

# Can the Poor Be Mobilized? Cooperation and Public Goods in Rural India

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# Outline

- Background
- The intervention
- Program impact
- Behavioral games
- Conclusions

# Background

- This paper evaluates a small scale implementation of a big idea in Indian anti-poverty and rural development policy, so called self-help groups.
- SHGs are a class of membership-based organizations that seek to facilitate the self-sufficiency of typically rural and marginalized participants (most often women).
- SHGs are typically established by NGOs with broad rural antipoverty agendas, but the government has also gotten involved more recently.
- An Indian SHGs typically consists of 10 – 20 members who meet regularly to pool small amounts of money into a common savings fund until there is sufficient capital to begin lending in small amounts to those same members.
- But, in addition to the rotating savings scheme linkages to banks for microcredits are often established, and a main objective of the intervention is to also encourage other activities to empower the members, such as leadership training, local political engagement and different activities to strengthen women.

# Background

- The Indian government has vowed to reach as many as 150 million households with SHGs and together with the World bank committed more than 5 billion \$ to this cause.
- Despite this there is very little solid evidence on the impact of SHGs. Studies suggest that SHGs can lead to:
  - increased incomes, reduced poverty, and improved women's participation in household decisions and civic engagement (Aiyar, Narayan, and Raju 2007 looking at the *Velugu* SHG program in Andhra Pradesh).
  - higher consumption, nutrition levels, and asset accumulation for poor participants (Deininger and Liu 2009a, looking also in AP).
  - increased self-reported trust in other villagers, elected representatives and government representatives, as well as women's attendance in village meetings (Deininger and Liu 2009a).
  - collective action to rectify public service deficiencies (Casini, Vandewalle, and Wahaj 2015, Datta 2015; Khanna *et al.* 2015).
- But all of these studies have their methodological issues in particular in terms of endogenous placement of interventions and how trust is measured.

# Background

- The paper also relates to evaluations of so called Community Driven Development projects.
- Recent impact evaluations of CDD projects (e.g. Casey et al 2012 in Sierra Leone, Humphrey et al 2012 in Congo, Avdeenko and Gilligan 2014 in Sudan) have shown some positive effects on livelihoods, etc., but most of the evaluations find no or little impact on the creation of cooperation, trust or social capital and/or political engagement.
- But maybe there are reasons to think SHGs could have more of an impact on cooperation and trust?

# Contrasts to CDD projects

- SHGs are typically focused on organizing the poor for a broader range of purposes beyond the implementation of specific projects.
- Often limited outside financial resources supplied.
- Since not oriented around a particular investment or flows of outside capital, meant to be long term, become an integrated part of village life.

# Results

- Women in treatment villages
  - Know more about where to field water related grievances (better informed).
  - Are more likely to field such grievances (collective action).
  - Report an improved water situation (affects outcomes).
  - Contribute more to a common pool in public goods games (cooperation and trust the mechanism?).

# Main contributions

1. We add to a small but growing body of evaluations using combinations of randomized-controlled trials and lab-in-the-field techniques to not only understand impact of development interventions but also try to trace the mechanisms behind that impact.
2. Very little solid impact evaluation of SHGs, in particular relative to more typical CDD projects. First RCT and lab-in-the-field evaluation we are aware of.



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# Research Setting: Dungarpur, Rajasthan

- 65% of the population consists of “Scheduled Tribes”, per capita income = Rs. 12,474 (approx. \$312), state average = Rs. 16,800 (approx. \$420)
- 21 percent BPL, literacy in our sample 18 %.
- Our partner: The Self-Employed Women’s Association (SEWA).

