women in the household in three age groups (20–40, 40–60 and ≥ 60).

SHGs: provided fewer loans to members in the last year (3.27 versus 4.48 in control); reported fewer total savings in the last 12 months (INR4,428.21 versus INR5,005.88); and performed less well, as reflected in *Panchsutra* scores (2.21 versus 2.41) and the number of meetings held in the previous year (38 versus 42). They were also more likely to report members having left, with 0.27 proportion of treatment SHGs reporting such exit relative to 0.20 for control.

Data on the largest and smallest loans provided by SHGs also reveal a maximum loan size in treatment GPs that far exceeds that in control SHGs (INR54,276 versus INR29,578.21). Alongside evidence on improved resource positions of treatment SHGs and a decline in the quantity of loans extended to members in any given year, the evidence suggests a rising capture of resources by some members and consequently greater inequality.

This decline in SHG quality along some dimensions, similar to that noted for other states, may help to explain the limited impact of the programme on outcomes such as measures of female empowerment.

8.7 Regression results

Regression results from the estimation of equation (4) are outlined in Table 23. This table reports the coefficient of interest from the interacted variable *treat * post,* as well as the coefficients on *treat* and *post* separately. The coefficients on *post* are particularly noteworthy, since they reveal the growth in Bihar, for the set of outcome variables, between 2011 and 2019. The last column provides the mean value of the outcome at baseline, and the percentage change in the outcome in question relative to baseline.

The results of our analysis are very similar to those obtained in the original evaluation and to the results of our seven-state study. The programme significantly impacted the composition of household loans, with large increases in loans from SHGs and banks. In turn, this resulted in an increase in the share of household loans from SHGs and from the formal sector, and a decline in the share of informal loans. As a consequence, the proportion of households reporting any high-cost loan bearing an interest rate of 4 per cent or more declined by 10 per cent between the survey periods. However, our results do not indicate any decline in the amount of high-cost loans.

Similar to the earlier evaluation, we find no effect on the number of income sources. While household expenditure in real terms does increase, it is not statistically significant at a 10 per cent level. Nor is there any improvement in house quality. However, our results reveal significant improvements in other variables associated with household welfare; specifically, the share of food expenditure and, most notably, investment in education. Our estimates also reveal a large increase in the number of productive assets owned by households. These results are unique to Bihar: similar effects on food shares, education and productive assets were not found in our seven-state study.

By including a further interaction of *treat * post* with other variables, we consider whether the effects of the programme differ across different groups of households. As in our primary analysis of data from the seven states, the variables we consider are the distance of the village from the nearest bank office, and indicator variables for membership in SCs or STs, mother's schooling (1 if ≥ five years), and head of household occupied in their own business, including salary income. The availability of baseline data

for Bihar enables us to examine heterogeneity in treatment effects by household occupation. This is important, given recent research that suggests its importance in explaining outcomes (Banerjee et al. 2019).

Overall, Tables 24 and 25 provide little evidence of heterogeneity, with the exception of the measure of village remoteness: distance from a bank. An increase in this distance increases the number of income sources, reduces household expenditure on education and increases the share of household expenditure on food. Other notable findings are the role of the head's occupation on measures of women's empowerment: the probability of the head being engaged in his own occupation reduces his wife's decision-making role and female labour force participation rates.

The striking feature of these results, as in the original study, is the high growth rate experienced in Bihar over this decade, as revealed in the coefficient on the indicator for the endline survey, *post*, which identifies the common growth in outcomes across treatment and control samples in the period. In real terms, household expenditure increased from INR44,500 to INR65,000, an increase of 46 per cent. This growth was accompanied by similarly large increases in consumer assets, superior consumer assets (e.g. TVs, refrigerators), production and consumer assets, the 'low-level' measure of women's role in household decisions (*wemp_say*), and declines in the share of food in household expenditure.

There are, however, some telling exceptions to this picture of overall improvement. The first is the lack of improvement, and even decline, in quality of housing. As previously noted, this could be a consequence of the region's history of floods. There is also no improvement in the strong measure of women's decision-making ability. And, most notably, high growth rates in the Bihar economy have been accompanied by a steady decline in women's labour force participation. The data reveal that this ratio fell from 78 per cent in the baseline survey to 66 per cent in the endline survey, with the decline being greater in treatment areas.

8.8 Discussion of results from the Bihar study

As previously noted, the results of this study should be viewed through the lens of the striking increase in incomes witnessed in the survey region and, more broadly, in the state, over the survey period. This, in combination with the relatively limited impact of the programme on household expenditure and measures of income suggests that there were sizeable returns to some occupations that perhaps limited the impact of SHGs.

We assess changes in occupational structure from regressions of measures of households' engagement in different occupations. These take the form of a set of dummy indicator variables that record if any member of the household is engaged in agriculture, livestock, wage income, non-agricultural own business, salary income or the government's primary welfare programme, MNREGA.

The results from repeating the regression of previous tables on this set of outcomes (Table 26) reveals a strong declining trend in engagement in wage labour, agriculture and MNREGA, as evidenced in the coefficient on the indicator variable for the endline survey. The decline in wage labour in particular, but also agricultural incomes, marks a decreased engagement in the primary sources of income.

When examining the impact of the programme (the coefficient on *treat * post*), households in treatment regions report a significant decline in employment in wage labour. This is consistent with the decline in female labour force participation rates in the economy as a whole and in the treatment region. The results suggest that the only 'growing' occupation is salaried employment.

The decline of participation in occupations that constitute the primary source of income in Bihar – combined with high growth rates in the economy as a whole and significant increases in several measures of welfare – suggest a role for migration and remittance income. Unfortunately, the two surveys do not provide comparable measures of household migration. However, regressions based just on the endline sample, exploiting the randomised allocation to treatment, reveal a statistically significant *negative* effect of treatment on the number of household migrants.[57]

Similar regressions on the baseline measure of migration, utilising just the baseline sample, reveal no statistically significant effect, supporting the integrity of the randomisation for this variable and the interpretation of the negative effect of treatment on migrants in the endline sample as a causal impact of the programme. Thus, our analysis suggests that the programme impacted migration, reducing it in treatment areas relative to control.

This likely plays a role in explaining the limited impact of the programme on measures of women's decision-making. If men are present in the household for longer periods of time, this will affect a woman's involvement in household decisions. It may also negatively affect her mobility and participation in the labour force. Further, if males exercise authority over women, then a resident male may also discourage his wife's participation in SHG meetings, which could explain the lower meeting frequency in treatment GPs and their reduced adherence to *Panchsutra*. The role migration plays in explaining outcomes from SHG participation is an under-researched topic that merits further investigation.

8.9 Discussion

In summary, our follow-up analysis of JEEViKA in Bihar suggests results that are very similar to the original JEEViKA evaluation. This finding is not that surprising, given that our analysis similarly identifies the impact of approximately two years of exposure, though at a different point in time in an SHG life cycle. The programme caused significant changes in credit sources, with households borrowing more from SHGs and banks, at the expense of high-cost loans from the informal sector.

However, in contrast to the first study, we do find improvements in a set of measures of household welfare, including education expenditures and food shares, as well as enhanced ownership of productive assets. We find no effects on measures of women's empowerment, and declining effects on female labour force participation rates.

Analysis of SHG data finds that though treatment groups have an improved resource position, they are less likely to extend loans to members and more likely to do poorly in performance measures such as *Panchsutra* scores and the probability of members

[57] This regression is based on equation (4), but since it is run only on the endline survey, it drops the indicator for this survey round (*post*) and all interactions with *post.*

exiting the group. There is also evidence of greater inequality in the distribution of loans, suggesting elite capture, a possibility that was raised by the qualitative analysis of the first original evaluation study (Datta et al. 2017).

One possible explanation for these diverse findings comes from the identified negative impact of treatment on migration. Higher rates of migration, and hence remittance income, in control SHGs could mute the impact of the programme on measures of household income. A greater presence of men in the household is also likely to affect measures of women's decision-making roles within the household and their labour force participation rates.

Table 22: Summary statistics for SHGs, Bihar sample

Variable	SHGs in treatment GPs	SHGs in control GPs	*t* test for difference
SHG characteristics			
Total members per SHG	11.79	11.70	1.15
	(0.06)	(0.05)	(0.25)
Highest schooling years of any member	5.88	6.40	1.74*
	(0.21)	(0.21)	(0.08)
Loans and savings			
Total savings in last year	4,428.21	5,005.88	-3.56***
	(127.13)	(101.11)	(0.0004)
Total loans to members in last year	3.27	4.48	-4.37***
	(0.19)	(0.21)	(0.00)
Difference between largest and smallest loan amount	49,586.99	26,146.17	-7.36***
	(2,426.63)	(2,072.27)	(0.00)
Other resource position			
Proportion reporting CIF	0.71	0.34	14.26
	(0.02)	(0.02)	(0.00)
Average amount of CIF funding per receiving SHG	48,050.44	31,803.38	16.83***
	(559.40)	(769.31)	(0.00)
Proportion reporting loan from bank	0.75	0.66	3.55***
	(0.02)	(0.02)	(0.0004)
Average amount of bank loan per receiving SHG	79,602.32	73,207.16	0.83
	(6,545.71)	(3,944.69)	(0.40)
Performance measures			
Panchsutra score	2.21	2.41	-3.4***
	(0.05)	(0.04)	(0.001)
Meetings last year	38.33	42.09	-3.77***
	(0.77)	(0.64)	(0.0002)
Proportion reporting members leaving	0.27	0.20	-2.68***
	(0.44)	(0.40)	(0.01)

Note: Figures in parentheses are standard errors. Sample size is 1,284. Sample is SHGs in treatment and control villages interviewed in the endline survey.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.01$.

Table 23: Heterogeneity of results with respect to caste and household head's wife's education

	Treat × post	Treat	Post	Baseline value	Percentage change from base
Loan amount (INR '000)	7.98 (6.170)	0.14 (0.610)	9.53 (10.510)	12.64	63.1%
Loan amount – SHG	3.38*** (0.910)	0.14** (0.050)	5.81*** (1.460)	0.1	
Loan amount – formal	6.38** (3.120)	-0.37 (0.390)	-0.3 (4.960)	1.14	559.6%
Loan amount – informal	-4.72 (2.980)	-0.21 (0.490)	-0.04 (5.840)	6.3	-74.9%
Loan amount – friends and relatives	2.86 (1.890)	0.66 (0.480)	4.17 (3.330)	4.99	57.3%
SHG share of loans	0.06*** (0.02)	0.01*** (0.002)	0.23*** (0.04)	0.01	600.0%
Formal loan share	0.04** (0.020)	-0.01 (0.01	-0.04 (0.030)	0.03	133.3%
Informal loan share	-0.08** (0.040)	-0.03 (0.030)	-0.21*** (0.060)	0.44	-18.2%
Any high-cost loan	-0.07* (0.040)	-0.01 (0.020)	-0.36*** (0.060)	0.75	-9.3%
High-cost loan amount	-1.65 (3.570)	0.03 (0.340)	-0.69 (6.150)	9.62	-17.2%
Number of income sources	-0.04 (0.090)	0.03 (0.060)	-0.43*** (0.160)	2.08	-1.9%
Household expenditure	9.94 (6.630)	1.48 (1.400)	63.92*** (9.920)	44.53	22.3%
Education expenses	4.94*** (1.840)	0.29 (0.180)	12.49*** (2.490)	1.5	329.3%
Food share	-0.02* (0.010)	-0.01 (0.010)	-0.11*** (0.020)	0.74	-2.7%
Indicator for poor-quality house	-0.01 (0.070)	-0.11* (0.060)	0.21* (0.110)	1.06	-0.9%
Number livestock	-0.09 (0.160)	-0.14 (0.140)	-0.37 (0.300)	2.21	-4.1%
Number productive assets	0.36* (0.180)	-0.02 (0.020)	1.27*** (0.300)	0.16	225.0%
Consumer assets	0.04 (0.170)	0.27*** (0.090)	1.31*** (0.270)	1.57	2.5%
Superior consumer assets	0.07 (0.070)	0.07** (0.030)	0.53*** (0.120)	0.68	10.3%
Women's empowerment – say	0.08 (0.070)	-0.05 (0.050)	0.25** (0.110)	3.57	2.2%
Women's empowerment – decision-making	-0.1 (0.140)	0.06 (0.050)	-0.12 (0.270)	1.09	-9.2%
HH female labour force participation rate	-0.04* (0.030)	-0.03 (0.020)	-0.22*** (0.040)	0.78	-5.1%

Note: HH = household. Standard errors, clustered at the level of the GP, in parentheses for coefficient values. Data in parentheses for baseline values represent percentage change over baseline. In addition to variables noted, all coefficients include: scale variables detailed in the text along with interactions of these variables with post; measures of GP average high-cost debt at baseline and interactions with post; number of control GPs and villages in the block, interacted with post; household size, counts of the number of household members in six age-gender groups, an indicator for whether the head of the household is occupied in an own-earnings job at baseline. All amounts are in constant (2011) INR '000. Sample size is 11,591.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table 24: Heterogeneity of results with respect to caste and household head's wife's education

