Public Good Provision and Deliberative Democracy: Evidence from Malawi

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July 2017

Abstract

We use results of a public goods game with farmer clubs in Malawi to determine the socio-political conditions that increase cooperation. We find that democratically-run clubs, in particular those with close social ties, contribute more than clubs with leader driven decision-making. Focus groups indicate that democratic clubs use deliberative discussion, and analysis confirms that open discussion in democratic settings reduces free-riding. A second set of public goods games in which we experimentally vary decision-making processes yields quantitatively similar results in arbitrary groupings of people and null results in clubs with established decision-making procedures, demonstrating the stickiness of institutional rules.

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

JEL Classification Numbers: O1; Q1; H4; D7

1 Introduction

Community-driven development programmes - programmes that incorporate local management and input in programme design and implementation - can provide benefits to organisations working in developing countries relative to centralised and top-down modes of operation. Successful community-driven development programmes are demand-responsive, accountable, and transparent; they empower poor men and women to identify and address local problems (Mansuri and Rao, 2013). The decentralised approach 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 programmes have not produced uniformly positive results. The requirement to contribute individual labour, time and in some cases financial resources in contexts in which project benefits are shared equally can lead to participant free riding. This can undermine programme goals and efficacy, resulting in the projects' failure to deliver anticipated benefits (Wong, 2012; Ojha *et al.*, 2016; McGranahan and Mitlin, 2016).

Under which conditions can we expect community-driven development programmes to succeed? Two strands of literature provide guidance. First, following Ostrom (1990), a rich body of literature developed studying the role of community organisations 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 benefit from 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 (1989); Agrawal and Goyal (2001); Poteete and Ostrom (2004); Zulu (2008); Gutiérrez *et al.* (2011).

While this literature highlights factors that are worthy of attention, the lack of (random) quantitative variation provides few causal conclusions regarding the relationship between community attributes and project outcomes. Furthermore, there is a clear distinction between refraining from over-utilising 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 (Bergstrom *et al.*, 1986). Empirically, this difference is observed in the finding 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)).

A second relevant literature experimentally varies these conditions in a public goods 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 researcher 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 maximises 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).[1]

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. Beekman *et al.* (2014), for instance, show that public and private investments in game settings decrease when local leaders are corrupt. Jang and Lynham (2015) document a spillover of sharing norms in Ugandan fisheries on behaviour 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. Henrich *et al.* (2004) observed substantially different results in the public goods and ultimatum games among the Orma ethnic group in Kenya. They 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 educational public goods.[2] 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.

We conduct a public goods game among farmer clubs in Malawi. Farmer clubs – which range in scale and formality from loosely organised informal village groups to legally consti-tuted 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 club public goods game with a household survey and qualitative data from focus group interviews.[3] 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 behaviour. In particular, we focus on (i) the degree of democracy, and (ii) the strength of social ties. One year later, we implement a second variation of the game among the same clubs and random groupings of individuals in com-parable villages, in which we experimentally vary the degree of democracy, while continuing to measure the strength of social ties.

We find few individual-level determinants of cooperation in the public goods game; instead, club-level differences explain the majority of the variation. The focus group interviews suggest that these club-level differences are related to the socio-political structure. We confirm in the data that farmer clubs are indeed heterogeneous in ways that critically affect club outcomes. In particular, the degree of democracy strongly predicts cooperative outcomes. Democratic clubs contribute roughly 44% more to the public good than clubs in which decisions are leader driven. These results are robust to a rich set of controls.

The focus group interviews provide a further insight useful for identification: farmer clubs do not strategically choose the degree of democracy upon club formation; rather, they adopt the norm present in the village. This 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.[4] The observation that these club 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.

Experimental results demonstrate the stickiness of institutional decision-making rules. When we experimentally vary the degree of democracy in random groupings of individuals in comparable villages, we find the same qualitatively and quantitatively comparable result: democracy increases contribution to the public good. However, when we experimentally vary the degree of democracy among the (established) farmer clubs we find no significant relationship between public good contributions and the degree of democracy. The null result suggests the policy importance of understanding existing decision-making norms. For example, while one might want to randomly assign farmer clubs to employ democratic or leader driven decision-making, the imposition of such an exogenous relationship might be difficult and might not have any "bite".

Finally, the 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, democracy is beneficial to the extent that conversation, and not voting, among club members influences outcomes. This deliberation is likely to be more effective if social ties are strong. This is confirmed in the data where we find an important complementarity between democratic decision-making and social relationships. We find that democratic clubs contribute more to the public good primarily in the presence of strong social ties. Leader driven clubs, on the other hand, seem unable to harness social capital. The fact that democracy plays a knowledge-generating as well as preference-aggregating role also reflects itself in the optimal club size. Democratic clubs have an optimal club size of 11-12 members, while for leader driven clubs, who are essentially playing a more standard voluntary contribution equilibrium, smaller clubs have higher levels of contributions.

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

2   Data

We collected the data for this study as part of an impact evaluation. As the impact evaluation itself is not the focus of this study, we summarise this programme only briefly here. The programme is implemented by the international NGO, the Clinton Development Initiative (CDI). Programme activities included: (i) the dissemination of information about and train-

ing on improved agricultural practices through the use of club-managed demonstration plots, (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 programmes, CDI works through farmer clubs.[5]

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 programme 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 programme activities, i.e., these were the treatment villages in the impact evaluation.

As the CDI programme works through farmer clubs, CDI, after having introduced their programme to village leaders, asked representatives of the 125 treatment villages to establish clubs of farmers to participate in the programme. 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). These 87 clubs form the sample for this study.

We collected data in 2014 and in 2015. 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 describe the public goods game. For further details, refer to Appendix A.1 for the game played in 2014 and A.2 for the one played in 2015. We first describe the data collected in 2014. 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 was 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, labelled 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, labelled the "common account," was placed in an envelope and shared with all club members, i.e., the club members together decide on its use. The money placed in the "common account" envelope, once aggregated, was 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 belongs to each individual and is a completely 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 account,

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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 envelope, 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 the extent 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%).

In October-November 2015 we returned to the same (and 13 additional) CDI clubs one year after the first series of public good games were played and introduced a similar version of the game with random variation in the way in which groups decided on the use of the funds in the common account.[6] The framing for the game remained roughly consistent with the game played in 2014: we asked each club to select a public good to invest in using proceeds from the game. The game was altered in one significant way that introduced random variation in the decision-making rule applied by each club during the course of the game. Half of the clubs were randomly selected to utilize a rule in which they were asked to reach consensus through democratic deliberation while in the remaining clubs decisions for the uses of the funds were made by club leaders before others were introduced to the game. Henceforward, we call the former treatment "deliberative democracy" and the latter "leader-driven." As figure 2 indicates, half of the 100 CDI clubs in our sample played one of the two versions of the game.

In both versions, we first informed the club leaders that during the game we would be presenting them with an alternative means of decision-making than the one adopted by the

club itself. Specifically, we invited them to consider the experimental method of decision-making as one they could gain insights from when considering the role of different modes of decision-making in influencing group outcomes. In the leader-driven treatment, we informed the club leaders about nature of the game and then invited them to decide how the funds in the common account will be used by the club. In the deliberative democracy treatment we informed the leaders that we would be inviting each club member to share their thoughts on how the common account should be used and that members would be invited to share their thoughts in a random order. After each member shared his or her thoughts, the leaders would be asked to facilitate a conversation in which the group would reach a consensus regarding the intended use of the common account.[7] Once a decision was made in either the leader-driven or deliberative democracy version of the game, the intended use of the public good would be announced to the entire club and club members would be invited to privately contribute to the common account in the same manner as in the 2014 game.[8]

We also took advantage of the setting of our broader impact evaluation to conduct the same randomized version of the public good game among members of our sample in 50 "control" villages - villages that had never been exposed to CDI's farmer club program. The public goods game participants in control villages consisted of the ten randomly selected individuals in our survey sample associated with the broader impact evaluation. This aspect of our data allows us to use variables collected in the household and village surveys (described below) to enrich our analysis. The challenge in translating the public goods game for random groupings of individuals, as opposed to established farmer groups, is in framing the experience so that the concept of a public good is made salient to individuals participating in the game. To do this, we first we invited the ten survey participants to a central location and asked them to imagine themselves as members of a farmers group that collectively provided benefits to participating households. We mentioned that such a group typically adopts a leadership structure in which a chairperson helps to set the group's agenda and the treasurer manages

group funds. We asked each group to select a chairperson and a treasurer who would be taken aside and be given further instructions. The remainder of the game script remained consistent with the above description of the game played in CDI farmer clubs.

2.2 Focus Groups

To gain insights into the nature of the decision-making processes utilized by the farmer clubs, 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 (1997) 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 club. For instance, the club 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, clubs appeared to be more committed to reaching agreement through discussions while stating that when there are disagreements, the club'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. A note on sample size: While we have 435 (87 by 5) CDI households covered in the household sample, only the households with presence at the game are included in the descriptive statistics and analysis here. This leaves us with a sample of 402 matched households. The survey modules include (among others) the demographic characteristics of the household members, household assets and the household's social network and club 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.[9] Thus, if there are ten members in a club, then the respondent was asked to detail their relationship with each of the other nine 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 organisations in which he or she participated. For each organisation that the respondent (personally) belonged to, we asked a series of follow up questions about the organisation (sourced from Grootaert *et al.* (2002)), including: "How does the group usually make decisions?"[10] 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. A note on sample size: a significant sub-section of the respondents were not personally involved in a CDI club (rather another member of the family was) and, among those that were involved, some stated that their club had yet to meet (and hence felt they could not respond to our questions). We remain with 261 responses that capture information regarding the decision-making processes present in our farmer clubs.

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; this is option number (3) 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* democratic or leader-driven manner. Recall that the focus group discussions help 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.[11]

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 due to a combination of these. Thus, we restrict descriptives of club-level data to the 74 remaining clubs with an average of 3.5 responses per club. Panel A in table 2 reports 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 democratic 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 B).