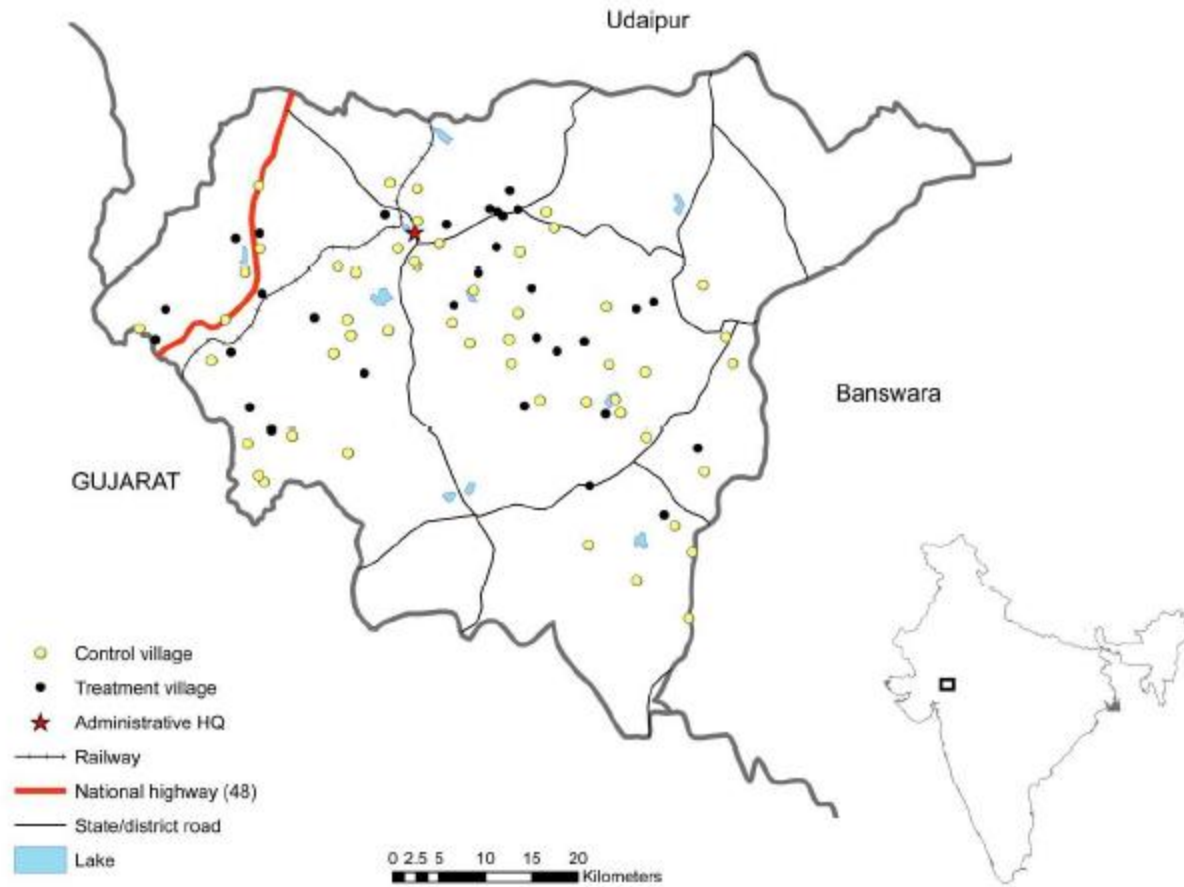


# RCT launched in Dec 2007

- Village selection was random.
- Census villages were stratified on the basis of female literacy, total number of households and household size
  - 32 treatment villages
  - 48 control villages



**Figure 1: Location of SEWA and non-SEWA villages in Dungarpur District, Rajasthan**



# Surveys

- Baseline survey was conducted prior to intervention.
- Survey firm mapped out village geographically, and listed all households with women in the age span 18-60 across village segments and then randomly picked a proportionate number to interview.
- End-line was conducted in the end of 2009, roughly 2 years later (repeated cross sections).

# The intervention

Village wide  
membership and  
awareness drive,  
5 Rs.

SHG organization,  
roughly 20  
women per  
group.

Monthly  
meetings, 25-100  
Rs.  
Empowerment.

