Public Good Provision and Deliberative Democracy: Evidence from Malawi*

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Abstract

Community-driven development programs empower local communities in developing countries with resources and decision-making to design and deliver public goods. The success of these programs critically depends on the ability of local communities to overcome problems of free riding. We use insights from focus group interviews alongside the results of a public goods game with farmer clubs in Malawi to determine the socio-political conditions that reduce free-riding and increase contributions to the public good. We find that democratically-run clubs, in particular those with close social ties, contribute significantly more to the public good compared to clubs whose decisions are made by leaders. Our results hold using a range of definitions of social ties and alternative measures of democracy; results are robust to an instrumental variable specification inspired by focus groups. Focus group discussions indicate that democracy employed by clubs is deliberative in nature, and quantitative analysis confirms that clubs containing relationships characterized by open discussion contribute more in democratic settings. This type of discussion serves as a means of aggregating preferences, but also seems to increases common knowledge and create goodwill within the club.

Keywords: Deliberative Democracy, Social Networks, Farmer clubs, Public Goods Game, Malawi

JEL Classification Numbers: O1; Q1; H4

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1 Introduction

Community-driven development programs - programs that incorporate local management and input in program design and implementation - can provide benefits to organizations working in developing countries relative to centralized and top-down modes of operation. Successful community-driven development programs are demand-responsive, accountable, and transparent; they empower poor men and women to identify and address local problems (Mansuri and Rao, 2012). The decentralized approach to project implementation and design may improve project design and implementation in situations where participants have privileged access to information about local needs, constraints and resources (Bowles and Gintis, 2002). Despite these possible benefits, community-driven development programs have not produced uniformly positive results. The requirement to contribute individual labor, time and in some cases financial resources in contexts in which project benefits are shared equally can lead to participant free riding, undermining program goals and efficacy. When practitioners ignore the social and political context of community driven programs, projects can fail to deliver anticipated benefits (Wong, 2012; Ojha et al., 2016; McGranahan and Mitlin, 2016).

Under what institutional and social conditions can we expect community-driven development programs to succeed? Two strands of literature provide guidance. First, following Ostrom (1990), a rich body of literature developed studying the role of community organizations in addressing common-pool resource problems (see Dietz et al. (2003) for a review). An insight from this literature: policies that successfully reduce competition in common-pool resource dilemmas depend on integration with complex social and political contexts. For example, Pagdee et al. (2006) uses a meta-analysis to identify key factors for the success of community forestry: substantive community involvement, strong community social capital and the involvement of local leaders (see also Wade (1994); Agrawal and Goyal (2001); Poteete and Ostrom (2004); Gutiérrez et al. (2011)). Zulu (2008) investigates village committees managing eucalyptus and miombo forest resources in Malawi. He argues that most are corrupt and unaccountable and he emphasizes the need for trained leaders and broad-based decision-making.

While this literature highlights factors that are worthy of attention, the lack of (random) quantitative variation provides few causal conclusions regarding the relationship between group processes or attributes and project outcomes. Furthermore, there is a clear distinction between refraining to over-utilize a common resource and contributing to a public good. In particular, while the individual consumption of common pool resources such as grazing lands and community forest reduces availability to others, public goods are non-rival and therefore subject to free-rider problems. Empirically, this difference is observed in the observation that individuals are typically more cooperative when it comes to contributing to public goods than they are in a context of common resource use (see Andreoni (1995) for an overview and a warm-glow model).

This brings us to a second relevant literature: one that is built on the public good game. In this game, participants are asked to divide a (researcher-provided) endowment between a private account and a common account. The funds in the common account are shared

equally among all participants while the funds in the private account are used by the participant alone. The experimenter multiplies the funds in the common account by a factor larger than one and less than the number of participants. According to standard game theory, in equilibrium, no participant will contribute anything to the common account, even though contributing one's full endowment maximizes the earnings of all; thus, the equilibrium outcome is non-cooperative and inefficient. However, analysis of the game outcomes conducted in laboratory settings have generally found that participants do cooperate, though cooperation usually declines in multi-period games over time (see Ledyard (1995); Chaudhuri (2011); Vesterlund (2012) for an overview).

Of course, results obtained in laboratory settings may not readily extend to field settings. The close social ties observed in field settings might trigger altruism (Guala et al. (2013) show such an effect in the laboratory) and corresponding moral norms might deter free-riding (Sugden (1984) and Dal Bó and Dal Bó (2014) show such effects in the laboratory). Increased heterogeneity in the field compared with laboratory settings might also affect free-riding (see Kölle (2015) for evidence from the laboratory). In addition, field settings might be affected by the presence of an existing social dilemma. Jang and Lynham (2015), for instance, document a spillover of sharing norms in Ugandan fisheries on behavior in a lab-in-the-field setting. Relatedly, Braaten (2014) documents that communities in rural Peru with a norm of joint-ownership contribute more to the public goods game compared to communities without such a norm.[1] In summary, the literature suggests that the social and political context matters and as a result laboratory-based public goods games can only offer limited guidance.[2]

We conduct a public goods game among farmer clubs in Malawi. Farmer clubs – which range in scale and formality from loosely organized informal village groups to legally constituted cooperatives – play a central role in community-driven rural development strategies in the developing world, often serving as the cornerstone of projects working to engage and assist smallholder farmers. We combine results from the farmer group public goods game with qualitative data elicited from the clubs through focus group interviews. In the public goods game we asked the club to use the proceeds to finance a public good of their choosing. Using the contribution to this public good as a measure of cooperation, we study the role of social and political context in cooperative behavior. In particular, we focus on (i) the degree of democracy, and (ii) the strength of social ties.

Our analysis makes three primary contributions to the literature. First, we find that farmer clubs are heterogeneous in ways that critically affect club outcomes and we identify

[1] Englmaier and Gebhardt (2016) show that when social dilemmas are presented in laboratory settings of the public goods game, results are substantially different than when social dilemmas are not made salient. Henrich et al. (2004) observed substantially different results in the public goods and ultimatum games among the Orma ethnic group in Kenya. This attribute this difference partly to the Orma's application of *harambee* rules in the public goods game, a local arrangement that pools resources to provide public goods for education.

[2] Additional evidence provided in Henrich et al. (2004), who conducted public goods games across many cultures and document that the cross-group variation was a more important predictor of cooperation than individual-level variation.

conditions that lead to cooperation. In particular, the degree of democracy strongly predicts cooperative outcomes. Democratic clubs contribute roughly 50% more to the public good than clubs in which decisions are leader driven. Second, we find an important complementarity between democratic decision-making and social relationships. We find that democratic clubs achieve more cooperative outcomes primarily in the presence of strong social ties. These results are robust to a rich set of controls and are complemented by interpretations emanating from our use of qualitative data, which is vital in enriching our understanding of complex local contexts.[3]

Consistent with Henrich et al. (2004), we find that in our public goods game, there are few individual determinants of cooperation; instead, group-level differences explain the majority of the variation.[4] The focus group interviews hint at what these group-level differences entail - the socio-political structure - and allow us to uncover much of the heterogeneity that drives variation in cooperation across clubs. Moreover, the focus group discussions provides us with a critical insight that informs our analysis and interpretation: farmer clubs do not strategically choose the degree of democracy upon club formation; rather, they adopt the norm present in the village. This is a critical finding because it allows us to assume that the sources of endogeneity of the political structure are not contingent on club characteristics - indeed, statistical tests show no difference in club characteristics along observable dimensions between democratic and leader-driven clubs.[5] The observation that these group norms reflect community norms also provides us with a plausible instrumental variable for the degree of democracy in the club: the degree of democracy in all *other* clubs in the village. Using these insights, we perform an instrumental variable analysis. Our findings are consistent with the OLS specification, evidence that the strongest threat to a causal interpretation of our results are unobservable village-level differences between villages with democratic and leader-driven regimes. However, none of our village observable characteristics (outside of the above instrument) meaningfully predict selection into either decision-making regime; strong evidence that our findings can be causally interpreted. Finally, focus group discussions shed light on the mechanisms through which democracy might increase cooperation. The democratic decision-making process employed by clubs is deliberative in nature. In fact, one club noted that voting is only used as a last resort if agreement is not reached after deliberation. When making the decision regarding spending the game funds, farmers discuss the pros and cons of the various options, learning about the options as well as each-other's preferences, before making a decision (usually unanimous). In other words, it is beneficial

[3] Mansuri and Rao (2012), in an overview of community-driven development programs, stress the importance of combining qualitative information on local social and political circumstance with quantitative analysis to further illuminate the processes that lead to success in community-driven development. A similar sentiment is prevalent in the literature on management of common pool resources. Agrawal and Gibson (1999) and Ostrom (2014) discuss the need to overcome the 'simplicity fixation' in studies examining the behaviors in heterogeneous settings.

[4] Fifty percent of the variation in our setting as opposed to twelve percent in Henrich et al. (2004). This difference may be attributable to the fact that our study uses established farmer groups while Henrich et al. (2004) looked at cross-cultural differences across random groupings of players.

[5] This is true even of variables that may indicate a high level of extant cooperation within the club such as the level of trustworthiness among club members.

to the extent that conversation, and not voting, among club members influences outcomes.[6]

The rest of the paper is organized as follows. In the next section, we describe the setting and data. We follow with the theoretical framework in section 3. Section 4 presents the results and section 5 concludes with a discussion and policy implications.

2 Data Collected

We collected the data for this study as part of an ongoing impact evaluation. As the impact evaluation itself is not the focus of this study, we summarize this program only briefly here. The program is implemented by the international NGO, the Clinton Development Initiative (CDI). Program activities included: (i) the dissemination of information about and training on improved agricultural practices, (ii) the provision of credit, improved seeds and other agricultural inputs, and (iii) the facilitation of access to output markets. As is common in agricultural development programs, CDI works through farmer clubs. For instance, CDI's credit program is at the club-level, punishing all members of the club if one member defaults. Additionally, CDI's disseminates information through structured interactions with each club. A lead farmer in each club serves as the primary liaison between the club and CDI: he or she attends the CDI trainings, interacts with the CDI extension agent, and is in charge of disseminating information about the improved agricultural practices promoted by CDI. We will return to this club-based model below.

In 2014, CDI worked in three districts in central Malawi: Mchinji, Dowa and Kasungu. Districts in Malawi are further sub-divided into Extension Planning Areas, or EPAs, and the CDI program was covering all EPAs in Mchinji, but only a subset of the EPAs in Dowa and Kasungu. Together with CDI, we selected two EPAs as study sites among the remaining EPAs in which CDI had not yet worked prior to 2014. Chibvala EPA, in Dowa district, and Mtumthama EPA, in Kasungu district. The total number of villages in these two EPAs amounts to 360; we selected the 303 villages which had more than 50 households and randomly selected 250 from this set. Half of these 250 villages, again randomly selected, were invited to participate in CDI's program activities, i.e., these were the treatment villages in the impact evaluation.

As the CDI program works through farmer clubs, CDI, after having introduced their program, asked representatives of the 125 treatment villages to establish clubs of farmers interested to participate in the program. The clubs were required to have between ten and twenty members, of which 50 percent are women, and to self-select a lead farmer. In total, 87 out of 125 villages formed farmer clubs (53 villages formed more than one club, in which case one club was randomly selected as part of this study). It is these 87 clubs which form the sample for this study.

[6]This is consistent with the fact that, in the public goods game, leader-driven clubs seem unable to harness the resource of social capital. It is also consistent with our observation that democratic clubs for whom democracy plays a knowledge generating as well as preference aggregating role, have an optimal club size of 12-13 members, while for leader-driven clubs, whom essentially are playing a more standard voluntary contribution equilibrium, smaller is always better.

We collected data in 2014. This data collection included public goods games, focus group interviews, household surveys and village surveys. We discuss these data sources in turn below, and present relevant descriptive statistics.