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 question-

naire 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 labour during harvest, and involvement with other civic organisations. Panel B of table 2 presents relevant village-level descriptive statistics for the 74 villages used in our analysis. Note the large variation across villages in these measures. Villages report being an average of 1.8 kilometres (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 organisational structure CDI espouses. A day's worth of labour (from a single labourer) during harvest also varies significantly across villages with an average of 1,101 MK and a standard deviation of 1,170 MK.

2.5   Motivating club-level Analysis

Before embarking on the analysis of these data, we highlight the importance of the club's operating context in predicting contributions to the common account. The observation that individuals contribute 43% of their endowment to the common account is similar to patterns of contributions in other studies utilising 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. Nevertheless, 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 behaviour. This is also reflected in panel C of table 2 which shows that the per-club average share of contributions closely correspond to average individual contributions (42%) but with a smaller standard deviation (21% vs. 30%).

We first explore individual correlates of common account contributions by regressing 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 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 one-way 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.

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. Recall, in our public goods 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 construct these aggregates, we generate within-club measures of averages and standard deviation to capture both levels and distributions of relevant club-level variables. We construct similar measures of within-club social interactions. Given the nature of the random-within-club sample design, aggregate measures constructed using survey data are assumed to be representative of the club. Finally, local context can be partially characterised by the village-level variables which capture village size, market access and familiarity with civic associations.

3 Conceptual Framework

Our objective is to analyse how the social and political context of the farmer club affects its ability to coordinate and overcome free riding. Our outcome measure of club level cooperation is the contribution to the common account 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 the 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 club members have different preferences, then the nature of the decision-making process used by the club is likely to impact the contributions to the common account. For example, if the lead farmer alone selects a public good, his decision will reflect his preferences only, and in an extreme case, might only include his information set. When the decision is made in a more democratic fashion, then the preferences and knowledge of each club member will be combined and the resulting decision will reflect this. The extant levels of social interactions are likely to influence these processes further. We formalize this below.

Assume there are N individuals in a club and two possible public goods, k_1 and k_2. Denote the endowment provided by the experimenter as w (i.e., 400 MK), and the amount contributed to the public good by individual i by x_i. Assume that individuals can differ from each other in terms of preferences and beliefs - denote such beliefs by $\phi_i(.)$. Abusing notation, these beliefs pertain to the preferences of others as well as the attributes of the possible public goods. Denote the club's decision-making process by P and let S represent the social interactions among the club members. Assuming a quasi-linear utility function,

individual i chooses x_i in order to maximise his expected utility:

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

where $\pi_i\{k_j\}$ denotes individual i's probability assessment of the club'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 maximise their utility given their endowment, preferences and beliefs. The solution of this joint set of maximisation problems takes the shape of a Bayesian Nash Equilibrium. The optimal contribution amount of each individual is determined in equilibrium and depends on the endowments, preferences, beliefs, the decision-making process and social interactions. 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: $P \in \{$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 follow the general framework outlined in Munger (2015) and Humphreys *et al.* (2006) and note three possible channels in which democratic decision-making influences contributions (x_i^*): justification, preference aggregation, and knowledge generation and 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.[12] 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 might increase 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 also 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 hypothesise the following:

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

This is primarily due to the deliberative nature of the clubs in our setting. However, within democratic clubs, discussion may hinder cooperation under certain conditions. 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. In the absence of a culture of open discussion among club members, deliberation can not be expected to yield cooperative outcomes. These dynamics suggest further means of testing the mechanism at play; we thus propose additional hypotheses unique to clubs utilising deliberative democratic decision-making:

Hypothesis 2 *The positive effect of democratic clubs will attenuate beyond a threshold club size.*

In other words, we expect that the positive relationship between democratic decision-making (hypothesis 1) is dependent on the number of participants in the discussion - this positive effect will decrease after a threshold number of participants in the discussion.[13] While it is straightforward to explore implications of our data related to hypothesis 2, the second dynamic requires further discussion of the role of social interactions in club decision-making.

3.2 Social Interactions

We first examine the direct relationship - independent of the decision-making process - between extant levels of social interaction among club members and individual contribution decisions. Relationships among club members have a direct effect on an individual'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 might result in more accurate beliefs about others' preferences. Second, when social interactions are characterised by a sense of trust in others, the direct effect is ambiguous. On the one hand, individuals might be incentivised 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 - now dependent on the decision-making process - is less ambiguous. Here, social interactions can influence the choice of a public good in democratic clubs characterised by deliberative decision-making. In such settings the virtues of deliberation only emerge if club members feel comfortable discussing and listening to each others' ideas. The discussion is thus enabled and enhanced by high baseline levels of social interactions - absent these interactions, deliberative democracy produces inefficiencies that likely hinders cooperative processes.

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 articulate and test the following hypothesis:

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

4 Analysis and Results

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, we argue that the questions asked and the hypotheses tested in this paper require analysis of observational data. The remainder of this section will first articulate our empirical strategy with respect to the observational data we collected in 2014. After presenting the results associated with this empirical strategy, we examine the validity of the assumption made in the above paragraph - that random variation of decision-making processes in established farmer groups will not effect outcomes due to the implicit stickiness of already established decision-making methods. We establish this by showing null and insignificant effects across the treatment arms in the randomized version of the game that was played in 2015. Finally, we show that the results from the 2015 game played among random groupings of people are consistent with results associated with the observational data. We argue that, combined, these results suggest a causal association between deliberative democracy and cooperation in the public goods game, especially when the environment for deliberation enables high quality conversations among club members.

4.1 Analysis of Observational Data

Identifying the causal effect of democratic decision-making on contributions in the public goods game presents two primary challenges: (i) reverse causality, and (ii) omitted variable bias. 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 process 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 utilised 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).[14] It is noteworthy that the decision-making process is not systematically related to any of the network variables, which may proxy for pre-existing norms of cooperation (see panel B in table 4). This suggests that an instrumental variable (IV) strategy that uses the village decision-making norm as an exogenous regressor of club-level decision-making holds considerable promise.

The fact that observable characteristics do not predict villages decision-making type does not solve the second empirical challenge: that unobservable characteristics are correlated with decision-making processes at the club-level in a way 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 does 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.

4.1.1 Empirical Specification

Formally, we first denote the farmer club S_j 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.

We use the "approach" response as our measure of S_j; we argue that it best represent of the culture of open discussion among club members as required by hypothesis 3 in democratic clubs as it characterises farmers' approach other members for advice about farming.

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 panel A 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 which randomly selects five households whose members belong to a CDI club - thus, aggregate levels of asset stocks are assumed to be

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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 labour during harvest, and the number of civic associations present in the village.[15]

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. This insight provides us with a potential instrument to use in an IV regression to account for the possible endogeneity in equation (2) with respect to R_j.

Recall, our household survey sample includes five randomly selected households who are not members of CDI clubs; however, we still collect information on the nature of their engagement with civic organizations at the village level and their respective decision-making processes. We use this information to construct a village-level measure of decision-making employed by all non-CDI village associations.[16] In other words, we construct a village-level average of the decision-making methods employed by all non-CDI clubs in which survey respondents participate. 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 behaviour 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.

Naturally, this instrument is only available in CDI villages in which survey participants report involvement in civic associations 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

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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). To strengthen the precision of our instrument, we omit 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; it is unlikely that the CDI decision-making method was chosen out of extant decision-making norms in these villages.[17] After omitting these 4 observations, the same t-test shows a stronger relationship between decision-making in CDI clubs and other village associations (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 co-operative behaviour 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 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.[18] 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 utilised 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.

4.1.2 Main Results

Table 5 presents results from estimations of equation 2. Each column progressively adds additional controls to assess whether omitted variable bias is a threat to our analysis. Column (1) 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 adds club-level controls, column 3 adds village level controls, and column 4 adds our measure of social interactions. Results presented in table 5 demonstrate that the controls have little effect on the coefficient of interest - indeed, adding additional controls marginally increases the coefficient associated with democratic decision-making, evidence that omitted variable bias may not be a significant problem for our analysis.

We find that the total share of contribution decreases by 1 percentage point for each additional individual in the club participating in the public goods game; this finding is consistent with both theory and empirical results which have found that free-riding increases as the number of participants grows. We also find that among the club-level variables, only average land size significantly influences public goods contributions. The negative correlation suggests that clubs with more farming resources (land) may 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 that theory suggests that the direct effect of social interactions is ambiguous. We address the indirect effect of social interactions reflected in hypothesis 3 in section 4.1.3.

Results associated with the village-level controls suggest that relatively isolated villages - as measured by distance from paved roads - and villages with more civic associations contribute more to the common account. Column 5 presents regression results in which we omit the democratic decision-making measure.

The analysis presented in table 5 uses a binary measure of the club's decision-making process. We can also treat club decision-making as located along a spectrum where fully leader driven and fully democratic processes occupy 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 using this continuous measure of club decision-making. The results are consistent with findings from estimations using the dichotomous measure but point estimates increase, suggesting that clubs towards the democratic end of the spectrum engage in more cooperative behaviour. [19]

Finally, table 6 presents results of the IV estimation in which we use the continuous measure of decision-making methods as the endogenous (CDI clubs) and exogenous (non-CDI civic associations) regressor.[20] In order to compare the results of the two-staged least squares IV estimation with the OLS estimation associated with the IV sub-sample, we present the limited-sample OLS results of equation 2 in column (1) in table 6. The instrumented coefficient is positive and statistically significant and the first stage is strong with an F statistic of 16.5. Moreover, we cannot reject the exogeneity of the instrument according to a Wu-Hausman test (p = 0.30). This result 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.