# Intent-to-treat effect

- Membership and SHG participation is endogenous, and we are interested in how a bundled intervention like this can affect women's life in the village: treatment is residence in SEWA village.
- $$Y_{h,v,b,t} = \beta_0 + \beta_1 \text{SEWA Village}_h + \beta_2 \text{Post-intervention}_t + \beta_3 (\text{SEWA Village}_h \times \text{Post-intervention}_t) + \beta_4 \mathbf{X}_{h,v,t} + \mu_b + e_{h,v,b,t}$$
- **X**: Woman's age, age squared, woman's education, marital status, husband's age, husband's education, family size, caste, home ownership, farm ownership, housing quality (whether or not the house was a temporary or permanent structure), access to sanitation, village-level NREGA presence
- Linear model with errors clustered at village level.

# Pre- and post-program differences

	Pre-intervention			Post-intervention		
	(1)	(2)	(3)	(4)	(5)	(6)
	SEWA village residents	Control village residents	Difference	SEWA village residents	Control village residents	Difference

(A) Independent variables

Age	37.39	36.35	1.044 (0.645)	36.69	37.97	-1.077 (0.628)
Literate	0.184	0.188	-0.004 (0.037)	0.213	0.186	0.057 (0.039)
Married	0.947	0.952	-0.006 (0.012)	0.923	0.952	-0.024 (0.015)
Scheduled tribe	0.668	0.730	-0.061 (0.100)	0.725	0.77	-0.057 (0.078)
Husband age	41.06	40.24	0.824 (0.710)	40.50	40.87	-0.463 (0.613)
Husband literate	0.086	0.083	0.003 (0.020)	0.095	0.070	0.023 (0.021)
Own house	0.861	0.835	0.026 (0.027)	0.805	0.884	-0.071** (0.030)
Have own farm	0.900	0.891	0.009 (0.040)	0.835	0.874	-0.027 (0.051)
<i>Kutcha</i> house	0.667	0.746	-0.079 (0.071)	0.642	0.676	-0.039 (0.060)
Household has toilet	0.098	0.081	0.017 (0.036)	0.073	0.045	0.025 (0.028)



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# Outcomes

- For the purpose of this paper and presentation we focus on the public service women on average specify as most important, water access and provision, along 3 dimensions.
  - Knowledge about where to file complaints.
  - Actual engagement, collective action.
  - Perceptions of the water situation.
- (But we also find some positive effects on perceptions of health and roads quality, say in domestic matters and participation in local politics).

# Key result 1: Women in treated villages were better informed about and more likely to act on water issues and reported a more beneficial water situation

**Table 1: Unconditional differences, pre- and post-treatment water access**

	Pre-treatment		Post-treatment		
	Mean	Difference	Mean	Difference	Difference in difference
Knowledge of public authority	0.156 <i>0.180</i>	0.025	0.233 <i>0.378</i>	0.144***	0.119***
Contacted public official	0.164 <i>0.183</i>	0.019	0.250 <i>0.406</i>	0.156***	0.137***
Contacted <i>Sarpanch</i>	0.139 <i>0.160</i>	0.021	0.220 <i>0.349</i>	0.128***	0.107***
Overall water quality	0.174 <i>0.166</i>	-0.008	0.241 <i>0.370</i>	0.297***	0.137***
Access to piped water	0.112 <i>0.134</i>	0.022	0.088 <i>0.182</i>	0.093***	0.071***
Access to irrigation for farming	0.011 <i>0.007</i>	-0.004	0.025 <i>0.061</i>	0.035***	0.039***

Notes: Differences are generated from two-sample *t*-tests by control/treatment group (treatment means are italicized). \*  $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