2.1 Public Goods Game

In this sub-section, we outline the public goods game. For further details, refer to the Appendix B.1. We invited all club members to a central location in the village and recorded, in private, their age, gender, education level and acreage of land owned. In total, we conducted 87 games with 1,084 club members (representing about 75% of all club members, or an average of 12.5 per club). Panel A of table 1 describes the sample. On average, club members are 38 years old, received five years of education and own close to 5 acres of land. Roughly half (48%) of club members are female.

After collecting this information, we explained the game to all members present: Each club member would be asked to divide 400 Malawian Kwacha (equivalent to one USD at the time of the game and provided by us) into two shares. One share, which we labeled the "individual account" would be the club member's money, i.e., the club member owns this money and decides on its use. The other share, which we labeled the "common account", and would be placed in an envelope, would be shared with all club members, i.e., the club members together decide on its use. The money placed in the "common account", once aggregated, would be multiplied by two. We illustrated this multiplication process with actual bills. We then emphasised that the decision as to how much to place in the common account is entirely theirs and a private decision.

Before the club members made their decisions, but after the game was explained, we gave the club members the opportunity to discuss how the money in the common account could be used. We did not monitor the process by which this decision was made, and did not impose any time constraints.

We then asked the club members to disperse and make their decision, individually and in private. We recorded, in a confidential manner, each member's decision. In addition, we also contributed an unknown - to the club members - amount (400 MK) to the common pot, so that no-one could derive the contributions of other members from the total amount in the common account. Once each club member made their contribution decision, we collected all "common account" envelopes, added our own envelop, mixed up the envelopes, and opened them. We then counted the total amount in front of the club, added an equivalent amount and returned the full amount to the club.

Panel A of table 1 summarises the main result of the game: on average, club members contributed 43% of their endowment to the common account. Figure 1 reveals that there is quite a bit of variation in individual contributions to the common account. Each participant received eight 50 MK bills, which is why we divide the histogram in figure 1 into eight bins. We see here that a plurality of club members (24%) contribute 100 MK followed by 200 MK (23%), 50 MK (17.9%) and 400 MK (13.4%). This suggests a multimodal distribution of contributions. We explore individual predictors of contributions and return to the implications of this finding below.

2.2 Focus Groups

We carried out focus group discussions with ten randomly selected clubs. In each instance, we invited all club members to a central location and, following Morgan (1996) and Krueger and Casey (2015), we facilitated a structured one-hour conversation around a small set of: (1) engagement questions - constructing a social network graph and documenting the history of the club, (2) exploration questions - focusing on the constraints and opportunities of club-based activities, and (3) exit questions - concluding with future plans and hopes for the club. The discussions were led by two experienced local Malawian researchers, one male and one female.

Most questions were addressed to the group. For instance, the group was asked 'What are the challenges of managing a demonstration plot together as a club?' Members were encouraged to talk freely among themselves. For some questions, individual responses were required. For instance, club members were individually asked 'Who (of the club) did you know before you formed the club and in what capacity?'.

The most important discussions relevant to this study involved the following two questions: 'How does your club generally make decisions?' and 'Why was this decision making process chosen?' From the ensuing discussions, we gleaned that clubs do not strategically choose decision-making methods but rather adopt whatever collective decision-making methods they are accustomed to using in their village. Half of the ten clubs interviewed stated that they have a democratic process in which they hold discussions to determine directions for collective action while the other half suggested that their leaders have the final say over the club's decisions. In the latter case, the leaders often stated that they discuss options with club members prior to deciding upon actions themselves. Among the more democratic clubs, some clubs appeared to be more committed to reaching agreement through discussions while others stated that when there are disagreements, the group's decision follows the majority rule after a vote. In effect, voting was often seen as a last resort, in case agreement could not be reached.

2.3 Household Survey

We administered a household survey among the households of four randomly selected club members and the club's lead farmer for each of the 87 clubs. In each case, we interviewed the head of the household. The survey modules include (among others) the demographic characteristics of the household members, household assets and the household's social network and group memberships. We describe survey questions from the latter two modules below given their importance to our analysis.

2.3.1 Social Networks

The respondent was asked to detail the nature of their relationship to each of the members of the farmer club. Thus, if there are ten members in a club, then the respondent was asked to detail their relationship with each of these ten members (excluding him/herself). We

formulated and asked the following four questions (borrowed from Conley and Udry (2010)): (1) "Do you know who this person is?" (2) "Have you asked this person for advice about your farm in the past year?" (3) Could you approach this person if you had a question about farming?" and (4) "Would you trust this person to look after a valuable item for you?"

Individual responses to each of these questions are reported in panel B of table 1. On average, the respondent knows 88% of other club members, seeks advice from 24%, can approach 80% of club members for farming advice, and can trust 68% of other members to hold valuable items (the latter 3 statistics are unconditional averages).

2.3.2 Club Decision-Making

The respondent was asked to list the civic associations that the household participates in: i.e., to list for each member of the household the organizations in which he or she participated. For each organization that the respondent (personally) belonged to, we asked a series of follow up questions about the organization (sourced from Grootaert et al. (2002)), including: "How does the group usually make decisions?"[7] Respondents could choose among the following responses: (1=) "The leader decides and informs the other group members" (2=) "The leader asks the group what they think and then decides" or (3=) "The group members hold a discussion and decide together", or (4=) "Other."

Panel C of table 1 shows individual responses to this question. Recall, 81% of the 437 households that self-reported participation in CDI farmer clubs stated personal involvement in their village's club.[8] However, only 74% of these households answered this question - most the remaining 26% stated that their club had yet to meet. We remain with 261 responses that capture information regarding the decision making processes present in our farmer clubs. This results in an average of 3.5 (instead of 5) responses per club for the 74 clubs that managed to form and identify club procedures prior to the collection of survey data.

Of the 261 responses, roughly half of the respondents indicated a more leader-driven decision-making process responsible for club decisions - 51.3% of respondents chose option number 1 or 2. 41% of respondents indicated a democratic decision-making process and only 8% of the respondents chose "other," indicating that the first three options sufficiently outline the set of decision-making methods employed by the majority of the clubs.

Note that within-club responses to this question may differ despite the fact that the question solicits information regarding a club-level process. Certainly, subjective perceptions of, and experiences with, the decision making process may differ depending on one's experience with the club. However, we are primarily interested in whether a club makes decisions in a *relatively* deliberative or leader-driven manner. Recall that the focus group discussions help

[7]Other follow up questions include: "How often did the group meet in the past year?", "Overall, in your view, how effective is the group's leadership?", "How strongly do you agree with the following statement: I am able to express my views at group meetings?", and "How strongly do you agree with the following statement: I am able to influence the views of others at group meetings."

[8]While most villages self-reported 5 CDI member households, roughly 36% reported no less and 3 and no more than 8 CDI member households. Thus, the total number of self-reported CDI participants is 437 as opposed to 435 (87×5) households.

us understand that there are degrees of discussion-based decision-making adopted by the democratic clubs as well as various forms of member contributions in leader-driven clubs. In this way, the responses can be thought of as providing information on the placement of a club along a spectrum of decision-making methods between two extremes: fully democratic and fully leader-driven. The average club-level response to this question will allow us to identify where a club lies along this spectrum.

Table 2 provides summary statistics at the club level for relevant variables in our analysis. In total, we lose information regarding decision making processes for 13 clubs that played the public goods game because either we did not capture information from a household member with personal involvement in the club, the club had yet to meet, or because of a mix of these two issues. Thus, we restrict summarizations of club-level data to the 74 remaining clubs. Panel A in table 2 reports the results of the club-level averages. The within-club average of the decision-making variable is 2.29 and the median of the within-club average is 2.2 (Recall that this number is between 1 and 3 where 1 is the most leader-driven process while 3 is the most deliberative process). To further ease interpretation of results, we also create a binary measure. We divide clubs into two mutually exclusive groups based on whether they are above or below this median value of 2.2 (See appendix A for more details regarding the construction of this variable.). In this way, we place 37 clubs above the median (relatively democratic decision-making) while 37 are under (relatively leader driven decision making).

2.4 Village Questionnaire

We administered a village questionnaire in each of the 87 villages among a knowledgeable individual, often the village head or secretary to the village head. This village questionnaire covered information on the village's (and hence the club's) distance from paved roads, population, access to NGO or governmental extension workers, price of daily labor during harvest, and involvement with other civic organizations. Panel B of table 2 presents relevant village-level descriptive statistics. Note the large variation across villages in these measures. Villages report being an average of 1.8 kilometers (km) away from paved roads; however, the furthest village is 13 km away and half of the villages are less than 0.3 km away. The average village size is 69 households, however the largest village has over 400 households. Roughly 30% of villages have never been visited by an NGO extension worker - which suggests that even though clubs are formed by CDI, many farmers have only interacted with CDI through the organizational structure CDI espouses. The cost of one dat of labor during harvest also vary significantly across villages with an average of 1,101 MK and a standard deviation of 1,170 MK.

2.5 Aggregating Variables at the Club Level

The observation that individuals contribute 43% of their endowment to the common account is similar to patterns of contributions in other studies utilizing variants of a public goods game. For example, a review by Chaudhuri (2011) notes that individuals on average contribute between 40% and 60% of the experiment's endowment. He notes, however, that these

contributions exhibit considerable, even multi-modal, variation similar to the distribution we discussed above. However, appendix figure C1, which shows the club-average distribution, shows a more balanced distribution of club-level contributions, which suggests key differences in club vs. individual contribution behavior.

To explore individual correlates of common account contributions, we regress individual contributions against individual characteristics in table 3. We find no statistically significant correlation for gender and age while educated and wealthier individuals contribute significantly more on average. In column (2) we incorporate club-level fixed effects and show that these effects do not change the direction of coefficients relative to column (1). However, they are able to explain roughly 50% of the variation in contributions as exhibited by the jump in the adjusted R^2 value from 0.04 to 0.52. Indeed, a oneway ANOVA regression provides an intraclass correlation coefficient of 0.51, suggesting that half of the variation in contributions is strongly related to club-level factors. The pattern of strong group level differences is much stronger in our data than in Henrich et al. (2004), who show that twelve percent of variation in results occurs at the group level with little variation at the individual level.

This difference is likely due to the local economic, social, and political context each club is embedded within, a context that we have attempted to measure through the data discussed above. To elaborate, while the agency to contribute to the public good belongs to the individual, individual factors alone will not help to understand the determinants of cooperation in the farmer club because in our version of the public good game, the club gets to keep and spend the multiplied common account funds towards their own ends. We have already described the construction of the primary club-level variable describing a club's political, or decision making, context. Other economic and social factors that influence cooperation include aggregate levels of wealth (land size and asset holdings), education, age and share of female members. To address these aggregates, we generate within-club measures of averages and standard deviation to capture both levels and distributions of relevant club-level variables. Furthermore, we construct measures of the strength of within-club social interactions by averaging responses to the survey questions eliciting social interactions between survey respondents and the registered club members. Given the nature of the random-within-club sample design, aggregate measures constructed using survey data are assumed to be representative of the club. The local context can also be characterized by the village-level variables which capture market access and familiarity with civic associations at the village level.

In addition to the above measures describing club composition, the total number of club members who participated in the game is generated by summing the number of contributions made during the course of the game for each club. Additionally, club-level analysis requires that we analyze average contributions towards the public good. Panel C of table 2 shows that roughly 13 club members participated in the game on average and that the per-club average share of contributions closely correspond to individual average contributions (42%) but smaller standard deviation (21% vs. 30%).

3 Theoretical Framework

Our objective is to analyze how the social and political (i.e. the process by which collective decisions are reached) context of the farmer club affects its ability to coordinate and overcome free-riding. Our measure of club-level cooperation is the contribution to the common pot in our public goods game. Recall that in our game, the club members were able to think about the various uses of the common account prior to making contributions and decided on an ultimate use after the contributions were made and the total amount contributed was revealed. Examples of the public good determined by the club include purchasing and providing inputs to a demonstration plot, funding shared food for social gatherings, and running a rotation credit club.

