

Costs and Cost-Benefit Analysis of the Bihar Rural Livelihoods Project—JEEViKA:

Preliminary Evidence

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Objective of This Note

Despite an increasing body of research on the impact of women's self-help groups (SHGs) on women's empowerment, wide gaps in understanding their costs and cost-effectiveness remain. An ongoing study by the Evidence Consortium on Women's Groups (ECWG) seeks to address these evidence gaps by conducting an analysis of the costs and return on investment (ROI) of JEEViKA, the Bihar Rural Livelihoods Project (BRLP).

The JEEViKA program is implemented as part of India's National Rural Livelihood Mission (NRLM) in the state of Bihar. This evidence note presents preliminary results on the costs of various components of JEEViKA over time and scale based on publicly available program and audit reports. The ECWG study team combined these cost data with results from existing impact evaluations of the program (Datta, Hoffmann, Rao, & Surendra, 2015; Hoffmann et al., 2018) to generate estimates of the program's ROI. Our analysis shows that the program has high potential to generate a positive ROI primarily because of benefits for households due to lower informal interest rates caused by JEEViKA and reduced program costs due to economies of scale.

The ECWG team will continue to examine the costs and ROI of JEEViKA in an upcoming study in which we will partner with the International Initiative for Impact Evaluation (3ie). This forthcoming study will involve primary cost data collection on the same sample as that covered in an ongoing impact evaluation of JEEViKA, [which is being undertaken by 3ie](#) in the context of a larger impact evaluation of the National Rural Livelihoods Mission (NRLM) in nine Indian states.



The Evidence Consortium on Women's Groups (ECWG) is funded by a grant from the Bill & Melinda Gates Foundation and aims to address evidence gaps on how groups and collectives can contribute to achieving women's empowerment and well-being, and to understand their implementation models and cost-effectiveness. The consortium is co-led by the American Institutes for Research and the Population Council, with partners from the University of Washington, Stanford University, the Campbell Collaboration, and Makerere University. To learn more, please visit <http://www.womensgroupevidence.org> or e-mail info@womensgroupevidence.org.

Preliminary Costing and Cost-Benefit Analysis of JEEViKA: Key Takeaways and Limitations

The National Rural Livelihoods Mission and the JEEViKA Project in Bihar

- JEEViKA is implemented as part of India's National Rural Livelihood Mission (NRLM) in the state of Bihar.
- JEEViKA creates and works with women's self-help groups (SHGs) in a federated structure to facilitate institutional and capacity building, financial inclusion, livelihoods promotion, social inclusion, and development.
- After being launched in 2007 in six priority districts, JEEViKA expanded its services and the scale of SHGs over a greater number of districts under NRLM after 2011. As of 2020, approximately 9.1 million women have been mobilized in 793,392 SHGs in Bihar.

Impact of the JEEViKA Program

- A 2018 impact evaluation of the JEEViKA program in Bihar shows no statistically significant effects of the program on productive asset ownership, on average. However, the same impact evaluation shows positive impacts on the productive asset ownership of landless households.
- The positive impacts on landless households were driven by a reduction in informal interest rates, which likely were caused by decreased demand for credit from informal money lenders because of the JEEViKA program (Hoffmann et al., 2018).

Financing and Costs of the JEEViKA Program

- JEEViKA was formed in 2007 after the project received joint financing from the World Bank and the Government of Bihar (State Government). Under the NRLM—that is, after 2011—JEEViKA was jointly financed by the State Government as well as the central Indian government, and by many other technical partners including the World Bank.
- Initially, as the program scaled and mobilized more households, a higher proportion of resources was devoted to community institution development, which includes start-up expenditures on SHG formation and capacity building.
- Once the program reached scale, the highest share of resources was devoted to community investment support, which includes spending on livelihoods and other social development initiatives layered onto SHGs.
- The annual per-household expenditure for basic program activities under JEEViKA declined from \$61.6 per member at the start of the program in 2007, when the program served fewer than 10,000 households, to \$11.9 per member at the scaled-up level in 2016, when the program reached more than 5 million households.

Return on Investment of the JEEViKA Program

- For an average household in program area, JEEViKA led to a \$30 increase in annual savings from lower interest rates after the household had participated in the program for almost 3 years. During the same 3-year period, per-member costs of basic program activities were estimated to be \$25, indicating a return on investment (ROI) of \$1.17 even when we assumed that benefits last for only 1 year, and increasing to \$4.89 when we assumed that benefits last for 5 years.

Assumptions and Limitations

- Our analysis relies on public audit statements of JEEViKA. Because these audit statements likely do not include all costs, these figures should be considered an underestimate of the true program costs, which may result in an overestimate of the cost-effectiveness of the program.
- When estimating benefits, the research team assumed that only JEEViKA participants would benefit from a reduction in informal interest rates. It is possible, however, that non-members also benefit from reduced interest rates. This assumption may lead to an underestimate of the economic benefits and cost-effectiveness of the program.