	Treatment × post	Tr × post × SC/ST	Treatment × wife prim	SC/ST	Wife prim
Loan amount	10.40	-3.62	2.28	-2.48*	2.90**
	(11.93)	(9.75)	(8.78)	(1.31)	(1.21)
Loan amount – SHG	3.56***	-0.50	0.99	0.02	0.13
	(1.33)	(1.20)	(1.18)	(0.10)	(0.08)
Loan amount – formal	5.61	0.83	1.21	-1.01	2.03**
	(5.84)	(5.28)	(4.09)	(0.67)	(0.87)
Loan amount – informal	-5.95	3.02	-5.23	1.48*	-0.05
	(5.57)	(4.99)	(5.90)	(0.80)	(0.66)
SHG loan share	0.06**	0.001	0.0005	-0.001	0.001
	(0.02)	(0.02)	(0.02)	(0.003)	(0.003)
Informal loan share	-0.093**	0.03	0.09**	0.142***	-0.073***
	(0.05)	(0.02)	(0.03)	(0.025)	(0.02)
Any high-cost loan	-0.01	-0.08*	-0.03	0.12	-0.04*
	(0.05)	(0.04)	(0.04)	(0.02)	(0.02)
Household expenditure	33.33*	-30.28*	-7.06	-4.97***	6.34***
	(18.66)	(17.42)	(10.27)	(1.39)	(1.60)
Education expenditure	5.81**	-1.96	2.62	0.04	0.86***
	(2.40)	(2.15)	(3.86)	(0.29)	(0.30)
Food share	-0.03**	0.02	-0.01	0.01	-0.01*
	(0.01)	(0.01)	(0.01)	(0.01)	(0.005)
Number of productive assets	0.64	-0.38	-0.01	-0.14***	0.05
	(0.39)	(0.33)	(0.21)	(0.04)	(0.03)
Superior consumer assets	0.16	-0.09	-0.15	-0.10***	0.35***
	(0.10)	(0.09)	(0.11)	(0.04)	(0.05)
Women's empowerment – say	0.18*	-0.11	-0.10	-0.05	0.06
	(0.10)	(0.08)	(0.07)	(0.05)	(0.04)
Women's empowerment – decision-making	-0.11	0.06	-0.24*	0.06	-0.06
	(0.14)	(0.12)	(0.14)	(0.04)	(0.04)
HH female labour force participation rate	-0.02	-0.03	-0.004	0.15***	-0.12***
	(0.05)	(0.05)	(0.03)	(0.02)	(0.02)

Note: Tr = treatment; HH = household. Additional regressors are detailed in Table 1 note. Standard errors, clustered at the level of the GP, in parentheses. All amounts are in constant (2011) INR '000. Sample size is 11,591.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table 25: Heterogeneity of results with respect to household head's occupation (at baseline) and distance to bank

	Treatment × post	Tr × post × own enterprise	Tr × post × bank distance	Head in own enterprise	Bank distance
Loan amount	3.27	0.38	0.99	2.72**	0.03
	(7.21)	(6.51)	(0.83)	(1.10)	(0.09)
Loan amount – SHG	3.6***	-1.50	-0.06	-0.08	0.004
	(1.00)	(0.97)	(0.15)	(0.07)	(0.003)
Loan amount – formal	4.55	0.89	0.48	1.66***	-0.004
	(3.52)	(4.05)	(0.39)	(0.59)	(0.06)
Loan amount – informal	-7.22*	-2.59	0.81	-1.99***	0.12*
	(3.99)	(3.88)	(0.51)	(0.66)	(0.06)
SHG share	0.07**	-0.02	-0.001	0.004*	0.0001
	(0.02)	(0.02)	(0.003)	(0.002)	(0.0001)
Informal share	-0.11**	-0.01	0.01*	-0.13***	0.004
	(0.05)	(0.04)	(0.005)	(0.02)	(0.003)
Any high-cost loan	-0.11**	0.07*	-0.003	-0.09***	-0.005*
	(0.05)	(0.04)	(0.005)	(0.02)	(0.002)
Household expenditure	15.36*	-0.41	-1.17	2.89	-0.05
	(9.39)	(7.02)	(0.72)	(2.84)	(0.13)
Education expenditure	6.85***	1.88	-0.44	0.86***	-0.003
	(2.00)	(2.06)	(0.16)	(0.27)	(0.02)
Food share	-0.04***	0.01	0.003***	-0.004	0.001
	(0.01)	(0.01)	(0.001)	(0.005)	(0.001)
Number of productive assets	0.17	0.27	0.03	0.27***	0.002
	(0.21)	(0.33)	(0.03)	(0.04)	(0.002)
Superior consumer assets	0.09	-0.05	0.003	0.21***	-0.003
	(0.08)	(0.08)	(0.01)	(0.04)	(0.002)
Women's empowerment – say	0.01	0.02	0.02	0.06*	0.002
	(0.09)	(0.07)	(0.01)	(0.03)	(0.01)
Women's empowerment – decision-making	-0.06	-0.31***	0.02	-0.08**	0.001
	(0.19)	(0.11)	(0.02)	(0.034	(0.01)
HH female labour force participation rate	0.0001	-0.07***	-0.002	-0.08***	0.0003
	(0.04)	(0.03)	(0.003)	(0.02)	(0.002)

Note: HH = household. Heterogeneity is with respect to distance to bank and an indicator variable that takes the value 1 if the household head reports their occupation to be own agriculture or non-agricultural enterprise, or a salaried income position. Additional regressors are detailed in the note to Table 1. Standard errors clustered at the level of the GP in parentheses. All amounts are in constant (2011) INR '000. Sample size is 11,591.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table 26: Programme effects on indicators for households earning income from different sources and number of migrants

	Treat × post	Treat	Post	Baseline value (change over baseline in parentheses)
Agriculture	0.02	0.02	-0.15***	0.40
	(0.03)	(0.02)	(0.04)	(6.14)
Wage labour (agriculture and non-agricultural)	-0.05**	0.02	-0.20***	0.86
	(0.02)	(0.01)	(0.04)	(5.89)
Livestock	-0.04	0.02	0.01	0.34
	(0.05)	(0.04)	(0.10)	(10.46)
Salary	0.05*	-0.02	0.07	0.16
	(0.03)	(0.02)	(0.05)	(28.30)
Non-agricultural business	-0.001	0.01	-0.02	0.09
	(0.01)	(0.01)	(0.03)	(1.03)
MNREGA	-0.03	0.02	-0.15***	0.23
	(0.03)	(0.03)	(0.05)	(12.15)
Number of migrant HH members	--	-0.13	--	0.08
		(0.07)		(166.83)

Note: HH = household. Regression on number of migrants is run on the endline sample alone, with a sample size of 5,766. All other regressions are on the panel data set, with a sample size of 11,591. Occupational variables measure if any member of the household reports engagement in the activity in question, and so are not exclusive. Additional regressors are those listed in Table 1 note. Standard errors clustered at the level of the GP in parentheses.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.01$.

9. Summary, conclusions and policy recommendations

In Section 9.1, we summarise the results from our study, and go on to present our conclusions in 9.2. The regression analysis of this report examined the impact of the programme on a set of outcome variables, providing evidence on some pathways or factors underlying identified effects through our descriptive analysis of the functioning of SHGs. Section 9.3 therefore outlines a research agenda to examine these pathways more deeply. Finally, section 9.4 offers policy recommendations based on our summary and conclusions.

9.1 Summary of study and main findings

Our evaluation of the NRLP is based on an analysis of an extensive data set, which provided information on households and included detailed modules on SHGs, VOs and CLFs. Our study exploits the depth of these data as well as detailed analysis and use of the project's MIS and programme reports, including annual action plans and other state government publications. This totality of evidence enables a programme impact evaluation, as well as an understanding of its functioning and the factors underlying our findings.

Our analysis comprised three distinct studies: a detailed descriptive analysis of SHGs, VOs and CLFs utilising survey and MIS data for the nine states of our study; an empirical analysis of the causal effects of the programme on household outcomes based on data for seven states; and a separate analysis of Bihar's JEEViKA programme conducted by

combining our ‘endline’ sample with data from a 2011 baseline survey undertaken for a prior evaluation of JEEViKA.

These three chapters of our report should be viewed as complementary to each other. Our descriptive analysis is broad in scope and allows us to provide a ‘broad brush’ view of the programme, focusing on institutional quality and performance and its core objectives, namely financial inclusion, livelihoods and convergence. The evidence of this section is, however, suggestive and cannot be interpreted as causal. In contrast, our quantitative analysis of the seven-state sample and Bihar is narrower in scope, but provides evidence of programme impacts utilising regression methodologies that identify causal effects.

The evidence from Bihar is particularly strong, since it uses a randomised control trial put in place in 2011 to evaluate the programme. The results from this analysis thus provide a check on the results from the seven-state study. Additionally, the Bihar data allow us to examine trends in outcome measures over the past decade and help to interpret the results in the context of the high rates of growth that characterised the Indian economy, particularly that of Bihar, in this period. Finally, access to a baseline sample provides a rich set of ‘control’ variables that in turn enable an analysis of the determinants of participation in SHGs and an analysis of the extent to which programme returns vary across different subpopulations.

Overall, we find strong effects of the programme on savings and household income, with large effects on loans from SHGs and formal banks following federation of SHGs with VOs and with increases in the duration of VO membership. Membership in VOs also significantly improves the value of productive assets. The income gains associated with the programme, however, primarily reflect increases in wage income that cannot be attributed to VOs. Our results suggest that it is SHGs that cause improvements in wage income, and additional analysis of the distributive returns to the programme suggest that wage increases result from an ‘indirect’ effect of the programme on the functioning of local labour markets.

The results from our seven-state sample are consistent with those from our evaluation of JEEViKA: In this study, too, we find a strong significant effect of the programme on household borrowing from SHGs and banks, a declining share of informal credit and reduction in high-cost debt, and an increase in the count of productive assets that households own.

Mirroring results from other evaluations of SHGs and microcredit programmes (cited in chapter 2 of this study), the effects on household expenditure are weaker, as are effects on measures of women’s empowerment and access to entitlements. Our seven-state study finds no effect on household expenditure and an increase in the share of expenditure on food. This latter effect is primarily a consequence of greater consumption of home stocks of food grains. In Bihar, however, the programme generated reductions in food shares and a substantial increase in expenditure on schooling.

Our analysis of heterogeneity in returns by caste, schooling levels and village access to markets and banks identified important gains from the programmes for members of SCs and STs. Specifically, the project has narrowed existing caste differentials in household

expenditure and the value of productive assets, with the latter reflecting increased engagement by members of SCs and STs in agricultural activities and livestock enterprises. Our results also indicate increased participation by women in wage labour markets in less-connected villages. These findings suggest that the programme has made significant progress in reducing caste-based inequalities in the economy and in achieving its objective of ensuring social inclusion.

While caste-based inequalities have been reduced, our results suggest growing inequality in education. The displacement of old structures of inequality by new ones as economies grow has been widely noted in diverse settings, including India (Munshi and Rosenzweig 2006). Rising inequality in countries such as the US are commonly associated with increasing returns to schooling and to skills associated with higher levels of learning (Autor et al. 2008; Juhn et al. 1993).

Our analysis of the NRLP suggests a similar process occurring, whereby increasing returns to schooling are engendering increased disparity amongst SHG members. Our regression results find that households with greater levels of schooling obtain larger loans from SHGs and that programme-induced improvements in women's confidence levels are also largest for more educated women.

Strikingly, our results reveal that it is the schooling of male members of the household that most affects loan amounts. This result is one that we will probe in follow-up research; it may merely be a consequence of the fact that there is far more variance in men's schooling attainment than in women's, reflecting low mean levels of female schooling. Our analysis of Bihar, however, also suggests the role of men in explaining outcomes for women. We find that the husband's occupation affects women's empowerment and economic roles; in families where the (male) household head owns an agricultural or non-agricultural enterprise, or is engaged in a job that pays a fixed salary, women report a reduced role in decisions made within the household and also lower participation in work outside the house.

Our descriptive analysis, reported in chapter 6, provided evidence on resource and capacity constraints, on SHG performance including its distributive impact, and on SHG quality. We found little evidence of variation in the amounts provided to SHGs in the form of RF, CIF and bank loans. The area in which young SHGs differ from their older counterparts is access: the proportion of young groups reporting receipt of funds from different sources is relatively low, suggesting considerable delays in these payments. However, this reflects access to resources at a common point in time (that is, at the time of our endline survey). Our survey data suggest that these delays in receipt of funds were even larger for older SHGs at a comparative stage in their development.

This issue partly reflects delays in forming VOs and CLFs. We find that these higher-order institutions have a clear impact on loan amounts, suggesting that they facilitate SHG access to funding sources. Additionally, there is strong evidence of the role that VOs and CLFs play in ensuring the convergence of the programme with other government programmes, and in supporting livelihoods. For example, the number of members that report receiving help in accessing government programmes increases from 31 per cent in SHGs that are yet to be federated to 43 per cent amongst those linked with CLFs. Also, it is only with the formation of CLFs that we see engagement in livelihoods.

However, the slow rate of formation of these higher-order institutions is reflected in the slow growth of households reporting benefits from these activities. The persistence of these delays in formation of institutions (which characterised the programme in its early years) in 2019 suggests that capacity constraints continue to undermine the programme. Indeed, our analysis of capacity constraints suggests very limited training at all levels of the federation and inadequate numbers of community cadre members.

This lack of capacity is reflected in measures of SHG performance. For older groups, we find a decline in lending activities relative to their younger counterparts, a finding that also exists for SHGs in Bihar. Additionally, there is evidence of declining adherence to *Panchsutras* and rising inequality in the distribution of loans across members over time. The data for Bihar, in fact, reveal declining participation in SHGs over time: by the time of our survey, participation rates of 60 per cent in 2015 had fallen to approximately 50 per cent.

9.2 Conclusions

These implementation challenges help in understanding our estimates of the impact of the programme. Our study was designed to estimate the impact of the approximately 2.5-year difference in exposure to the programme between early and late villages in early and late blocks. However, the particularly slow progress in early years of the programme implies that in terms of effective implementation, the difference between early and late SHGs may have been far less.

Our empirical methodology allows for these differences in implementation between early and late SHGs through the inclusion of ‘scale’ variables. And, indeed, their exclusion from regressions yields estimates of the impact of the programme on savings and incomes that are significantly smaller. To the extent that these variables still leave unexplained other aspects of a difference in implementation over time, their effect will be incorporated into estimates of the programme’s effect.

The better returns in Bihar also must be viewed through this lens. Our analysis of the pace of implementation in treatment villages in Bihar suggested a faster pace than in other areas, perhaps because of the attention that is paid to treatment villages in randomised studies when treatment areas are well known to all functionaries. This faster pace of implementation suggests that treatment GPs in the Bihar sample were better off, relative to control, than their counterparts in our seven-state study.

Conversely, our state-level graphs in chapter 6 suggests that performance in control or late-entry SHGs in Bihar was poorer than in control SHGs in other states. The variation in performance across states likely reflects differences in implementation, rather than in the effectiveness of inputs provided by the programme.