If group members have different preferences, then the nature of the decision-making process used by the group is likely to impact the contributions to the common account. For example, if the lead farmer alone selects a public good to spend on from the common account, his decision will reflect his own preferences only, and in an extreme case, might only include the his information set. When the decision is made in a more democratic fashion, the the voice of each club member will be combined to better reflect the preferences of multiple group members. The extant levels of social interactions are likely to influence these processes further by influencing free-riding behavior. Finally, high levels of extant social interaction in a more democratic club might improve the efficiency of the decision making process through open and frank discussion. We formalize this intuition in an analytical framework below.

To fix ideas, assume there are N individuals in a group and two possible public goods, k_1 and k_2 (Camerer, 2003). Denote the endowment provided by the experimenter as w_i (i.e., 400 MK), and the amount contributed by individual i by x_i. Assume that individuals can differ from each other in terms of preferences, endowments and beliefs of others' preferences - denote such beliefs by $\phi_i(.)$. Abusing notation, these beliefs pertain to the preferences, endowments and beliefs of others as well the attributes of the possible public goods. The choice of the public good will depend, among other factors, on the club's decision-making process. Denote this decision-making process by P. Finally, let S represent the level of social interactions among all club members. Assuming a quasi-linear utility function, individual i chooses x_i in order to maximize his expected utility:

$$\max_{x_i} (w_i - x_i) + \pi_i\{k_1|P, S, \phi(.)\}U_{ik_1}(\alpha \sum_{\forall i} x_i) + \pi_i\{k_2|P, S, \phi(.)\}U_{ik_2}(\alpha \sum_{\forall i} x_i) \tag{1}$$

where $\pi_i\{k_j\}$ denotes individual i's probability assessment of the group's choice of public good $j = \{1, 2\}$, $U_{ik_j}(.)$ is the utility individual i derives from public good k_1 or k_2, α indicates the multiplication factor determined by the experimenter (in this case 2) and $\sum_{\forall i} x_i$ the sum of all contributions in the club.

All individuals in the club maximize their utility given their endowment, preferences and beliefs. The solution of this joint set of maximization problems takes the shape of a Bayesian Nash Equilibrium. The optimal contribution amount of each individual is determined in equilibrium and depends on the preferences of other club members (U_{-i}), beliefs ($\phi(.)$), the decision-making process (P) and the social network (S), or: We are primarily interested in

understanding how x_i^* depends on P and S and will discuss our framework regarding these variables below.

3.1 Club Decision-Making

We first turn to the influence of the decision-making process by distinguishing between the two processes adopted by clubs in our data: $P \in \{\text{democratic, leader-driven}\}$. In leader-driven clubs, the public good is chosen based on the leader's preferences, which may include social preferences such as altruism and inequality-aversion. When club members know the leader's preferences in this setting, they respond by contributing to the common account assuming the leader's choice of public good. Thus, we focus our attention on the ways in which democratic clubs influence contributions relative to leader-driven clubs.

We note three possible channels in which democratic decision-making influences contributions (x_i^*): justification, preference aggregation, and knowledge aggregation. Justification resembles the opportunity to express one's voice throughout the decision-making process and is intrinsically valued by club members. This intrinsic utility boost is only achievable in democratic P and has the effect of increasing one's contribution to the common account.

Preference aggregation has an instrumental effects on the choice of the public good. We assume that preferences of all club members are known with certainty for now.[9] In such a case, each individual chooses their contribution level based on the collectively chosen public good, k_j. Democratic clubs may aggregate preferences by, at the very least, allowing club members to vote for a public good. In cases in which the choice of the public good differs from the choice made by leaders alone, this difference may be due to a voting rule that aggregates preferences in democratic clubs, which increases contributions made by club members on average.

Focus group discussions in our empirical context suggest that preference aggregation through voting is not the primary means of coming to a collective decision used by democratic clubs. For example, one club stated that voting is used as a last resort only if the club cannot reach consensus through deliberation. Fung and Wright (2003) note that this deliberative decision-making has benefits over preference aggregation because deliberation leads club members to consider aspects of the collective decision other than individual self-interest such as reasonableness, fairness, or acceptability of a given option to others.

One might say, then, that a democratic process incorporating elements of deliberation may have additional benefits associated with knowledge sharing and generation. Discussion might lead to a broader collective understanding of what the set of feasible options are for the chosen public good. The increased collective understanding of the possible alternatives suggests that the probability of choosing the option consistent with the social optimum will increase after deliberation, thereby increasing contributions to the common account.

Given the above discussion, we hypothesize the following:

Hypothesis 1 *Democratic clubs have higher levels of contributions relative to leader-driven clubs.*

[9] I.e. we replace $\phi(\mathbf{U}_{-i})$ with $\mathbf{U}_{-i}$.

The main tradeoff between the two decision-making processes comes from the efficiency losses of a deliberative process. First, it may be more time-consuming to make decisions through discussion, especially when the number of participating members is large. Additionally, club members may not want to speak their mind publicly to one another and will withhold thoughts that are otherwise important to the deliberative process. To confirm the mechanism at play, we hypothesize two heterogeneous effects of democratic decision-making:

Hypothesis 2 *The positive effect of democratic clubs will attenuate as club size increases*

Hypothesis 3 *The positive effects of democratic clubs can only be harnessed if discussion is effective.*

It is straightforward to propose a test for hypothesis 2, the next section will discuss our approach to studying the second.

3.2 Social Interactions

We now examine the role of extant levels of social interaction among club members on individual contribution decisions. Relationships among club members have a direct effect on one's contribution to the public good as well as an indirect effect related to their instrumental influence on the choice of a public good. The direct effects are not contingent on the decision-making environment and theory suggests that they have a somewhat ambiguous effect on cooperation. In either of the two decision-making contexts (democratic or leader-driven), there are three channels through which social interactions directly influence contributions. First, higher levels of social interactions among club members result in more accurate beliefs of others' preferences. Second, when social interactions are characterized by a sense of trust in others, the direct effect is ambiguous. On the one hand, individuals might be incentivized to free-ride off of the contributions of others whom they trust. Alternatively, high levels of trust might indicate altruistic tendencies within a club, thereby increasing the levels of individual contributions.

The instrumental role of social interactions is less ambiguous. Here, social interactions can influence the choice of a public good in democratic clubs characterized by deliberative decision making. In such settings the virtues of deliberation only emerge if club members feel comfortable to discuss and listen to each others' ideas. The learning process that underlies the discussion is thus enhanced by high baseline levels of social interactions.

We have reasoned that the sign of the direct effect associated with social interactions is ambiguous. However, by providing measures of baseline levels of social interactions we are able to refine hypothesis 3 in the following manner:

Hypothesis 3' *Social interactions characterized by an openness to discuss important matters with club members will positively influence contributions in democratic clubs.*

3.3 Empirical Specification

By way of a thought experiment, consider a setting in which decision-making processes are randomly allocated to clubs as they determine a course of collective action in their choice of a public good. In such a setting, newly formed farmer clubs would have been randomly assigned to employ democratic or leader-driven decision making. It is clear from the outset, though, that the imposition of such an exogenous relationship would be difficult to say the least. It would, perhaps, require community and NGO partnership over a long period of time during which a controlled decision making method would be monitored and implemented by practitioners during each meeting held by a village club. Furthermore, given the nuanced role of social interactions in decision making processes, these relationships need to be naturally occurring and not induced by experimental variation.

Thus the questions asked and the hypotheses tested in this paper require analysis of observational data. In the absence of purely random variation in observational data, we argue for alternative means of determining the exogeneity of the relationship between the decision-making method and cooperation in the public goods game. The identification has two primary challenges: (i) Reverse causality, and (ii) Omitted variable bias. We discuss each in turn below.

First, the clubs may select into democratic decision-making due to extant cooperative norms in relationships among club members. In other words, democratic clubs may choose to make decisions in such a manner because they are already more cooperative than other clubs. However, we believe this is not the case in our context: we learned through focus group discussions that the primary driver behind the club's choice of decision-making methods consisted of existing decision-making norms at the village level. In other words, clubs adopted the same decision-making rules used in other club settings within the village. Thus, if reverse causality is an issue, this suggests that any extant norms of cooperation are determined at the village level, which means that villages that choose democratic decision-making are inherently more cooperative.

We look into this possibility in table 4, which presents mean values of all of the variables included in the analysis by the decision-making method utilized by CDI clubs. The last column reports P-statistics associated with t-tests in which the null hypothesis is that the sample mean is equivalent in the two decision-making clubs. Out of 26 variables tested, only 3 means differed significantly from each other (at the 90% confidence level).[10] It is noteworthy that the decision-making process is not at all systematically related to any of the network variables, which may proxy for pre-existing norms of cooperation (see panel B in table 4).

While observable characteristics do not present systematic differences across villages with different decision-making types, this fact does not absolve us of the second challenge: that

[10]First, clubs using democratic decision making methods tend to have two fewer members participate in the public goods game than those using centralized regimes. Second, the mean age of club members in clubs using democratic methods is two years higher than the centralized regime. Third, 20% more of the villages in which clubs employed democratic decision-making methods were not visited by government extension workers in the twelve months prior to the survey.

unobservable characteristics are correlated with decision-making processes at the club level that may present problems in the form of omitted variable bias. While we do not deny the possibility that such omitted variables exist, we argue that they should not pose a major threat to the identification. Our analysis is primarily driven by club-level differences in cooperation. In order for unobservable factors to influence club dynamics, they must be cultural or economic forces specific to each village that will influence a collective body of people. Given the richness of our data, we can control for many of these forces in our analysis. If we show that the progressive inclusion of controls do little to change the estimate associated with the decision-making variable of interest, then it is unlikely that omitted variables are driving the results in the analysis.

Formally, we first denote the farmer club as the unit of analysis and then regress the average contributions to the common account against the decision-making process employed by the club alongside other covariates as follows:

$$C_j = \alpha + \beta_1 R_j + \beta_2 S_j + \beta_3 X_j + \beta_4 V_j + \epsilon_j \tag{2}$$

where each club is represented by subscript j. The dependent variable, C_j, represents the average share of the endowment contributed by club members. Variable R_j represents club j's decision-making method which can be either leader-driven (0) or democratic (1) - thus, β_1 can be interpreted as the effect of democratic decision-making on contributions in the public goods game in percent terms.

Given the richness of information pertaining to social interactions, we have the challenge of selecting the variable that best represents S_j. We argue that "approach" best represents the extent to which relationships within a club can be characterized by the ability to approach other members for advice about farming. We choose this measure, as opposed to "known," "trust," or "advice," in our analysis because it is the strongest indicator of the culture of open discussion among club members, which will be an important measure in our discussion of mechanisms below (section 4).

Vector X_j includes club-level variables such as the club mean and standard deviation of age, gender, years of education, land, and asset stock for all club members and the total number of game players. In other words, we aggregate the variables in panels A and B of table 1 and include them in the estimation of equation (2) by taking both the per-club mean and standard deviations of these measures. Among these variables, information regarding asset stocks is taken from the household survey, as discussed in section 2.5, which randomly selects five households whose members belong to a CDI club - thus, aggregate levels of asset stocks are assumed to be representative of the club's membership. V_j contains village-level characteristics that may influence the value of the club's public good: the village's distance to a paved/all-weather road, the number of households in the village, the presence of NGO or governmental extension workers, the value of labor during harvest, and the number of civic organizations present in the village.[11]

[11] A number of the variables in the analysis are skewed quite far to the right. Due to the small sample in the analysis, we apply log transformations of the following variables to ensure our results are not biased by outlier observations: mean and standard deviations of land and asset stock, distance from paved road, the

A second approach involves using one of the insights from the focus group discussions in our analysis: that farmer clubs adopted decision-making methods correspond to decision-making methods they have experienced in other club settings within the village level. This insight provides us with a potential instrument to use in an instrumental variable (IV) regression to account for the possible endogeneity in equation (2) with respect to R_j.

