Does Community-Based Development Empower Citizens? Evidence from a Randomized Evaluation in Ghana[*]

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Abstract: The "community-based development" approach may empower citizens and improve outcomes through three mechanisms: (1) an immediate direct effect of engaging citizens to decide how to allocate resources within the community-based development program, (2) an indirect effect on community organization that improves citizen engagement with other local institutions, and (3) an indirect effect on community organization that improves representation within centralized government structures. Using a randomized evaluation of a nongovernmental-organization-led CBD program in Ghana, we examine whether community-based development results in citizens' empowerment to improve their socioeconomic well-being through these mechanisms. We find that the leadership training and experiences associated with community-based development translate into higher perceived quality of village leaders, but they simultaneously decrease contributions to collective projects outside the context of the community-based development program. In addition, although the process encourages more people to run for district-level office and results in more professional political representation, it does not increase aggregate levels of government investment in communities. Ultimately, we find that although the program led to changes in village-level and district-level leadership, it did not increase investment in public goods and did not improve socio-economic outcomes.

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I. INTRODUCTION

Does community-based development empower citizens to achieve better socioeconomic outcomes? Community-based development (CBD) programs typically include both resources to improve local public goods as well as activities to engage and empower local citizens, with an aim to giving citizens voice and control over how resources are spent. Thus by increasing local participation in the development process, community-based development aims to improve not only the immediate efficiency of the use of resources provided by the program, but also the long-term efficiency of future non-CBD funding. Measuring both the short run and long run are critical for understanding the implications for local communities of CBD programs.

CBD programs provide leadership experiences that might generate improvements in two distinct spheres of action. They might improve engagement in community-level institutions, allowing communities to better collaborate to provide public goods through decentralized resources. They might also improve representation in higher-level government, resulting in communities to receiving more prioritized public goods from centralized funding sources. To date, most research on community-based development has focused on its effects in the first sphere, namely whether it increases the ability of communities to act collectively to provide public goods in a decentralized manner (Avdeenko and Gilligan 2015; Casey, Glennerster and Miguel 2012; Fearon, Humphreys and Weinstein 2015; Humphreys, de la Sierra and van der Windt 2015). But how these approaches change how individuals interact with the government to demand the centralized provision of more appropriate public goods may be more important in affecting socioeconomic outcomes in many settings.

We examine whether CBD empowers citizens to achieve better socioeconomic outcomes both through self-reliant actions that result in increases in the decentralized provision of public goods and through engagement with government to increase centralized investment in public goods in their community. In contrast to existing evaluations of community-driven development (CDD) projects, we study the impact of community-based approaches in poor communities in a non-post-conflict setting with an established government. Using a randomized evaluation of The Hunger Project's (THP's) programming in 97 village groupings in Eastern Ghana, we are able to test the impact of community empowerment programming on community self-governance and engagement with government. We collected data from citizens, village leaders and elected district-level politicians, allowing us to estimate the effects of community-based development on participation, leadership quality and investment in public goods at numerous levels. In addition, the duration of our study – five years between baseline and endline – allows us to examine the medium-term effects of the program.

We find that the leadership training and experiences associated with CBD translate into improved perceptions of the quality of village-level leaders, but decrease citizens' willingness to contribute to collective projects outside the CBD program in their villages. In addition, the process results in more people being drawn into local government and more professionalized political representation at the district level. However, we do not find that this increases total local government investment in treated communities. Ultimately, we find that the community-based development programming did not cause improved socio-economic outcomes.

II. CBD, CAPACITY-BUILDING, AND THREE SPHERES OF ACTION

Community-based development (CBD) is an approach that advocates community participation in decision-making about and management of local development projects. It aims to involve communities in project design and implementation with the goal of using local knowledge and resources to run more effective development projects. Community-driven development (CDD) projects, which emphasize the transfer of control of project resources to communities, are on one continuum of this approach, and have recently become popular (Mansuri and Rao 2004: 1). However, CBD approaches encompass a wide variety of levels and types of community participation, and have been advocated by aid agencies starting as early as the 1950s (White 1999).