# Conditional effects

Table 2: Water access and quality, conditional effects

	(1)	(2)	(3)	(4)	(5)	(6)
	Knowledge of public authority	Contacted public official	Contacted <i>Sarpanch</i>	Overall water quality	Access to piped water	Irrigation for farming
SEWA Village	0.015 (0.023)	0.009 (0.022)	0.013 (0.022)	-0.024 (0.040)	-0.002 (0.046)	-0.006 (0.010)
Post-Intervention	0.085*** (0.024)	0.094*** (0.025)	0.088*** (0.022)	0.071** (0.024)	-0.008 (0.027)	0.010 (0.010)
SEWA Village × Post-Intervention	0.111** (0.053)	0.125** (0.052)	0.097* (0.053)	0.148** (0.062)	0.084 (0.053)	0.040** (0.017)
Age	-0.000 (0.001)	-0.001 (0.001)	-0.001 (0.001)	0.001 (0.001)	0.001** (0.001)	0.000 (0.000)
Head of Household	0.000 (0.031)	0.007 (0.031)	0.007 (0.029)	0.017 (0.027)	0.063** (0.028)	-0.011 (0.009)
Scheduled Tribe	-0.034 (0.027)	-0.036 (0.028)	-0.026 (0.027)	-0.127*** (0.041)	-0.235*** (0.050)	-0.002 (0.010)
Scheduled Caste	0.042 (0.061)	0.045 (0.062)	0.057 (0.063)	-0.073 (0.051)	-0.111 (0.082)	-0.002 (0.016)
Literate	0.150*** (0.032)	0.165*** (0.031)	0.128*** (0.032)	0.091*** (0.026)	0.064*** (0.022)	0.006 (0.009)
Married	-0.038 (0.039)	-0.053 (0.034)	-0.040 (0.037)	-0.039 (0.043)	0.034 (0.028)	0.003 (0.014)
Children	0.002 (0.005)	-0.000 (0.005)	-0.001 (0.005)	-0.002 (0.005)	-0.004 (0.003)	0.002 (0.002)
Landowner	-0.035 (0.023)	-0.039 (0.024)	-0.029 (0.026)	0.028 (0.022)	0.009 (0.014)	-0.004 (0.007)
<i>Kutcha</i>	-0.066*** (0.021)	-0.075*** (0.022)	-0.054** (0.021)	-0.115*** (0.026)	-0.112*** (0.027)	-0.016* (0.008)
<i>N</i>	3,205	3,205	3,205	3,195	3,198	3,205
<i>R</i> <sup>2</sup>	0.091	0.105	0.080	0.135	0.293	0.023
<i>Control group mean</i>	0.196	0.208	0.181	0.209	0.100	0.134
<i>Treatment group mean</i>	0.275	0.291	0.251	0.265	0.157	0.178

Notes: Results are OLS with standard errors clustered by village in parentheses. Selection-strata fixed effects and intercepts are estimated but not reported. Control and treatment means are pre- and post-treatment. \*  $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

# Census confirmation

Table 3: Water quality and access, village-level results

	(1)	(2)	(3)
	Percent with piped water (Survey)	Percent with poor access to water (Survey)	Percent with access to treated water (Census 2011)
SEWA Village	1.474** (0.681)	-1.093 (0.812)	5.417** (2.456)
Post-Intervention	1.334* (0.753)	-21.297*** (1.485)	
SEWA Village × Post-Intervention	5.358*** (1.301)	-8.276*** (1.298)	
Literate (%)	0.162*** (0.029)	-0.460*** (0.141)	0.037 (0.101)
Married (%)	-0.167 (0.249)	0.324 (0.297)	-0.162 (0.235)
Kutcha (%)	-0.239*** (0.054)	0.019 (0.106)	-0.080 (0.051)
Scheduled Tribe (%)	-0.339*** (0.071)	0.198** (0.098)	-0.132** (0.058)
Scheduled Caste (%)	-0.417** (0.170)	0.021 (0.146)	-0.286** (0.127)
<i>N</i>	157	157	79
<i>Villages</i>	80	80	
<i>R</i> <sup>2</sup>	0.506	0.383	0.356
( <i>p</i> > $\chi^2$ )	0.000	0.000	
<i>Control village mean</i>	7.310	66.421	1.260
<i>Treatment village mean</i>	14.465	58.877	7.193

Notes: Observations are village-year (before/after) aggregated from baseline and endline surveys (columns 1 and 2) or taken from the *Census of India 2011* (column 3); census figures are for a village cross-section. Survey-based results are generated using OLS with panel-correct standard errors, corrected for contemporaneous correlation across villages. Census-based results are OLS with robust standard errors. Control and treatment means are pre- and post-treatment. \*  $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

# Interpretation?

- Results suggest that the intervention make a difference for information, engagement and public service quality (water), but why?
- We explore if it possibly has to do with increased **cooperation and trust**.