Upcoming Work

- In our forthcoming collaboration with 3ie, we plan to collect disaggregated data from *panchayats* and blocks that were selected in the impact evaluation of the JEEViKA program.
- To facilitate a more rigorous ROI estimation, we plan to combine these disaggregated cost data with the impact estimates from 2016 and with forthcoming impact estimates from a follow-up impact evaluation conducted by 3ie in 2019.

The National Rural Livelihoods Mission—Background

The Government of India launched the NRLM in June 2011 with the goal of “creating efficient and effective institutional platforms for the rural poor and enabling them to increase household income through sustainable livelihood enhancements and improved access to financial services” (Government of India, 2019). The NRLM operates in 28 states through the State Rural Livelihoods Missions (SRLMs), which create and work with women's SHGs to facilitate institutional and capacity building, financial inclusion, livelihoods promotion, social inclusion, and development. SHGs under NRLM usually start

with a period of collective savings to facilitate intragroup lending, after which members can gradually take larger loans (from banks, for example). In addition, many SHGs include a training component to improve agricultural and non-agricultural livelihoods and health outcomes, and they have a strong focus on the most disadvantaged groups, including scheduled castes and scheduled tribes.

The NRLM follows a federated structure, a system of functional integration between groups at various levels, in which apex structures perform higher level functions (Shylendra, 2018). Federations are formed at the village, gram panchayat, cluster, or higher levels to support SHGs through collective action and community investment for undertaking common and collective socio-economic activities. As of 2020, more than 67 million Indian women have been mobilized into 6.1 million SHGs under the NRLM (Government of India, 2020).

What We Know About Self-Help Groups and the NRLM

Evidence suggests that SHGs can have positive effects on several domains of women's empowerment—including economic, reproductive, social, and political domains—although impacts depend substantially on program design and implementation context (Brody et al., 2015; Karlan et al., 2017). Although SHGs have shown positive impacts on financial inclusion, the evidence of their impact on expenditures, asset ownership, and income is largely mixed (Barooah et al., 2019; Deininger & Liu, 2013; Karlan et al., 2017; Hoffmann et al., 2019; Christian et al., 2019; Anderson et al., 2019).

A recent impact evaluation of the JEEViKA project in Bihar shows no statistically significant effects of the program on productive asset ownership, on average. However, the same impact evaluation shows positive impacts on the productive asset ownership of landless households, because the program results in a reduction in interest rates on loans from informal money lenders, likely because of decreased demand for informal credit caused by the JEEViKA project (Hoffmann et al., 2018).

What We Don't Know

Research on the costs and cost-effectiveness of women's groups is scarce, primarily due to a lack of consistent cost data collection linked to group activities and outcomes. Evidence that does exist comes predominantly from smaller-scale pilot programs (Isern et al., 2007; Tankha, 2002). Further, most impact evaluations of women's groups focus on pilot models operating at a smaller scale.

Recent evidence from a portfolio evaluation of the Bill and Melinda Gates Foundation's investments in women's groups conducted by the ECWG suggests that economic SHGs and saving groups (SGs) that operate at larger scales may have lesser direct effects on women's empowerment and economic outcomes than smaller-scale pilot programs (Brody et al., 2015; Anderson et al., 2019). However, these SHGs and SGs may achieve impacts through alternative pathways, such as changes in prices, interest rates, and wages (Anderson et al., 2019; Hoffmann et al., 2018). These factors show the importance of understanding the implications of program scale for costs as well as the impact of SHGs.

Background on Bihar in the Context of NRLM

The state of Bihar historically has had low social and economic development indicators compared to other Indian states (Government of India, 2011). Compared to the national average, Bihar also has a much higher gender gap in terms of literacy, educational attainment, and women's empowerment indicators (see Table 1). Further, women in Bihar appear to have less exposure to microcredit programs, and lower autonomy in mobility, their own healthcare, and household spending (International Institute for Population Sciences [IIPS] & ICF, 2017). These state-specific characteristics may have

implications for the costs of targeting and mobilizing women into SHGs to promote and deliver livelihoods services.

On the one hand, Bihar is densely populated, which may lead to low targeting costs in the state. On the other hand, the relatively low female literacy rates may prevent women from learning about and effectively accessing social schemes available to them, and may limit the program's ability to recruit literate community mobilizers, which can drive up targeting costs (Paltasingh & Paliwal, 2014). Some areas of the state also grapple with restricted physical access and mobility caused by poor roads and transport connectivity, dispersed remote habitations, and Maoist insurgency. These factors could directly increase the costs of mobilizing women into groups and of using SHGs as a delivery vehicle for livelihoods initiatives.