4.1.3 Quality of Conversation and Deliberative Democracy

As discussed, there are situations in which inefficiencies can emerge when using a deliberative, democratic, approach that are not present in a leader driven approach. We test for the presence of these inefficiencies to confirm mechanisms associated with deliberation in club settings. First, in hypothesis 2 we posited that as the number of individuals increases within a democratic club, we expect agreement is more difficult to reach via deliberation. Figure 3 displays a flexible polynomial relationship between average contributions and club size by the decision-making style employed. The left panel, which presents average contributions in leader driven clubs and the number of game players, shows what may be a slight negative relationship between the number of participants in the public goods game and the amount of cooperation. This is expected if larger numbers of participants increase free riding behaviour.

A different dynamic emerges in the right panel of figure 3, which includes only democratic clubs. The right panel presents a strong inverse-U shaped pattern between the number of participants in the game and average contributions. When club sizes are small, additional members increase average contributions, perhaps because of the contribution of new insights in club discussion. However, beyond a threshold of around 11 or 12 individuals, additional members decrease average contributions, perhaps because it becomes difficult for the club to identify a public good compatible with (club) preferences.

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 characterised by strong social interactions can aggregate

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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.

We find (column (1)) 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 percentage points. 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. To check for the robustness of this result, we control for the direct effect of other measures of social interactions in column (2) and see that the coefficient on the interaction term associated with approachability is significantly positive while the direct effect is not significantly different from zero.

4.2   Experimental Results

At the beginning of section 4, we claimed that the randomization of decision rules in established community groups would be ineffective. One way to confirm this claim is to obtain null

results in a version of the public goods game in which decision-making rules are randomized.

Columns (1) and (2) in table 8 show the effect of deliberative decision-making on contributions to the public good game in established CDI farmer clubs. We cannot reject a null treatment effect when the treatment is defined as the random selection into a deliberative decision-making rule in established CDI clubs. This confirms our original assumption that the randomization of decision-making rules in established community organizations would not be effective, and that such a study would need to rely on observational data. Established decision-making rules in such clubs are likely too sticky to be manipulated by outsiders - clubs may make decisions in public goods games as though their own decision-making rules will prevail after funds are transferred to the clubs.

To identify a causal relationship between deliberative decision-making and cooperation in public goods games, we also played the randomized game with random groupings of individuals in 50 villages that had never been exposed to CDI's farmer clubs. The sample for these games consisted of ten randomly selected individuals per (randomly-selected) control village; individuals are also survey respondents in baseline and midline survey for the larger RCT. Random groupings of individuals are unlikely to have an established mode of decision-making, making it easier to exogenously vary decision-making rules. Each game was played with ten randomly selected individuals who also provided responses to a survey instrument in which they were asked to describe the nature of their relationship with each of the other participants in the public goods game.

Results for these games are reported in columns (3) through (8). In these columns, we show that random groupings of individuals exposed to deliberative decision-making increase average contributions to the common account by 10 to 14 percentage points, roughly similar to our OLS results presented in table 5. Furthermore, we (weakly) show that when the participants in the deliberative decision-making rule have stronger social ties - defined by the percent of game players who were related to one another or have daily conversations

with one another - contributions to the common pot increase. This is consistent with the mechanism discussed in section 4.1.3, though we suspect we are underpowered and are thus unable to demonstrate statistically significant results associated with these interactions.

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 farmer clubs are heterogeneous in ways that critically affect club outcomes. Consistent with the literature, we find that a significant percent of the variation is across clubs and not within clubs (Henrich *et al.*, 2004). We then identify conditions that lead to cooperation and find that democracy matters. We find that democratically-run clubs contribute about 44 percent more to the public good (of their choice) compared with clubs run in a leader driven fashion. This result is strongly dependent on the nature of the social relationships in the club: democratic clubs 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 11 to 12 members. In contrast, increasing numbers in leader- driven clubs linearly decreases the average contribution to the public good. These results, together with insights from the focus group discussions, suggest that cooperation within farmer clubs depends on the ability of club members to share information and discuss preferences in a deliberative, democratic manner. As expected, due to the stickiness of decision-making processes in established clubs, we do not find significant effects on public goods contributions in farmer clubs in which we experimentally vary the degree of democracy. However, we are confident in the causal interpretation of our analysis based on observational data given that

the experimental variation of the degree of democracy in random groupings of individuals in comparable villages generates results both quantitatively and qualitatively similar to the OLS and IV analyses.

These findings contribute to our understanding of the functioning of small, village-based, community groups in developing countries. Development programmes often rely on these types of community groups to organise 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 programmes. Often, these farmer clubs tend to be treated as a black box - one of a number of bundled project interventions - even among studies that use randomised 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, because these clubs are characterised by politics, agendas, and complex social relationships, a development programme built around such clubs as the primary channel for dissemination of information, learning, or stakeholder collaboration may succeed or fail based on the club's socio-political structure. Given the individual costs of coordination and participation, such clubs 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 external validity of empirical analyses – randomised controlled trials or otherwise – which treat farmer

clubs as a black box.

These results also suggest the importance of attending to group formation as a part of project implementation and offer some guidance for programme 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 in terms of cooperative outcomes. 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. Third, depending on the project objectives, projects may want to pay attention to club size: the optimal club size to encourage cooperation might be significantly below 20 members. Finally, if practitioners desire to influence decision-making processes, they are likely to only succeed if they do before decision-making norms become too sticky.

More research is needed on these issues, in particular with respect to the possible trade-offs among working with groups with existing 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. See, for instance, Deserranno *et al.* (2015) who show that Ugandan community groups who select their leaders through open discussion are richer and less inclusive than those who use secret ballots.

Finally, an important distinction between our paper and other studies of the relationships between governance practices and public good provision is that our clubs not only delegate

the choice of the public good democratically, but the members themselves are also responsible for producing said public good. For instance, Olken (2010) randomized the political process through which Indonesian villages can select and invest in infrastructural public goods. He finds that a democratic process, just as in our study, increases knowledge about the public good, changes preferences, and results in an overall increase in the willingness to contribute to the public good before the public goods are put into place. Madajewicz *et al.* (2017) randomizes the way in which an NGO implements a safe drinking water project and find that the approach which requires all community members to participate in the decision-making results in increased community engagement.

However, when groups are also deeply embedded in a given community via their role not only in determining the choice of the public good but also producing the public goods, for instance by managing a demonstration plot, the role of decision-making processes may be more nuanced, as our research suggests. The clubs exist in a context in which members' social ties influence the decision-making and production process of public goods. This point is important when considering clubs that make decisions in a democratically deliberate manner - it is important that the members of the club feel welcome to share and listen to others' thoughts in club meetings, but also that they can effectively coordinate when putting the funds to use on a demonstration plot. Future research may benefit from a careful analysis of how collective action environments change when local groups are responsible for both the delegation and delivery of a public good.

Notes

[1]Considering factors which may affect levels of cooperation, we know that (i) people might be more generous with time than money (Ellingsen and Johannesson, 2009; Linardi and McConnell, 2011), (ii) people contribute less when the benefits of the public good are

unknown and delayed (Frederick *et al.*, 2002; Xiao and Kunreuther, 2016), (iii) revealing contributions to the common account or public good increases contributions (Rege and Telle, 2004; Andreoni and Petrie, 2004; Jack and Recalde, 2015), more so when peer punishment is possible (Yamagishi, 1986; Fehr and Gächter, 2000; Nicklisch *et al.*, 2016) and participants know one-another (Lacetera and Macis, 2010; Soetevent, 2005; Harrison and List, 2004; Alpizar *et al.*, 2008).

[2]Not only can an existing social dilemma influence the results of the game, Turiansky (2015), also documented the reverse process.

[3]Mansuri and Rao (2013), in an overview of community-driven development programmes, 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 behaviour in heterogeneous settings.

[4]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.

[5]For instance, CDI's credit programme is at the club-level, punishing all members of the club if one member defaults. Additionally, CDI 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 among the club members.

[6]The 13 additional clubs come from the same villages as the original 87. In baseline, we only included one club per village in our survey - this club was the same to play the game in 2014. In 2015, we allowed additional clubs in the same 87 villages to participate in the

game in order to increase our sample size to 100 clubs.

[7]We also emphasized the importance of valuing each club member's opinions equally and not forcing a club in a particular direction when consulting on the final use of the common account.

[8]Between 2014 and 2015 the value of a USD increased from close to 400 Malawian Kwacha to 500. Thus, in 2015 we distributed 500 MK and in 2014 we distributed 400 MK, both in 50 MK denominated notes, to each club member as their endowment for the public goods game.

[9]For arbitrary groupings of people who participated in the randomized version of the public goods game, we documented the nature of each individual's relationship with each other game participant. Here, we also have detailed information on the nature of kinship ties and the frequency of conversation among individuals.

[10]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."

[11]In calculating the average, we omit responses that answered "other."

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

[13]For example, consensus-building is more difficult to achieve through discussion in a large club relative to a small club, *ceteris paribus*.

[14]First, clubs using democratic decision-making methods tend to have two fewer members participate in the public goods game than those using centralised regimes. Second, the mean age of club members in clubs using democratic methods is two years higher than the centralised regime. Third, 20% more of the villages in which clubs employed democratic decision-making methods were not visited by government extension workers in the 12 months

prior to the survey.

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

[16]In some cases, CDI households also participate in other clubs at the village level. To supplement and add precision to our measure of village-level norms, we include information from these cases in the construction of our instrumental variable.

[17]Our results are robust to the use of an instrument inclusive of these 4 observations; however the instrument is weakened in this case.

[18]Recall, only five CDI households in each village were randomly selected to participate in the household survey. Because all CDI clubs have more than five members, we cannot construct the full list of civic associations that CDI households participate in.

[19]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 behaviour across 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.

[20]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.

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Tables and Figures

	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
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 account 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. Answers for data in Panel C are limited to a further subset with knowledge of their club's decision-making process.