Using the same method discussed in section 2.3.2, we construct a village-level measure of decision-making employed by all non-CDI village associations. In other words, we construct a village-level average of the decision-making methods employed by all non-CDI clubs that survey respondents participate in. The intuition behind the use of this variable as an instrument is the following: club decision making norms at the village level indirectly influence cooperation by influencing the choice of the decision-making method by the CDI farmer club. However, the decision-making norm does not directly influence cooperative behavior during the public goods game otherwise. We use the continuous version of this measure as an instrument that predicts the level of democratic decision-making in CDI farmer clubs.

Unfortunately, this instrument is only available in CDI villages in which survey participants report involvement in civic organizations other than CDI. Panel D of table 4 shows that, of the 47 villages for which we can construct a measure for the instrument, 24 are in villages for which the CDI club uses democratic decision-making methods. A simple t-test suggests that the instrument holds some promise as the decision-making norms are significantly more democratic in non-CDI clubs in these villages ($p = 0.07$). There are four cases in our data in which the absolute difference between the continuous measure of decision-making in CDI and non-CDI clubs is larger than one.[12] To strengthen our instrument, we omit these observations from the analysis since it is unlikely that the CDI decision-making method was chosen out of extant decision-making norms in these villages. The same t-test shows a potentially strong relationship between decision making in CDI groups and other village groups ($p = 0.004$).

We argue that this variable is excludable from a second stage in which we regress democratic decision-making against the average share contributed by the club in the public goods game. We identify and discuss two challenges to this strategy. First, it could be that cooperative behavior is a village-level norm that is correlated with the choice of democratic decision-making styles across all civic associations as well as cooperation in the context of the public goods game. Again, we believe this unlikely given that selection into democratic

number of households residing in the village and the value of labor during harvest. Table C1 in the appendix provides detailed summary statistics of all of the variables as they are used in the analysis.

[12]Recall, we would apply a value of 3 if all the respondents (whether for CDI or non-CDI) state the use of a consultative group decision-making process and a value of 1 if all the respondents state the use of a purely leader-driven group decision-making process. A value of 2 indicates that all the respondents stated that the leader consults the group before deciding. Thus, the difference between CDI and non-CDI decision-making is bounded by 2, though we do not see differences this large in our data. When the difference between these averages is more than one, it indicates that the average difference in decision-making between CDI and non-CDI respondents is more than a survey unit apart in absolute value. These cases suggest a disconnect between methods of decision making prevalent in a village and methods of decision making adopted by a CDI club. Our results are robust to the use of an instrument inclusive of these 4 observations; however the instrument is weakened in this case.

decision-making is uncorrelated with any of our observable variables as demonstrated in table 4. Second, it is possible that influential individuals determine the mode of decision-making within the club and that these same individuals are members of other village associations, thereby compromising the excludability of our instrument. Unfortunately, it is not possible to test for this possibility.[13] However, we again argue that this is unlikely given that, as mentioned earlier, club-level variation accounts for 50% of the variation in contributions towards the common account in the public goods game. Therefore, we think it is unlikely that a single individual has so much leverage over club-related structures that he moves the entire club towards (or away from) cooperation based on his choice of decision making method.

A parallel challenge to excludability is the following: to the extent that clubs need to "learn" to apply the decision-making methods they employ towards decisions involving collective action, clubs that reside in villages in which a prevalent decision-making norm matches the choice of decision making method utilized by the club would be better equipped to use it towards cooperative outcomes. We argue that this does not violate the exogeneity or excludability of the proposed instrument. Rather, it will result in a more accurate effect of the decision-making method employed by the club. To the extent that "learning" democratic methods increases the efficacy of such methods, we expect the IV-estimate of the effect of democratic clubs to be larger than the OLS estimate.

4 Results

Table 5 presents results from estimations of equation 2. Each column progressively adds more controls to explore whether omitted variable bias is a threat to our analysis. Column (1) only includes the effect of democratic clubs (relative to leader-driven clubs) and shows that democratic clubs contribute 14 percentage points more towards the common account (44% more than leader-driven clubs) on average. Column 2 includes club-level controls, column 3 adds village level controls, and column 4 adds our measure of social interactions. Finally, we see that additional controls do little to change the coefficient of interest - indeed, adding additional controls marginally increases the coefficient in front of democratic decision making. As argued above, this suggests that omitted variable bias does not play a large role in our analysis.

We see that the total share of contribution decreases by 1% with each additional individual participating in the public goods game - this is consistent with both theory and other empirical results which have found that free-riding increases in the number of participants. We also see that among the club-level variables, only average land size contributes significantly to public goods contributions. The negative correlation suggests that clubs with more farming resources (land) value club-provided public goods less than others. However, clubs with greater variation in the distribution of land and education (measured using within-club standard deviations) see higher contributions, on average, than other clubs. Finally, the effect of our measure of social interactions is not significantly different from zero. Recall

[13]Recall, only 5 CDI households were randomly selected to participate in the household survey, so we cannot construct club rosters of all the other village associations all CDI households participate in.

that the theory suggests that the direct effect of social interactions is ambiguous as it could influence cooperation in either direction. Section 4 will analyze the indirect effect of social interactions by interacting the "approachable" measure with democratic decision-making.

Results associated with the village-level controls suggest that villages with higher transaction costs - as measured by distance from paved roads - and villages with more civic associations are more likely to contribute to the common account. Column 5 presents regression results in which we omit the variable of democratic decision making and see that the adjusted R^2 value is substantially lower than column 4 (0.30 vs 0.12).

The analysis presented thusfar in table 5 uses a binary measure of the decision-making process. The dichotomization of the decision-making into democratic and leader-driven categories will necessarily provide conservative estimates of the effects of democratic processes since, with some positive probability (made larger with larger mean standard errors of within-club responses), a few clubs will be incorrectly specified as belonging to one or the other category. However, one can think of the process of decision-making any group of individuals undertakes as being situated along a spectrum with fully leader-driven and fully democratic processes at the two extremes. The use of a continuous measure of decision-making can provide information on the position of each club along this spectrum. Appendix table C2 provides estimation results of equation 2 in which such a continuous measure is used. The results are consistent with findings provided by the dichotomous measure with higher point estimates suggesting that clubs towards the democratic end of the spectrum are more likely to engage in cooperative behavior.[14]

Finally, table 6 presents results of the IV estimation discussed above in which we use the continuous measure of decision-making methods as the endogenous (CDI clubs) and exogenous (non-CDI civic associations) regressor.[15] In order to compare the results of the two-staged least squares IV estimation with the OLS estimation associated with the IV subsample, we show the limited-sample OLS results of equation 2 in column (1) in table 6. The instrumented coefficient is positive and statistically significant and the instrument appears to be sufficiently strong - a first stage F statistic of 16.5. Additionally, we cannot reject the exogeneity of the instrument according to a Wu-Hausman test (p = 0.30). This result

[14]Columns (1) and (2) of Table C2 are analogous to columns (3) and (4) of table 5. The difference between the ends of this spectrum are highlighted by increasingly larger coefficients in columns (3), (4), and (5) in which clubs are only included in the analysis if, respectively, more than 1, 2, or 3 individuals responded to survey questions providing information on the method of decision-making employed by the clubs. In this sense, columns (3), (4), and (5) represent progressively more accurate estimates of the specific location of the club along the decision-making spectrum. Although unreported, this is verified by the coefficient on the within-club mean standard error of the decision making variable - it has progressively less significance in predicting cooperative behavior accross columns of this table. This follows from logical argumentation using the law of large numbers - the sample average moves closer to the true mean as the number of observations increases. Thus, clubs with more responses more accurately describe the true decision-making process.

[15]Table C4 in the appendix presents results of the IV estimation in which the dichotomous decision-making variable is the endogenous regressor (CDI) and the continuous variable is the exogenous (non-CDI) regressor. The continuous measure of decision-making adds precision to the estimate of decision-making in a way related to our discussion in the previous paragraph - our measure likely reflects how a club is positioned within a potential spectrum of decision making methods ranging from leader-driven to democratic.

suggests that democratic decision-making methods cause farmer clubs to contribute more towards the common account. We expect that the coefficients are slightly inflated relative to their comparison OLS specifications because of the learning channel discussed above.

As discussed earlier, there are tradeoffs in utilizing a democratic approach relative to leader-driven. First, in hypothesis 2 we posited that as the number of individuals increases within a club, we expect agreement is more difficult to reach via democratic deliberation. Figure 2 displays a flexible polynomial relationship between average contributions and club size by the decision-making style employed. The left panel, which contains all observations of average contributions in leader-driven clubs, shows what appears to be a slightly negative relationship between participants in the public goods game and cooperation. This is expected if larger numbers of participants increase instances of free-riding behavior.

A different dynamic emerges in the right panel of figure 2 where only democratic clubs are included. Here, we see a strong inverse-U shaped pattern between the number of participants in the game and average contributions suggesting that when club sizes are small, each additional member of the club provides valuable insights in club discussions, leading the club to increase their level of cooperation. However, beyond a certain threshold of roughly 11 to 12 individuals, additional members may make it difficult for the club to identify a public good compatible with (group) preferences. This may be a key mechanism explaining the decrease in contributions when democratic club sizes increase beyond the threshold.

The inverse-U shape of the relationship between club size and cooperation in the democratic clubs suggests that there may be benefits of knowledge, in addition to preference, aggregation in such clubs. We explore this possibility be proposing an alternative analysis of social interactions as discussed in hypothesis 3'. Recall, our baseline analysis in table 5 showed an ambiguous effect of social interactions on cooperation. However, our theoretical approach suggests that clubs characterized by strong social interactions can aggregate knowledge through discussion to greater effect, thereby contributing more towards the public good. Thus, the effect of social interactions will be heterogeneous across decision making methods.

Table 7 interacts democratic clubs with our de-meaned measures of social interactions. Column (1) examines the heterogeneous effect of our preferred measure of social interactions, aggregate "approachability" of club members, while column (2) attempts to isolate the effect of approachability by controlling for our other measures of social interactions. In this way, we are extracting the direct effect of social interactions out of the approach measure to get the cleanest measure of whether the club possesses the capacity to engage in open discussion among club members.

Column (1) shows a negative effect associated with increased approachability of club members in leader-driven environments and a null effect in democratic clubs - in other words we cannot reject a wald joint hypothesis test that the sum of the coefficients in front of the interacted terms is different from zero. In leader-driven clubs, a ten percent increase above the mean decreases cooperation by 8%. The negative coefficient suggests that, among the direct effects of social interactions in the public goods game, the negative effects of social interactions dominate the positive effects in clubs whose decisions are made by leaders.

However, much of this negative effect appears to dissipate in democratic settings. When we control for the direct effect of other measures of social interactions in column (2), we see that the coefficient on the interaction term associated with approachability is significantly positive while the direct effect is not significantly different from zero. This suggests that clubs characterized by a strong culture of discussion are able to harness this capacity towards cooperative outcomes in deliberative settings; however, absent of such a culture deliberative democracy further hinders cooperation.

5 Conclusion

We study the relationship between democracy and contribution to public goods in farmer clubs in Malawi using data from a public goods game, household surveys, and qualitative information from focus group discussions. We find that democratically-run clubs contribute significantly more to the public good (of their choice) compared with clubs run in a leader-driven fashion. However, this result is conditional on the nature of the social network in the club: democratic clubs only exhibit greater cooperation (as measured by public good contributions) in the presence of strong social ties. In addition, we also find a concave relationship between the number of members in the democratic club and the degree of cooperation; clubs are most cooperative when they include 10 to 12 members. In contrast, increasing numbers in leader-driven clubs linearly decreases the average contribution to the public good. These results, together with the results of the focus group discussions, suggest that cooperation among farmer clubs depends (among others) on the ability of these clubs to share information and discuss preferences in a deliberative, democratic manner.