Table 1: A Snapshot of Economic and Social Indicators in Bihar Compared to National Average

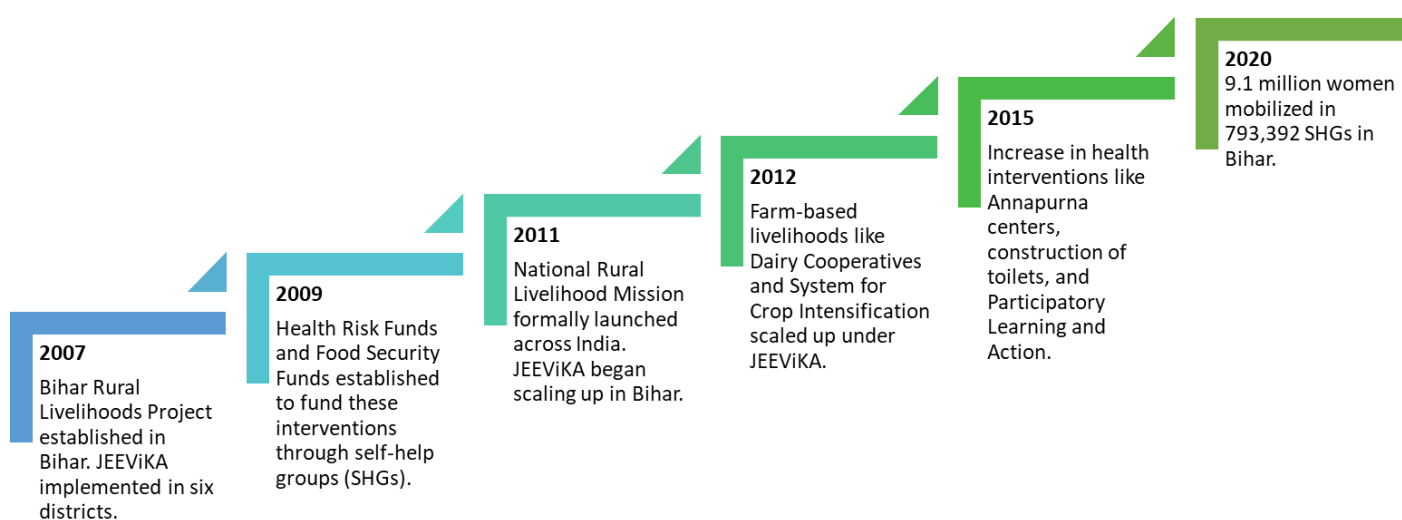
Indicator	Bihar	All India
Overall Socio-Economic Development		
Population density, 2011 (per sq km)	1,102	382
Population residing in rural areas, 2011	89%	69%
Other backward caste, 2016	58%	42%
Poverty rate, 2012	34%	22%
Maternal mortality ratio, 2013 (maternal deaths per 100,000 live births)	208	167
Education		
Female literacy rate, 2016	50%	68%
Male literacy rate, 2016	78%	86%
Women with no schooling, 2016	48%	28%
Men with no schooling, 2016	21%	12%
Women's Empowerment		
Married by age 18, 2016	42%	28%
Employed in the last 12 months, 2016	21%	31%
Have money that they can decide how to use, 2016	33%	42%
Have bank or savings account that they themselves use, 2016	26%	53%
Have known of a microcredit program, 2016	28%	41%
Have taken a loan from a microcredit program, 2016	5%	8%
Have a mobile phone that they themselves use, 2016	41%	46%

Data sources: Government of India Census, 2011; World Bank India State Briefs, 2016; National Family Health Survey (NFHS-4), 2016.

Although the NRLM was formally launched in 2011, the State Government of Bihar had established the BRLP, also known as JEEViKA, in 2007 in six priority districts with the aim of mobilizing poor households into SHGs. In 2011–12, JEEViKA expanded its services and the scale of SHGs to cover a greater number of districts under the NRLM.