Table 2: Club Level Descriptive Statistics

	N	Mean	Sd	Median	Max
Panel A - Decision-Making Method					
Continuous Measure of Decision-Making Process*	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
Number of Households in Village	74	68.77	58.94	52.5	412.0
Number of Organisations 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 Labour 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. Construction of this variable is summarized in appendix B.

Table 3: Correlates of Individual Common Account 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 Characteristics

	Leader N	Leader Mean	Democratic N	Democratic 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 organisations 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 Labour During Harvest (100 MK/Day)	37	10.53	37	11.49	0.727
Panel D - Non-CDI Decision Making Norm:					
Non-CDI Organisations: 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 organisations 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 parentheses. Dependent variable equals the average share of the game endowment contributed by club (0-1). Additional controls were included but not reported in the following manner: 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 labour 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 parentheses. 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 column (4) of 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)	0.56*	0.99**
× Club Mean: Percent Approachable (0-1)	(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 parentheses. Dependent variable equals the average share (0-1) of the game endowment contributed by club. Club-and-village-level controls are same as in column (4) of 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.

Table 8: Random Variation in decision-making Rule

	CDI Clubs		No CDI Clubs - Random Groupings (10 Players)					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Treatment:								
Deliberative Dem.	-0.017	-0.025	0.10*	0.13**	0.12*	0.14**	0.13**	0.13**
	(0.05)	(0.05)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
Social Interactions:								
% Family Members (0-1)					0.063		-0.19	
					(0.26)		(0.35)	
% Daily Conversation (0-1)						0.15		0.034
						(0.24)		(0.33)
Deliberative Dem. × % Family Members (0-1)							0.41	
							(0.38)	
Deliberative Dem. × % Daily Conversation (0-1)								0.29
								(0.37)
Constant	0.73***	2.22***	0.52***	0.39	0.12	-0.041	0.19	0.24
	(0.03)	(0.60)	(0.04)	(0.67)	(0.73)	(0.80)	(0.73)	(0.71)
Controls	No	Yes	No	Yes	Yes	Yes	Yes	Yes
Social Interaction SD	No	No	No	No	Yes	Yes	Yes	No
R-squared	0.00	0.12	0.06	0.31	0.34	0.34	0.37	0.35
N	101	101	50	50	49	49	49	49

*$p < 0.1$, **$p < 0.05$, ***$p < 0.01$. OLS regression (0 is lower bound, 1 is upper bound). Dependent variable equals average share of individual contributions to the common account. Controls include all variables listed in appendix table C6. Unit of observation is the group playing the public goods game. Columns (1)-(2) only includes games played with established CDI clubs while columns (3)-(8) are only games played with random groupings of individuals from the survey sample. Deliberative decision making increases contributions to the common account by 10-14 percentage points in the random groupings of individuals, but has seemingly no effect on established CDI clubs.
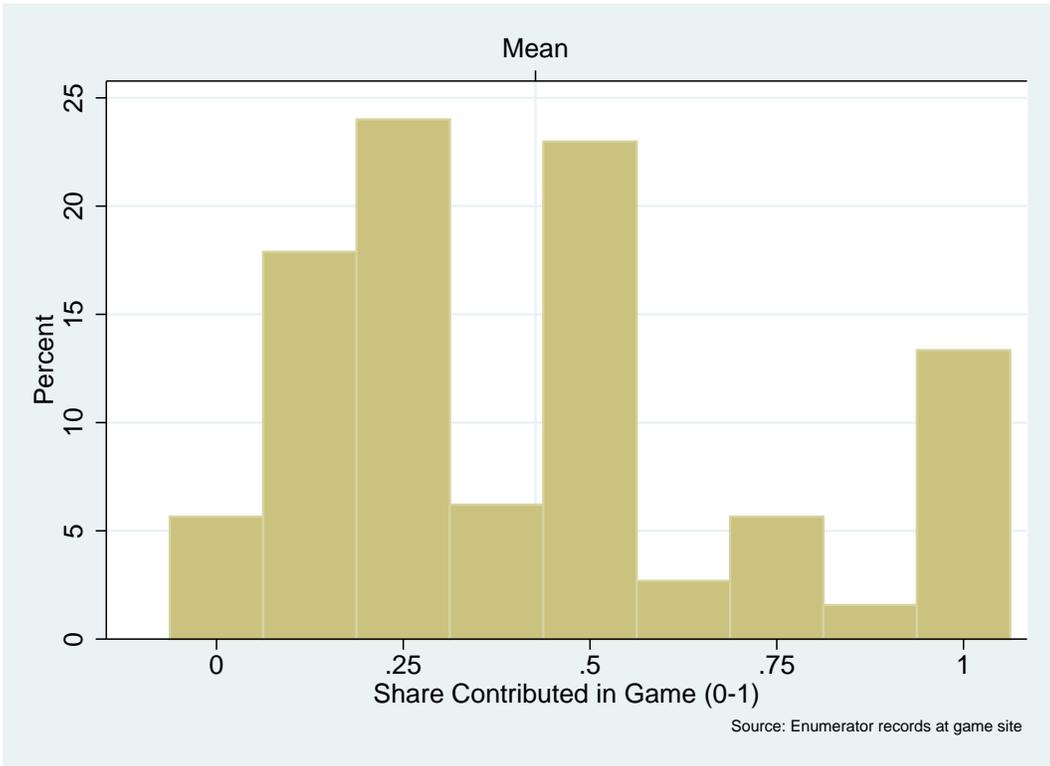
Figure 1: Histogram of Individual Contributions to Public Goods
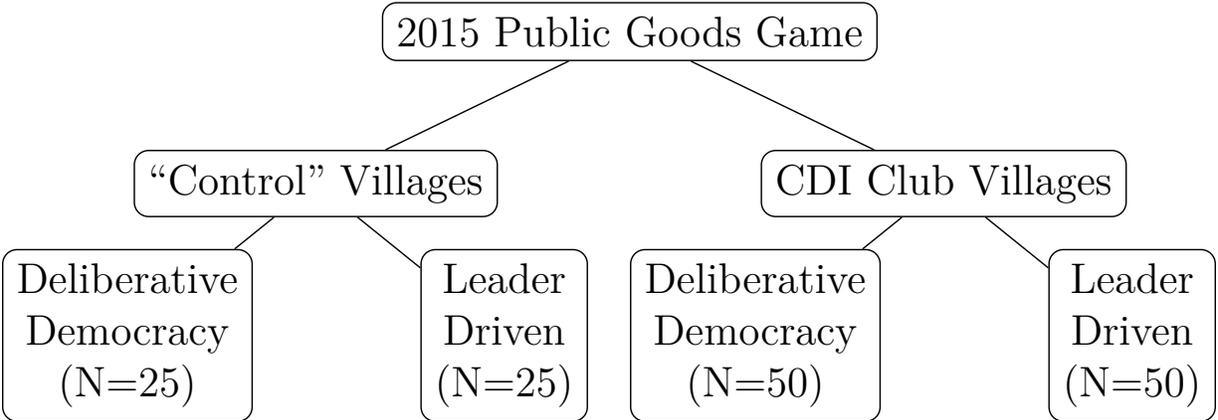
Figure 2: 2015 Public Goods Game Randomization
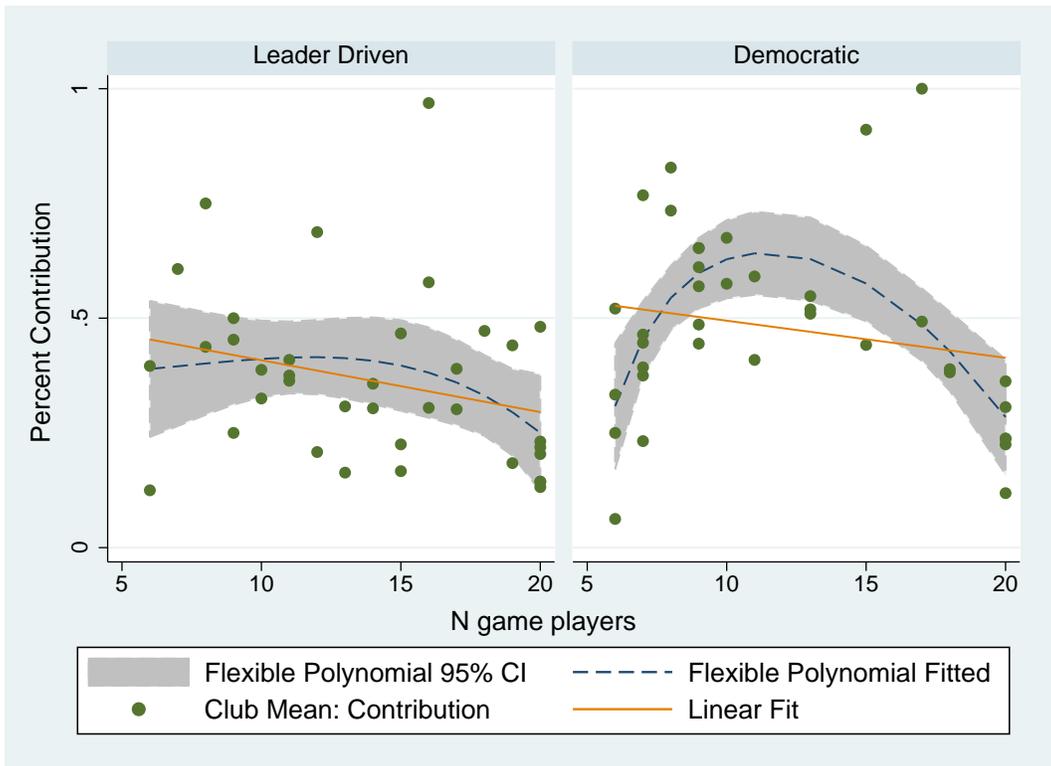
Figure 3: Average Club Level Contribution by Club Size and Decision Regime

ONLINE APPENDIX

A Game Details

A.1 2014 Game 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? _____

A.2   2015 Game Instructions

A.2.1   Discussion Treatment

GROUP GAME - INSTRUCTIONS

1 Before the Meeting Starts

- Write down the village number code in the space at the top of each sheet. Consult the randomization list and make sure you are using the correct document for the "Decision Type" (1 = leader decides, 2 = group decides). The "Pre-Game Conversation Type" will be either 1 = Control, 2 = Ability, or 3 = Values. Write down the "Pre-Game Conversation Type" at the top of every sheet. Only follow the instructions for the pre-game conversation relevant for your particular case according to the randomization list. As an aid, go through the remaining pages of this document and circle the sections you will read based on the randomization codes. Double check to make sure you are using the correct document and instructions according to the randomization list.