Our findings contribute to our understanding of the functioning of small, village-based, community groups in developing countries. Development programs often rely on these types of community groups to organize and implement project activities; a popular strategy given limited resources and the often assumed ability of community members to coordinate and improve outcomes using information often inaccessible to policy-makers and practitioners. Farmer clubs, in particular, are central to contemporary agricultural development and extension programs. Often, these farmer groups tend to be treated as a black box - one of a number of bundled project interventions - even among studies that use randomized controlled trials to evaluate the effects of projects that employ a farmer club model (Burke, 2014; Duflo et al., 2014; Ashraf et al., 2009). Yet these farmer clubs are institutions and therefore likely to be characterized by politics, agendas, and complex social relationships. A development program built around such clubs as the primary channel for dissemination of information, learning, or stakeholder collaboration may succeed or fail based on the group's socio-political structure. Given the individual costs of coordination and participation, such groups are beneficial only to the extent that they are capable of coordinating to produce an outcome that dominates what participant farmers could achieve individually.

Our results suggest that researchers and implementers should seek to understand how project groups (either pre-existing or formed for purposes of the project) function. For example, though our research area is relatively small - two districts in Central Malawi - we

find considerable variation in the socio-political structures of the farmer clubs. The presence of such variation in combination with our results suggests that the socio-political structure is likely to meaningfully impact project outcomes and may call into question the the external validity of empirical analyses – randomized controlled trials or otherwise – which treat farmer clubs as a black box.

Our results also suggest the importance of attending to group formation as a part project implementation and offer some guidance for program implementers who either want to help form new community groups or who want to help new or pre-existing community groups function more cooperatively. For example, our analysis finds clubs with close social ties are likely to perform better. Hence, allowing members to form a club themselves, rather than having the implementer select members might be preferable. Second, it may be worthwhile for implementers to work to encourage or strengthen social ties among new or existing groups or to try and encourage discussion and democratic decision-making in which club members voice and discuss their concerns with leaders. Finally, projects may want to pay attention to club size: the optimal club size to encourage cooperation might be significantly below 20 members. More research is needed on these issues over different sorts of groups, projects, and contexts however, in particular with respect to the possible tradeoffs between working with groups with social connections and the possibilities of social exclusion based on gender, wealth, ethnicity or other existing power dynamics in the community. We would, for instance, expect that choices regarding club formation might disadvantage sub-populations in a community such as women, widows or the indigent, the socially excluded, ethnic or religious minorities, and existing groups may exclude such members. It is not obvious that in such a case either a democratic or leader-driven process is preferred.

It is important to keep in mind the limitations of this study, which suggest several avenues for future inquiry. First, while the participants of our game could potentially earn a significant amount, our primary outcome of interest emerges from a lab-in-the-field game and we have yet to establish longer term effects on public goods of more considerable significance.[16] Second, while our main result - democracy increases cooperation in public good provision - is robust to alternative specifications, including an instrumental variable specification, we acknowledge that a lack of experimental or quasi-experimental variation in the socio-political factors, which might affect our estimates. Such variation in socio-political structure might be hard to come by, motivating research into how close-knit democratic structures emerge and the evolution of these institutions over time. Overall, to our knowledge, the academic literature to date has produced few quantitative studies focusing on the origins, decision-making, and composition of community-based groups. Given the importance of these groups, we would consider studies that explore the interaction of club formation in concert with the adoption of particular decision-making methods a promising area of inquiry for future research.

[16] A club with twenty members could potentially earn 40 USD, sufficient to purchase high-quality inputs for a one acre farm.

References

Agrawal, Arun and Gibson, Clark C. (1999). 'Enchantment and disenchantment: the role of community in natural resource conservation', *World development* 27(4), 629–649.

Agrawal, Arun and Goyal, Sanjeev. (2001). 'Group size and collective action third-party monitoring in common-pool resources', *Comparative Political Studies* 34(1), 63–93.

Andreoni, James. (1995). 'Warm-glow versus cold-prickle: the effects of positive and negative framing on cooperation in experiments', *The Quarterly Journal of Economics* 110(1), 1–21.

Ashraf, Nava, Giné, Xavier and Karlan, Dean. (2009). 'Finding missing markets (and a disturbing epilogue): Evidence from an export crop adoption and marketing intervention in Kenya', *American Journal of Agricultural Economics* 91(4), 973–990.

Bowles, Samuel and Gintis, Herbert. (2002). 'Social capital and community governance', *The Economic Journal* 112(483), F419–F436.

Braaten, Ragnhild Haugli. (2014). 'Land Rights and Community Cooperation: Public Goods Experiments from Peru', *World Development* 61, 127–141.

Burke, Marshall. (2014). 'Selling low and buying high: an arbitrage puzzle in kenyan villages', *Working Paper* .

Camerer, Colin. (2003), *Behavioral game theory: Experiments in strategic interaction*, Princeton University Press.

Chaudhuri, Ananish. (2011). 'Sustaining cooperation in laboratory public goods experiments: a selective survey of the literature', *Experimental Economics* 14(1), 47–83.

Conley, Timothy G and Udry, Christopher R. (2010). 'Learning about a new technology: Pineapple in Ghana', *The American Economic Review* pp. 35–69.

Dal Bó, Ernesto and Dal Bó, Pedro. (2014). '"Do the right thing:" The effects of moral suasion on cooperation', *Journal of Public Economics* 117, 28–38.

Dietz, Thomas, Ostrom, Elinor and Stern, Paul C. (2003). 'The struggle to govern the commons', *Science* 302(5652), 1907–1912.

Duflo, Ester, Keniston, Daniel and Suri, Tavneet. (2014). 'Diffusion of Technologies within Social Networks: Evidence from a Coffee Training Program in Rwanda', *Working Paper* .

Englmaier, Florian and Gebhardt, Georg. (2016). 'Social dilemmas in the laboratory and in the field', *Journal of Economic Behavior & Organization* 128, 85–96.

Fung, Archon and Wright, Erik Olin. (2003), *Deepening democracy: Institutional innovations in empowered participatory governance*, Vol. 4, Verso.

Grootaert, Christiaan, Van Bastelaer, Thierry et al. (2002), *Understanding and measuring social capital: A multidisciplinary tool for practitioners*, Vol. 1, World Bank Publications.

Guala, Francesco, Mittone, Luigi and Ploner, Matteo. (2013). 'Group membership, team preferences, and expectations', *Journal of Economic Behavior & Organization* 86, 183–190.

Gutiérrez, Nicolás L, Hilborn, Ray and Defeo, Omar. (2011). 'Leadership, social capital and incentives promote successful fisheries', *Nature* 470(7334), 386–389.

Henrich, Joseph, Boyd, Robert, Bowles, Samuel, Camerer, Colin F, Fehr, Ernst, Gintis, Herbert and McElreath, Richard. (2004), *Foundations of human sociality: Economic experiments and ethnographic evidence from fifteen small-scale societies*, Oxford University Press.

Jang, Chaning and Lynham, John. (2015). 'Where do social preferences come from?', *Economics Letters* 137, 25–28.

Kölle, Felix. (2015). 'Heterogeneity and cooperation: The role of capability and valuation on public goods provision', *Journal of Economic Behavior & Organization* 109, 120–134.

Krueger, Richard A and Casey, Mary Anne. (2015), Focus group interviewing, *in* **Kathryn E Newcomer, Harry P Hatry and Joseph S Wholey**., eds, 'Handbook of practical program evaluation.', John Wiley & Sons.

Ledyard, John. (1995), Public Goods Experiments, *in* **John H Kagel and Alvin E Roth**., eds, 'Handbook of Experimental Economics.', Princeton University Press.

Mansuri, Ghazala and Rao, Vijayendra. (2012), *Localizing development: does participation work?*, World Bank Publications.

McGranahan, Gordon and Mitlin, Diana. (2016). 'Learning from Sustained Success: How Community-Driven Initiatives to Improve Urban Sanitation Can Meet the Challenges', *World Development* 87, 307–317.

Morgan, David L. (1996), *Focus groups as qualitative research*, Vol. 16, Sage publications.

Ojha, Hemant R, Ford, Rebecca, Keenan, Rodney J, Race, Digby, Vega, Dora Carias, Baral, Himlal and Sapkota, Prativa. (2016). 'Delocalizing Communities: Changing Forms of Community Engagement in Natural Resources Governance', *World Development* 87, 274–290.

Ostrom, Elinor. (1990), *Governing the commons: The evolution of institutions for collective action*, Cambridge university press.

Ostrom, Elinor. (2014). 'Do institutions for collective action evolve?', *Journal of Bioeconomics* 16(1), 3–30.

Pagdee, Adcharaporn, Kim, Yeon-su and Daugherty, Peter J. (2006). 'What makes community forest management successful: a meta-study from community forests throughout the world', *Society and Natural Resources* 19(1), 33–52.

Poteete, Amy R and Ostrom, Elinor. (2004). 'Heterogeneity, group size and collective action: The role of institutions in forest management', *Development and change* 35(3), 435–461.

Sugden, Robert. (1984). 'Reciprocity: the supply of public goods through voluntary contributions', *The Economic Journal* 94(376), 772–787.

Vesterlund, Lise. (2012). 'Voluntary giving to public goods: moving beyond the linear VCM', *Handbook of Experimental Economics* 2.

Wade, Robert. (1994), *Village republics: Economic conditions for collective action in South India.*, Institute for Contemporary Studies.

Wong, Susan. (2012). 'What have been the impacts of World Bank Community-Driven Development Programs? CDD impact evaluation review and operational and research implications', *World Bank, Washington, DC* .

Zulu, Leo Charles. (2008). 'Community forest management in southern Malawi: solution or part of the problem?', *Society and Natural Resources* 21(8), 687–703.

6 Tables and Figures

Table 1: Individual-level Descriptive Statistics

	N	Mean	Sd	Median	Max
Panel A - Demographic Variables:					
Share Contributed in Game (0-1)	1,079	0.43	0.30	0.4	1.0
Female	1,059	0.48	0.50	0.0	1.0
Age	1,082	38.77	13.12	36.0	82.0
Years of Education	1,073	5.39	3.49	5.0	12.0
Land Size (Acres)	1,080	4.86	10.47	3.0	260.0
Asset Value (1000s MK)	402	218.52	764.19	55.0	8,967.4
Panel B - Social Ties - % of Club Members:					
Known	398	0.88	0.15	0.9	1.0
Sought Advice From	398	0.24	0.29	0.1	1.0
Could Approach for Advice	398	0.80	0.24	0.9	1.0
Could Trust with Valuables	398	0.68	0.32	0.8	1.0
Panel C - Club's Decision-Making Process:					
The leader decides and informs the group	261	0.17	0.38	0.0	1.0
The leader decides after consulting the group	261	0.34	0.47	0.0	1.0
The group decides through consultation	261	0.41	0.49	0.0	1.0
Other (unexplained)	261	0.08	0.27	0.0	1.0

The discrepancy in the number of observations results from the following: contributions to the common pot and demographic variables (with the exception of asset value) are sourced from data collected during the public goods game. All other data are sourced from the household survey. Data in Panel C are sourced from the organization module in the household survey. Even though roughly 400 household heads reside in households engaged with CDI clubs, only 261 of household heads were personally involved in these clubs.