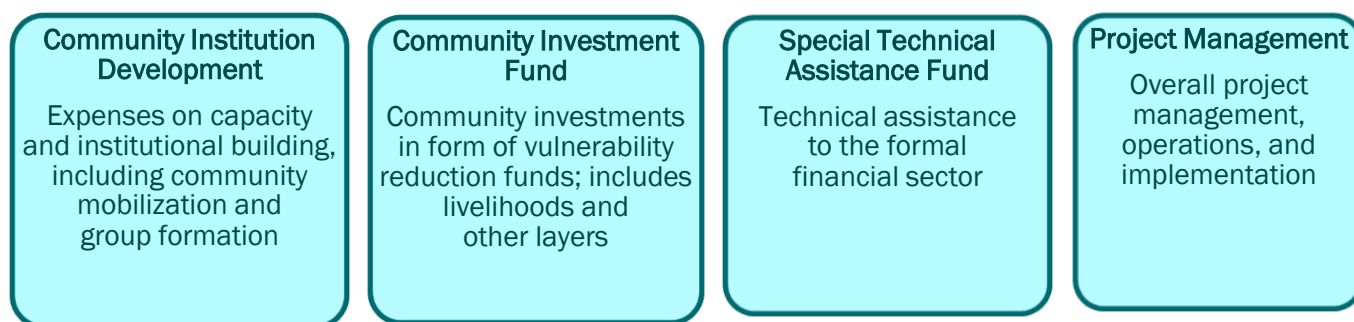
At its inception, JEEViKA received \$63 million from the World Bank and an additional \$7 million from the State Government (World Bank, 2007). The organization received additional funding from various implementing partners—such as the United Nations Children’s Fund (UNICEF)—for specific interventions, totaling approximately \$3 million initially (JEEViKA, n.d.). Under the NRLM—that is, after 2011—JEEViKA was jointly financed by the State Government as well as the central Indian government, which also sourced funding from the World Bank. Additionally, JEEViKA received \$100 million from the World Bank in 2012. These funds were used to scale up core program interventions to all blocks in the six initially chosen project districts and to scale up interventions to new districts, thus deepening livelihoods interventions and enabling convergence with other development programs—such as the Mahatma Gandhi National Rural Employment Guarantee Scheme—and strengthening partnerships and monitoring and evaluation systems (World Bank, 2012). Figure 1 shows a timeline illustrating JEEViKA’s growth.

Figure 1. JEEViKA’s Operations Over Time



SHG federations under the JEEViKA program are organized in a three-tiered, pyramidal structure in which the SHG is the basic unit. In the second tier, SHGs are federated into primary-level federations known as *village organizations* (VOs). The VOs are further organized into cluster-level federations (CLFs), which is the apex level of federation. Resource allocation under the program is divided across four broad cost categories: Community Institution Development, the Community Investment Fund, the Special Technical Assistance Fund, and Project Management. Descriptions of the four cost components are shown in Figure 2.

Figure 2. JEEViKA Cost Components



Cost and ROI Estimation Methodology

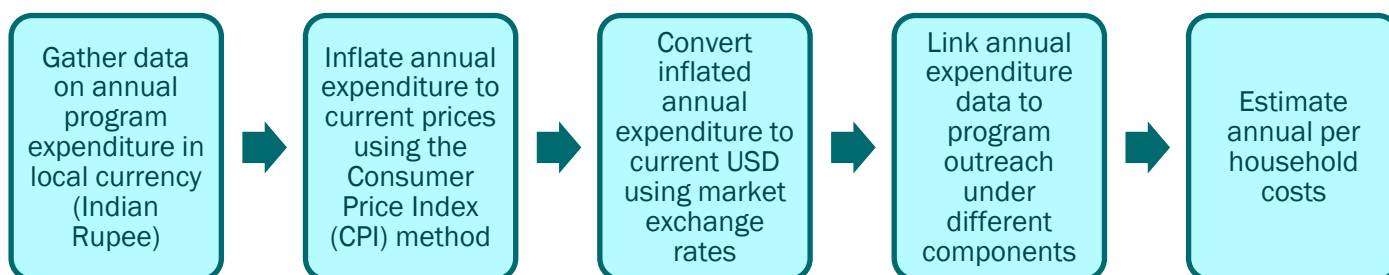
Estimating Program Costs From Publicly Available Audit Reports

The ECWG research team collected data on program implementation, components, and progress in terms of outreach from publicly available JEEViKA annual reports, and on program expenditures from JEEViKA's annual audit statements and World Bank project documents. The program also uses inputs and resources of other agencies, including the Government of India, the World Bank, and many other technical partners such as the Bill & Melinda Gates Foundation and UNICEF. Because our analysis relies on public audit statements, these numbers reflect the overall program expenditures incurred directly by the JEEViKA program. The public audit statements likely do not include costs incurred by other agencies, such as the Government of India, and these figures should be considered an underestimate of the true program costs, which may result in an overestimate of the cost-effectiveness of the program. In our future work with 3ie, the ECWG will perform more detailed examinations of costs incurred by other agencies.

Figure 3 shows a summary of the steps undertaken to estimate annual per-household program costs. To address data limitations in public documents, we made the following assumptions for cost estimation:

- We estimated per-household annual costs by dividing overall program expenditure across the cumulative program outreach in the state up to a given year.
- We based our analysis solely on *reported program expenditures* and therefore did not include costs of resources that might have been used but not directly paid for (e.g., the time spent by volunteer staff). We also did not include any non-accounting costs, such as costs to women in terms of time foregone on group activities.