We emphasise, however, that our analysis links implementation delays to lack of capacity rather than to governance issues such as bureaucratic failure or leakage of programme funds. The NRLP took on the difficult challenge of changing lives in India’s poorest regions not just by a large infusion of funds, but also by addressing extremely low levels of schooling and capabilities in these regions. The uniqueness of the programme, and its most innovative feature, was a design mechanism that paid attention to the constraints that plague most programmes when they move from pilot to scale: the lack of both financial and human capital.

While most development programmes infuse funds into the local economies in which they operate, the infusion of human capital is more limited, generally taking the form of training programmes. The NRLP, however, also innovated in this regard, in that it did not restrict itself to infusing funds into local economies, but also brought in external human capital. It did so by relying on a cadre of 'external' personnel in the early stages of the programme, drawn from states with extensive experience in similar programmes, and through the development of resource blocks that could similarly serve to enhance human capital abilities.

Slow progress despite these efforts suggests that the effectiveness of large infusions of financial and human resources is constrained by local capacity, a constraint particularly binding at the very low levels of human capital that characterise the blocks in which the NRLP operates. These represent the poorest blocks amongst India's poorest districts and states. The role of 'local' factors in explaining economic growth, even in economies in which households are connected to relatively well-functioning markets, has been emphasised in research by Chetty and colleagues (2014) and in a seminal set of papers by Benabou (1994; 1996).

Given the very poor initial conditions in these regions, the programme's slow rate of progress should not detract from its significant achievements in bringing poor households together into groups, federating these groups, facilitating access to loans, and enhancing the degree of 'formality' in rural areas. In this regard, this study does not do justice to the NRLP's accomplishments, as it does not focus on its progress regarding social inclusion and coverage of India's poor.

There has been real growth in the process of linking poor households to the larger economy, and the expansion of credit and savings opportunities to even remote villages is a significant achievement. Our study supports the critical role of the federated structure in these gains and suggests that this approach represents an important breakthrough in terms of institutional arrangements for delivering services to the poor. Additionally, the growth of the community cadre, and a design mechanism that provides monitoring at the local level, are additional innovations whose returns will only increase over time.

9.3 Future research agenda

In this section, we briefly outline a research agenda to take up the important task of establishing the pathways through which the NRLP impacts households. This agenda would include the following items.

Women's empowerment: Our initial analysis suggests minimal effects on measures of women's empowerment, a finding that is consistent with the other studies of microfinance and SHGs referenced earlier in this report. The NRLP envisages effects on women's empowerment through several avenues, including: behavioural change from membership in a collective organisation; improvements in women's resource position, and subsequent bargaining weight, through financial inclusion and enhanced livelihoods opportunities offered specifically to women; improvements in women's bargaining weight through improved access to rights and entitlements; membership in wider networks that would link women of diverse socio-economic circumstances and advance behavioural

change; and the opportunity to engage with local community leaders (offered to members of VOs and CLFs). A promising research agenda is to examine these distinct pathways and identify their effects on women.

Convergence with government programmes: The government, particularly in recent years, has emphasised the importance of *convergence,* or the relationship between the SHG platform and the functioning of government welfare programmes. The belief is that stronger SHGs, and subsequently the greater bargaining power of women from poor households particularly following the formation of VOs and CLFs, would improve the functioning of welfare programmes and village governments. This in turn should help enhance their impact on targeted beneficiaries. Our finding of an impact of the programme on participation and incomes earned from MNREGA suggests such a pathway. Additional research is required to establish this, and to examine the effect of SHGs on the functioning of other government programmes and consequently on women's access to their rights and entitlements.

Women's labour force participation and sectoral shifts: The limited identified impact of the NRLP on women's empowerment must be viewed in the context of the significant decline in women's labour force participation rates that have characterised the Indian economy over the past 15 years. Has this decline affected participation in SHGs and the impact of the programme on women? Or have SHGs impacted women's work force participation rates, reducing the impact of other factors that explain reduced participation? To what extent have declining opportunities in agriculture affected women's work force participation and empowerment, and have livelihoods interventions impacted these outcomes?

Scale and capacity constraints: As noted in this report, one of the NRLP's innovations and significant contributions is the attempt to address the capacity constraints that frequently inhibit successful scaling of pilot programmes. Has this been successful, and to what extent do capacity constraints affect the identified impact of SHGs? The analysis of this report controls for some aspects of scale, but without a full analysis of its impact. This question has significant importance for policy and the design of other programmes that similarly operate at scale.

Insurance and growth: Researchers have highlighted trade-offs between households' need for insurance and their willingness to undertake income-enhancing investments – the need to hold precautionary liquid funds and assets to help mitigate the consequences of income shortfalls may prevent households from investment in non-liquid assets required for improvements in income. To the extent that SHGs help women cope with short-term income shortfalls, membership should promote households' willingness to invest in productive assets.

While previous research has addressed this household-level response, there is far less evidence on the *institutional* response; that is, on how the collective organisation handles the trade-off between insurance and income. If loans to poorer SHG members are subject to longer repayment periods that negatively impact the recycling of funds, and hence the loan amounts available to others, do SHGs react by lending primarily to those of relatively higher wealth who can ensure timely repayment?

Demographic changes: The aspirations of young parents for demographic outcomes such as their completed fertility and the educational attainment of their children differ significantly from those of older generations: most young mothers state their ambitions in terms of the education levels they hope to provide to their children. Yet, the significant costs of higher education combined with the continued need for children, particularly sons, to complement the current and future (expected) income of parents makes these aspirations difficult to realise. Have SHGs helped in this regard? If so, have they done this by helping to create new social norms or by reducing the budgetary and other constraints that prevent households from achieving desired outcomes?

9.4 Policy recommendations

Our policy recommendations stem from the findings of our analysis and are detailed below:

1. ***Continued infusions of 'experienced' human capital in relatively less-developed regions are needed.*** We found that a geographical and community-level concentration of literacy was one reason for low capacity of SHGs and federations. This poses a challenge in overcoming poor initial 'local' conditions in less-developed areas. Prolonged support should be provided to SHGs by trained and experienced personnel where initial capability levels are known to be low.

   In these regions, while the programme of communitisation continues, the duration of use of experienced resource persons should be maintained, at least until the strength of the local community cadre achieves a level that enables the programme to scale using internal resources. We recommend experienced resource persons to provide hand-holding support throughout the period of programme implementation.

2. ***Alternatively, more resources should be provided for trainings in less-developed areas, with 'remedial' training provided to those who need it.*** While our field work over the past two years revealed excellent training sessions for CRPs throughout the country, we found that these trainings, frequently conducted at a group level, did not always allow an assessment of their impact on individuals, or an identification of those who may require remedial classes. In this respect, trainings provided to community cadre members should follow the example of 'teach at the right level' experiments in schooling throughout India.

3. ***A re-evaluation of Panchsutras will be helpful to ensure that these reflect quality against which SHGs can be monitored.*** As described in policy documents, *Panchsutras* represent the 'essence' of the programme, serving as an accountability mechanism and thus a means of ensuring SHG quality. Our study found low and declining levels of adherence to *Panchsutras* and a lack of effectiveness in this accountability mechanism, in that loans and funds are available even to SHGs that clearly do not meet prescribed standards.

   These standards appear to us to be exceptionally high: an A grade is possible only if the SHG achieves a 90 per cent standard across all five norms, including a 90 per cent rate of lending from internal savings. A lack of adherence to these standards thus is understandable: if they were strictly enforced, lending would be

severely constrained. While our extensive field work suggests that the implementation of a set of standards has improved performance, greater progress in this area may require re-evaluating this system.

Similar accountability standards in the schooling sector offer some lessons. In many countries, fund deployment is based not on an absolute set of standards, but on the rate of growth or progress. Such a dynamic system has the benefit of not penalising schools or institutions located in very poor regions, where achieving a common set of targets is much more difficult than for those in more advantaged regions.

Additionally, as in schooling programmes, distributive concerns can be mitigated somewhat by expanding expected standards to include features such as the support extended within all levels of the institution to particularly disadvantaged members.

The above insight makes us concerned about the ability of all SHGs to adequately take up *Dashasutras* that are being implemented in many states. At the same time, the emphasis of *Dashasutras* on individual and community empowerment by focusing on health, education, local governance and entitlements is important. We recommend that *Dashasutras* be implemented in a phased manner by targeting those SHGs that need such support.

4. ***More attention to interventions and processes that improve the distribution of programme returns can bring in larger average gains*.** Building on the previous point, we suggest a need for greater attention to the distribution of returns within SHGs. Our evidence that the vast majority of members receive small loan amounts (with large loans accruing only to one or two members) suggests low membership returns for most, which may explain exit and failure rates.

   While there is obvious value in ensuring that loans are provided to those with repayment capacity, attention to repayment capacity must be kept in mind. That is, the solution is not to force all households to borrow larger amounts. Instead, there is a need to ensure that other returns to SHG membership, in the form of convergence activities and livelihoods training, are prioritised and put in place as soon as possible. With the federated structure of VOs in place, accelerating the establishment of the platform with an effective working relationship with Panchayati Raj Institutes could increase benefits from convergence.

5. ***Capacity constraints need to be recognised in implementation and programme planning*.** Our analysis suggests that the numbers of community cadre members are still limited, and that there is variation across regions in recruiting members with necessary levels of experience. With this in mind, particular care has to be paid to ensuring that members of the community cadre are not constrained by an increase in their roles and responsibilities. That is, the pace of programme expansion must be based on the ability to expand local capabilities, which suggests that pace may have to differ across regions, unless external resources can be deployed in less-developed areas.

6. ***The importance of developing non-agricultural employment should be emphasised.*** The Bihar study provides striking evidence of changing economic conditions in the Indian economy and information on the context within which the NRLP operates. Specifically, the economy has witnessed striking declines in agricultural and wage employment in rural areas, and in female labour force participation rates. In this environment, opportunities for growth in incomes can only come from a focus on non-agricultural employment. Thus, the transition from the NRLP to the National Rural Economic Transformation Project is one that is likely to reap dividends. In this transition, however, we emphasise again the importance of a programme that differentially provides inputs to regions based on their level of development and pays specific attention to addressing local capacity constraints.

7. ***Adaptive processes that can accommodate the changing dynamics of SHGs must be developed for their sustainability*.** The data from Bihar, as well as the experience of states with older programmes, suggest a need to focus on the dynamics of SHGs, developing vibrant institutions that can accommodate exit and new entry. As economic growth rates increase, exit out of collective institutions should be expected. SHGs may, however, need guidance on how to handle these transitions. For example, our field work in Odisha and other states revealed a completely different process in place for bringing new members in to replace those who have left. These decisions were made by SHG members, without any input from CRPs. Such new entrants do not receive the basic training on SHG concepts provided to all members at the time of SHG formation. This may contribute to declining adherence to *Panchsutras* over time.

8. **There should be a *special focus on empowering women through trainings in life skills, interpersonal skills, financial literacy and livelihoods.*** Women's confidence levels in engaging with GP and other community leaders was found to increase only for more educated women, which may reflect the fact that these women disproportionately occupy leadership positions at higher levels of the federation. Ensuring leadership opportunities for those with less education, alongside the existing emphasis on inclusion of members of SCs and STs, may help to promote women's empowerment.

   Our analysis also suggests that improving women's decision-making roles within the household is difficult. The role played by the nature of husbands' occupations in explaining women's empowerment suggests that improvements require attention to the types of work available to women. While expanding employment opportunities for women will take time, improved training on financial literacy, life skills, interpersonal skills and livelihoods may have similar effects (Bandiera et al. 2020 Groh et al. 2016

Appendix

A1: Overall results and methodologies

There is increasing consensus that pure microfinance type programmes have modest positive impacts on savings but can hardly be considered transformative. A review of systematic reviews by Duvendack et al (2019) find that microfinance programmes lead to small increases in household savings but that these do not translate to consistently higher incomes or consumption. A similar conclusion is reached by Banerjee, Karlan and Zinman (2015) in their review of the evidence from six randomised evaluations of microcredit programmes in six countries. Their conclusion is that there are moderately positive, but not transformative, effects from access to microcredit. Other systematic reviews of microfinance programmes such as Stewart et al (2012), Duvendack et al (2013) discuss the challenges of the evaluating these programmes: the lack of comparable 'control' groups and limited uptake of the programme which adversely affects statistical power of the studies.

In contrast to studies that focus purely on microcredit programmes (Banerjee, Duflo, Glennerster and Kinnan 2015; Tarozzi, Desai and Johnson 2015), the growing literature that evaluates SHG programmes within India, based primarily on early variants of NRLM in states such as Bihar and Andhra Pradesh, generally reports significant effects on several diverse household outcomes. These include the incidence of high-cost debt (Datta Hoffman et al 20185; Khanna et al. 2015); ownership of productive assets (Singh et al. 2017; Deininger and Liu 2013; Prennushi and Gupta 2014); household income and income from enterprises (Singh et al. 2017); measures of female empowerment (Desai and Joshi 2014; Prennushi and Gupta 2014; Khanna et al. 2015; Datta 2015, Brody et al. 2015); and even household consumption and nutrition (Deininger and Liu 2013).

However, the set of outcomes that appear to be significantly improved through SHG programmes varies across studies. Effects are not consistent across studies. For example, while Deininger and Liu (2013) report improvements in household consumption, other studies do not (Singh et al. 2017; Khanna et al. 2015). Similarly, while several studies find positive impacts on productive assets and female decision-making, these findings are not universal (Datta 2015; Ban et al. 2015).

Some of the variation in results may reflect differences in households' exposure to the programme in the studies in question, given that benefits under most SHG programmes are intended to increase over time. For example, the study by Ban et al examined impacts over a one-and-a-half-year period, while Deininger and Liu's study spans two-and-a-half years. Yet another reason for the difference in results could be the actual interventions that are being implemented by SHGs. For example, Hoffman et al (2018) attribute their finding of no impact of the JEEViKA programme on consumption to the fact that the programme had not started convergence activities with other social schemes. On the other hand, convergence activities with public distribution systems has been discussed as factor that led to improved nutrition outcomes in the study in Andhra Pradesh by Deininger and Liu.