Table 2: Club-level Descriptive Statistics

	N	Mean	Sd	Median	Max
Panel A - Decision-Making Method					
Continuous Measure of Decision-Making Method*	74	2.29	0.56	2.2	3.0
Heterogeneity in Responses (Mean SE)	74	0.24	0.28	0.2	1.0
Panel B - Village Characteristics:					
Distance to Paved Road (km)	74	1.83	2.75	0.3	13.0
N of HH in Village	74	68.77	58.94	52.5	412.0
N organizations from village questionnaire	74	1.97	1.26	2.0	5.0
No Visits by Gov. Extension (year)	74	0.27	0.45	0.0	1.0
No Visits by NGO Extension (year)	74	0.28	0.45	0.0	1.0
Price of Labor During Harvest (100 MK/Day)	74	11.01	11.68	7.3	70.0
Panel C - Other Club Variables:					
N game players	74	12.88	4.89	12.5	20.0
Share Contributed in Game (Club Average)	74	0.42	0.21	0.4	1.0

* Equal to 1 if all members chose leader and 3 if all members chose discussion

Table 3: Correlates of Individual Common Pot Contributions in the Public Goods Game

	(1)	(2)
Game Data:		
Female	-0.001	-0.018
	(0.019)	(0.014)
Age	0.000	-0.000
	(0.001)	(0.001)
Years of Education	0.011***	0.005**
	(0.003)	(0.002)
Log: Land Size (Acres)	0.071***	0.016
	(0.016)	(0.012)
Club FE	No	Yes
Adjusted R^2	0.04	0.51
Observations	1045	1045

Robust standard errors in parentheses. Dependent variable equals the percent of the game endowment (0-1) contributed by each individual.

$^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$

Table 4: Comparing Democratic and Leader-Driven Club Characterstics

	Leader		Democratic		
	N	Mean	N	Mean	P
Panel A - Club Variables:					
N Club Members	37	17.70	37	17.08	0.428
N game players	37	13.95	37	11.81	0.060*
Club Mean: Female (0-1)	37	0.47	37	0.50	0.528
Club Sd: Female (0-1)	37	0.49	37	0.48	0.540
Club Mean: Age	37	37.61	37	39.84	0.056*
Club Mean: Years of Education	37	5.24	37	5.58	0.371
Club Mean: Land (acres owned)	37	4.07	37	4.75	0.183
Club Mean: Asset Value (1000s MK)	34	127.23	37	222.09	0.160
Club Sd: Age	37	12.52	37	12.24	0.679
Club Sd: Years of Education	37	3.13	37	3.15	0.903
Club Sd: Land (acres owned)	37	3.00	37	3.62	0.479
Club Sd: Asset Value (1000s MK)	34	160.68	37	316.49	0.218
Panel B - Network Variables:					
Club Mean: Percent Known (0-1)	34	0.90	37	0.88	0.227
Club Mean: Percent Approachable (0-1)	34	0.81	37	0.82	0.598
Club Mean: Percent Sought Advice (0-1)	34	0.23	37	0.25	0.595
Club Mean: Percent Trusted (0-1)	34	0.67	37	0.73	0.200
Club Sd: Percent Known (0-1)	34	0.08	37	0.11	0.142
Club Sd: Percent Approachable (0-1)	34	0.19	37	0.14	0.119
Club Sd: Percent Sought Advice (0-1)	34	0.21	37	0.26	0.116
Club Sd: Percent Trusted (0-1)	34	0.27	37	0.23	0.179
Panel C - Village Characteristics:					
Distance to Paved Road (km)	37	1.84	37	1.82	0.973
N of HH in Village	37	65.03	37	72.52	0.588
N organizations from village questionnaire	37	1.89	37	2.05	0.583
No Visits by Gov. Extension (year)	37	0.16	37	0.38	0.037**
No Visits by NGO Extension (year)	37	0.27	37	0.30	0.800
Price of Labor During Harvest (100 MK/Day)	37	10.53	37	11.49	0.727
Panel D - Non-CDI Decision Making Norm:					
Non-CDI Organizations: Decision-Making (Continuous)$^{+}$	23	2.31	24	2.58	0.069*

Note: All t-tests are binary means tests with unequal variance.

$^{+}$ Equal to 1 if all survey respondents chose leader and 3 if all chose discussion.

Table 5: Effect of Decision Making Method on Cooperation in Public Goods Game

	(1)	(2)	(3)	(4)	(5)
Main effects:					
Democratic (Dichotomous)	0.14***	0.16***	0.17***	0.19***	
	(0.05)	(0.05)	(0.05)	(0.05)	
Club Mean: Percent Approachable (0-1)				-0.35	-0.34
				(0.29)	(0.32)
Club Variables:					
N game players		-0.01**	-0.01**	-0.01**	-0.01*
		(0.00)	(0.00)	(0.00)	(0.01)
Club Mean: Female (0-1)		0.09	0.11	0.10	0.13
		(0.15)	(0.15)	(0.15)	(0.16)
Club Mean: Years of Education		0.02	0.01	0.00	-0.00
		(0.02)	(0.02)	(0.02)	(0.02)
Log: Avg. Land Owned		-0.17	-0.26**	-0.34**	-0.16
		(0.12)	(0.13)	(0.13)	(0.14)
Club Sd: Female (0-1)		0.36	0.39	0.36	0.28
		(0.36)	(0.37)	(0.37)	(0.40)
Club Sd: Years of Education		0.05	0.07**	0.08**	0.05
		(0.03)	(0.03)	(0.03)	(0.03)
Log: Sd. Land Owned		0.14*	0.16**	0.21**	0.10
		(0.07)	(0.07)	(0.08)	(0.08)
Village Variables:					
Log: Distance to paved road (km)			0.07**	0.07**	0.07*
			(0.03)	(0.03)	(0.03)
N organizations from village questionnaire			0.06**	0.06**	0.06**
			(0.02)	(0.02)	(0.03)
Constant	0.32***	-0.01	-0.51	-0.37	-0.67
	(0.04)	(0.43)	(0.49)	(0.52)	(0.57)
Adjusted R^2	0.10	0.19	0.29	0.30	0.12
Observations	74	71	71	71	71

Standard errors in parantheses. Dependent variable equals the average share of the game endowment contributed by club (0-1). Additional controls were included but not reported. Columns 1-4: within-club heterogeneity in reporting decision-making methods (SE Mean). Columns 3-5: village population (log), whether the village received visits from extension agents (NGO and Gov), price of daily labor during harvest (log), distance from major trading areas (log km). Columns 4-5: within-club heterogeneity in social connectivity (SD).

Table 6: 2SLS IV Regressions

	(1)	(2)
Instrumented:		
Democratic (Continuous)	0.35*	0.58***
	(0.20)	(0.22)
Network Variables	Yes	Yes
Club Variables	Yes	Yes
Village Variables	Yes	Yes
R^2	0.52	0.48
Observations	43	43
H_0: Instrument is Exogenous		0.30
First Stage F-Statistic		16.5

Standard Errors in Parantheses. Column (2) shows results of a 2sls instrumental variable regression (Column (1) is estimated using OLS and only includes the sample used in column (2)) in which club decision-making is instrumented by the decision-making norm in the rest of the village. The dependent variable equals the average share of the game endowment contributed by club. Null hypothesis test results report Wu-Hausman P-values. Club-and-village-level controls are the same as in table 5. First stage of estimation reported in table C3.

Table 7: Heterogeneous Effects of Social Networks

	(1)	(2)
Decision-Making:		
Democratic (Dichotomous)	0.19***	0.20***
	(0.05)	(0.06)
Approach:		
Club Mean: Percent Approachable (0-1)	-0.77**	-0.19
	(0.37)	(0.56)
Democratic (Dichotomous) × Club Mean: Percent Approachable (0-1)	0.56*	0.99**
	(0.32)	(0.40)
Social Interaction Variables	No	Yes
Club Variables	Yes	Yes
Village Variables	Yes	Yes
Adjusted R^2	0.33	0.31
Observations	71	71

Standard errors in parantheses. Dependent variable equals the average share (0-1) of the game endowment contributed by club. Club-and-village-level controls are same as in table 5. Column 2 includes controls for all other social interaction variables (club mean and club sd) associated with trust, advice, and known. Interacted social interaction variables are de-meaned.

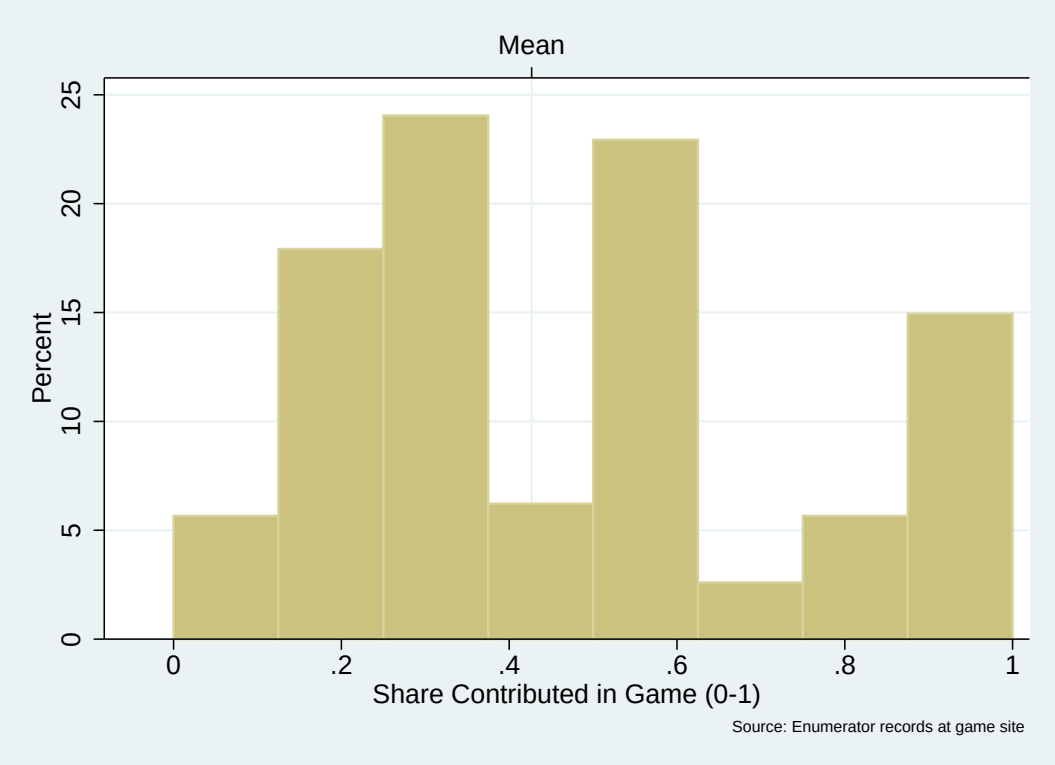

Figure 1: Histogram of Individual Contributions to Public Goods

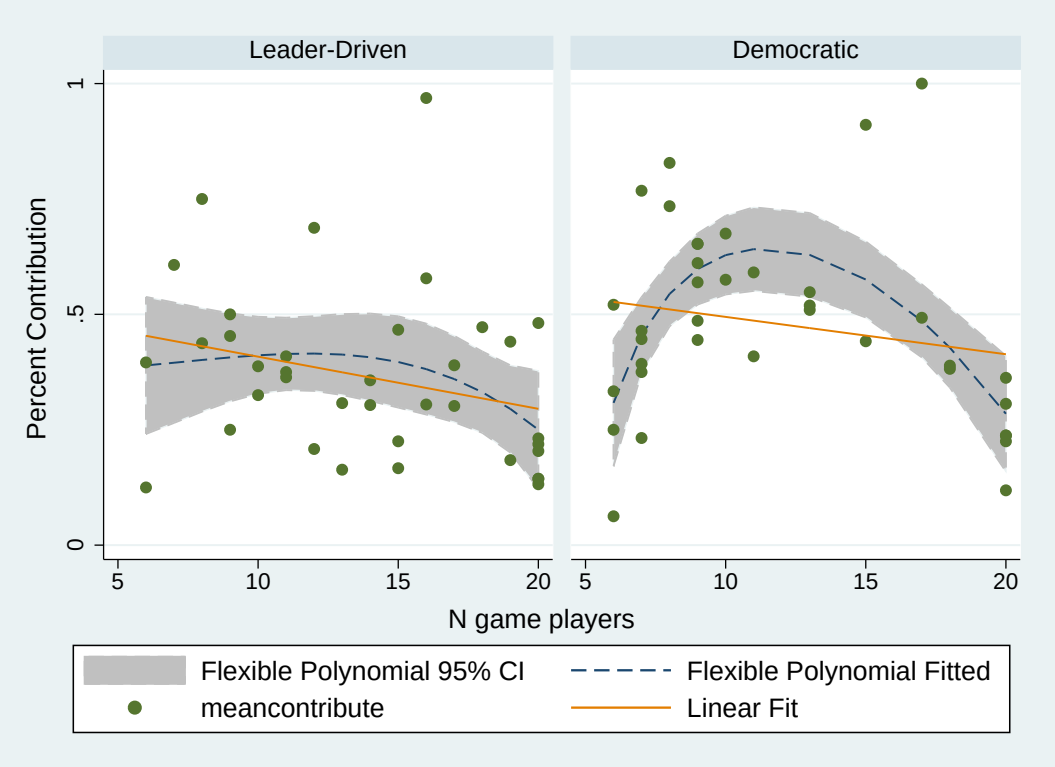

Figure 2: Average Club-Level Contribution by Club-size and Decision Regime

A Constructing Decision-Making Variable

Table A1: Individual Responses to Decision-Making Regime Used by Farmer Club

"How did the club make decisions in the past year?"	N	%
(1=) "The leader decides and informs the other group members"	45	17.2%
(2=) "The leader asks the group what they think and then decides"	89	34.1%
(3=) "The group members hold a discussion and decide together"	106	40.6%
(4=) "Other"	21	8.1%
Total	261	100.0%