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# Public goods games

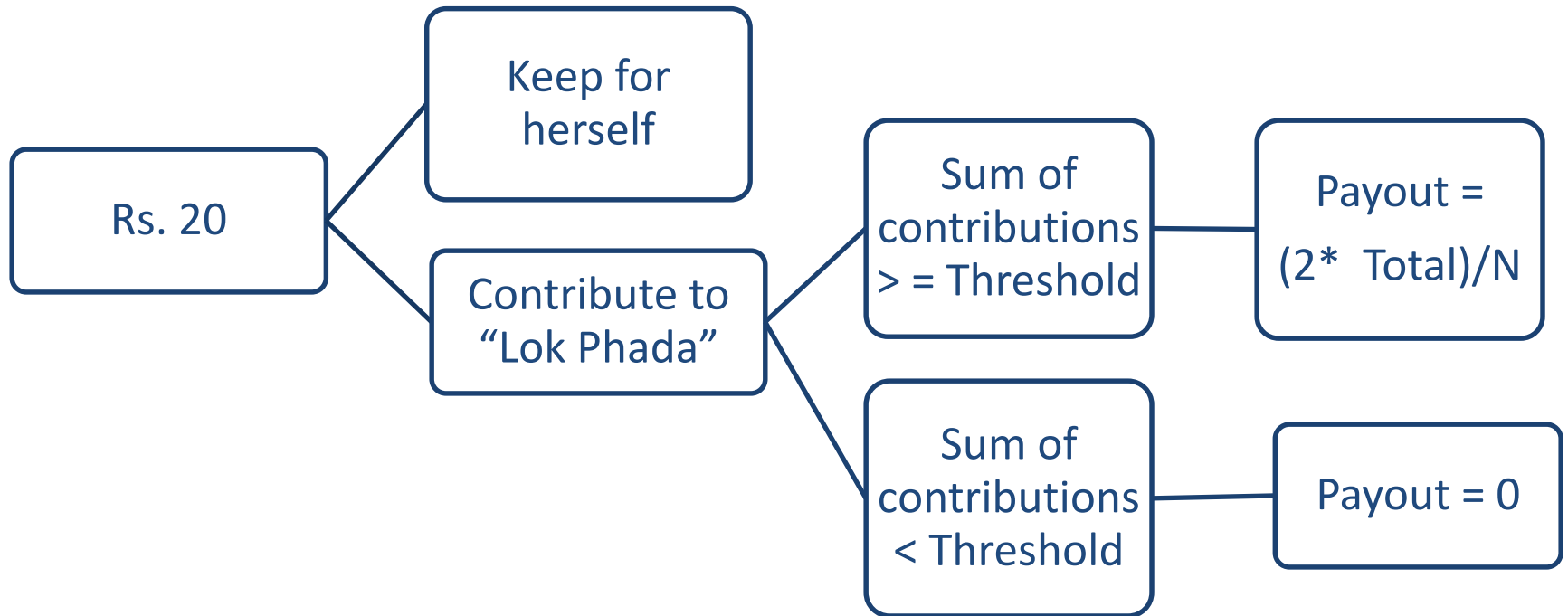
- Lab-in-the-field experiments in 14 villages, 7 treatment and 7 control (very limited financial and time resources), were conducted in 2011 (almost 4 years after program was launched).
- Control villages matched one to one based on geographical proximity and similarity in terms of population size and female literacy.
- Women randomly picked with help from Sarpanch in control villages, and mainly from SEWA member list in treatment villages.