Research studies, however, also differ in their methods, and this variation in methodology contributes to the variation in results (Brody et al. 2015). A small set of

studies utilize random assignment of villages within a block or a district to treatment and control samples (Deininger and Liu 2013; Desai and Joshi 2014; Ban et al. 2015), with SHGs being formed in treatment areas but not in control. However, in several of these studies, the contamination of the control sample is an issue (Deininger and Liu 2013). Additionally, the randomisation of treatment may also affect the programme, complicating comparisons with other studies. For example, when the programme is randomly introduced in some but not all gram panchayats (GP) of a block, one consequence is that block level officials can concentrate their efforts (and resources) just on treatment blocks. As a consequence, even when monetary resources and programme inputs are held constant, the ability to concentrate managerial and human capital abilities on just a subset of the block may generate much larger treatment effects than what one would observe from other programme designs, such as one that phased in the programme over blocks. That is, different methods of implementing a programme affect evaluation results.

Given the inability to implement RCTs in most instances, much of the literature has dealt with potential bias due to endogenous programme placement or selection into treatment through a mix of matching methods and difference-in-difference regressions, with the latter being used (in combination with matching methods) in studies that have access to two rounds of data. Identification under both methods, however, requires strong identifying conditions.

For example, matching methods assume that selection is based on observable variables. In the case of NRLP, however, this is unlikely to be true, particularly as regards the selection of treatment blocks. Programme guidelines require NRLP blocks to be the poorest of all blocks in a district. That is, NRLP blocks were intended to be different from other blocks in a district. Though guidelines were given for the variables to be taken into account in identifying NRLP blocks, such as the proportion of scheduled caste (SC) and scheduled tribe (ST) households, the choice could also be based on unobservable (to the econometrician) variables such as the strength of existing community institutions. Additionally, discussions with state-level officials suggest that political and other factors also played a role. In short, controlling for observable characteristics such as the observed level of poverty, NRLP blocks are likely to differ from other blocks in terms of unobservable variables. In such cases, concerns related to endogenous programme placement remain.

Though many studies undertook matching at the level of the village, matching villages in treatment blocks to those in control blocks in which the programme had not yet commenced; the fact that the programme is importantly influenced by block-level factors including the capacity of block administrative units, invalidates this approach. Thus, treatment and control villages that are perfectly matched in terms of observable village-level attributes differ in terms of the attributes of the blocks in which they are located. In turn, block-level unobservable factors will generate biased estimates.

Similarly, difference-in-difference methods based on changes in outcomes over time assume that selection into the programme is based on time-invariant unobservable characteristics of the region. However, to the extent that programme placement took into place the success of earlier SHG efforts under SGSY, this assumption may be difficult to support.

Identification based on instrumental variables also relies on stringent identifying assumptions that are often difficult to substantiate. They require the existence of a set of variables, 'instruments,' that are correlated with the treatment variable or a measure of programme implementation, but not directly with the outcome in question. In studies of SHGs and their effects, research based on instrumental variables has frequently used measures of caste heterogeneity, such as an index for whether the household belong to the dominant caste of the hamlet (Garikipati 2012, Hoop et al 2010). This choice of instruments is guided by literature that argues that collective action and community institutions are adversely affected by group heterogeneity, a hypothesis that is supported by empirical evidence (Alesina, Baqir and Easterly 1999). However, the use of measures of caste heterogeneity as instruments for SHG membership are unlikely to satisfy exclusion restrictions: the 'distance' in caste between the household in question and that of the majority of households in a hamlet is likely to influence any number of other socio-economic outcomes, such as access to informal credit and risk-sharing networks. These outcomes, in turn, will undoubtedly directly affect households' savings, income and expenditure. More promising would be identification of programme effects that relate explicitly to the programme in question.

A different set of concerns relates to the interpretation of results. Most of the available studies provide intent-to-treat (ITT) estimates of the mean effect of the programme on household outcomes in treatment relative to control areas (Khanna et al. 2015; Singh et al. 2017). It is well recognised that ITT estimates cover the response of households to the package of inputs or interventions offered by the programme. In some instances, positive and significant ITT estimates may exist, even if central aspects of the programme are ineffective. For example, an underlying premise of NRLP is that SHGs can facilitate improved financial engagement and hence financial outcomes, such as formal savings, for households. And, many existing studies do in fact suggest such an effect. However, these positive effects may be a consequence of specific features of NRLP, such as the system of 'bank *mitras*' that entails placing a community cadre member in each bank to facilitate households' access to financial services, features that could be put in place even in the absence of SHGs, and are likely to enhance outcomes for all households, not just SHG members. Similarly, improvements in financial savings in programme areas may also reflect improved institutional arrangements put in place by the formal banking sector in an attempt to support NRLP. In both cases, positive ITT estimates may be consistent with ineffective SHGs but effective development of supporting infrastructure and systems.

These problems of interpretation are difficult to address and common to most programme evaluations. They remain even in studies that attempt the identification of causal effects of SHGs. A positive effect of a SHG may be a consequence of a number of factors, including an impact through improved delivery of financial services or other government programmes, and the challenge of identifying pathways is not automatically addressed by these estimates. However, causal estimates of the effect of SHGs, should they be established, do at least suggest that a pathway through SHGs is important for affecting household outcomes.

There are, however, very few estimates of the causal effect of SHG quality on household outcomes. This reflects the fact that control villages are generally selected from blocks in which the programme had not commenced at the time of the study and that lack SHGs.

Consequently, SHG quality is only measured for treatment villages. Deininger and Liu (2013) is an exception in that they compare early implementing regions to late implementing regions, with SHGs also in existence in the latter. This allows them to estimate the effect of early versus late SHG membership on household outcomes. However, they do not exploit the availability of SHGs in both treatment and control areas to examine the effect of programme duration on SHG quality, or the causal effect of SHG quality on household outcomes.

Limited information on SHG quality in most studies, combined with insufficient geographical coverage, also explains the lack of evidence on some of the distinctive elements of NRLM, such as the effect on SHG quality of block and cluster-level (programme) resources; most studies contrast treatment and control villages, ignoring factors such as differences across treatment SHGs caused by variation in block or cluster level support. Additionally, little evidence exists on some of the key tenets of NRLP, such as the hypothesis that federating SHGs within a village may be critical for enhancing the bargaining power of the poor and also providing the scale necessary to achieve improvements in livelihoods. Similarly, there is little evidence on whether the attempt to sustain the programme through the recruitment of a community cadre is proving successful.

A2: Validating the difference-in-difference methodology

Identification of programme effects in difference-in-difference regressions builds on the assumption that the change in variables of interest in treatment units would have been similar to that in control units prior to the initiation of the programme. If so, any post-programme difference in growth rates can be ascribed to the programme. In the context of this study, the identifying assumption is that the difference between early and late villages in early programme blocks would have been identical to the difference between early and late villages in late blocks.

Testing this assumption requires pre-programme data. While baseline studies for our set of sample villages are not available, India's 2011 census provides a valid baseline, since it provides information on all villages and was conducted just prior to the initiation of NRLP in 2012. The usefulness of the census for this purpose comes from its village directories. These directories not only provide information on village infrastructure but also on a set of household outcomes aggregated at the level of the village, of which some are very closely related to those targeted by NRLP. We focus on the following: An index reported in the Census of asset poverty (the percentage of households who do not own either a radio, TV, landline phone, cell phone or computer); an index of (poor) house quality (the percentage of households who reside in a house with a poor quality roof or walls, and without a kitchen); the proportion of households availing bank services; and the female work force participation rate.

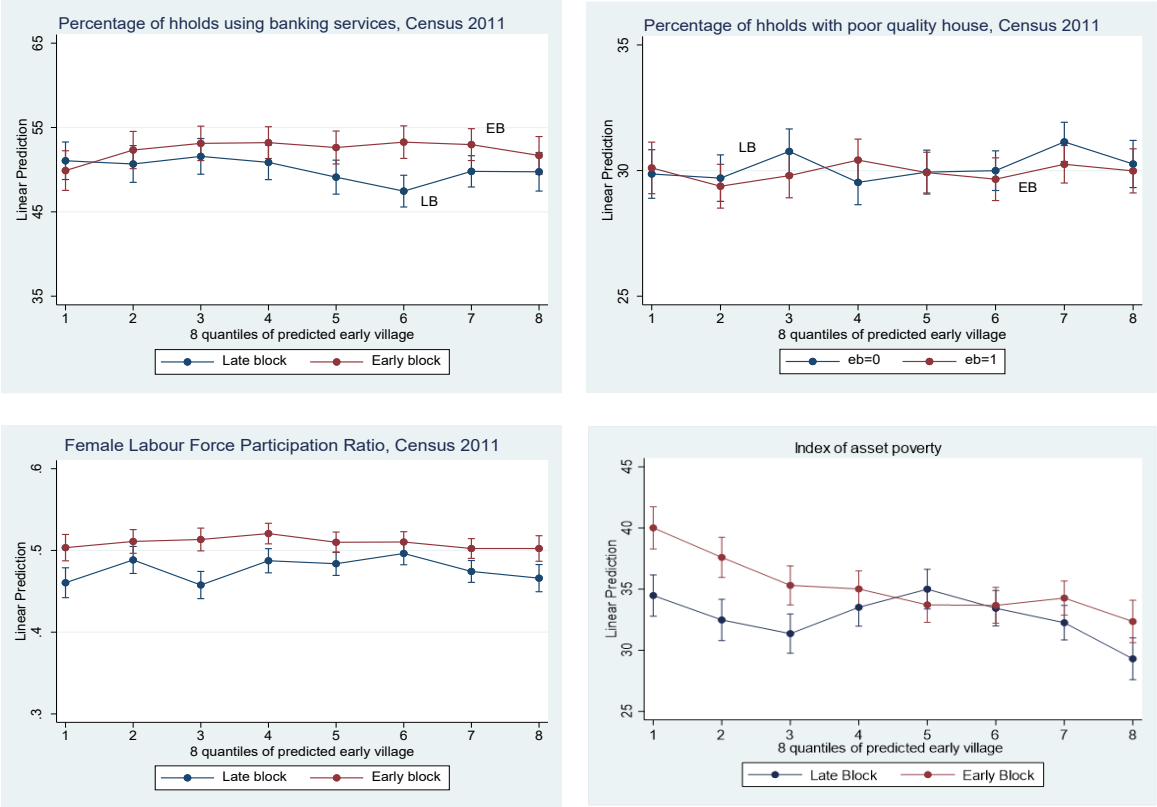
Matching our survey villages to the 2011 census thus provides a set of baseline outcomes for each village in our sample which we use to test the difference-in-difference "equal pre-trends" assumption. Regressions in table 1.2 report coefficients from a simple regression of the outcome variable on the interaction of early village and early block, as well as on indicator variables for each of these components. Additionally, all regressions include the following: the number of villages in the district, block and cluster; district,

block and village population; and a set of state fixed effects. The regression is run on the set of our sample villages only, yielding a sample size of 735. Robust standard errors, adjusted for heteroscedasticity, are reported in parentheses. The regression reveals that the interaction of early village and early block is never statistically significant, suggesting that the difference between early villages in early and late blocks is statistically similar to that between late villages in these two sets of blocks.

However, the coefficients in the indicators for early village and for early block are also rarely significant, suggesting that these regressions may lack statistical power due to the relatively small sample size. To address this concern, we expand our sample to include *all* census villages within our survey cluster, a sample of 12,380 villages. We generate a predicted early village score (PEV), through a regression of EV on the variables used as the basis for the phased introduction of SHGs across villages in a cluster, specifically the village's cluster population rank, its distance from block head office, and the interaction of these two variables. The predicting regression also includes the other regressors defined in the paragraph above (number of villages in the district, block and cluster; district, block and village population, and state indicator variables). Creating eight groupings of this predicted score, we graph outcomes for all villages by this ranking, separately for early and late blocks. This allows us to visually examine differences in outcomes across villages in early and late blocks by ordered groupings of the predicted EV score.

The graphs in Figure A1 reveal that outcomes are very close to parallel for early and late blocks across the entire distribution of cluster rank, lending strong support to the assumption that there is no statistically significant difference between outcomes in early villages across early and late blocks, relative to this same difference for late villages. Of the four outcomes we consider, there is only one (the index of asset poverty) which suggests a small difference between early and late villages in early versus late blocks.

Figure A1: Testing assumptions of simple difference-in-difference methodology



This validation exercise is qualified by the limited number of outcomes available in census data, particularly relative to the large number of outcomes we examine in our study. However, the fact that the census data includes a measure of financial inclusion is particularly useful. Since any improvements in household outcomes as a consequence of NRLP are likely to follow from changes in financial outcomes, particularly use of banks for savings and loans, the evidence of this section suggests that the identifying assumption of equal pre-programme differences is also likely to hold for these outcomes.

Table A1: Testing difference-in-difference specification

	EV x EB	EV	EB
Household asset	-3.81	3.27	8.10***
(poverty) index	(2.86)	(2.08)	(2.06)
Prop. of hholds using	2.43	0.09	2.04
banking services	(4.53)	(3.25)	(3.36)
Female labour force	0.01	-0.03	0.02
participation rate	(0.03)	(0.02)	(0.02)
Prop with poor quality	0.14	0.24	-0.53
house	(0.09)	(1.15)	(1.18)

Note: Sample size is 735. Household assets is the proportion of households who do not report ownership of any of the following assets: radio, TV, landline, cell, computer. Poor quality house is an index of the proportion of households with a roof of poor material (grass, bamboo, thatch, etc), walls of poor material (mud, thatch, grass, bamboo), and of no kitchen. All regressions include the following additional regressors: number of villages in the district, block and cluster; district, block and village population, and state fixed effects. Robust standard errors in parentheses.