- Place 500 KW in 20 envelopes in notes of 50 KW, meaning 500 K per envelope. There should be at least one envelope per club member.

- If there is a CDI club in your village:

  - Consult the club listing for your village and write down the names, leadership roles and gender of each of the club members on the form titled "Game Data" attached to this document. Write down the HH ID of the households that were included in the survey in baseline.

  - First arrange to meet the CDI club leaders (chairperson, secretary, lead farmer, and treasurer) in one central village location, secluded from the rest of the village as to avoid bystanders. Arrange to have the rest of the CDI club members arrive 45 minutes later. If the entire club arrives at the same time, then take the leaders aside first to fill out the leader questionnaire and describe the activity as mentioned in section 2

- If there is NOT a CDI club in your village:

  - Arrange to meet all of the individuals in the sample in a village and write down their names, gender, and household IDs on the form titled "Game Data" attached to this document. Once everyone is present, read the following prompt:

    We would like to invite you to participate in an activity where you will have the opportunity to provide a useful good to your households. In order for this activity to work, we would like for you to imagine that you are members of a farmers group. You can imagine that your group gets together twice a month or so to discuss various farming techniques and items of group interest using an agenda created by the group chairperson. You can also imagine that your group has a treasurer who keeps group contributions in a common fund. The group sometimes uses the funds to provide various services or items of value to club members. Each club is unique and can make different decisions regarding how to use the funds. Each club member can choose how much to contribute to the club's well-being. In the following activity you will be making hypothetical decisions associated with how the group funds will be used. You will have actual funds available to you when thinking of the decision at hand, so your decision can be acted upon if the group desires to.

  - Ask if there are any questions. If necessary, state that this is only a hypothetical exercise and that we will provide the group with funds, do not specify how at this time, to use in deciding how to spend money as a group. After addressing any questions, ask the group to choose one person to act as a temporary chairperson and one person to act as a temporary treasurer. Once these individuals are identified, specify who is the chairperson and who is the treasurer on the form titled "Game Data" in the relevant column and proceed by telling these individuals (temporary chair person and treasurer) that you have specific instructions just for then. Tell the remaining club members that you will spend

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15 minutes or so explaining instructions to the chosen leaders and that you appreciate their patience very much as they wait. Take the leaders aside and proceed to section 2.

2 Once the Leaders are present

- Skip the sections of the exercise that are only relevant for CDI clubs only (e.g. how many group activities do you attend, etc.). As an aid, these bullets are labeled [**CDI CLUBS ONLY**]

- [**CDI CLUBS ONLY**]: Ask the leaders for their names and note whether they are present or not in the form titled "Game Data." Indicate what kind of leader they are in the "Leader" Column next to the name column (Chairperson - CP; Secretary - S; Lead Farmer - LF; Treasurer - T). Ask questions G1 to G5 on the "Game Data" form and document responses on the form.

- [**CDI CLUBS ONLY**]: (20 minutes) Say "Before I explain the nature of our activities today, I'd like to get some more information about your club. This should take about twenty minutes." Find the document titled **"Group Leaders"** attached to this document. Follow the instructions and proceed to collect relevant information.

- Once documentation is complete, read the following script:

  Good day, I am [your name] and I came to this village to learn more about the group today. I wanted to talk to you before talking to the group as a whole in order to describe some of the activities we'll be doing together today. Shortly, we will distribute some funds to each of the group members and you will all try to decide how much of these funds to give to the common funds that belong to the group. We will double whatever amount the group gives for the use of the funds that you decide on. **Before asking the group to contribute, we will ask the entire group to participate in discussions that will help describe some of the workings of the group. We will also ask the group to decide on how the funds will be used through a group discussion.** I understand that your group may make decisions in a different manner than through group discussion. If it does, then I'd like to invite you to think of this as an experiment of how decisions might be made by groups in a different way. This is what we are studying by conducting this activity, and the research group looks forward to sharing the results of this study in the future.

  During the group discussions I will ask each group member to offer their opinion on a question that I will pose to them. After each person has spoken, I will ask you to lead the group to arrive to a consensus with respect to the topic of conversation. I will share the topics of conversation once everyone is present. As you try to lead the group to a consensus regarding the decision that the group can make together, please remember that everyone's opinion should be valued equally. If disagreements arise, you can try your best to help the group find a way to overcome these disagreements, but you should try not to tell the group what to do. This is certainly not an easy task, but I only ask that you try your best to facilitate the group decision in this manner. Do you know which of you would take the lead in this manner? [allow the leaders to respond and note who would lead the discussion... this should be the chairperson] Do you have any questions for me?

- Who is leading the discussion (Name/"Game Data" ID): ⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯

3 Once everyone is present

- Once all 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 form at the back of this document. **A minimum of 6 members should be present to play the game.**

2

- Read the following script

  Good day, I am [your name] and I came to this village to learn more about the group today. Before we start, would anyone like to say a prayer?

- After the prayer, say the following.

  Thank you. We would like to do a group activity with you. This activity will take about 60 minutes, but before we begin I would like to go around the group and ask you some information about yourself.

- Go around the group and fill in the "Game Data" form questions G10 through G13 for all members - all shaded columns in the middle of the table. 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 question G9 on the "Game Data" form.

- At this time, you may also randomly select "Match numbers" only for individuals who are present during the game as indicated by G6. This is a task done by enumerators without discussing with game participants.

- Read the following script

  I will ask the group to participate in two different activities. In the first activity, we will discuss and agree upon the 5 most important abilities that would be good for group members to have when trying to cooperate as a group. To help you think of this list, we thought we'd describe some of the things that we've seen farmer clubs do. Clubs can manage demonstration plots in villages in order to learn about new farming techniques, have fundraisers to help group members in need, use club funds to finance a village savings group, help each other with high labor tasks on each others plots, bargain for higher prices with buyers as a group, and many other things. We are interested in hearing your thoughts on the 5 most important abilities that a club would need to have among its members (not every person has to possess all of the abilities) to successfully carry out group activities. I will first call on each of you to share your thought on ONE such important ability. After everyone has spoken, the club leaders will help you chose the five most important abilities from the list that you have created.

- Tear a sheet of paper in equal pieces according to the number of people present. Write down numbers 1, 2, 3... on each sheet so that you have one number for each participant PRESENT in the discussion. For example, if there are 12 individuals present, tear a sheet of paper into 12 equal parts and write numbers 1, 2, 3... 10, 11, 12 on each of these 12 pieces. You may need to skip numbers associated with individuals who are not present as per their identifier in the "Game Data" Form. Put all of the pieces in a hat, bowl, cup, or other container. Pull a number out of the container and refer to the form titled "Game Data" to find the name of the individual associated with this number. Leave the piece of paper with this number outside of the container. Ask this person with all other club members present "What are a few (no more than 3) abilities you think would lead to group success?" After the person lists ONE ability, record their response on the sheet titled "Randomly-sorted Ability Response." Repeat the activity (draw a new number) until everyone has spoken once. Then, read the following script:

  These are all excellent ideas! I would now like to ask the group leaders to help you take 5 minutes to choose the 5 most important abilities out of the abilities you've already chosen. Everyone is free to discuss their thoughts and all opinions should be equally considered. Please be considerate of others and do not take too much time to share your thoughts.

- Start a timer for 5 minutes. Once the timer says that there is only one minute left, tell the group that they will have to decide on their list in the next minute. If the group is able to come up with a list of 5 qualities, please note their decisions in the form at the back of this document. If they are unable to come to a decision in this time, give them 2 more minutes to discuss their list and take note of their decisions in the same form. If after the group is still unable to make a decision on the list, read the following:

  It's very useful to hear your thoughts on qualities that are important and that lead to cooperation in these groups. Even though the time was short to come to agreement on the 5 most important

3

qualities, hopefully the discussion itself has been useful to you as you think about how your group can improve in the future.

- **If Pre-Game Conversation = 1, move to section 4.** Otherwise, read the following according to the Pre-Game Conversation Type:

    Pre-Game Conversation 2 - ABILITY Now that you have a list of the 5 most important abilities for group discussion [List the 5 abilities], turn to the person you are sitting next to (small groups no larger than 3 people) and decide who among you is particularly strong in each of these abilities. If possible, think of examples of how each person's abilities can be used to the benefit of the group. This conversation is important to the activity, so I appreciate your cooperation!

    Pre-Game Conversation 3 - VALUES Now that you have a list of the 5 most important abilities for group discussion [List the 5 abilities], turn to the person you are sitting next to (small groups no larger than 3 people) and share a story of how your group managed to come to an agreement after an initial moment of disagreement between group members. Did these abilities help lead to agreement or were other factors at play? If your group has not yet had disagreement, then share how you might overcome disagreement if it were to arise. This conversation is important to the activity, so I appreciate your cooperation!

- Spend 2-3 minutes having these small-group discussions. The idea is for everyone to have a brief conversation according to the prompt, the content of these conversations should not be recorded and need not be monitored by the enumerator.