# Public goods games

- Women were given 2 envelopes. A big envelope with 7 coupons representing denominations of 10 (1), 5 (1), and 1 (5) in different colors. A small envelope for contributions.
- Standard public goods games, with provision points as focal points for cooperative behavior (cooperative and non-cooperative equilibrium in the stage game).
- Shareen served as game leader and explained the game based on a script provided in the paper.

# Illustration of stage game



# Repeated game

- Players are not informed in advance, but we repeat the game (allows for learning, as players are informed after each round).
- Provision point starts at  $N \times 10$  and is raised by 20 % after successful completion.
- Game stops after 10 rounds or when provision point beyond  $(N-1) \times 20$  is reached.

# Hypotheses

- Women in treatment villages should contribute more, in particular in the first round.
- Information, identity, bargaining power, repeated interaction -> collective action, cooperation and trust:
  - Information is shared, membership may encourage common identity and preference convergence (though SEWA emphasizes all women in villages).
  - Women are actively encouraged to engage as a group rather than individually to increase their bargaining power (Collective action facilitated).
  - Savings scheme requires trust. Repeated successful interaction: Trust and cooperation increases → Collective action is facilitated.

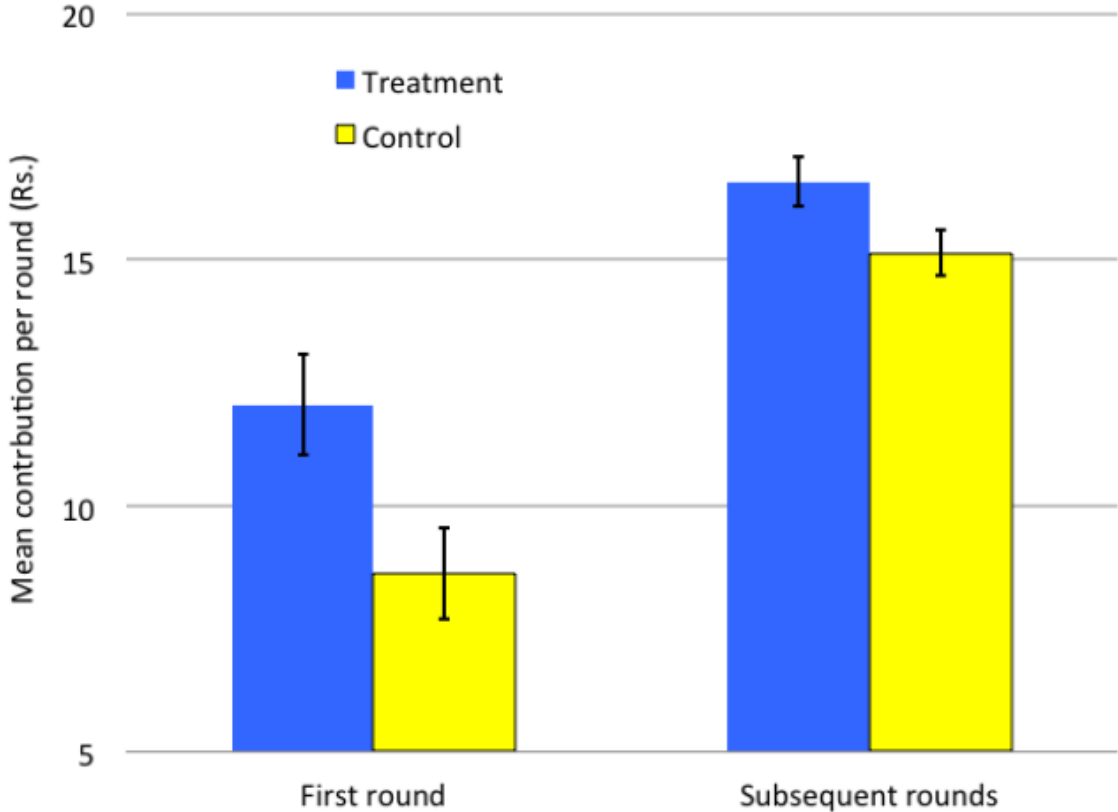
# Games were played with similar women in treatment and comparison areas