A3: Justification of scale variables

These controls for scale are similar in spirit to those used in recent research to identify spatial spillovers from programme implementation in adjoining geographies to treatment units (Muralidharan, Niehaus and Sukhtankar 2018; Egger, Haushofer, Miguel, Niehaus and Walker 2019). Muralidharan et al, for example, examine how outcomes are affected by the proportion of treated units in adjoining blocks (*mandals*) to that in question, a measure that is very similar to ours. The concern of both studies is the existence of general equilibrium effects such as programme effects on prices of wages in broader markets. Consequently, the measures they use reflect contemporaneous spatial spillover. In contrast our concern with initial conditions underlies our use of lagged treatment intensity.

Survey data on how SHGs were formed allows us to support the value of this set of 'scale variables' in controlling for differences in formation and initial conditions.[58] We do so through regressions in which the dependent variable is an indicator variable for whether the SHG was formed by an internal CRP (including active women). This information is available for all SHGs that we surveyed, a sample of 3,494 SHGs, including those that are matched to survey households as well as the additional four SHGs in each village. Results are reported in table. The first regression regresses the indicator variable (iCRP) on the state-level covariates we will use later in our regression equations. These covariates are the number of villages in the district, block and cluster; and district, block and village population. The first regression, however, excludes scale variables. The second regression adds on the three scale variables (*distr_vill, bl_vill, distr_shg)* along with their interactions with state dummy variables.

The results reveal that in the absence of controls for scale, the coefficient on the interaction of the indicator for early village (EV) with that for early block (EB), the variable we use to identify programme effects, is negative and statistically significant at one per cent confidence level, confirming that SHGs in these villages are least likely to be formed by internal CRPs. In regressions with scale variables, however, the coefficient on the interaction of EV and EB is no longer statistically significant while the scale variables are. These results suggest that the interaction of EV and EB, EV*EB, will not reflect differences in the method in which SHGs were formed, in regressions that also control for scale effects. They will likely also capture the effect of other initial differences that are related to programme scale within the block and district at the time of SHG formation.[59] However, we cannot rule out the possibility that the interaction of EV*EB may still identify the effect of some (residual) initial differences.

[58] Because the calculation of these variables omits the number of pre-existing SHGs formed within the cluster, they are unlikely to be correlated with the recruitment of community cadre members from within the village for VO level appointments (internal drivers).

[59] For example, if early members of the community cadre are used to train those who are later recruited, then measures of geographic scale will also reflect this improvement in training capacity.

Table A2: Interpreting scale variables

(Dependent variable: indicator if SHG formed by iCRP)

Variable	(1)	(2)
ev * eb	-0.08***	0.02
	(0.02)	(0.03)
ev	0.10***	0.11***
	(0.02)	(0.02)
eb	0.12***	-0.05
	(0.02)	(0.04)
scale variables[1]		
distr_vill	--	0.0008
		(0.001)
bl_vill	--	0.005***
		(0.001)
distr_shg	--	-0.0001
		(0.0001)
Interactions of scale variables with state fixed effects	No	Yes
F test for distr_vill * state interactions (Prob > F)	--	11.42
		(0.00)
F test for bl_vill * state interactions (Prob > F)	--	12.25
		(0.00)
F test for distr_shg * state interactions (Prob > F)	--	12.07
		(0.00)

Note: Robust standard errors in parentheses. All regressions include: the number of villages in the district, block and cluster; district, block and village population; and state fixed effects. Sample sizes: 3,664 .

[1]Coefficients on scale variables in regression 2 are those on the omitted state (Rajasthan).

*** (p<=0.01); ** (p<=0.05); * (p<=010)

Table A3: Determinants of SHG and VO age

	Regression 1		Regression 2	
	SHG age	**VO age**	**SHG age**	**VO age**
Instruments				
EV x EB	25.52***	15.97***	22.69***	20.00***
	(0.53)	(0.83)	(0.60)	(1.08)
EV x EVOB	--	--	4.68***	-6.71***
			(0.65)	(1.27)
Addditional regressors				
EV	9.05***	5.61***	8.90***	5.57***
	(0.24)	(0.38)	(0.24)	(0.38)
EB	14.28***	5.49***	9.31***	0.81
	(0.47)	(0.71)	(0.51)	(0.91)
EVOB	--		11.78***	8.89***
			(0.80)	(0.90)

Note: Sample excludes Bihar. Sample size is 13,654. Additional regressors include state fixed effects and their interaction with scale variables, number of villages in district, block and cluster, district block and village population. Robust standard errors in parentheses.

*** (p<0.01) ** (p<0.05) * (p<0.01)

Table A4: Testing extended difference-in-difference specification

	EV x EB	EV x EVOB	EV	EB
Household asset (poverty) index	-2.06	-2.86	3.42	10.10***
	(3.87)	(4.55)	(2.14)	(2.78)
Prop. of hholds using banking services	-2.04	6.41	-0.65	1.92
	(5.32)	(5.85)	(2.78)	(4.13)
Female labour force participation rate	0.005	0.005	-0.003	0.05
	(0.04)	(0.04)	(0.02)	(0.03)
Prop with poor quality house	-0.16	0.62	0.44	-0.04
	(2.23)	(2.48)	(1.17)	(1.69)

Note: Sample size is 735. Household assets is an index based on ownership of radio, TV, LPG gas cylinder, cell phone and a bike. Poor quality house is an index of the proportion of households with a roof of poor material (grass, bamboo, thatch, etc), walls of poor material (mud, thatch, grass, bamboo), and of no kitchen. Robust standard errors in parentheses.

Table A5: Survey districts and samples

State	District	Sample size
Bihar	Gaya	249
	Madhepura	2000
	Madhubani	402
	Muzaffarpur	925
	Nalanda	381
	Saharsa	983
	Supaul	930
Chattisgarh	Balrampur	466
	Bastar	474
	Gariyabad	475
	Raipu	469
	Rajnandgaon	470
	Surguja	447
Jharkhand	Giridh	989
	Latehar	478
	Palamu	479
	Paschimi Singhbhum	457
	Ranchi	455
Madhya Pradesh	Damoh	481
	Guna	480
	Narsimhapur	480
	Raisen	481
	Rajgarh	478
	Rewa	477
Maharashtra	Gadchiroli	480
	Jalna	479
	Nandurbar	932
	Solapur	480
	Yavatmal	480
Odisha	Kandhamal	479
	Korapur	450
	Mayurbhanj	474

State	District	Sample size
	Rayagada	474
	Sambalpur	446
	Sundargarh	471
Rajasthan	Banswara	470
	Bhilwara	481
	Chittaurgarh	479
	Dungapur	960
	Udaipur	956
Uttar Pradesh	Allahabd	473
	Ambedkar Nagar	480
	Azamgarh	470
	Bijnor	479
	Chandauli	496
West Bengal	Burdwan	372
	Maldah	361
	Paschim Medinipur	368
	South 24 Parganas	361
Total		27,257

Table A6: Main variables and their definitions

Variable	Description
Savings (in 000s)	
Total savings of household	Total household savings, defined as income minus expenditure
Bank savings	Total Institutional savings by the household (includes savings in banks, post office, cooperative society, excludes SHGs)
Bank savings - male	Total Institutional savings by males of the household (includes savings in banks, post office, cooperative society, excludes SHGs)
Bank savings - female	Total Institutional savings by females of the household (includes savings in banks, post office, cooperative society, excludes SHGs)
SHG savings - female	Total SHG savings by females of the household
HH Loan Amounts, Current Outstanding Loans (in 000s)	
Total household loan amount	Total current outstanding loan amount for loans taken by the household. Also defined separately by loans taken by all males and females in the household
Bank / formal household loan amount	Total current outstanding loan amount for loans taken by the household from banks and formal institutions. Formal instutions includes - banks, MFIs, cooperative society, finance company, provident fund, SC/ST corporation, KCC, cooperative bank, government loan, LIC). Also defined separately for loans taken by all males and females in the household

Variable	Description
Informal household loan amount	Total current outstanding loan amount for loans taken by the household from informal sources. Informal sources includes - Pawn shop, Money lender, Shopkeeper, Chit fund, Employer. Also defined separately for loans taken by all males and females in the household
Relatives / friends household loan amount	Total current outstanding loan amount for loans taken by the household from relatives, friends and neighbours. Also defined separately for loans taken by all males and females in the household
SHG household loan amount	Total current outstanding loan amount for loans taken by the household from SHG
Total female SHG loan amount	Total current outstanding loan amount for loans taken from SHGs by all the females in the household
Informal Loans and high cost debt	
Share of informal loans to all loans in last 5 years	Calculated as the proportion of borrowings from informal sources (last five years). Informal sources includes - Pawn shop, Money lender, Shopkeeper, Chit fund, Employer
Share of informal loans to all loans in last 2 years	Calculated as the proportion of borrowings from informal sources (last two years). Informal sources includes - Pawn shop, Money lender, Shopkeeper, Chit fund, Employer
Amount of high cost loan (Calculated for informal loans)	Total amount of outstanding high cost loan (defined as informal loans wherein the monthly rate of interest exceeds 4 percent)
Indicator for high cost loan (Calculated for informal loans)	Indicator variable, takes a value 1 if the household has any high cost loan and 0 otherwise
Interest Rate on informal loans	Interest paid by the household on informal loans
Labour Force Participation	
Labour force participation rate (Female)	Proportion of females (in 20-60 age group) who are active in productive activities as per primary, secondary or tertiary activity status
Labour force participation rate (Male)	Proportion of males (in 20-60 age group) who are active in productive activities as per primary, secondary or tertiary activity status
Labour force participation rate (Female, Primary status)	Proportion of females (in 20-60 age group) who are active in productive activities as per primary activity status
Labour force participation rate (Female, Secondary status)	Proportion of females (in 20-60 age group) who are active in productive activities as per secondary activity status
Labour force participation rate (Male, Primary status)	Proportion of males (in 20-60 age group) who are active in productive activities as per primary activity status

Variable	Description
Labour force participation rate (Male, Secondary status)	Proportion of males (in 20-60 age group) who are active in productive activities as per secondary activity status
Average hours in productive work (Females, Primary status)	Calculated as the average number of hours spent by females (in 20-60 age group) in productive activity, as per primary status, calculated only for those females who are into productive activity in the household
Average hours in productive work (Females, Secondary status)	Calculated as the average number of hours spent by females (in 20-60 age group) in productive activity, as per secondary status, calculated only for those females who are into productive activity in the household
Average hours in productive work (Males, Primary status)	Calculated as the average number of hours spent by males (in 20-60 age group) in productive activity, as per primary status, calculated only for those males who are into productive activity in the household
Average hours in productive work (Males, Secondary status)	Calculated as the average number of hours spent by males (in 20-60 age group) in productive activity, as per secondary status, calculated only for those males who are into productive activity in the household
Income and Livelihoods (Incomes in 000s)	
Total income	Total income of the household earned in the past 12 months
Agriculture income	Total income of the household from agriculture, in the past 12 months
Livestock income	Total income of the household from livestock, in past 12 months
MNREGA wages	Total income of the household from MGNREGA, in past 12 months
Wage income, casual labour market	Total income earned by the household from casual wage employment, excludes income from MGNREGA and salary
Total wage income	Total income earned by the household from wage employment, includes income from casual work, MGNREGA and salary
Enterprise Income	Total income of the household from Non Agricultural Enterprises, in past 12 months
Number of female owned enterprises	Total number of female headed enterprises
Number of sources of income	Total number of sources wherein the household earned income from
HH involved in cultivation	Indicator variable, defined as 1 if the household is engaged in occupation - cultivation and 0 otherwise

Variable	Description
HH involved in livestock occupation	Indicator variable, defined as 1 if the household is engaged in occupation - livestock and 0 otherwise
HH involved in enterprises	Indicator variable, defined as 1 if the household is engaged in occupation - non agricultural enterprises and 0 otherwise
HH involved in NREGA	Indicator variable, defined as 1 if the household is engaged in occupation - MGNREGA and 0 otherwise
HH involved in occupation involving wages and salaries (male & female)	Indicator variable, defined as 1 if the household is engaged in occupation - wages and salaries, and 0 otherwise
HH has tranfer income	Indicator variable, defined as 1 if the household is engaged in occupation - transfer income, and 0 otherwise
HH has other income	Indicator variable, defined as 1 if the household is engaged in occupation - others, and 0 otherwise
Earned income from agriculture	Indicator variable, defined as 1 if the household earned income from cultivation and 0 otherwise
Earned income from livestock	Indicator variable, defined as 1 if the household earned income from livestock and 0 otherwise
Earned income from enterprises	Indicator variable, defined as 1 if the household earned income from non agricultural enterprises and 0 otherwise
Earned income from NREGA	Indicator variable, defined as 1 if the household earned income from MGNREGA and 0 otherwise
Earned income from wages and salaries (male & female)	Indicator variable, defined as 1 if the household earned income from wages & salaries and 0 otherwise
Earned income from transfers	Indicator variable, defined as 1 if the household earned income from transfer income and 0 otherwise
No. of HH members who migrated	Total number of household members who migrated
Expenditure	
Household expenditure (incl. expenditure on durables and education) (in 000s)	Total expenditure by the household in the past 12 months
Food share of	Share of food in the total expenditure by the household on food, non

Variable	Description
household expenditure	food, education, consumption durables
Went hungry	Whether the survyed women went hungry during the past 12 months (Yes=1, No=0)
Household education expenditure (in 000s)	
Food diversity index	The food diversity index is calculated using the reported dietry diversity by the surveyed women. It takes a value 1 if the household consumed from atleast five of the following broad food categories - a) Grains, b) Beans or peas, c) Nuts or seeds, d) Milk or milk products, e) Meat or fish, f) Eggs, g) Green Vegetables (Spinach, Methi), h) Other Vegetables (Cabbage, Cauliflower), i) Other fruits (Banana, Apple), and j) Orange fruits or vegetables (Mango, Pumpkin); other it takes a value 0
value of total exp on all food items	Value of total expenditure on all food items (Past 1 month)
total non-food items of monthly exp	Value of total expenditure on all non food items (Past 1 month)
total non-food items of annual exp	Value of total expenditure on other non food items (includes clothing, bedding, footwear etc) (Past 1 year)
Did your household incur any expenditure on agricultural land improve	Indicator variable, 1 if the household incur any expenditure on agricultural land improvement in last 12 months and 0 otherwise
Did your household incur any expenditure on improvements of buildings	Indicator variable, 1 if the household incur any expenditure on building improvement in last 12 months and 0 otherwise
Expenditure on durables	Expenditure on consumer durables (includes sewing machine, washing machine etc)
Expenditure on cereals - PDS (Rice and Wheat)	Value of expenditure incurred on cereals - rice and wheat purchased from PDS (Past 1 month)
Expenditure on cereals - Home produce (Rice, Wheat, Pulses and Other Cereals)	Value of expenditure incurred on cereals - rice, wheat and other cereals from home produce (Past 1 month)
Expenditure on cereals - Market value (Rice, Wheat, Pulses and Other Cereals)	Value of expenditure incurred on cereals - rice, wheat and other cereals purchased from market (Past 1 month)