Proponents of CBD have advocated its participatory approach as an effective way to achieve development goals given a set amount of external resources. By involving community members both in the mobilization of resources and decision-making about how resources should be allocated, community-based development promises both to increase the amount of resources available for programming and to ensure they are spent efficiently in areas prioritized by communities (Chambers 1983; Ostrom 1996). In contrast, skeptics have pointed to the potential for capture and reduced capacity when community members take on leadership roles in development programs (Bardhan and Mookherjee 2000, 2006; Khwaja 2004). Whether increased community participation in the management of programs actually improves program outcomes is a matter of on-going debate (Mansuri and Rao 2004, 2013).

But, in addition to the direct benefits that development programs espousing a community-based approach can have on local development, this approach is also thought to build skills, norms and institutions that translate into other spheres and thereby indirectly improve socioeconomic outcomes. In particular, scholars and practitioners have hypothesized that CBD approaches build norms and institutions that improve the capacity for collective action within communities and therefore the capacity for local self-governance. In their review of CDD programs, King and Samii write that "the 'learning by doing' and 'demonstration effects' are expected to generate sustained patterns of cooperative problem solving…. By participating in effective collective action, community-members should be better prepared for future collective action and willing to draw on these social and institutional models for non-CDD activity" (King and Samii 2014, 742). Similarly, Casey et al. (2012) model the CDD process as reducing the fixed cost of collective action within communities, and Avdeenko and Gilligan (2015) focus on these program's effects on building social networks, trust and thereby contributions to community public goods. This emphasis on the effects of CDD programs on improved community self-governance does not preclude a role for improved village leadership within communities (Baldassari and Grossman 2011), but the emphasis of previous studies has been on the effects of these programs on the mobilization of local resources for community development.

The focus of scholars on the effects of community-based programming on community self-governance and decentralized contributions to public goods may be the result of the post-conflict settings of the most recent experimental evaluations of CDD programs. However, in settings with established governments, the skills, norms and institutions built as part of community-based development programs may also improve the ability of community members to engage with the government and secure centrally-funded

local public goods. Indeed, in many poor communities, improved engagement with the government has greater potential to improve socioeconomic outcomes than improved capacity for local collective action, given the limited resources available locally.

The leadership skills, civic norms and community institutions fostered through community based development could result in more government investment in communities both by improving the ability of communities to demand public goods from their elected representatives and by improving the supply of high quality politicians seeking to represent the community. On the demand side, community-based development may give voters the skills necessary to ensure they do not (re-)elect lazy or corrupt politicians who will fail to ensure available resources are used for public interests. If community-based development empowers community members with new skills or gives them new belief in the skills they already have, then they may be better able to vote out politicians who fail to act in the public interest (Barro 1973; Ferejohn 1986) or be better able to judge the character of politicians competing for office (Besley and Burgess 2002). Through better selection and sanctioning of politicians, citizens should be able to achieve greater investment in public goods within their communities. On the supply side, community-based development may foster new leaders and encourage them to enter politics. If the new leaders are more civic minded or more capable than previous leaders, this could improve the pool of candidates contesting office and thereby result in greater government investment in communities (Besley 2005; Caselli and Morelli 2004). Importantly, even if community-based development has limited impact on most community members, it could improve government investment in communities by improving the quality of leaders seeking office.

The three spheres of action that CBD programming is hypothesized to impact are displayed in figure 1. The impact of CBD could be through the direct effect of its programming, through its indirect effect on communities' capacity to provide public goods through decentralized resources, or through its indirect effect on communities' ability to engage with government to secure centrally funded public goods. To date, most of the empirical research on the effects of community-based development has focused on changes in the second sphere of action - community self-governance (Avdeenko and Gilligan 2015; Beath et al. 2015; Casey et al. 2012; Fearon et al. 2009, 2015; Humphreys et al. 2012). However, in settings where communities are poor but centralized governments control significant resources, the third sphere of action could be equally important. Even if CBD does not improve the capacity of communities to provide public goods from local resources, it could conceivably improve political representation either by improving voter oversight of politicians or by improving the pool of politicians seeking office. Although existing studies of the impact of CDD in settings with weak governments have generally found disappointing effects on local self-governance and long-term socioeconomic impacts (Beath et al. 2015, Fearon et al. 2015, Humphreys et al. 2015), the possibility of achieving improvements though the third mechanism means that this programming model should also be assessed in contexts with well-established governments.