	<b>Control</b>	<b>Treatment</b>	<b>Difference</b>
Average Age	32.950	32.604	-0.349 (0.549)
Average Education	1.440	1.416	-0.0252 (0.213)
Average Literacy	0.233	0.313	0.080 (0.035)
Live with husband	0.883	0.937	0.054*** (0.019)

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

# Key result 2: Women in treatment villages contribute more, in particular in round 1.

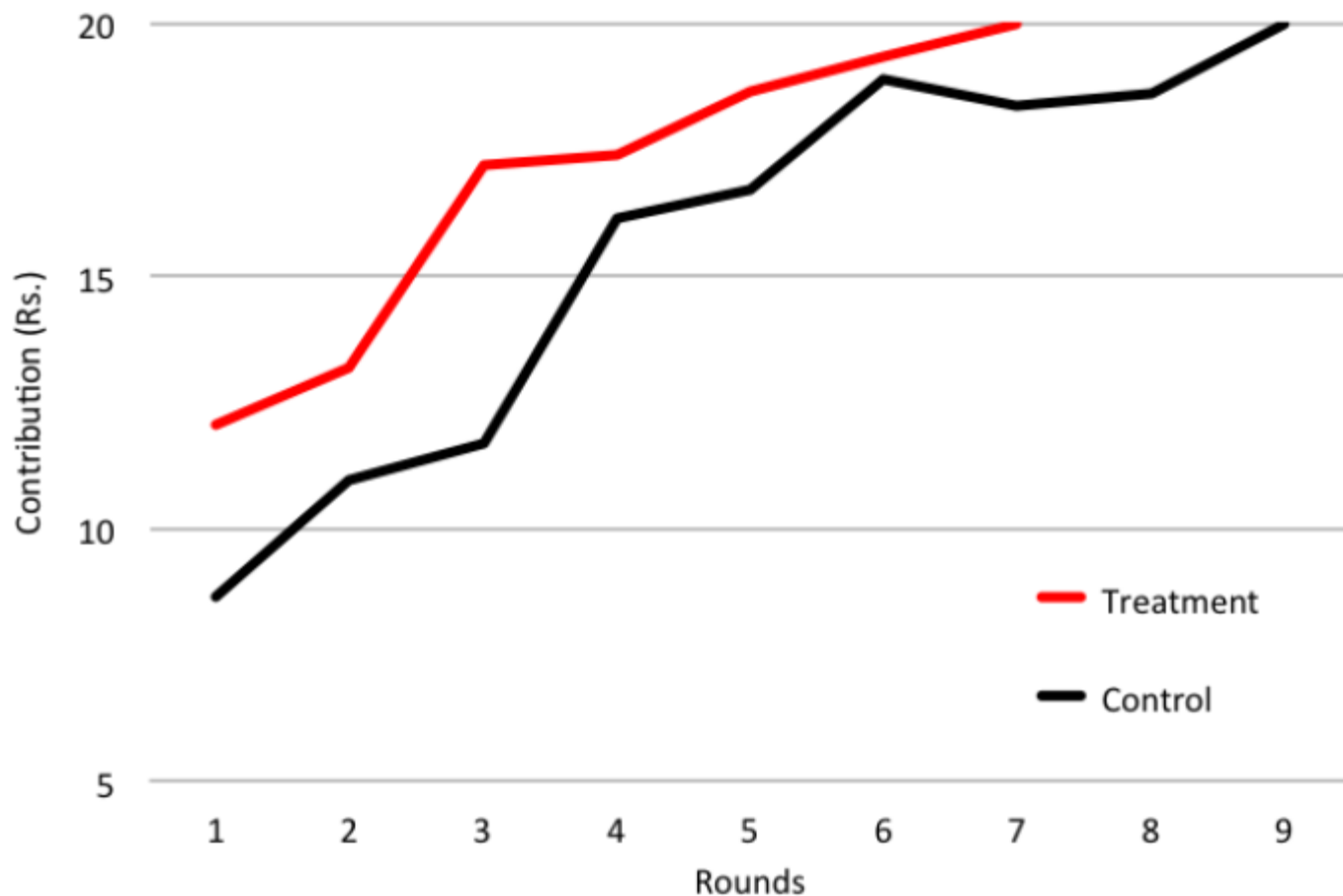
Figure 2: Average contributions by group



Notes: Bars are average contributions of different cohorts for first round and all subsequent rounds, with  $\pm 95\%$  confidence intervals.