Figure 3. Cost Estimation



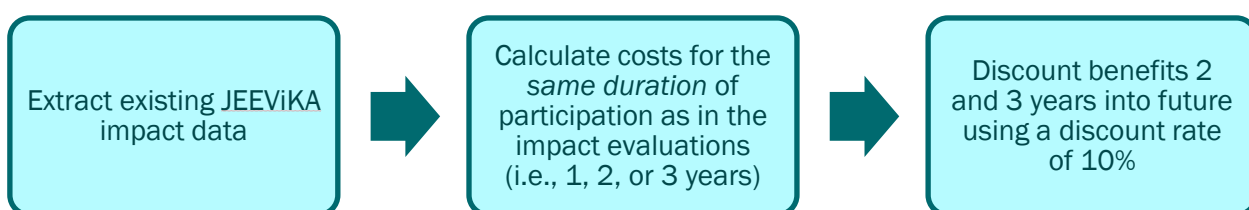
Using Existing Evidence on Program Impact to Estimate ROI

To estimate the program ROI, the ECWG team combined our cost estimates with results from existing studies (Datta et al., 2015; Hoffmann et al., 2018) that evaluated the benefits of program exposure for almost 3 years (2011 to 2014). Using variation created by the randomized rollout of the program and employing a difference-in-differences analysis, Datta and colleagues (2015) showed that the introduction of JEEViKA resulted in a significant reduction in interest rates paid on informal loans taken by households. This interest-rate reduction affected the cost of servicing outstanding debt for JEEViKA participants. It is likely that program nonparticipants also benefited from lower informal interest rates. However, in this preliminary analysis, we do not account for spillover benefits to program nonparticipants. Instead, we used the cost savings from lower interest rates to estimate annual program economic benefits for an average household covered by JEEViKA in Bihar. In our upcoming collaboration with 3ie, we also plan to include spillover effects in our analysis.

The ROI methodology followed the steps outlined in Figure 4 and included the following assumptions:

- Hoffmann and colleagues (2018) reported that the main activities during the period of evaluation included SHG and VO formation, credit provision, and basic literacy and numeracy trainings, and that livelihoods trainings were not included at this stage. We estimated the ROI using cost estimates under two scenarios: (a) costs that only include group formation, basic group functions, and capacity building; and (b) total program costs after including livelihoods support.
- Because program benefits were estimated annually, we calculated the program ROI under the assumption that program benefits last anywhere from 1 to 5 years.
- When estimating benefits 2, 3, 4, and 5 years into future, we assumed that the same annual benefits would apply in the subsequent years and used a discount rate of 10% to estimate the present discounted value of future stream of benefits. This approach uses the standard discount rate based on opportunity costs in developing countries (Dhaliwal, Duflo, Glennerster, & Tulloch, 2013).
- When estimating benefits, we assumed that only JEEViKA participants would benefit from a reduction in informal interest rates. Spillovers to non-program participants may lead to an underestimate of the economic benefits and cost-effectiveness of the program.
- We did not include any noneconomic benefits, such as improvements in women's empowerment, in our ROI estimation. Moreover, the impact evaluation of Hoffmann and associates (2018) showed only limited evidence for impacts on women's empowerment, but landless households may have gained some benefits.