4 Choosing and Contributing to Public Goods

- Read the following script

    In the following activity, you will each receive 500 Kwacha in this envelope (hold up an envelope). Once you receive the 500 Kwacha, we will ask you to make an important decision. You will each divide up the 500 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. **You will all decide together what the group will do with this total amount. You will make this decision before you decide how much to put in the envelope.** Do you have any questions?

    In the same manner as before, I would like you to decide what the best use of the funds will be. I will first call on each of you to share your thought on one way in which the funds can be used. After everyone has spoken, the club leaders will help you discuss the options that have been presented and come to a decision on how the funds will be used. Your group is free to use the funds in any way you choose.

- Return the pieces of paper with the numbers on them to the container. Repeat the same activity as earlier but with a different question. Specifically, take a number out of the container (and leave it out of the container) and refer to the "Game Data" form to find the name of the individual associated with the number. Ask this individual "Please briefly describe your opinion on how the money should be spent by the group." Record responses in the form titled "Randomly-Sorted Decision Response." After the person finishes their thought, repeat the activity (draw a new number), until everyone has spoken once. Then, read the following script:

    Again, these are excellent thoughts. I would now like to ask you to spend 5 minutes to discuss the various options with the help of your group leaders. By the end of five minutes you should have a decision on how to spend the group's money. After this, each of you will decide how much of the 500 Kwacha to leave in the envelope and how much to put in your pockets.

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- Start a timer for 5 minutes and remain listening to the group's conversation, but do not say anything! Once the timer says that there are only 2 minutes left, tell the group that they will have to decide on their list in the next two minutes. If the group has completed their decision, please note their decision in the form titled "Decision for Use of Common Funds" at the back of this document. Also note how long it took (in minutes) for the group to make their decision. If they are unable to come to a decision in this time, give them 2 more minutes to discuss their list and take note of their decisions in the same form. Note why it took long for the group to come up with their decision. In either case, read the following:

  > It's very useful to hear your thoughts on how to use the funds. You are free to think further about how to use the funds after you receive the common pot at the end of this activity if you need more time.

5 Return to Group

- Read the following prompt:

  > You have decided to use the funds for [read the decision that was arrived at and that you documented in question 2]. Now that we know how the funds will be used I would like to ask you to make your decisions on how much to put in the envelope. [Emphasize the following] **I want you to know that the decision you make will be a secret decision. This is your decision and yours only. So when it is time to decide how much money to put in the envelope, 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 envelope, so it can be 0 or 500 KW or anything in between. I will come around the circle and record your decision. But it will be only me knowing your decision; I will not share this information with anyone in the village. Your decision is secret. No-one else will know what you decided.

- Ask whether there are any questions. If not, proceed and hand out the envelopes to everyone. Tell the members to disperse and make their decision. Make sure they are not in earshot of one another.

- 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 questions G14-G18 on the "Game Data" form and fill in G9-G12 if not yet filled in. 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. Ask the individuals how much they kept to themselves and note down their contribution to the pot on "Game Data" form. After they share their contribution amount, ask them for the envelope and move on to the next person. Once information has been collected for the entire group, come back to the area where the group is gathered.

- 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 envelope. Count the total in a public fashion and announce the total (e.g. count outloud for each 50 KW bill). Then match the total and place the full amount on a table.

- If the treasurer of the group is present, tell the group that you will hand the funds to the treasurer. If the treasurer is not present, ask "Who shall I give this amount to?"

- Write down that person's ID number as listed on the "Game Data" Form. _____

THE FOLLOWING INSTRUCTIONS (IN THIS BOX) ARE ONLY FOR THE CASE WHERE THE GROUP PLAYING THE GAME IS <u>NOT</u> A CDI CLUB

- At the end of the activity, you may read the following:

  > Since those of you who have participated in an activity may not actually be members of a farmer club, we would like to give you the following option. Please decide whether you would like to use the funds in the way that was decided during the activity, or whether you would like for us to return the funds in equal shares to each of you.

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- Allow the group some time to decide whether they would like to receive the funds as a group or whether they would like to receive the funds in equal shares. I they would like to receive the funds in equal shares, divide the funds in as equal shares as possible. Otherwise, if the group decides to use the funds in the matter they decided originally, hand the funds to the treasurer. If there are funds left over that can not be be divided equally, mark this amount (it should be less than 50KW × The number of people playing the game) separately. Take note of the decision and the remaining money on the following lines.

- **Decision**. Circle one of the following: Group Use of Funds   /   Divide in Equal Shares

- **Remaining Amount**. _____

6 Notes

- Sometimes group members or leaders 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.

- Sometimes group members will say that the decision-making process is not the same one they employ in their group meetings. Tell them that you understand this and apologize if it creates difficulties but that it is part of an experiment to study ways in which groups can make decisions together. Hopefully the group can discuss the outcomes of their experience with each other after the activity and compare it with how they usually make decisions.

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A.2.2 Leader Treatment

GROUP GAME - INSTRUCTIONS

1 Before the Meeting Starts

- Write down the village number code in the space at the top of each sheet. Consult the randomization list and make sure you are using the correct document for the "Decision Type" (1 = leader decides, 2 = group decides). The "Pre-Game Conversation Type" will be either 1 = Control, 2 = Ability, or 3 = Values. Write down the "Pre-Game Conversation Type" at the top of every sheet. Only follow the instructions for the pre-game conversation relevant for your particular case according to the randomization list. As an aid, go through the remaining pages of this document and circle the sections you will read based on the randomization codes. Double check to make sure you are using the correct document and instructions according to the randomization list.

- Place 500 KW in 20 envelopes in notes of 50 KW, meaning 500 K per envelope. There should be at least one envelope per club member.

- If there is a CDI club in your village:
  - Consult the club listing for your village and write down the names, leadership roles and gender of each of the club members on the form titled "Game Data" attached to this document. Write down the HH ID of the households that were included in the survey in baseline.
  - First arrange to meet the CDI club leaders (chairperson, secretary, lead farmer, and treasurer) in one central village location, secluded from the rest of the village as to avoid bystanders. Arrange to have the rest of the CDI club members arrive 45 minutes later. If the entire club arrives at the same time, then take the leaders aside first to fill out the leader questionnaire and describe the activity as mentioned in section 2

- If there is NOT a CDI club in your village:
  - Arrange to meet all of the individuals in the sample in a village and write down their names, gender, and household IDs on the form titled "Game Data" attached to this document. Once everyone is present, read the following prompt:

    We would like to invite you to participate in an activity where you will have the opportunity to provide a useful good to your households. In order for this activity to work, we would like for you to imagine that you are members of a farmers group. You can imagine that your group gets together twice a month or so to discuss various farming techniques and items of group interest using an agenda created by the group chairperson. You can also imagine that your group has a treasurer who keeps group contributions in a common fund. The group sometimes uses the funds to provide various services or items of value to club members. Each club is unique and can make different decisions regarding how to use the funds. Each club member can choose how much to contribute to the club's well-being. In the following activity you will be making hypothetical decisions associated with how the group funds will be used. You will have actual funds available to you when thinking of the decision at hand, so your decision can be acted upon if the group desires to.

  - Ask if there are any questions. If necessary, state that this is only a hypothetical exercise and that we will provide the group with funds, do not specify how at this time, to use in deciding how to spend money as a group. After addressing any questions, ask the group to choose one person to act as a temporary chairperson and one person to act as a temporary treasurer. Once these individuals are identified, specify who is the chairperson and who is the treasurer on the form titled "Game Data" in the relevant column and proceed by telling these individuals (temporary chair person and treasurer) that you have specific instructions just for then. Tell the remaining club members that you will spend

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15 minutes or so explaining instructions to the chosen leaders and that you appreciate their patience very much as they wait. Take the leaders aside and proceed to section 2.

2 Once the Leaders are present

- Skip the sections of the exercise that are only relevant for CDI clubs only (e.g. how many group activities do you attend, etc.). As an aid, these bullets are labeled [**CDI CLUBS ONLY**]

- [**CDI CLUBS ONLY**]: Ask the leaders for their names and note whether they are present or not in the form titled "Game Data." Indicate what kind of leader they are in the "Leader" Column next to the name column (Chairperson - CP; Secretary - S; Lead Farmer - LF; Treasurer - T). Ask questions G1 to G5 on the "Game Data" form and document responses on the form.

- Once documentation is complete, read the following script:

  Good day, I am [your name] and I came to this village to learn more about the group today. I wanted to talk to you before talking to the group as a whole in order to describe some of the activities we'll be doing together today. Shortly, we will distribute some funds to each of the group members and you will all try to decide how much of these funds to give to the common funds that belong to the group. **Before asking the group to contribute, we will ask the leaders of the group, you, to decide how the funds will be used.** We will double whatever amount the group gives for the use of the funds that you decide on. I understand that your group may make decisions in a different manner than by having the leaders determine the outcome. If it does, then I'd like to invite you to think of this as an experiment of how decisions might be made by groups in a different way. This is what we are studying by conducting this activity, and the research group looks forward to sharing the results of this study in the future.

- [**CDI CLUBS ONLY**]: (20 minutes) Say "First, I'd like to get some more information about your club. This should take about twenty minutes." Find the document titled **"Group Leaders"** attached to this document. Follow the instructions and proceed to collect relevant information.

- The following script initiates the first decision that the leaders will have to make. Read the following:

  Before doing this activity, however, we would like you to spend 5 minutes listing 5 important attributes that would be good for group members and groups to have when trying to cooperate. To help you think of this list, we thought we'd describe some of the things that we've seen farmer clubs do. Clubs can manage demonstration plots in villages in order to learn about new farming techniques, have fundraisers to help group members in need, use club funds to finance a village savings group, help each other with high labor tasks on each others plots, bargain for higher prices with buyers as a group, and many other things. We are interested in hearing your thoughts on the top 5 most important attributes that a group and group members would need to have in order for the club to be successful in some of these activities. Again, you have five minutes to come up with this list; please write down your decision on this sheet of paper.