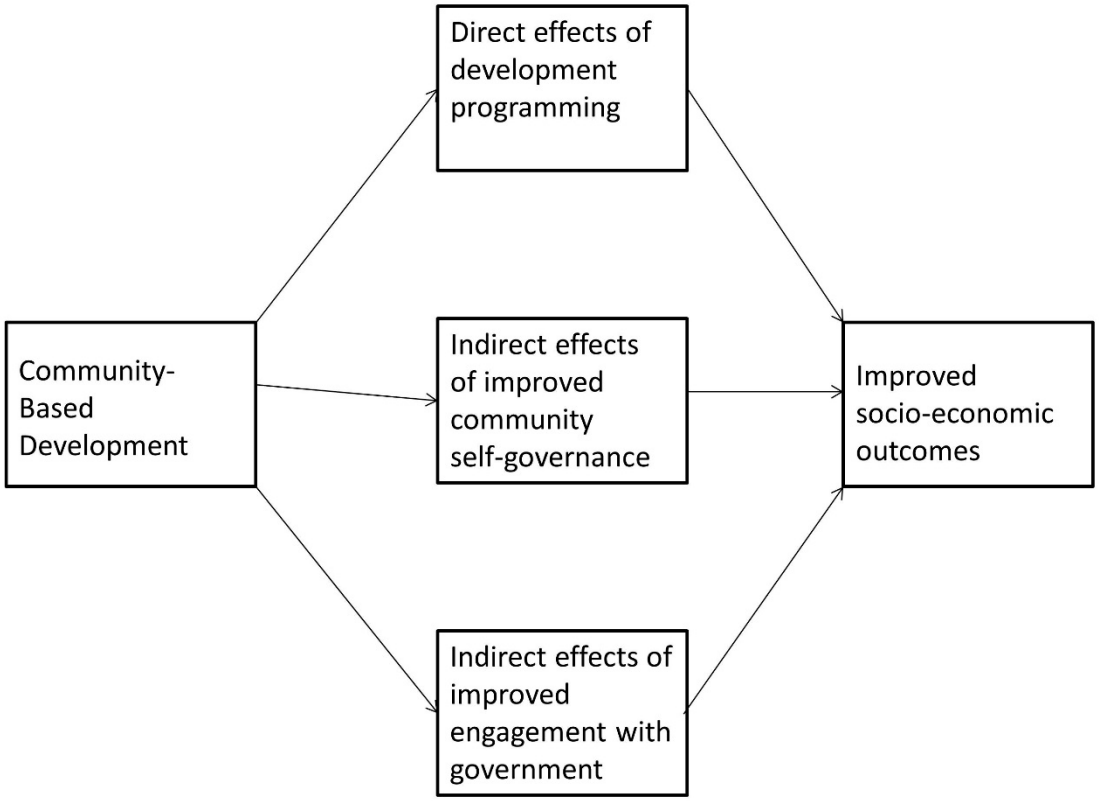


Figure 1. Model of Community-Based Development's Effects

III. BACKGROUND

A. The Setting: Eastern Ghana

Our study was conducted in Ghana's Eastern Region. Ghana is a lower middle income country that has avoided civil conflict since its independence in 1957. At the national level, it has had two peaceful turnovers of government since multiparty elections were reintroduced in 1992, and it also has functioning district-level governments. According to the Center for Systemic Peace's State Effectiveness Index, a measure of government performance in providing security, social, economic and political development, it is tied for the nineth most effective state in sub-Saharan Africa in 2013 (Marshall and Cole 2014). Ghana's Eastern region has had relatively low exposure to NGOs, thereby making it an appropriate location in which to conduct a study to measure their impact.

We study the impact of CBD programming on community self-governance by examining their impact on village-level participation and leadership. Rural villages in Eastern Ghana are led by village chiefs, a

traditional position that is typically inherited from within the village's founding family. Village chiefs play important roles in local dispute resolution, land allocation and community mobilization, but they do so without formal support or budgets from the government. Village-level governance institutions in Ghana are thus informal and self-reliant in the sense that they depend on voluntary contributions from community members for their resource bases.

In contrast, we study the impact of CBD on representation in centralized government by examining its effects on citizens' engagement with district-level governments. The district is the lowest level of elected government in Ghana with a formal budget and taxation capacity.[5] The national government in Ghana controls the majority of public resources, but district governments have the power to raise revenues by setting property taxes and market tolls, and they are entitled to transfers from the central government via the District Assembly Common Fund, which must be at least 7.5 percent of national revenue. District governments are in theory responsible for the provision of basic education, primary health care, local roads, environmental protection, water and sanitation. In practice, they play an important role in the provision of facilities and infrastructure, while the central government controls policy making in many of these areas (CLGF 2012).