# Contributions in treatment villages persistently higher

Figure 3: Average contributions by group-round



Results are robust to controlling for game round, individual characteristics and the provision point.

Table 6: Regression results for experimental games, all rounds

	(1)	(2)	(3)	(4)	(5)	(6)
	Contribution		Payout		Net earnings	
SEWA Village	3.859** (1.910)	4.033** (1.712)	20.943*** (7.788)	24.360*** (8.434)	16.995*** (6.305)	20.167*** (7.260)
SEWA Village × Net Earnings <sub>t-1</sub>		0.082** (0.041)		0.058 (0.220)		-0.020 (0.206)
Provision Point	0.017* (0.009)	0.012* (0.007)	-0.113*** (0.031)	-0.134*** (0.032)	-0.131*** (0.026)	-0.147*** (0.029)
Net Earnings <sub>t-1</sub>		-0.060* (0.031)		-0.172 (0.151)		-0.117 (0.157)
<i>p-values from small cluster adjustment:</i>						
Cluster-robust SE	0.003	0.002	0.001	0.000	0.001	0.001
Bias-reduced linearization	0.044	0.019	0.007	0.004	0.007	0.006
Wild bootstrap- <i>t</i>	0.006	0.031	0.024	0.048	0.032	0.047
<i>N</i>	1,034	848	1,046	860	1,046	860
Adjusted <i>R</i> <sup>2</sup>	0.404	0.354	0.425	0.498	0.438	0.487

Notes: Standard errors adjusted for (village-level) clustering with bias-reduced linearization in parentheses. Age and Literate (as controls) as well as intercepts and seasonal dummies are included but not reported. Reference lines show *p*-values for “SEWA Village” coefficient from linear regression with cluster-robust standard errors, bias-reduced linearization, and cluster wild bootstrap-*t* with 5,000 resamples. \* *p*<0.10; \*\* *p*<0.05; \*\*\* *p*<0.01.



# Conclusions

- A SHG intervention organized by outsiders can influence communities
  - Information on how to address grievances
  - Collective action/engagement in fielding grievances
  - Improvement in the quality and infrastructure of public services
- How it works?:
  - SEWA membership → information sharing, identity, repeated interaction in SHGs → creation of cooperation and trust -> improves collective action -> better water services

# Alternative explanation: congruence of preferences?

- To test convergence of preferences we use an inter-rater reliability coefficient (Krippendorffs alpha) that quantifies the extent of agreement, in this case over public goods priorities (Water, Sanitation, Health, Electricity, Education, Work, Roads).
- We do this for both treatment and control subjects and before and after the SHG intervention.

# SHGs do not seem to cause priorities to converge.

- Rankings of priorities suggest agreement in both treatment and control villages and increased agreement in both over time (increased water shortage).
- But, no signs of a larger increase in agreement in treatment villages post intervention.

## RANKINGS

	Pre-intervention	Post-intervention	Diff
Control	0.514*	0.756***	0.242
Treatment	0.479*	0.620***	0.140
Treatment A		0.599***	0.120
Treatment B		0.655***	0.176

# Outcomes

- For the purpose of this paper and presentation we focus on public service provision, more specifically water. But we also have other results:
  - More likely to regularly save and be part of savings groups, but we see no significant effect on actual amount of savings.
  - No (short term) effects on income but more likely to participate in non-agricultural labor force.
  - Greater bargaining power within family (say over family decisions).
  - Greater participation in village-level political meetings (small effects).