Variable	Description
Expenditure on other food - Market value (Milk, Oil, Sugar, Vegetables and Fruits)	Value of expenditure incurred on other foods (including Milk, Oil, Sugar, Vegetables and Fruits) purchased from market (Past 1 month)
Expenditure on other food - Home produce (Milk, Oil, Sugar, Vegetables and Fruits)	Value of expenditure incurred on other foods (including Milk, Oil, Sugar, Vegetables and Fruits) from home produce (Past 1 month)
Expenditure on eggs, meat and fish - Home produce	Value of expenditure incurred on eggs, meat and fish from home produce (Past 1 month)
Expenditure on non food items (Fuel, Cell Phone, Rent, Transport etc)	Value of expenditure on non food items (including Fuel, Cell Phone, Rent, Transport etc) (Past 1 month)
Assets	
Value of productive assets (in 1000s) (incl. livestock and ag land)	Total Value of productive assets of the household (including agricultural land and livestock), these includes the following for instance - pump set, tractor and so forth
Value of consumer assets (in 1000s)	Total value of consumption assets of the household, these includes the following for instance - sewing machine, refrigerator, washing machine and so forth. This excludes value of gold and silver
Indicator for household owning any productive assets (incl. livestock and ag land)	Indicator variable, 1 if the household has any productive assets (including agricultural land and livestock) and 0 otherwise
Value of ag land	Value of agricultural land owned by the household
Indicator for household owning ag land	Indicator variable, 1 if the household owns any agricultural land and 0 otherwise
Index for housing quality (higher score indicates lower quality)	Index of poor house quality, ranging from 1-3, with 3 being poorest. Defined using information on the quality of floor, roof and walls of the house
Empowerment	
Decision-making Index (Using percentage) - Standardized	In order to capture information on decision-making within the household, we asked the women respondents as to what they feel about their inputs in household decisions relating to household expenditure, borrowing, education and healthcare for children. Based on the reported information, we define a decision-making index as the percentage of cases (for a total of 26 decisions) for which the females felt that their inputs were important for that decision. The decision-making index for indexed SHG households has been further standardized using the mean

Variable	Description
	and standard deviation of the decision-making index for the non-indexed SHG households
Confidence Index (Using percentage)	With regard to self-efficacy, we asked the respondents eight questions. These questions captured respondent's confidence in - a) interacting and dealing with service and administrative officials such as the sarpanch, bank officials, b) going to the PDS shop, c) raising issues and sharing opinions in SHG meetings, and c) discussing health care related issues and accessing health care facilities. We use the responses on these measures of self-efficacy to define a confidence index as the percentage of cases (out of eight) wherein the female responded as - *very confident*.
Number of social security schemes availed	Out of a list of 28 social security and welfare related schemes (such MGNREGA, Swach Bharat, Ujwala Yojana and so forth), we asked the households the number of schemes that they are aware of and have availed. The variable herein measures the total number of schemes (out of the listed 28 schemes) that the households have availed in the past 12 months

Table A7: Survey village characteristics

	Mean	Standard Deviation
Village Population (Source: Census 2011)	2320.873	(2482.1)
Village proportion SC/ST (Source: Census 2011)	0.421	(0.314)
Access to banks: Bank in village	0.462	(0.499)
Access to banks: distance to bank (0 if bank in village)	6.719	(7.521)
Distance from block HQ	16.922	(15.52)
Access to markets: Market in village	0.221	(0.415)
Access to markets: distance (0 if market in village)	5.939	(7.199)
Sample size	1052	--

Source: Survey and Census 2011 data

Table A8: Summary Statistics, Households

	Mean	Standard Deviation
Household Size	5.188	(2.139)
Scheduled Caste	0.315	(0.465)
Scheduled Tribe	0.308	(0.462)
Maximum level of schooling of household males ages 18 and older	6.561	(4.862)
Maximum level of schooling of household females ages 18 and older	4.535	(4.867)
Prop. hholds with agriculture income	0.537	(0.499)
Prop. hholds with wage income	0.705	(0.456)
Prop. hholds with non-ag business income	0.121	(0.327)
Prop. hholds with salary earnings	0.175	(0.380)
Prop. hholds earning productive assets	0.455	(0.498)
Prop. hholds owning agricultural land	0.574	(0.494)
Total household income (INR)	74977.215	(164614.8)
Annual household consumption expenditure (INR)	123671.8	(140542.4)
Food share	0.433	(0.168)
Hhold average female labour force participation rate (women >=20 years and <60 years)	0.799	(0. 361)
Decision-making Index	20.109	(30.971)
Confidence Index	52.912	
Food diversity Index	0.161	
Food share	0.433	(0.168)
Sample size	27257	--

Source: Survey data

Note: Maximum education is the highest grade completed by a male or female household member above 18 years of age. Productive assets include assets like tractor, thresher etc., agricultural land and livestock. Definitions for decision-making, confidence and food diversity indices are in Appendix table A6.

Table A9: Difference in difference results (excluding MP and Maharashtra)

	(1)	(2)	(3)	(4)	(5)
Variable	**EV x EB**	**EB**	**EV**	**Predicted Mean (EV x EB==1)**	**Percentage Change (Beta/abs(Predicted Mean)**
Savings (in 000s)					
Total savings of household	15.014***	-4.830	-3.937	-53.57	28.02
	(5.395)	(4.905)	(3.526)		
Bank savings	-0.695	-1.458***	0.730*	6.293	-11.04
	(0.596)	(0.520)	(0.387)		
Bank savings - male	-0.330	-1.092***	0.125	3.467	-9.52
	(0.423)	(0.372)	(0.273)		
Bank savings - female	-0.081	-0.439**	0.131	1.934	-4.18
	(0.214)	(0.192)	(0.138)		
SHG savings - female	0.975***	0.141	0.262***	2.066	47.19
	(0.102)	(0.087)	(0.068)		
HH Loan Amounts, Current Outstanding Loans (in 000s)					
Total household loan amount	3.340	-5.392***	3.443**	20.53	16.27
	(2.203)	(1.956)	(1.360)		
Bank / formal household loan amount	0.675	-1.516	1.598**	4.279	15.77
	(1.084)	(0.949)	(0.696)		
Informal household loan amount	-0.029	-0.463	-0.006	2.076	-1.38
	(0.563)	(0.497)	(0.358)		
Relatives / friends household loan amount	0.677	-2.038***	-0.147	3.475	19.48
	(0.832)	(0.721)	(0.539)		
SHG household loan amount	1.131**	1.233***	1.103***	7.225	15.65
	(0.463)	(0.376)	(0.254)		

HH Loan Amount (by gender, in 000s)					
Total male loan amount	0.751	-4.138**	1.114	9.744	7.71
	(2.024)	(1.808)	(1.276)		
Total female loan amount	2.380***	-1.077	2.555***	10.98	21.68
	(0.850)	(0.728)	(0.480)		
Total female SHG loan amount	1.182**	1.254***	1.064***	7.155	16.52
	(0.461)	(0.375)	(0.251)		
Total male bank loan amount	0.055	-0.482	1.269*	3.309	1.65
	(1.014)	(0.879)	(0.662)		
Total female bank loan amount	0.566	-0.989***	0.377*	1.008	56.15
	(0.358)	(0.332)	(0.217)		
Total male informal loan amount	0.074	-0.304	-0.044	1.722	4.32
	(0.544)	(0.475)	(0.350)		
Total female informal loan amount	-0.160	-0.068	0.053	0.445	-35.96
	(0.144)	(0.145)	(0.075)		
Total male relative loan amount	0.202	-1.336*	-0.130	2.993	6.75
	(0.796)	(0.690)	(0.517)		
Total female relative loan amount	0.428*	-0.722***	-0.034	0.526	81.37
	(0.235)	(0.206)	(0.154)		
Informal Loans and high cost debt					
Share of informal loans to all loans in last 5 years	0.001	-0.013	-0.008	0.0506	2.31
	(0.011)	(0.010)	(0.007)		
Share of informal loans to all loans in last 2 years	0.002	-0.004	-0.002	0.0457	5.45
	(0.010)	(0.010)	(0.007)		
Amount of high cost loan (Calculated for informal loans)	661.790	-1,808.606***	215.923	113.1	585.15
	(597.890)	(672.688)	(324.131)		
Indicator for high cost loan (Calculated for informal loans)	0.001	-0.029**	0.002	0.0401	2.11
	(0.012)	(0.011)	(0.008)		

Interest Rate on informal loans	2.209	-3.443	0.338	33.36	6.62
	(6.129)	(5.939)	(3.051)		
Labour Force Participation					
Labour force participation rate (Female)	0.003	0.060***	0.008	0.772	0.41
	(0.019)	(0.017)	(0.013)		
Labour force participation rate (Male)	0.012	0.002	-0.002	0.941	1.32
	(0.010)	(0.009)	(0.006)		
Labour force participation rate (Female, Primary status)	-0.039*	0.073***	-0.009	0.278	-13.99
	(0.020)	(0.018)	(0.013)		
Labour force participation rate (Female, Secondary status)	0.028	0.022	0.022	0.596	4.77
	(0.023)	(0.021)	(0.015)		
Labour force participation rate (Male, Primary status)	-0.007	0.014	0.003	0.936	-0.77
	(0.012)	(0.011)	(0.008)		
Labour force participation rate (Male, Secondary status)	-0.018	0.130***	-0.025	0.628	-2.80
	(0.025)	(0.022)	(0.016)		
Average hours in productive work (Females, Primary status)	-2.341	7.625	-2.941	129.3	-1.81
	(7.842)	(7.345)	(5.123)		
Average hours in productive work (Females, Secondary status)	7.718**	-3.836	-4.556*	77.31	9.98
	(3.917)	(3.307)	(2.441)		
Average hours in productive work (Males, Primary status)	14.862***	-13.030***	-4.721	148.6	10.00
	(4.824)	(4.417)	(3.031)		
Average hours in productive work (Males, Secondary status)	7.164	0.505	1.283	85.19	8.41
	(5.202)	(4.653)	(3.309)		

Income and Livelihoods (Incomes in 000s)					
Total income	9.206**	-11.600***	1.782	63.53	14.49
	(3.781)	(3.231)	(2.490)		
Agriculture income	0.968	0.145	-0.410	-7.448	13.00
	(0.878)	(0.763)	(0.693)		
Livestock income	-0.273	-1.132	-1.010	1.982	-13.77
	(0.975)	(0.761)	(0.665)		
MNREGA earnings	0.564***	-0.134	-0.223**	0.564	100.00
	(0.174)	(0.150)	(0.110)		
Wage income, casual labour market	11.144***	-8.439***	-2.116	31.19	35.72
	(2.413)	(2.066)	(1.611)		
Total wage income	11.062***	-12.450***	-0.072	50.76	21.79
	(3.672)	(3.193)	(2.390)		
Enterprise income	-0.245	-1.951	1.325	9.781	-2.50
	(4.400)	(3.696)	(2.872)		
Number of female owned enterprises	-0.087***	0.083***	0.010**	0.116	-74.91
	(0.017)	(0.015)	(0.005)		
Number of sources of income	0.188***	0.100	-0.022	2.310	8.14
	(0.073)	(0.067)	(0.043)		
HH involved in cultivation	-0.041*	0.107***	0.010	0.753	-5.47
	(0.023)	(0.020)	(0.015)		
HH involved in livestock occupation	-0.027	0.047**	0.010	0.632	-4.24
	(0.025)	(0.022)	(0.016)		
HH involved in enterprises	-0.079***	0.080***	0.032***	0.226	-35.09
	(0.019)	(0.016)	(0.011)		
HH involved in NREGA	0.031	0.058***	0.002	0.168	18.45
	(0.019)	(0.018)	(0.012)		
HH involved in occupation involving wages and salaries (male & female)	0.070***	-0.029	-0.001	0.794	8.85

	(0.020)	(0.018)	(0.013)		
HH has transfer income	-0.007	-0.005	0.020	0.215	-3.08
	(0.022)	(0.020)	(0.014)		
HH has other income	0.006	-0.002	0.001	0.0103	54.37
	(0.006)	(0.005)	(0.003)		
Earned income from agriculture	0.056**	0.040*	-0.023	0.543	10.29
	(0.026)	(0.024)	(0.017)		
Earned income from livestock	0.000	-0.005	-0.007	0.417	0.03
	(0.026)	(0.024)	(0.016)		
Earned income from enterprises	-0.065***	0.074***	0.023**	0.194	-33.25
	(0.018)	(0.016)	(0.010)		
Earned income from NREGA	0.037**	0.053***	-0.003	0.150	24.53
	(0.019)	(0.017)	(0.011)		
Earned income from wages and salaries (male & female)	0.107***	-0.051**	-0.022	0.678	15.78
	(0.023)	(0.021)	(0.014)		
Earned income from transfers	-0.007	-0.005	0.020	0.215	-3.08
	(0.022)	(0.020)	(0.014)		
No. of HH members who migrated	-0.050	0.049	0.085***	0.293	-17.24
	(0.033)	(0.031)	(0.018)		
Expenditure					
Household expenditure (incl. expenditure on durables and education) (in 000s)	-6.235	-7.428	5.913*	118.3	-5.27
	(4.952)	(4.601)	(3.035)		
Food share of household expenditure	0.001	0.006	-0.021***	0.414	0.15
	(0.009)	(0.008)	(0.006)		
Went hungry	-0.018	0.005	0.016*	0.0837	-21.98
	(0.015)	(0.014)	(0.009)		
Household education expenditure (in 000s)	-1.081*	-0.380	0.414	7.022	-15.39
	(0.586)	(0.532)	(0.368)		