We study the effect of CBD on representation in district-level governance for two reasons. First, we expect to see the most immediate effects of the program on district-level governance, given the overlap between THP's activities and the mandates of district-level political representatives. Second, our study villages map to different district-level political representatives but are clustered within the constituencies of only a handful of national-level Members of Parliament.

At the time this study began, Ghana's Eastern region was divided into 17 different districts, a number that has since expanded. Each district is led by a district chief executive (DCE), appointed by the president, who governs with the assistance of an assembly. The district assembly has the power to accept or reject the president's nominations for the position of DCE and to modify the district budget. Seventy percent of the district assembly is elected, with the remainder appointed by the DCE. Local elections are supposed to be held every 4 years, with assembly members elected by plurality from single-member districts (known as "electoral areas"). In 2010, the districts in our study had an average of 40 electoral areas. The position of district assembly member is a part-time position. Assembly members are not paid salaries but receive transport and sitting allowances for their work. They are responsible for attending general assembly meetings (which must occur at least three times a year), attending meetings of sub-committees on which they sit, and organizing meetings with community members prior to all general assembly meetings (Ayee 2004). In practice, citizens view elected assembly members (and Members of Parliament) as being mainly responsible for for new local infrastructure projects for their communities (Ahwoi 2000; Lindberg and Morrison 2008; Weghorst and Lindberg 2011).

[5] Ghanaians also elected members of "unit committees", which are in turn supposed to elect area councils, but these levels of government have no budget, no political power, and are in practice defunct across much of the country.

B. The Hunger Project's Community-Based Development Approach

We assess the impact of community-based development aid through a randomized evaluation of The Hunger Project's (THP's) activities in Eastern Ghana. THP is a major international NGO whose approach seeks to empower men and women to take control of their futures both by mobilizing communities to work together and by encouraging them to engage constructively with local government. A critical component of their approach is the organization of Vision, Commitment and Action (VCA) workshops, intensive workshops involving community members and local government officials that seek to cultivate leadership skills and civic commitment. THP begins their engagement with communities by organizing a VCA workshop in which workshop participants are asked to help develop a collective community action plan, as well as a specific action plan for a project they can undertake to improve their community using their own skills and resources. Community members identified as having strong leadership skills through the workshop are selected to become THP "animators" (volunteer leaders) who subsequently receive further training and are expected to play leadership roles in mobilizing other community members to contribute to collective projects. VCA workshops are regularly repeated throughout the course of THP's engagement with a community.

Only once community members have demonstrated a commitment to devoting time and resources to collective goods following the initial VCA workshop does THP provide any financial support for programming activities. At this point, it helps to facilitate the creation of "epicenters," which are community centers containing meeting halls, clinics, rural banks, foodbanks, toilets,a demonstration farm, and either a preschool or library. Once completed, these centers also run agricultural training programs, literacy classes and microfinance programs. THP provides funds to secure the title for the land for the community centers, it hires a contractor to oversee the construction of the center, and it provides some financial support for its education and microfinance programs. However, community members are also expected to devote significant resources in cash or in kind to support the construction of the center, and the goal is to have the local government provide support for many of the programs subsequently run out of the center. Thus, THP's model of change centers mainly around the effects of organizing workshops that develop leadership skills and civic mindedness, not on the effects of a capital infusion into communities.

The broad components of THP's approach exemplify the community-based approach that has become prevalent in development programming. There is an emphasis on the importance of incorporating community members into programming in order to align project outcomes with citizens' needs, reduce corruption and reduce dependence on outside resources in the context of project implementation THP's programming is overseen by a committee of local citizens who can influence aspects of the design of the program in their community, deciding how much emphasis to place on the different components of THP's programming.[6] This committee is also tasked with overseeing the implementation of the program in the community, including mobilizing local resources for the project and monitoring programming. The modest

[6] For example, in one of our study communities, the committee decided not to build a community center as part of the programming.

level of control over the project this permits community members is typical of the processes that have become known as "participatory development" (Mosse 2005).