Out of the 87 farmer clubs that played the public goods game game, only one village did not have any survey respondents participate in the organizational participation module of the household questionnaire. Each individual survey respondent listed the civic organizations that the household participates in. Using the administrative records, we identified CDI clubs in each village and tagged responses by individuals who stated that a household member is also a CDI club member. In this manner we identified 421 individuals who stated household membership in a CDI club. Each of these individuals was asked how the group usually made decisions in the past year and responded either (1=) "The leader decides and informs the other group members" (2=) "The leader asks the group what they think and then decides" or (3=) "The group members hold a discussion and decide together"[17].

Table A1 shows individual responses to this question. The survey was administered roughly 1-2 months after many of the clubs had formed[18], thus many of the respondents did not provide a response to this question - only 261 out of 421 possible responses were captured - 12 villages did not have any club members provide information regarding this question and are thus omitted from the analysis. Of the 261 responses, roughly half of the respondents indicated a more centralized decision-making regime in which club leaders are responsible for collective decision making - 51.3% of respondents chose option number 1 or 2. Only 8% of the respondents chose "other," indicating that the three options sufficiently outline the set of decision-making styles employed by the majority of the clubs.

After omitting responses by individuals indicating "other" as a response to this question, we average club-level responses in our effort to impose a decision-making rule on all club members in each farmer club. Naturally, we would like to know what the variation in responses look like when we impose such a rule. First, we note that variation in this response is also a function of the number of individuals responding to this question. Only one individual provided a response to this question in 11 of our study farmer clubs whereas multiple individuals provided responses in the remaining 63 villages. Table A2 displays the number of responses and the variation in responses according to the number of respondents. Of note is the fact that close to 40% of the clubs had zero variation in responses to this

[17]Survey respondents were also allowed to respond (4=) "Other."

[18]Some clubs were in existence prior to being registered as CDI clubs.

question when there were multiple responses available and a majority (60%) of clubs with at least 2 respondents had negligible variation in responses (measured by mean standard error). Since only response number 3 is indicative of a fully democratic decision making style adopted by the club we see that clubs adopting this method have lower mean standard error in club-level responses, as expected - 80% of these clubs had negligible variation in responses to this question.

We note that the regression results throughout the paper are not sensitive to replacing a dichotomous measure of democracy with a continuous measure as demonstrated in table C2. In fact, the dichotomous measure attenuates coefficients of interest (correlation between democratic decision making and contribution in public goods game), which is expected since a club may be labeled "democratic" when it may not in fact be such.

Our IV estimation strategy aggregates information regarding the decision-making methods used in non-CDI village clubs in much the same way as presented above by creating a variable that only aggregates information from clubs that are not recognized in our data as CDI clubs. This includes non-CDI clubs that both CDI and non-CDI households participate in at the village level (e.g. village savings and loans organizations, women's clubs, village committees and other civic clubs organized by non-CDI NGOs).

For the sake of transparency, table A3 presents the full set of responses to this question for each of the 74 CDI farmer clubs for which data are available.

Table A2: Decision Making By N of Respondents

Respondents by Club	Mean SE = 0			Mean SE < 0.3			Mean SE < 0.5			Total		
		L	D		L	D		L	D		L	D
1 Response	11	4	7	11	4	7	11	4	7	11	4	7
2 Respondents	9	4	5	9	4	5	12	4	8	16	8	8
3 Respondents	7	3	4	8	3	5	9	4	5	13	7	6
4 Respondents	4	2	2	10	3	7	15	5	10	15	5	10
5 Respondents	4	3	1	9	4	5	16	11	5	16	11	5
6 Respondents	0	0	0	1	1	0	3	2	1	3	2	1
Sub-Total	35	16	19	48	19	29	66	30	36	74	37	37
% of Total	47%	43%	51%	65%	51%	78%	89%	81%	97%	100%	100%	100%
% of Total Excluding Clubs with 1 Response	38%	19%	31%	59%	31%	69%	87%	73%	96%	100%	100%	100%

Note: "L" Indicates "Leader-Driven" and "D" Indicates "Democratic."

Table A3: Decision Making Responses

	Response to "How did this club usually make decisions"						
Club ID	=1	=2	=3	N	Mean	Type	Mean SE
1	0	2	0	2	2.0	L	0.00
2	1	0	0	1	1.0	L	N/A
3	1	3	0	4	1.8	L	0.22
4	0	0	3	3	3.0	D	0.00
5	2	0	1	3	1.7	L	0.54
6	0	1	0	1	2.0	L	N/A
7	0	1	2	3	2.7	D	0.27
8	0	0	3	3	3.0	D	0.00
9	4	0	0	4	1.0	L	0.00
10	0	3	0	3	2.0	L	0.00
11	1	0	1	2	2.0	L	0.71
12	2	0	0	2	1.0	L	0.00
13	1	1	2	4	2.3	D	0.41
14	0	0	4	4	3.0	D	0.00
15	0	0	1	1	3.0	D	N/A
16	0	3	2	5	2.4	D	0.22
17	1	0	0	1	1.0	L	N/A
18	0	3	1	4	2.3	D	0.22
19	1	2	3	6	2.3	D	0.30
20	1	2	2	5	2.2	L	0.33
21	1	2	2	5	2.2	L	0.33
22	0	0	1	1	3.0	D	N/A
23	2	0	0	2	1.0	L	0.00
24	0	3	2	5	2.4	D	0.22
25	0	1	0	1	2.0	L	N/A
26	1	2	1	4	2.0	L	0.35
27	0	3	0	3	2.0	L	0.00
28	0	4	0	4	2.0	L	0.00
29	1	0	1	2	2.0	L	0.71
30	0	2	2	4	2.5	D	0.25
31	0	5	0	5	2.0	L	0.00
32	0	5	0	5	2.0	L	0.00
33	2	0	1	3	1.7	L	0.54
34	2	2	1	5	1.8	L	0.33
35	1	0	2	3	2.3	D	0.54

Note: "L" Indicates "Leader-Driven" and "D" Indicates "Democratic."

Continued on next page...

Table A3 – continued from previous page

	Response to "How did this club usually make decisions"						
Club ID	=1	=2	=3	N	Mean	Type	Mean SE
36	0	2	2	4	2.5	D	0.25
37	2	1	2	5	2.0	L	0.40
38	1	2	2	5	2.2	L	0.33
39	3	1	2	6	1.8	L	0.37
40	2	2	1	5	1.8	L	0.33
41	1	3	2	6	2.2	L	0.28
42	2	0	1	3	1.7	L	0.54
43	0	0	4	4	3.0	D	0.00
44	0	1	4	5	2.8	D	0.18
45	0	1	3	4	2.8	D	0.22
46	0	0	2	2	3.0	D	0.00
47	1	0	3	4	2.5	D	0.43
48	0	0	2	2	3.0	D	0.00
49	0	0	2	2	3.0	D	0.00
50	0	0	2	2	3.0	D	0.00
51	0	2	2	4	2.5	D	0.25
52	0	0	3	3	3.0	D	0.00
53	0	1	1	2	2.5	D	0.35
54	0	1	1	2	2.5	D	0.35
55	0	0	5	5	3.0	D	0.00
56	0	0	1	1	3.0	D	N/A
57	1	0	1	2	2.0	L	0.71
58	0	0	1	1	3.0	D	N/A
59	0	1	1	2	2.5	D	0.35
60	0	0	2	2	3.0	D	0.00
61	2	1	1	4	1.8	L	0.41
62	1	0	3	4	2.5	D	0.43
63	0	0	1	1	3.0	D	N/A
64	1	0	1	2	2.0	L	0.71
65	0	3	2	5	2.4	D	0.22
66	1	2	2	5	2.2	L	0.33
67	1	4	0	5	1.8	L	0.18
68	0	3	0	3	2.0	L	0.00
69	0	0	3	3	3.0	D	0.00
70	0	5	0	5	2.0	L	0.00
71	0	2	0	2	2.0	L	0.00

Note: "L" Indicates "Leader-Driven" and "D" Indicates "Democratic."

Continued on next page...

Table A3 – continued from previous page

	Response to "How did this club usually make decisions"						
Club ID	=1	=2	=3	N	Mean	Type	Mean SE
72	1	1	1	3	2.0	L	0.47
73	0	0	1	1	3.0	D	N/A
74	0	0	1	1	3.0	D	N/A
Total	45	89	106	240	2.3	-	0.75*

Note: "L" Indicates "Leader-Driven" and "D" Indicates "Democratic."

* Standard Deviation reported as opposed to Mean Standard Error.

B Game Details

B.1 Instructions

Before the game starts:

- Arrange to meet all the CDI club members in one central village location, secluded from the rest of the village as to avoid bystanders
- Place 400 KW in brown envelopes in notes of 50 KW (these cannot be see through), meaning 400 K per envelope, one envelop per club member.
- Place a table or mat in the center area. and arrange seating in a circle.

Once all the members are present, ask every individual to introduce themselves to the group by name. Note down who is present and who is not present on the next page. **A minimum of 6 members should be present to play the game**.

Read from the following script: Good morning, I am [your name] and I came to this village to learn more about group today. Ask whether anyone would like to say a prayer, if appropriate, and continue: We would like to do a group activity with you. This activity will take about 30 minutes. But before we get started, I'll go around the group and will ask you some information about yourself.

Go around the group and fill in the notation sheet - all columns except for the two last columns. Use the Club Game Matching Number Table to select the column that matches the number of club members present and complete the 'Match Number' - second column. These numbers have been drawn randomly such that the 'Number assigned for the game' is not the same as 'Match number'. While this information is not secret, keep the conversation with each member at a quiet volume. Keep track of spouses within the group as per notation sheet. Continue with the script: In this activity you will each receive 400 Kwacha in this white envelop (Hold up a white envelop). Once you receive the 400 Kwacha, we will ask you to make an important decision. You will each divide up the 400 Kwacha in two parts: one part, you will put in your pocket. This part will be yours to keep and you and your family can decide what to do with it. The other part, you will put back into the envelope. You will then place the envelope back onto the table (point to the table). Once we have all made our decision, I will open these envelopes and tell you the total amount that is in the envelopes. I will then multiply this amount by 2, and place back double onto the table. So if the total amount is 500 Kwacha, I will add 500 Kwacha and place a total of 1000 Kwacha on the table. Then, you - as a group - will have to decide what to do with this money. You can decide to spend it on something for the group, or return it to the members. That decision is up to you - as a group - together.