- Hand the leaders the attached sheet titled "5 Attributes of Successful Groups" and ask them to write their decisions on this sheet. Mention that this sheet will be handed back to the enumerators.

- Start a timer and allow the leaders 5 minutes to come up with this kind of list. Make sure that they decide on 5 (and only 5) of the most important abilities. It is important that they not mention more than 5, but that if they come up with more than 5 abilities, they decide which are the top 5 most important combined abilities for group success.

- If the leaders have not completed the activity after 5 minutes, ask "Do you need 1 more minute to complete the activity?" If yes, grant them one more minute to fill as many slots on the sheet as they can. After the extra minute is up, ask them to hand in the sheet even if it is incomplete.

2

- If the **Pre-Game Conversation = 1** then proceed to section 4. If the **Pre-Game Conversation = 2 OR 3**, proceed to section 3 by saying "Thank you for your effort in coming up with this list. Let us return to the group where we will share this list with the rest of the group members."

3 Everyone is present

- NOTE: IF **PRE-GAME CONVERSATION = 1**, then you should skip this section entirely and go straight to section 4. Do not gather the group together until AFTER section 4.

- Now that the first activity with the club leaders is complete, invite everyone to gather together and sit in a circle.

- Once all 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 question G6 on form titled "Game Data" attached to this. Make sure the sex (G8) of each group member is correctly recorded. If an individual is being represented by a spouse or other family member during the activity, please note this in question G9 in the form titled "Game Data."

- **A minimum of 6 members should be present to play the game.** If this is the case, read the following script:

  Good day, I am [your name] and I came to this village to learn more about the group today. Before we start, would anyone like to say a prayer?

- After the prayer is said, say the following:

  Thank you. We would like to do a group activity with you. This activity will take about 45 minutes, but before we begin I would like go around the group and ask you some information about yourself.

- Go around the group and fill in the "Game Data" form questions G10 through G13 for all members - all shaded columns in the middle of the table. 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 question G9 on the "Game Data" form.

- At this time, you may also randomly select "Match numbers" only for individuals who are present during the game as indicated by G6. This is a task done by enumerators without discussing with game participants.

- Read the following according to the Pre-Game Conversation Type:

  I would now like to explain a few instructions on the side to the leaders you identified earlier. While the rest of you wait, I would like you to do the following activity:

  Pre-Game Conversation 2 - ABILITY Your group leaders have identified the following 5 abilities as important abilities that lead to success in group activities [List the 5 abilities the leaders came up with]. Turn to the person you are sitting next to (small groups no larger than 3 people) and decide who among you is particularly strong in each of these abilities. If possible, think of examples of how each person's abilities can be used to the benefit of the group. This conversation is important to the activity, so I appreciate your cooperation!

  Pre-Game Conversation 3 - VALUES Your group leaders have identified the following 5 abilities as important abilities that lead to success in group activities [List the 5 abilities the leaders came up with]. Turn to the person you are sitting next to (small groups no larger than 3 people) and share a story of how your group managed to come to an agreement after an initial moment of disagreement between group members. Did these abilities help lead to agreement or were other factors at play? If your group has not yet had disagreement, then share how you might overcome disagreement if it were to arise. This conversation is important to the activity, so I appreciate your cooperation!

3

4 Talking to Leaders

- Take the leaders identified earlier aside and read the following script:

    The activity that follows will help us understand how different decision-making processes can lead to different outcomes in group cooperation. Earlier, I told the group that you will make the decisions on how to use the funds. I understand that your group may make decisions in a different manner than the one I described. If it does, then I'd like to invite you to think of this as an experiment of how decisions might be made by groups in a different way. This is what we are studying by conducting this activity, and the research group looks forward to sharing the results of this study in the future. In your particular case, I would like you to follow the following procedure for making a decision.

    Before the group members decides how much to contribute, I would like you to decide what the best use of the funds will be. Please take the next 5 minutes to decide what your group will use the funds to do. Please keep this conversation among yourselves, do not talk to other group members when making this decision. When I return, I would like you to tell me your decision. Then, we will reunite with the rest of the group and you will tell them your decision. After that, the group members (yourselves included) will decide how much to put in the envelope. Do you have any questions?

- Allow 5 minutes for the leaders to make their decisions. Start a timer (perhaps on your phone) for five minutes. *[These two sentences only for **Pre-game Conversation = 2 OR 3**: While you wait, feel free to listen in on the conversations the rest of the group members are having in pairs or groups of three. If groups are not talking, approach them and ask them if they have discussed the pre-game conversation at length or whether they would like to hear the instructions again.]* When the leaders are ready, note the decision that is made on the form at the end of this document titled "Decision for Use of Common Funds." Note how many minutes it took for the leaders to come up with this decision. If the leaders spend more than 5 minutes, ask them why the decision is taking longer than 5 minutes and note the reason down in the available slot in the same form. If needed, urge them to finalize the decision since the group is waiting for a response. Remember, do not allow the leaders to discuss this decision with the rest of the group.

5 Return to Group

> **If Pre-Game Conversation = 1, then this is the first time you are with all of the club members. Do the tasks outlined in this box. Otherwise, skip this box.**
>
> - Now that the first activity with the club leaders is complete, invite everyone to gather together and sit in a circle.
>
> - Once all 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 question G6 on form titled "Game Data" attached to this. Make sure the sex (G8) of each group member is correctly recorded. If an individual is being represented by a spouse or other family member during the activity, please note this in question G9 in the form titled "Game Data."
>
> - **A minimum of 6 members should be present to play the game.** If this is the case, read the following script:
>
>   Good day, I am [your name] and I came to this village to learn more about the group today. Before we start, would anyone like to say a prayer?
>
> - After the prayer is said, say the following:

4

Thank you. We would like to do a group activity with you. This activity will take about 45 minutes, but before we begin I would like to go around the group and ask you some information about yourself.

- Go around the group and fill in the "Game Data" form questions G10 through G13 for all members - all shaded columns in the middle of the table. 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 question G9 on the "Game Data" form.

- At this time, you may also randomly select "Match numbers" only for individuals who are present during the game as indicated by G6. This is a task done by enumerators without discussing with game participants.

- Read the following script

  In the following activity, you will each receive 500 Kwacha in this envelope (hold up an envelope). Once you receive the 500 Kwacha, we will ask you to make an important decision. You will each divide up the 500 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. **The leaders you identified earlier will decide what to do with this total amount and inform you of their decision before you decide how much to put in the envelope.** Do you have any questions?

- After any questions are addressed, read the following prompt:

  The leaders of your group have decided to use the funds in the following manner [read the decision that was arrived at and that you documented in the "Decision for Use of Common Funds" form]. Now that we know how the funds will be used I would like to ask you to make your decisions on how much to put in the envelope. [Emphasize the following] **I want you to know that the decision you make will be a secret decision. This is your decision and yours only. So when it is time to decide how much money to put in the envelope, 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 envelope, so it can be 0 or 500 KW or anything in between. I will come around the circle and record your decision. But it will be only me knowing your decision; I will not share this information with anyone in the village. Your decision is secret. No-one else will know what you decided.

- Ask whether there are any questions. If not, proceed and hand out the envelopes to everyone. Tell the members to disperse and make their decision. Make sure they are not in earshot of one another.

- 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 questions G14-G18 on the "Game Data" form and fill in G9-G12 if not yet filled in. 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. Ask the individuals how much they kept to themselves and note down their contribution to the pot on the "Game Data" form. After they share their contribution amount, ask them for the envelope and move on to the next person. Once information has been collected for the entire group, come back to the area where the group is gathered.

- Mix the envelopes carefully. Then open the envelopes and take out the funds. Do this quickly and try not

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to show too much how much is in each envelope. Count the total in a public fashion and announce the total (e.g. count outloud for each 50 KW bill). Then match the total and place the full amount on a table.

- If the treasurer of the group is present, tell the group that you will hand the funds to the treasurer. If the treasurer is not present, ask "Who shall I give this amount to?"

- Write down that person's ID number as listed on the "Game Data" Form. _____

THE FOLLOWING INSTRUCTIONS (IN THIS BOX) ARE ONLY FOR THE CASE WHERE THE GROUP PLAYING THE GAME IS <u>NOT</u> A CDI CLUB

- At the end of the activity, you may read the following:

  Since those of you who have participated in an activity may not actually be members of a farmer club, we would like to give you the following option. Please decide whether you would like to use the funds in the way that was decided during the activity, or whether you would like for us to return the funds in equal shares to each of you.

- Allow the group some time to decide whether they would like to receive the funds as a group or whether they would like to receive the funds in equal shares. I they would like to receive the funds in equal shares, divide the funds in as equal shares as possible. Otherwise, if the group decides to use the funds in the matter they decided originally, hand the funds to the treasurer. If there are funds left over that can not be be divided equally, mark this amount (it should be less than 50KW × The number of people playing the game) separately. Take note of the decision and the remaining money on the following lines.

- **Decision**. Circle one of the following: Group Use of Funds   /   Divide in Equal Shares

- **Remaining Amount**. _____

---

6 Notes

- Sometimes group members or leaders 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.

- Sometimes group members will say that the decision-making process is not the same one they employ in their group meetings. Tell them that you understand this and apologize if it creates difficulties but that it is part of an experiment to study ways in which groups can make decisions together. Hopefully the group can discuss the outcomes of their experience with each other after the activity and compare it with how they usually make decisions.