Food diversity index	-0.012	-0.028*	-0.003	0.129	-9.07
	(0.018)	(0.017)	(0.012)		
Exp on all food items	-305.053	-59.931	-167.267	3929	-7.77
	(272.382)	(264.692)	(179.865)		
Exp on non-food items (monthly)	-93.158	-141.883	90.185	2253	-4.13
	(105.361)	(89.374)	(68.543)		
Exp on non-food items (annual)	-9,082.632**	-3,077.925	7,339.297***	47356	-19.18
	(4,177.829)	(3,620.359)	(2,613.362)		
Any expenditure on agricultural land improvement	0.017	-0.010	0.001	0.0337	51.63
	(0.012)	(0.011)	(0.008)		
Any expenditure on improvements of buildings	0.015*	-0.003	0.008*	0.0152	96.05
	(0.007)	(0.006)	(0.005)		
Exp on durables	-2,544.302	1,196.275	1,554.920	6833	-37.23
	(1,698.736)	(1,455.882)	(949.017)		
Exp on cereals - PDS (Rice and Wheat)	-0.322	1.969**	-0.229	38.06	-0.85
	(0.991)	(0.910)	(0.715)		
Exp on cereals - Home produce (Rice, Wheat, Pulses and Other Cereals)	-92.114**	72.062**	42.227*	548.8	-16.78
	(38.354)	(33.149)	(24.359)		
Exp on cereals - Market value (Rice, Wheat, Pulses and Other Cereals)	-186.834	34.386	-58.636	1037	-18.01
	(146.876)	(156.473)	(86.532)		
Exp on other food - Market value (Milk, Oil, Sugar, Vegetables and Fruits)	23.995	-102.697	-187.748	1536	1.56
	(187.114)	(174.930)	(136.265)		
Exp on other food - Home produce (Milk, Oil, Sugar, Vegetables and Fruits)	-75.625*	-87.247**	-0.985	395.3	-19.13
	(42.781)	(37.957)	(27.416)		
Exp on eggs, meat and fish - Home produce	-20.266*	27.266**	3.144	53.29	-38.04
	(11.603)	(11.193)	(6.378)		

Exp on non food items (Fuel, Cell Phone, Rent, Transport etc)	-45.229	-85.965	109.351**	1357	-3.33
	(77.403)	(62.863)	(51.149)		
Assets					
Value of productive assets (in 1000s) (incl. livestock and ag land)	-127.260***	7.151	136.863***	529.7	-24.03
	(47.212)	(43.407)	(28.779)		
Value of consumer assets (in 1000s)	-14.175	-17.538**	8.981	114.3	-12.41
	(9.640)	(8.155)	(6.180)		
Indicator for household owning any productive assets (incl. livestock and ag land)	0.008	0.040**	-0.011	0.815	1.00
	(0.020)	(0.018)	(0.013)		
Value of agriculture land	-130,637.742***	25,235.363	131,250.891***	485562	-26.90
	(45,499.887)	(42,049.391)	(27,594.605)		
Whether HH owns agriculture land	-0.127	0.044	0.028	1.385	-9.17
	(0.320)	(0.348)	(0.083)		
Index for housing quality (higher score indicates lower quality)	0.124**	0.110**	0.003	1.105	11.22
	(0.051)	(0.045)	(0.031)		
Empowerment					
Decision Making Index (Using percentage) - Standardized	-0.026	0.001	0.053	0.104	-25.48
	(0.055)	(0.048)	(0.034)		
Confidence Index (Using percentage)	-1.773	-1.902	3.526***	58.11	-3.05
	(0.158)	(0.142)	(0.101)		
Number of social security schemes availed	0.191*	0.037	-0.074	2.854	6.69
	(0.099)	(0.088)	(0.061)		

Note: In addition to regressors above, all regressions include interactions of state dummy variables with scale variables; district, block and village population, and number of villages in the district, block and cluster. Sample excludes the state of Madhya Pradesh and Maharashtra. Robust standard errors in parentheses. Robust standard errors in parentheses

*** p < 0.01, ** p < 0.05, * p < 0.1

Table A10: IV regressions on SHG and VO age

	Linear Specification		Quadratic Specification		
Variable	**SHG Age**	**VO Age**	**SHG Age**	**SHG Age Squared**	**VO Age**
Savings (in 000s)					
Total savings of household	0.850***	-0.314	0.226	0.004	-0.153
	(0.305)	(0.432)	(0.904)	(0.005)	(0.413)
Bank savings	0.012	-0.019	-0.174**	0.001**	0.012
	(0.031)	(0.044)	(0.089)	(0.001)	(0.042)
Bank savings - male	0.011	-0.005	-0.181***	0.001***	0.025
	(0.022)	(0.032)	(0.066)	(0.000)	(0.031)
Bank savings - female	0.013	-0.021	-0.017	0.000	-0.016
	(0.011)	(0.015)	(0.030)	(0.000)	(0.014)
SHG savings - female	0.022***	-0.011	0.027	-0.000	-0.009
	(0.007)	(0.009)	(0.018)	(0.000)	(0.008)
HH Loan Amounts, Current Outstanding Loans (in 000s)					
Total household loan amount	-0.392**	0.671***	-0.634	0.002	0.579**
	(0.164)	(0.242)	(0.515)	(0.003)	(0.256)
Bank / formal household loan amount	-0.149*	0.211	-0.284	0.001	0.193
	(0.089)	(0.131)	(0.296)	(0.001)	(0.144)
Informal household loan amount	-0.145***	0.269***	-0.341**	0.001	0.246***
	(0.049)	(0.078)	(0.165)	(0.001)	(0.081)
Relatives / friends household loan amount	-0.096	0.163*	-0.115	0.000	0.134
	(0.059)	(0.092)	(0.205)	(0.001)	(0.098)
SHG household loan amount	-0.086***	0.132***	0.120*	-0.001***	0.101***
	(0.025)	(0.034)	(0.068)	(0.000)	(0.031)
HH Loan Amount (by gender, in 000s)					
Total male loan amount	-0.374**	0.620***	-0.708	0.002	0.549**
	(0.159)	(0.237)	(0.502)	(0.002)	(0.252)
Total female loan amount	-0.026	0.064	0.091	-0.001	0.036
	(0.051)	(0.070)	(0.140)	(0.001)	(0.069)
Total female SHG loan amount	-0.086***	0.128***	0.126*	-0.001***	0.097***
	(0.025)	(0.034)	(0.068)	(0.000)	(0.030)
Total male bank loan amount	-0.194**	0.265**	-0.252	0.000	0.233
	(0.086)	(0.129)	(0.289)	(0.001)	(0.142)
Total female bank loan amount	0.044*	-0.054	-0.021	0.000	-0.044
	(0.024)	(0.034)	(0.063)	(0.000)	(0.033)
Total male informal loan	-0.137***	0.261***	-0.249	0.001	0.229***

	Linear Specification		Quadratic Specification		
Variable	**SHG Age**	**VO Age**	**SHG Age**	**SHG Age Squared**	**VO Age**
amount					
	(0.047)	(0.076)	(0.162)	(0.001)	(0.079)
Total female informal loan amount	-0.009	0.008	-0.071***	0.000***	0.015
	(0.008)	(0.011)	(0.025)	(0.000)	(0.012)
Total male relative loan amount	-0.105*	0.154*	-0.171	0.000	0.133
	(0.058)	(0.089)	(0.201)	(0.001)	(0.095)
Total female relative loan amount	0.003	0.006	0.053	-0.000	-0.003
	(0.015)	(0.021)	(0.041)	(0.000)	(0.021)
Informal Loans and high cost debt					
Share of informal loans to all loans in last 5 years	-0.002***	0.002**	-0.007***	0.000**	0.002**
	(0.001)	(0.001)	(0.003)	(0.000)	(0.001)
Share of informal loans to all loans in last 2 years	-0.002**	0.001	-0.004*	0.000	0.001
	(0.001)	(0.001)	(0.002)	(0.000)	(0.001)
Amount of high cost loan (Calculated for informal loans)	-28.247	41.943	240.648*	-1.509**	-11.039
	(31.843)	(38.800)	(143.924)	(0.700)	(48.784)
Indicator for high cost loan (Calculated for informal loans)	-0.001	0.000	-0.001	0.000	-0.000
	(0.001)	(0.001)	(0.002)	(0.000)	(0.001)
Interest Rate on informal loans	-0.260	0.113	0.286	-0.003	0.122
	(0.162)	(0.161)	(0.578)	(0.003)	(0.151)
Labour Force Participation					
Labour force participation rate (Female)	-0.001	0.003***	0.000	-0.000	0.003***
	(0.001)	(0.001)	(0.003)	(0.000)	(0.001)
Labour force participation rate (Male)	-0.000	0.001	0.000	-0.000	0.001
	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)
Labour force participation rate (Female, Primary status)	-0.001	0.001	0.014***	-0.000***	-0.000
	(0.001)	(0.002)	(0.004)	(0.000)	(0.002)
Labour force participation rate (Female, Secondary status)	0.001	0.001	-0.008**	0.000**	0.003*
	(0.001)	(0.002)	(0.004)	(0.000)	(0.002)
Labour force participation rate (Male, Primary status)	-0.001*	0.002*	0.000	-0.000	0.001

	Linear Specification		Quadratic Specification		
Variable	**SHG Age**	**VO Age**	**SHG Age**	**SHG Age Squared**	**VO Age**
	(0.001)	(0.001)	(0.002)	(0.000)	(0.001)
Labour force participation rate (Male, Secondary status)	-0.001	0.002	0.003	-0.000	0.002
	(0.001)	(0.002)	(0.004)	(0.000)	(0.002)
Average hours in productive work (Females, Primary status)	-0.467*	0.366	0.080	-0.003	0.332
	(0.273)	(0.325)	(0.917)	(0.005)	(0.322)
Average hours in productive work (Females, Secondary status)	-0.110	0.523	0.396	-0.003	0.417
	(0.181)	(0.328)	(0.559)	(0.003)	(0.320)
Average hours in productive work (Males, Primary status)	0.078	0.400	0.671	-0.004	0.485
	(0.252)	(0.368)	(0.699)	(0.004)	(0.345)
Average hours in productive work (Males, Secondary status)	0.144	0.685	0.290	-0.001	0.601
	(0.229)	(0.452)	(1.094)	(0.006)	(0.572)
Income and Livelihoods (Incomes in 000s)					
Total income	0.528**	-0.074	1.467**	-0.006*	-0.095
	(0.212)	(0.312)	(0.626)	(0.004)	(0.298)
Agriculture income	0.305***	-0.538***	0.838***	-0.003**	-0.568***
	(0.094)	(0.133)	(0.288)	(0.001)	(0.140)
Livestock income	0.061	-0.037	-0.473***	0.003***	0.039
	(0.067)	(0.094)	(0.183)	(0.001)	(0.096)
MNREGA earnings	0.024**	-0.016	0.095***	-0.000**	-0.024*
	(0.011)	(0.015)	(0.033)	(0.000)	(0.014)
Wage income, casual labour market	0.119	0.357*	1.466***	-0.008***	0.207
	(0.138)	(0.202)	(0.405)	(0.002)	(0.191)
Total wage income	0.083	0.561*	1.191*	-0.007*	0.452
	(0.209)	(0.307)	(0.643)	(0.004)	(0.291)
Enterprise income	0.164	-0.001	1.117	-0.005	-0.176
	(0.371)	(0.424)	(0.815)	(0.005)	(0.378)
Number of female owned enterprises	-0.003***	0.001	0.007***	-0.000***	-0.000
	(0.001)	(0.001)	(0.002)	(0.000)	(0.001)
Number of sources of income	-0.001	0.019***	0.029**	-0.000***	0.016***
	(0.004)	(0.005)	(0.011)	(0.000)	(0.005)
HH involved in cultivation	-0.003**	0.007***	-0.015***	0.000***	0.009***
	(0.001)	(0.002)	(0.004)	(0.000)	(0.002)
HH involved in livestock	-0.001	0.003*	-0.008*	0.000*	0.004**

	Linear Specification		Quadratic Specification		
Variable	**SHG Age**	**VO Age**	**SHG Age**	**SHG Age Squared**	**VO Age**
occupation					
	(0.001)	(0.002)	(0.004)	(0.000)	(0.002)
HH involved in enterprises	-0.001	-0.002	0.002	-0.000	-0.002
	(0.001)	(0.001)	(0.003)	(0.000)	(0.001)
HH involved in NREGA	0.002**	-0.003**	0.004	-0.000	-0.003**
	(0.001)	(0.001)	(0.003)	(0.000)	(0.001)
HH involved in occupation involving wages and salaries (male & female)	-0.002	0.005***	0.006**	-0.000***	0.004***
	(0.001)	(0.002)	(0.003)	(0.000)	(0.001)
HH has tranfer income	0.005***	-0.004**	0.019***	-0.000***	-0.005***
	(0.001)	(0.002)	(0.004)	(0.000)	(0.002)
HH has other income	-0.000	0.000	0.001	-0.000	0.000
	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)
Earned income from agriculture	-0.002	0.010***	-0.011**	0.000**	0.011***
	(0.002)	(0.002)	(0.005)	(0.000)	(0.002)
Earned income from livestock	-0.002	0.007***	-0.004	0.000	0.007***
	(0.002)	(0.002)	(0.005)	(0.000)	(0.002)
Earned income from enterprises	-0.001	-0.001	0.003	-0.000	-0.002
	(0.001)	(0.001)	(0.003)	(0.000)	(0.001)
Earned income from NREGA	0.003**	-0.004**	0.005	-0.000	-0.003***
	(0.001)	(0.001)	(0.003)	(0.000)	(0.001)
Earned income from wages and salaries (male & female)	-0.001	0.006***	0.004	-0.000	0.005***
	(0.001)	(0.002)	(0.004)	(0.000)	(0.002)
Earned income from transfers	0.005***	-0.004**	0.019***	-0.000***	-0.005***
	(0.001)	(0.002)	(0.004)	(0.000)	(0.002)
No. of HH members who migrated	-0.002	0.005*	-0.003	0.000	0.004
	(0.002)	(0.003)	(0.006)	(0.000)	(0.003)
Expenditure					
Household expenditure (incl. expenditure on durables and education) (in 000s)	-0.349	0.271	1.152	-0.009**	0.022
	(0.269)	(0.370)	(0.790)	(0.004)	(0.355)
Food share of household expenditure	0.001***	-0.000	-0.003*	0.000***	0.001
	(0.000)	(0.001)	(0.001)	(0.000)	(0.001)
Went hungry	-0.001	-0.000	0.008***	-0.000***	-0.002
	(0.001)	(0.001)	(0.003)	(0.000)	(0.001)