Figure 4. ROI Estimation

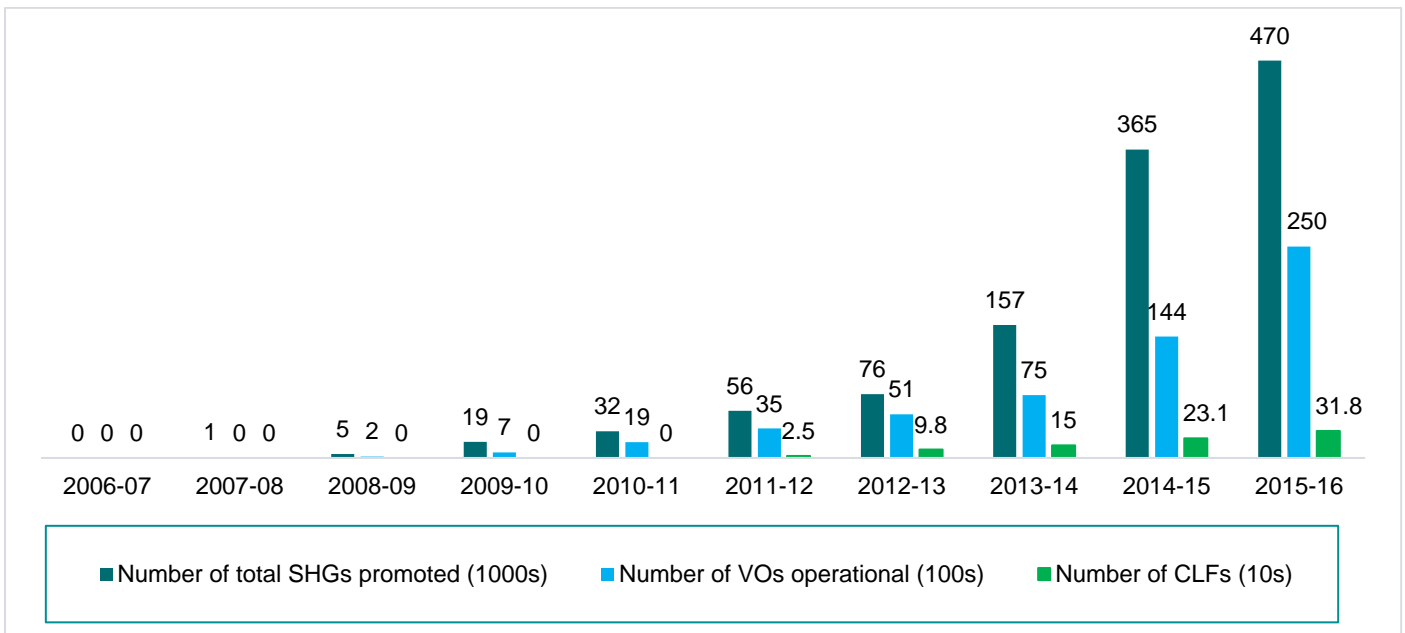


Findings

JEEViKA expanded rapidly under NRLM. Figure 5 shows the number of SHGs, VO, and CLFs formed by the end of each year, indicating a steep increase in coverage starting in 2011–12. By 2016, JEEViKA had led to the formation of 0.47 million SHGs across the state. According to the NRLM Management Information System, by 2020, more than 9.1 million women had been mobilized into almost 0.79 million SHGs.

Next, we describe how JEEViKA’s cost composition evolved over time as the program scaled its outreach.

Figure 5. Scaling Up of SHGs Under JEEViKA



The annual per-household cost under JEEViKA declined from \$61.6 per person at the start of the program to \$11.9 per person at the scaled-up level.

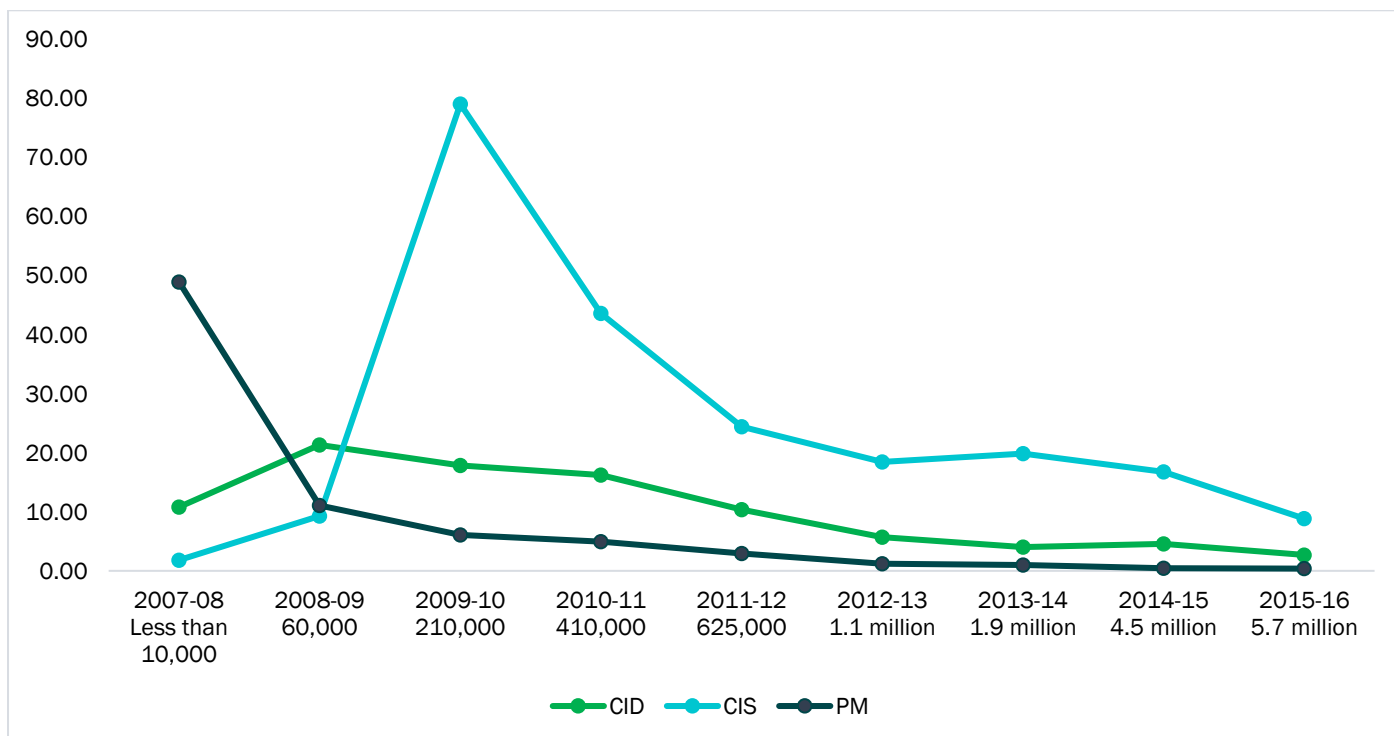
Initially, as the program scaled and mobilized more households, a higher proportion of resources was devoted to Community Institution Development (CID). The CID component included start-up expenditures on SHG formation and capacity building, which needed to be frontloaded. An inverse U-shaped trend in the relationship between per-household annual CID costs and scale suggests an increase in costs, with the increase in the number of households covered when the program is at a relatively small scale (under 200,000 households), and a decrease in costs as the program scales up using its established infrastructure and capacity-building network.