In addition, THP shares with other community-based development programs a concern with building the capacity of communities to provide public goods outside the context of the program (World Bank 2000). In particular, community-based development programs often purport to be building social capital that will facilitate future community endeavors. The VCA workshops that are at the center of THP's programming emphasize leadership skills, civic commitment and community organization. Workshop participants are asked to reflect both on what they can individually do for their community, and they are encouraged to work together with their neighbors to develop community plans. Furthermore, THP creates new community organizations through its committee systems that may help organize future collective activities. THP programming places particular emphasis on inculcating good leaders and political activism, but many community-based development programs operate in a broadly similar fashion (Mansuri and Rao 2004).

IV. STUDY DESIGN

A. Experimental Design

The study was conducted in 13 of the 17 recognized districts in Ghana's Eastern Region as of 2006 (Afram Plains/Kwahu North, Birim South, Atiwa, Suhum-Kraboa-Coaltar, Fanteakwa, East Akim, West Akim, Kwaebirirem, Manya Krobo, Asuogyaman, Akwapem North, Akwapem South, Yilo Krobo). We identify the effect of THP's programming on socioeconomic and political outcomes by randomizing which communities were invited to receive an epicenter. Within each of the study districts, the research team first determined the villages that were eligible for inclusion in the study. Villages had to have fewer than 2000 people and could not be on a main road. THP's programming is targeted at groupings of villages, so the programming team then divided villages that met this criteria into geographically defined village groupings of approximately 10,000 people. Within each study district, between six and eight village groupings were defined, for a total of 97 village groupings across the 13 districts.[7] Enough clusters were identified that the sample frame was twice the capacity of The Hunger Project for expansion. Finally, in each district, a public lottery was held to determine which village groupings would be invited to receive THP's programming. These lotteries were conducted between September 2006 and September 2008, with 51 of the 97 village groupings invited to take-up the treatment. The lotteries were conducted by pulling names out of a hat in public, and so no stratification beyond the district level was possible.

After the lottery, the villages selected for treatment were invited to participate in THP's VCA workshops with the understanding that these workshops were part of a process of developing leadership skills and community plans that were intended to culminate in the construction of an epicenter building. Due to capacity constraints, THP did not immediately begin engagement with all communities selected for

[7] The initial plan was to conduct the study in 14 districts (and to have 105 village groupings). However, the baseline surveys for one district, Birim North, were lost in transport, and this district was subsequently excluded from subsequent surveying.

treatment. It began engagement in some communities in 2008, in some communities in 2009, in some communities in 2010, and in some communities in 2011. The timing of engagement with different communities was not randomly determined.

Not all of the communities invited to take part in THP's programming accepted the invitation, as displayed in figure 2. Only 28 of the 51 village groupings invited to take part actually began the THP process. All but three of these groupings successfully completed construction of the epicenter building, and four groupings built two epicenter buildings. Figure 3 shows the timing of the construction of these epicenters relative to the timing of the lotteries and the baseline and data collection exercises.

Figure 2. Treatment assignment and take-up.