	Linear Specification		Quadratic Specification		
Variable	**SHG Age**	**VO Age**	**SHG Age**	**SHG Age Squared**	**VO Age**
Household education expenditure (in 000s)	-0.145***	0.144***	-0.069	-0.000	0.122***
	(0.035)	(0.049)	(0.095)	(0.001)	(0.047)
Food diversity index	-0.001	0.005***	0.007**	-0.000***	0.003**
	(0.001)	(0.001)	(0.003)	(0.000)	(0.001)
Exp on all food items	-4.040	25.033	71.499	-0.449	15.671
	(15.453)	(19.037)	(44.865)	(0.302)	(15.521)
Exp on non-food items (monthly)	2.470	-3.296	33.642*	-0.181*	-9.317
	(6.127)	(8.164)	(19.249)	(0.107)	(8.016)
Exp on non-food items (annual)	-317.676	-335.743	-152.973	-1.173	-359.184
	(220.708)	(321.062)	(687.208)	(3.660)	(309.781)
Any expenditure on agricultural land improvement	0.001	-0.001	0.009***	-0.000***	-0.002*
	(0.001)	(0.001)	(0.002)	(0.000)	(0.001)
Any expenditure on improvements of buildings	-0.000	0.001	-0.000	0.000	0.001
	(0.001)	(0.001)	(0.002)	(0.000)	(0.001)
Exp on durables	8.053	-205.280	59.505	-0.496	-174.198
	(113.232)	(139.324)	(248.026)	(1.393)	(123.911)
Exp on cereals - PDS (Rice and Wheat)	0.095	-0.128*	0.114	-0.000	-0.128*
	(0.059)	(0.076)	(0.217)	(0.001)	(0.072)
Exp on cereals - Home produce (Rice, Wheat, Pulses and Other Cereals)	9.706***	2.772	-7.810	0.093*	6.851**
	(2.971)	(3.548)	(7.557)	(0.049)	(3.428)
Exp on cereals - Market value (Rice, Wheat, Pulses and Other Cereals)	-11.456	18.181	39.414*	-0.287*	11.068
	(10.096)	(14.684)	(23.129)	(0.166)	(11.483)
Exp on other food - Market value (Milk, Oil, Sugar, Vegetables and Fruits)	-2.910	3.603	41.219	-0.274	-0.077
	(8.486)	(8.597)	(32.906)	(0.219)	(7.646)
Exp on other food - Home produce (Milk, Oil, Sugar, Vegetables and Fruits)	-1.839	2.292	-20.682***	0.109**	3.903
	(2.483)	(3.932)	(7.962)	(0.042)	(3.904)
Exp on eggs, meat and fish - Home produce	-1.035	1.026	-1.380	0.001	1.270*
	(0.831)	(0.837)	(2.395)	(0.013)	(0.741)
Exp on non food items (Fuel, Cell Phone, Rent, Transport etc)	-3.518	10.401*	17.656	-0.119	5.690

	Linear Specification		Quadratic Specification		
Variable	**SHG Age**	**VO Age**	**SHG Age**	**SHG Age Squared**	**VO Age**
	(4.532)	(6.274)	(14.600)	(0.082)	(5.980)
Assets					
Value of productive assets (in 1000s) (incl. livestock and ag land)	-5.135*	8.125*	-26.933***	0.123**	10.425**
	(3.071)	(4.191)	(8.814)	(0.048)	(4.219)
Value of consumer assets (in 1000s)	0.060	-0.876	-2.299	0.013	-0.535
	(0.532)	(0.757)	(1.584)	(0.009)	(0.699)
Indicator for household owning any productive assets (incl. livestock and ag land)	-0.001	0.003**	-0.004	0.000	0.004**
	(0.001)	(0.002)	(0.003)	(0.000)	(0.002)
Value of agriculture land	-4,832.988*	7,817.547**	-30,305.389***	143.975***	10,619.181***
	(2,870.530)	(3,826.851)	(8,194.825)	(45.549)	(3,855.904)
Whether HH owns agriculture land	-0.012	0.014	-0.042	0.000	0.022
	(0.022)	(0.019)	(0.030)	(0.000)	(0.014)
Index for housing quality (higher score indicates lower quality)	0.010***	-0.002	-0.012	0.000***	0.002
	(0.003)	(0.004)	(0.008)	(0.000)	(0.003)
Empowerment					
Decision Making Index (Using percentage) - Standardized	-0.004	0.001	0.002	-0.000	0.000
	(0.003)	(0.004)	(0.009)	(0.000)	(0.004)
Confidence Index (Using percentage)	-0.268**	0.315**	0.082	-0.002	0.226
	(0.115)	(0.160)	(0.344)	(0.002)	(0.153)
Number of social security schemes availed	0.002	0.009	0.014	-0.000	0.007
	(0.006)	(0.008)	(0.017)	(0.000)	(0.008)

Note: Instruments included are described in equation 2 of Chapter 4. In addition to regressors above, all regressions include interactions of state dummy variables with scale variables; district, block and village population, and number of villages in the district, block and cluster. Robust standard errors in parentheses. *** (p<0.01) ** (p<0.05) * (p<0.1)

Table A11: First Stage regression analysis of instruments

	EV*EB	EVOB*EV	Predicted value of EV* SHG Block entry year	Predicted value of EV squared* SHG Block entry year	Predicted value of EV squared* VO Block entry year	Constant	Observations
SHG Age	23.155***	1.590***	-4.124***	3.427***	0.573*	154.088***	13,355
	(0.546)	(0.589)	(0.645)	(0.464)	(0.298)	(5.067)	
SHG Age Squared	2,936.537***	1,544.169***	-231.120**	193.021**	147.994***	18,811.551***	13,355
	(58.962)	(73.224)	(101.028)	(84.491)	(36.326)	(675.685)	
VO Age	20.554***	-7.825***	9.712***	0.621	-6.048***	160.061***	13,672
	(1.363)	(1.529)	(1.966)	(1.502)	(0.874)	(15.454)	

Table A12: Analysis of Households leaving SHGs

	Treated	SC/ST HH	Wife completed primary education	Residing in SC hamlet	HH has high cost loan	Observations
Left SHG	-0.294*	0.134	-0.263**	-0.401**		1,891
	(0.163)	(0.140)	(0.118)	(0.173)		
Left SHG	-0.290*	0.177	-0.292**	-0.399**	-0.174**	1,891
	(0.160)	(0.137)	(0.120)	(0.173)	(0.088)	

Note: The dependent variable takes a value 1 if the household left the SHG following the midline survey. We also control for husband's occupation and migration. For the second specification, we additionally control for housing quality, household size, consumer assets and women empowerment. All independent variables are from the baseline survey

Table A13: Romano-Wolf P-values for multiple hypothesis testing

Outcome category	Indicators	Model p-value	Resample p-value	Romano-Wolf
Income	Total income	0.0016	0.004	0.0279
	Agriculture income	0.5457	0.4701	0.9681
	Livestock income	0.7429	0.6653	0.988
	MNREGA earnings	0.0012	0.004	0.004
	Wage income, casual labour market	0.0004	0.004	0.004
	Total wage income	0.0034	0.004	0.0518
	Enterprise income	0.8785	0.8088	0.988
	Number of female owned enterprises	0	0.004	0.004
Livelihoods	Number of sources of income	0.0001	0.004	0.004
	HH involved in cultivation	0.718	0.757	0.988
	HH involved in livestock occupation	0.8995	0.9044	0.988
	HH involved in enterprises	0.0016	0.004	0.0279
	HH involved in NREGA	0.1777	0.2072	0.8327
	HH involved in occupation involving wages and salaries (male & female)	0.0303	0.0359	0.251
	HH has transfer income	0.0033	0.004	0.0518
	HH has other income	0.4886	0.5378	0.9602
	Earned income from agriculture	0.0042	0.004	0.0598
	Earned income from livestock	0.2094	0.243	0.8367
	Earned income from enterprises	0.0062	0.008	0.0797
	Earned income from NREGA	0.1435	0.1355	0.7729
	Earned income from wages and salaries (male & female)	0.0034	0.004	0.0518
	Earned income from wages and salaries (male)	0.0037	0.012	0.0598
	Earned income from wages and salaries (female)	0.2935	0.3108	0.9084
	Earned income from transfers	0.0033	0.004	0.0518
	No. of HH members who migrated	0.3873	0.4343	0.9363
Expenditure	Household expenditure (incl. expenditure on durables and education) (in 000s)	0.1202	0.1275	0.4303
	Food share of household expenditure	0.0002	0.004	0.004
	Went hungry	0.1021	0.0996	0.4303
	Household education expenditure (in 000s)	0.001	0.004	0.012
	Food diversity index	0.0694	0.0757	0.4064
	Exp on all food items	0.6455	0.6295	0.9402
	Exp on non-food items (monthly)	0.7773	0.7649	0.9402

Outcome category	Indicators	Model p-value	Resample p-value	Romano-Wolf
	Exp on non-food items (annual)	0.0005	0.004	0.004
	Any expenditure on agricultural land improvement	0.2332	0.1713	0.6175
	Any expenditure on improvements of buildings	0.6083	0.6215	0.9402
	Exp on durables	0.0682	0.1315	0.4064
Savings	Total savings of household	0.0004	0.004	0.004
	Bank savings	0.8843	0.8486	0.9641
	Bank savings - male	0.871	0.8566	0.9641
	Bank savings - female	0.7291	0.741	0.9482
	SHG savings - female	0	0.004	0.004
Loans	***Outstanding loans***			
	Total household loan amount	0.7351	0.741	0.9841
	Bank / formal household loan amount	0.355	0.3227	0.9163
	Informal household loan amount	0.6896	0.6534	0.9801
	Relatives / friends household loan amount	0.6334	0.6255	0.9761
	SHG household loan amount	0.2598	0.2829	0.9124
	Total loans in past 5 years			
	Total male loan amount	0.4779	0.4382	0.9482
	Total female loan amount	0.3202	0.3586	0.9163
	Total female SHG loan amount	0.272	0.3028	0.9163
	Total male bank loan amount	0.2528	0.2271	0.9124
	Total female bank loan amount	0.7351	0.7729	0.9841
	Total male informal loan amount	0.8109	0.8127	0.9841
	Total female informal loan amount	0.2683	0.3187	0.9163
	Total male relative loan amount	0.3845	0.3944	0.9163
	Total female relative loan amount	0.5655	0.6056	0.9761
	Share of informal loans to all loans in last 5 years	0.0403	0.0279	0.3466
	Share of informal loans to all loans in last 2 years	0.0457	0.0199	0.3785
Empowerment	Decision Making Index (Using percentage) - Standardized	0.4664	0.4542	0.7849
	Confidence Index (Using percentage)	0.1885	0.1833	0.4861
	Number of social security schemes availed	0.0302	0.0279	0.1036
Assets	Value of consumption assets	0.1605	0.1394	0.2311
	Value of productive assets	0.8907	0.8645	0.8645

Table A14. NRLP PAD Indicators

	Indicator Name	Results
PDO 1	% of SHGs federated into Village Level federations	4046 of 5000 SHG that are more than 6 months old at the time of survey i.e 81%. 83% in 3829 functioning SHGs.
PDO 2	% of SHG members reporting 30% increase in assests	17.5% SHG (CIF/Bank_loan) households in the sample report value of productive assets 30% higher than the average of SHGs members in the village. 19% in EBEV and 16% in the rest. 41% of 14,625 SHG member household have received either CIF or bank loans
PDO 3	% of SHG members report reduction in high cost debt	4% SHG households in EBEV report any hc loan from informal sources in the past 3 years (closed+outstanding). Average 15% SHG households report this in other three groups. Reduction is 73%
PDO 4	% increase in Income of households that have accessed technical and financial services	6101 households of have received CIF/Bankloan and trainings in the past 12 months (41% of all SHG member hhs in our sample of 14,625). The impact of the NRLP programme on household income of this sample is an increase of Rs. 9000. This represents a 17% increase from a predicted income of Rs 58000 without the programme.
IRI 3	% of SHG households with atleast one additional source of income	18% of SHG member households reported at least one more source of income compared to the village mean.

Online appendixes: NRLP Impact Evaluation Survey Questionnaires

Online appendix A: Village module

https://www.3ieimpact.org/sites/default/files/2020-10/IE128-NRLP-Online-appendix-A-Village-Module.pdf

Online appendix B: Household module

https://www.3ieimpact.org/sites/default/files/2020-10/IE128-NRLP-Online-appendix-B-Household-Module.pdf

Online appendix C: Women's module

https://www.3ieimpact.org/sites/default/files/2020-10/IE128-NRLP-Online-appendix-C-Women%27s-Module.pdf

Online appendix D: SHG module

https://www.3ieimpact.org/sites/default/files/2020-10/IE128-NRLP-Online-appendix-D-SHG-Module.pdf

Online appendix E: Village organisation module

https://www.3ieimpact.org/sites/default/files/2020-10/IE128-NRLP-Online-appendix-E-Village-Organization-Module.pdf

Online appendix F: Cluster Level Federation (CLF) module

https://www.3ieimpact.org/sites/default/files/2020-10/IE128-NRLP-Online-appendix-F-Cluster-Level-Federation-%28CLF%29-Module.pdf

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