Once the program reached scale, the highest share of resources was devoted to Community Investment Support (CIS). The CIS component included spending on livelihoods and other social development initiatives layered onto SHGs. High expenditure on CIS is not surprising given that livelihood interventions operated at a much smaller scale in the first 10 years of the program. In the initial stages, the CIS funds were infused into the VOs as catalytic capital to stimulate financial intermediation and build the credit history of members (JEEViKA, 2017). While the proportion of CIS expenditure remained highest in all years after 2010, it steadily increased after 2012 (post-NRLM).

The share of Project Management (PM) expenses declined rapidly over time. Costs associated with PM declined to less than 5% of overall project costs by 2012–13 when JEEViKA reached over a

million households. Figure 6 shows the changes in per-household cost components with respect to program outreach.

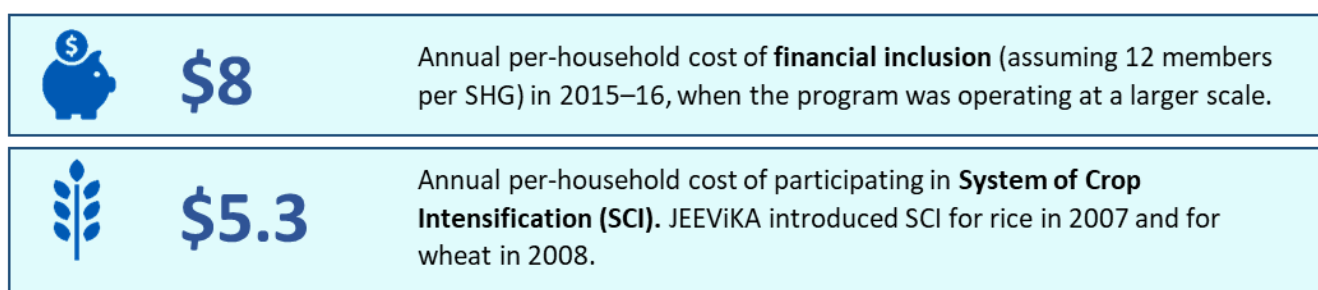
Figure 6. Costs per Household Over Time and Scale



Note. All figures are estimated in 2018 U.S. dollars. The x-axis shows the fiscal year and the cumulative number of members added up to that year.

Annual per-household cost of layered interventions: In line with the NRLM guidelines, primary activities under the JEEViKA program included SHG formation, community mobilization, and financial inclusion. Apart from these primary activities, project activities can be broadly classified into livelihoods, which included farm and non-farm-based activities; and social development, which included health, sanitation, and food security. Information on expenditures related to health and non-farming livelihoods were deemed insufficiently reliable to be included in this brief; however, we present preliminary estimates on costs of other major activities in Figure 7.