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GAME DATA

Village: |___|___|___|
Decision Type: _____
Pre-Game Conversation Type: _____

ENUMERATOR		ENUMERATOR GETS INFORMATION DURING CONVERSATION WITH GROUP LEADERS						ENUMERATOR NOTES RESPONSES DURING GROUP INTRODUCTIONS				ENUMERATOR GETS INFORMATION AFTER INTRODUCTIONS				ENUMERATOR GETS INFORMATION MEMBERS AFTER CONTRIBUTION IS MADE						
Number assigned for the game	Match number	Name	G1 Leader Role? (CP, S, LF, T)	[LEADERS ONLY] G2 were you a leader last year?	G3.	G3a. If G3 = "NOT IN VILLAGE", Village Name?	G4	G5	G6. Present? (Yes/No)	G7. Household ID (if in sample)	G8 Sex (M/F)	G9 Represented by Family Member (Y/N)	G10. Age (years)	G11. Education (years completed)	G12. Land (acre owned)	G13.Does your dwelling have iron sheets?	G14	G15	G16	G17	G18	Reported Match Acreage	Contribute
1																							
2																							
3																							
4																							
5																							
6																							
7																							
8																							
9																							
10																							
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22																							
23																							
24																							
25																							

[G2-G5] CDI CLUBS ONLY
G3 [ASK THE LEADERS] Are there any individuals in the group who do not live in the village? If yes, who? [MARK THE BOXES OF INDIVIDUALS WHO DO NOT LIVE IN THE VILLAGE. CODE: 0 = IN VILLAGE 1 = NOT IN VILLAGE]
G4 [ASK THE LEADERS] Are there any individuals in the group who do not attend meetings regularly? If yes, who? [MARK THE BOXES OF INDIVIDUALS WHO DO NOT ATTEND REGULARLY. CODE: 0 = REGULAR; 1 = NOT REGULAR]
G5 [ASK THE LEADERS] Are there any individuals who have joined the group in the last year? If yes, who? [MARK THE BOXES OF INDIVIDUALS WHO ARE NEW TO THE GROUP. CODE: 0 = OLD MEMBER; 1 = NEW MEMBER]
[READ THE FOLLOWING STATEMENT BEFORE ASKING THE FOLLOWING QUESTIONS]

NOTE TO ENUMERATOR: If not with a CDI club, change wording of G14, G16, and G17 to refer to the activity they just participated in.
In other words, G14 would be "The club will effectively use the group funds contributed today." G16 would be "I was able to express opinions in the meeting today" And so on.

In the next set of statements I want you to respond with one of 5 options: 1 = Strongly Agree; 2 = Somewhat Agree; 3 = Neither Agree nor Disagree; 4 = Somewhat Disagree; 5 = Strongly Disagree. Are these instructions clear?
G14.   The club was very effective in its use of group funds in the last year
G15   I often take risks in important decisions affecting my household
G16   I am able to express my opinions in group meetings
G17   Others listen to my opinions and take them seriously in group meetings
G18   The leadership of this group is very effective

Match Number: Use a random number generator to match each individual with another individual who is PRESENT during the game.
[Reported Match Acreage] Ask the individual to state the acreage of the random match within the group and record the response. Code for "I don't know" = -99.
Contribute: Ask the individual to state how much they are contributing to the group. In other words, how much of the money in the envelope are you leaving in the envelope?

B   Constructing Decision-Making Variable

Table B1: Individual Responses to Decision-Making Process 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 organisational participation module of the household questionnaire. Each individual survey respondent listed the civic associations 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 437 household heads 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"[21].

Table B1 shows individual responses to this question. The survey was administered roughly 1-2 months after many of the clubs had formed[22], thus many of the respondents did not provide a response to this question - only 261 out of 437 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 centralised 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 common 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 B2 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 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 less than 0.3). 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 labelled "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 recognised 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 organisations, women's clubs, village committees and other civic associations organised by non-CDI NGOs).

For the sake of transparency, table B3 presents the full set of responses to this question for each of the 74 CDI farmer clubs for which data are available.

Table B2: Decision-Making By N of Respondents

Respondents by Club	Mean SE = 0			Mean SE < 0.3			Mean SE < 0.5			Total		
	T	L	D	T	L	D	T	L	D	T	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: "T" indicates total, "L" indicates "Leader Driven" and "D" indicates "Democratic."

xx.

Table B3: Decision Making Responses

Club ID	Response to "How did this club usually make decisions"			N	Mean	Type	Mean SE
	=1	=2	=3				
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."

Club ID	Response to "How did this club usually make decisions" =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."

Table B3 – continued from previous page

Club ID	Response to "How did this club usually make decisions"			N	Mean	Type	Mean SE
	=1	=2	=3				
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.

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 Responses (Mean SE)	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 Labour 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 organisations 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 summarise variables as used in all estimation tables (other than 3 as part of our empirical analysis. Variables with right-skewed distributions are log-transformed due to the relatively small sample used in the analysis . "Club Mean: 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 parentheses. Dependent variable equals the average share (0-1) of the game endowment contributed by club. Club-and-village-level controls are same as in column (4) of table 5 (with the exception of column (1) - the controls here are the same as in column (3) of table 5). The "Democratic (Continuous)" variable has been normalised 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 utilised 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 (there are not enough degrees of freedom to limit analysis to the sample of 5 or more respondents).

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 DMP 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 Labour 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 organisations 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 parentheses. DMP is short for "Decision-Making Process."

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 parentheses. 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 column (4) of 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 DMP 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 Labour 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 organisations 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 parentheses. DMP is short for "Decision-Making Process."

Table C6: Balance Test Associated with Experiment Described in Section 4.2

	No Club						CDI Club			
	N	Mean	Sd	Leader	Dem.	P	N	Leader	Dem.	P
Average Contribution (0-1)	50	0.57	0.21	0.52	0.62	0.09*	101	0.73	0.72	0.73
Game-player characteristics										
Sex (1-M; 2-F)	50	1.53	0.21	1.52	1.53	0.87	101	1.47	1.48	0.61
Age (Years)	50	41.91	6.18	42.84	41.05	0.31	101	40.68	39.63	0.29
Land (Acres)	50	4.82	2.09	4.65	4.97	0.60	101	4.88	5.21	0.28
Education (Years)	50	3.42	1.72	3.50	3.35	0.77	101	4.20	4.10	0.82
Dwelling with Iron Sheets (1-Y; 2-N)	50	1.72	0.23	1.76	1.68	0.26	101	1.79	1.79	0.96
SD: Sex (1-M; 2-F)	50	0.47	0.07	0.46	0.48	0.33	101	0.49	0.48	0.32
SD: Age (Years)	50	13.77	3.41	14.15	13.42	0.45	101	13.02	13.04	0.97
SD: Land (Acres)	50	3.75	2.80	4.00	3.52	0.55	101	3.13	3.14	0.92
SD: Education (Years)	50	2.12	1.69	2.42	1.84	0.23	101	2.61	3.30	0.27
SD: Dwelling with Iron Sheets (1-Y; 2-N)	50	0.38	0.18	0.35	0.40	0.32	101	0.35	0.37	0.58
Relationships among game-players										
% Family Members (0-1)	49	0.00	0.17	0.01	-0.01	0.61	56	-0.01	-0.02	0.78
% Daily Conversation (0-1)	49	0.01	0.17	0.02	-0.01	0.47	56	0.01	-0.02	0.60
SD: % Family Members (0-1)	49	0.46	0.04	0.46	0.46	0.88	56	0.44	0.45	0.61
SD: % Daily Conversation (0-1)	49	0.47	0.05	0.48	0.46	0.19	56	0.46	0.46	0.74

xxx
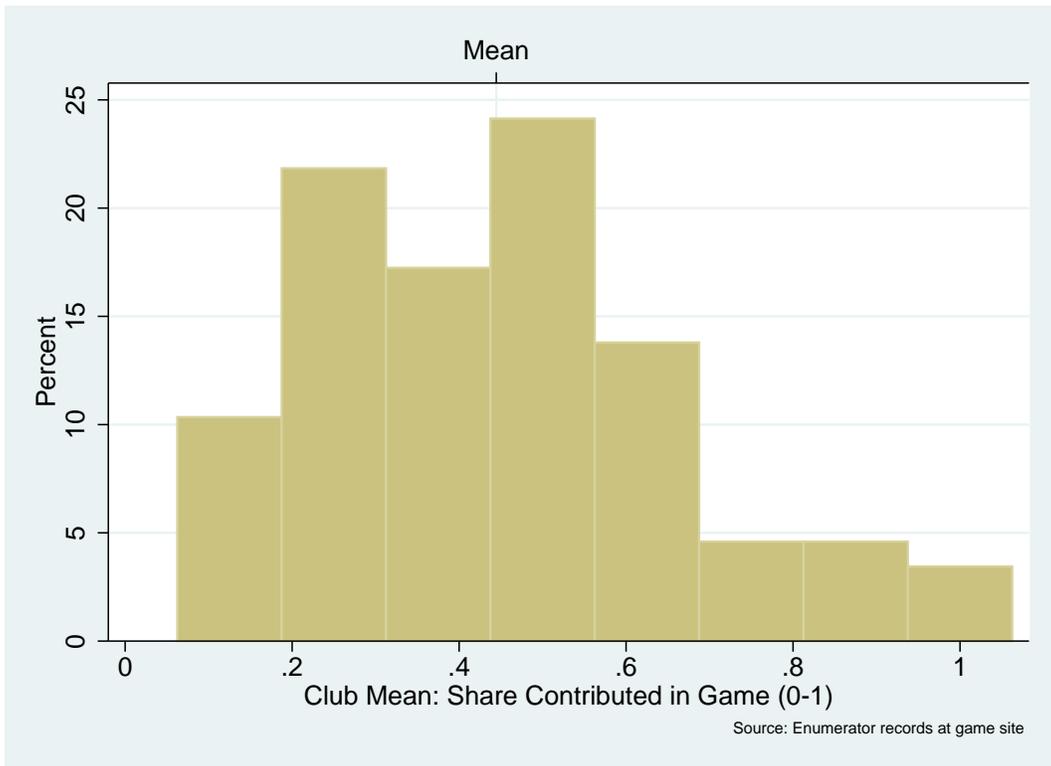
Figure C1: Histogram of Average Club Contributions to Public Goods