Emphasize the following. The decision you make will be a secret decision. This is your decision and yours only. So I will ask you to go to different corners of the square and divide the money you have in secret, without anyone seeing you. You can decide to put as much or as little as you want into the envelop, so it can be 0 or 400 KW. There is no right or

wrong decision. It is just a personal decision. I will also play. (Hold up your own envelop). I will come around the square and record your decision. But it will be only me knowing your decision; I will not share this information with anyone in the village. So your decision is secret. No-one else will know what you decided.

Ask whether there are any question. If not, proceed and hand out the envelopes to everyone.

Continue the script: Before you make a decision, I would like you to discuss for 5 minutes with the group what you would like to do with the group money, once you receive it. Allow the group members to discuss in your absence for 5 minutes.

Return to the group and tell the members to disperse and make their decision. After a few minutes, go around and speak to each member. It is very important that no-one else can hear you, so go further from the others if need be. Ask the individual how much they kept to themselves and note down their contribution to the pot on the next page. Then ask them whether they happen to know their match and how much acreage the match has. Note down this stated acreage on the next page. Do not pressurize people to make a decision quickly. Give them sufficient time. When everyone is done, ask them to place their envelope on the table. Mix the envelopes carefully. Then open the envelopes, and take out the funds. Do this quickly and try not to show too much how much is in each envelop. Count the total and announce the total. Then match the total and place the full amount on the table.

Ask: whom should I give this to? [Write down that person's ID]

Ask: So what does your group plan to do with this money? [Write down the answer on the next page]

Notes: Sometimes group members might ask what they can do with the money they have: emphasize that this is up to them. They should treat this money as regular normal income.

Sometimes group members might want to know the exact amount they will get before they can discuss what to do. Tell them that you don't know this either, this will depend on what each person will put in, and they should try to discuss nevertheless.

Number assigned forăthe game	Match number	Name	Present? (Yes/No)	Household ăID	Age (years)	Education (years com- pleted)	Land (acre owned)	Spouse number	Reported match acreage	Contribute
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

How does the group intent to use the funds from the common pot? _____

C Appendix Tables and Figures

Table C1: Summary Statistics of Club-level Variables as Used in Analysis

	N	Mean	Sd	Median	Max
Panel A - Decision-Making Method					
Democratic (Dichotomous)	74	0.50	0.50	0.5	1.0
Heterogeneity in DMM Responses	74	0.24	0.28	0.2	1.0
Panel B - Village Characteristics:					
Log: Distance to paved road (km)	74	0.71	0.75	0.3	2.6
Log: N of HH in village	74	4.01	0.65	4.0	6.0
Log: Price of Labor During Harvest	74	6.66	0.79	6.6	8.9
No Visits by Gov. Extension (year)	74	0.27	0.45	0.0	1.0
No Visits by NGO Extension (year)	74	0.28	0.45	0.0	1.0
N organizations from village questionnaire	74	1.97	1.26	2.0	5.0
Panel C - Other Club Variables:					
N game players	74	12.88	4.89	12.5	20.0
Club Mean: Female (0-1)	74	0.49	0.18	0.5	0.9
Club Mean: Age	74	38.73	5.03	38.7	50.6
Club Mean: Years of Education	74	5.41	1.62	5.4	9.6
Log: Avg. Land Owned	74	1.37	0.49	1.4	2.5
Log: Avg. Asset Value	71	11.59	0.90	11.6	14.6
Club Sd: Female (0-1)	74	0.48	0.07	0.5	0.5
Club Sd: Age	74	12.38	2.87	12.7	18.7
Club Sd: Years of Education	74	3.14	0.83	3.2	5.0
Log: Sd. Land Owned	74	0.86	0.77	0.8	3.2
Log: Sd. Asset Value	71	11.60	1.15	11.5	15.2
Panel D - Social Interaction Variables:					
Club Mean: Percent Approachable (0-1)	71	0.00	0.14	0.0	0.2
Club Sd: Percent Approachable (0-1)	71	0.17	0.13	0.1	0.5

All variables in this table summarize variables as used in table 5, the baseline specification in our analysis. Variables with right-skewed distributions are log-transformed. DMM is short for Decision-making method. "Percent Approachable" in Panel D is de-meaned in the analysis, hence the mean value reported above is zero.

Table C2: Effect of Continuous Decision-Making on Cooperation in Public Goods Game

	(1)	(2)	(3)	(4)	(5)
Main effects:					
Democratic (Continuous)	0.20**	0.23**	0.24**	0.38**	0.59**
	(0.10)	(0.10)	(0.11)	(0.15)	(0.20)
Network Variables	No	Yes	Yes	Yes	Yes
Club Variables	Yes	Yes	Yes	Yes	Yes
Village Variables	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.19	0.21	0.33	0.40	0.47
Observations	71	71	62	48	34

Standard errors in parantheses. Dependent variable equals the average share (0-1) of the game endowment contributed by club. Club-and-village-level controls are same as in table 5. This variable has been normalized such that a value equal to 1 (0) is consistent with a scenario in which all of the club members reporting on the decision-making method stated that the club utilized democratic (leader-driven) decision-making. Column (3) Limits analysis to clubs in which 2 or more individuals provided information on decision-making methods employed; (4) limits analysis to 3 or more and (5) limits analysis to 4 or more.

Table C3: First Stage of 2SLS IV Regressions Associated with Table 6

	(1)	
Instrument:		
Non-CDI Orgs: Democratic = 1 (Continuous)	0.57***	(0.14)
Social Connectivity		
Club Mean: Percent Approachable (0-1)	-0.32	(0.33)
Club Variables:		
N game players	0.01	(0.01)
Heterogeneity in DMM Responses (Mean SE)	-0.13	(0.13)
Club Mean: Female (0-1)	0.17	(0.19)
Club Sd: Female (0-1)	-0.92**	(0.42)
Club Mean: Age	0.01	(0.01)
Club Mean: Years of Education	0.04*	(0.02)
Log: Avg. Land Owned	0.67***	(0.19)
Log: Avg. Asset Value	-0.07	(0.12)
Club Sd: Age	-0.01	(0.01)
Club Sd: Years of Education	0.03	(0.05)
Log: Sd. Land Owned	-0.26**	(0.09)
Log: Sd. Asset Value	0.04	(0.10)
Club Sd: Percent Approachable (0-1)	-0.99**	(0.44)
Village Variables:		
Log: Distance to paved road (km)	0.07	(0.05)
Log: N of HH in village	-0.06	(0.06)
Log: Price of Labor During Harvest	0.09*	(0.05)
No Visits by Gov. Extension (year)	0.20**	(0.10)
No Visits by NGO Extension (year)	-0.07	(0.11)
N organizations from village questionnaire	0.05	(0.03)
Adjusted R^2	0.62	
Observations	43	

First stage of 2sls IV regression associated with table 6. Standard Errors in Parantheses. DMM is short for "Decision-Making Method."

Table C4: 2SLS IV Regressions - Dichotomous Decision-Making

	(1)	(2)
Instrumented:		
Democratic (Dichotomous)	0.18*	0.36***
	(0.09)	(0.14)
Network Variables	Yes	Yes
Club Variables	Yes	Yes
Village Variables	Yes	Yes
R^2	0.53	0.45
Observations	43	43
H_0: Instrument is Exogenous		0.26
First Stage F-Statistic		7.30

Standard Errors in Parantheses. Column (2) shows results of a 2sls instrumental variable regression (Columns (1) is estimated using OLS and only includes the sample used in column (2)) in which club decision-making is instrumented by the decision-making norm in the rest of the village. The dependent variable equals the average share of the game endowment contributed by club. Null hypothesis test results report Wu-Hausman P-values. Club-and-village-level controls are the same as in table 5. First stage of estimation reported in table C5.

Table C5: First Stage of 2SLS IV Regressions Associated with Table C4

	(1)	
Instrument:		
Non-CDI Orgs: Democratic = 1 (Continuous)	0.90**	(0.33)
Social Connectivity		
Club Mean: Percent Approachable (0-1)	-0.33	(0.80)
Club Variables:		
N game players	0.03	(0.02)
Heterogeneity in DMM Responses (Mean SE)	-0.40	(0.30)
Club Mean: Female (0-1)	0.42	(0.46)
Club Sd: Female (0-1)	-1.69	(1.01)
Club Mean: Age	0.03	(0.02)
Club Mean: Years of Education	0.06	(0.05)
Log: Avg. Land Owned	1.34***	(0.45)
Log: Avg. Asset Value	0.01	(0.29)
Club Sd: Age	-0.04	(0.03)
Club Sd: Years of Education	0.01	(0.11)
Log: Sd. Land Owned	-0.60**	(0.23)
Log: Sd. Asset Value	0.03	(0.23)
Club Sd: Percent Approachable (0-1)	-1.64	(1.06)
Village Variables:		
Log: Distance to paved road (km)	-0.00	(0.12)
Log: N of HH in village	-0.21	(0.14)
Log: Price of Labor During Harvest	0.24*	(0.12)
No Visits by Gov. Extension (year)	0.52**	(0.23)
No Visits by NGO Extension (year)	-0.25	(0.27)
N organizations from village questionnaire	0.03	(0.08)
Adjusted R^2	0.45	
Observations	43	

First stage of 2sls IV regression associated with table C4. Standard Errors in Parantheses. DMM is short for "Decision-Making Method."

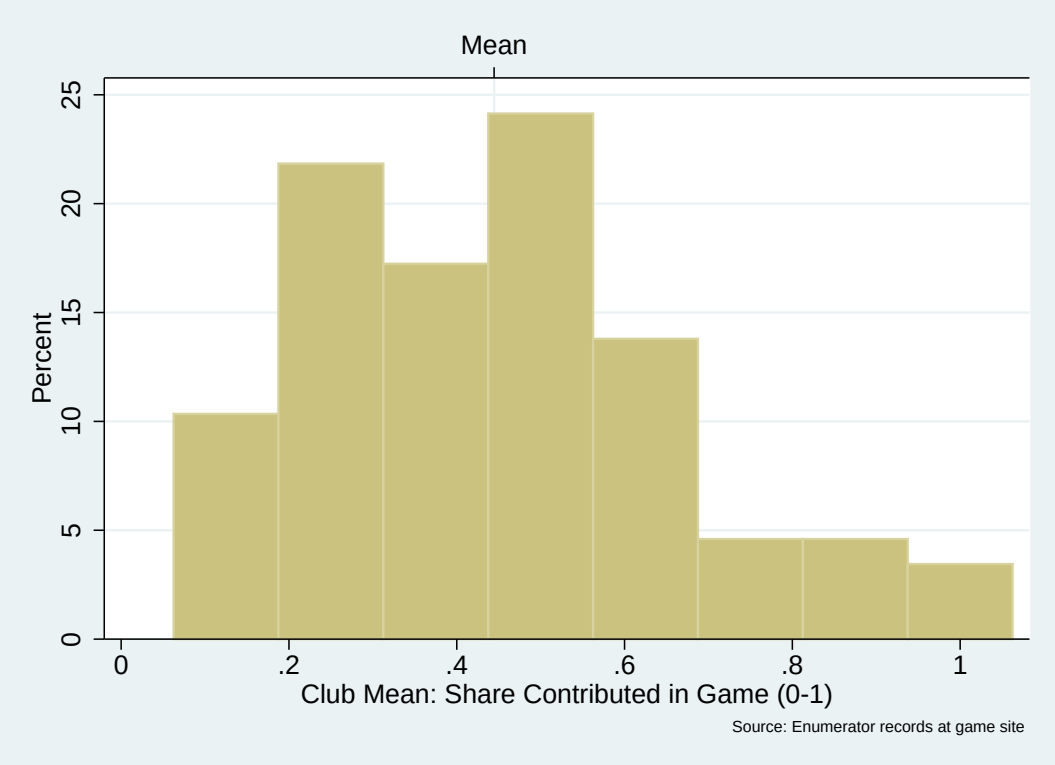

Figure C1: Histogram of Average Club Contributions to Public Goods