Figure 7. Costs of Layering Additional Interventions

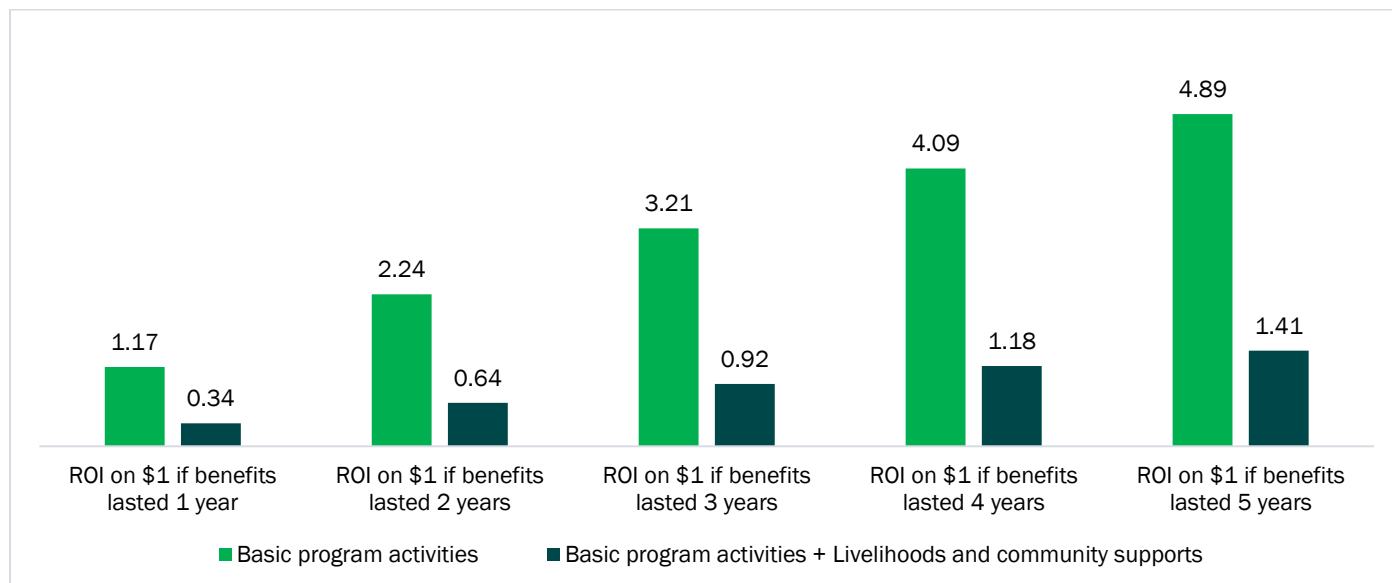


ROI Estimation Findings

Assuming that benefits last for 1 year and the program includes only basic SHG activities, every dollar invested in an average household under JEEViKA returns \$1.17 for that household. The ROI increases

to \$4.89 in Bihar when we assume that benefits last for 5 years. If we add community investment and livelihoods costs in addition to basic program activities, JEEViKA takes at least 4 years to break even. In this case, every dollar invested results in a return of \$0.34 if benefits last for 1 year, and \$1.41 if benefits last for 5 years. Figure 8 shows the return on one dollar invested when comparing annual benefits under JEEViKA against program costs for the years evaluated in the study.

Figure 8. ROI Under Various Assumptions



JEEViKA led to a \$30 increase in annual savings from lower interest rates for an average household after that household participated in the program for almost 3 years. During the same period, per-household costs of basic program activities were estimated as \$25, indicating an ROI of \$1.17 even when we assumed that benefits last for only 1 year, and increasing to \$4.89 when we assumed that benefits last for 5 years.

The findings suggest a trade-off between direct impact on program beneficiaries and positive spillover effects on *all* borrowers in the program region. In-depth interviews by Hoffmann and colleagues (2018) found that the pressure to scale up quickly reduced the intensity of mobilization and the direct social impacts in the later stages of the program. At the same time, SHGs operating at a smaller scale are unlikely to produce the impacts on informal lending rates that were achieved when the program moved to scale. In addition, the overall benefits associated with lower interest rates are likely to increase as loan amounts increase with time.

Further, at the time of the impact evaluation, the implementation of JEEViKA had also benefited from economies of scale, resulting in a per-household annual cost of only \$5 for basic program activities and \$25 when expenditure on community investment was added. The study also showed that JEEViKA had a higher impact on landless households: The borrowing rate for landless households declined by an additional 0.4 percentage points compared to landed households (Hoffmann et al., 2018). However, it is unclear whether the average cost of reaching an additional landless household is similar to the cost of participation for an average household under the program. Our upcoming work with 3ie will further explore the ties between program costs and household characteristics.

Lessons Learned, Remaining Puzzles, and Upcoming Work

This note summarized results from a preliminary analysis of costs and cost-effectiveness of the JEEViKA project in Bihar. This work was based solely on publicly available information, where we applied average costs estimated from aggregate data across the state, and impact estimates collected from seven selected districts in which the project was launched in 2012. In our forthcoming collaboration with 3ie, we plan to collect disaggregated data from *panchayats* and blocks that were selected in the ongoing impact evaluation of the JEEViKA program (which is a follow-up study to Hoffmann and colleagues [2018] and, therefore, uses the same sample) to facilitate a more rigorous ROI estimation aligned with the estimated benefits. In addition, more evidence on the impact and ROI of specific program components is needed beyond financial inclusion. Specifically, our upcoming work will aim to address the following evidence gaps:

- **The costs of different forms of CIS common to JEEViKA.** For the preliminary analysis, we were unable to estimate precise costs of various community investments that complement the basic JEEViKA activities (for example, agricultural interventions, dairy cooperatives, and formation of producer groups). In our upcoming work, we will generate evidence on the costs of these components, which is especially important considering the high proportion of CIS spending highlighted earlier.
- **The relationship among differences in implementation models of NRLM, their impacts, and their cost.** Implementation differences across states may explain the variation not only in costs but also in the estimated impacts of the program, as evidenced in an earlier study on a large-scale SHG program in Andhra Pradesh in India (Deininger & Liu, 2013). A recent study focusing on programs in humanitarian contexts also notes a wide variation in costs of the same type of program even within the same country (Tulloch, 2019). In future work, we will explore the relationship between state-specific socio-economic conditions and physical infrastructure as well as historical outreach of other social programs and costs of building the NRLM network.

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