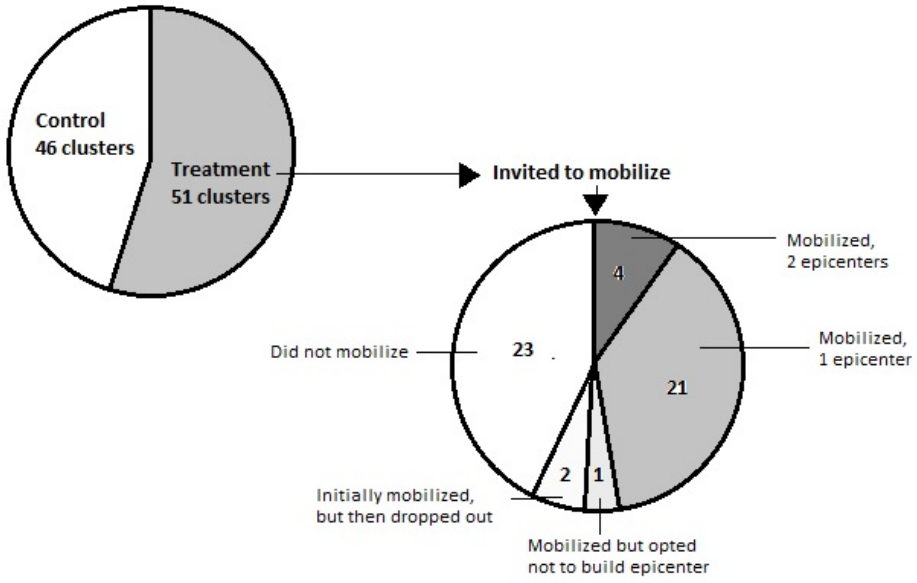
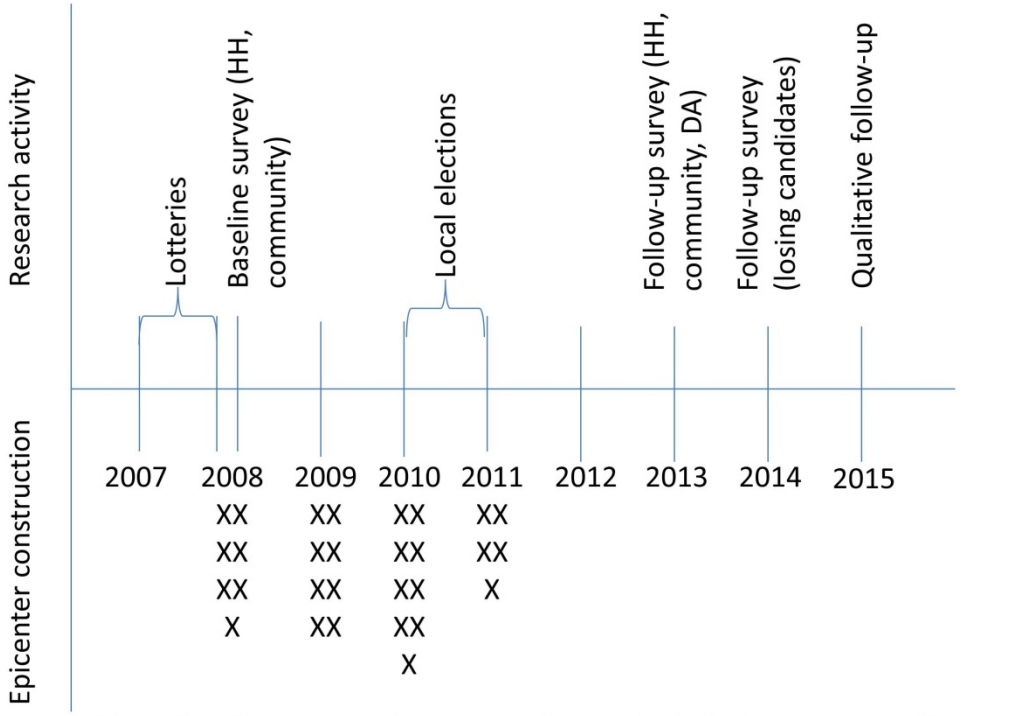


Figure 3. Timeline of Project Activities



Note: One X corresponds to one epicenter built in the corresponding year

B. Data Collection

This study is able to assess the effects of CBD in multiple spheres of action through a multi-pronged data collection effort. In particular, we are able to assess the effects of CBD on participation, leadership and public goods provision at distinct levels by bringing together four types of data collected at multiple points in time. The timing of the distinct data collection efforts relative to epicenter construction are displayed in figure 3. The four types of data collected are described in more detail below.

Household surveys (both baseline and endline). In each of the 97 village groupings in the study, two villages were randomly selected for surveying. A baseline survey was conducted in 2008, at which point none of the study villages had built the community center that is the centerpiece of THP's programming. Twenty households were interviewed in each village in the sample, except in the handful of cases where the village contained fewer than 20 households. The follow-up survey was conducted with the same households in 2013. At this point, all of the treatment villages had been introduced to THP's programming at least two years earlier, and some had been introduced to it five years earlier, as illustrated in figure 3. Given the long nature of the study, attrition was a significant risk. We were able to resurvey 74 percent of baseline households. We have examined whether the treatment – either by itself or in interaction with baseline outcome variables – affects the likelihood of attrition, and have found no empirical evidence that suggests concerns of bias due to attrition from the survey sample frame.[8]

Community leader surveys (both baseline and endline). We surveyed a key informant from each village (most frequently, the village chief or another local traditional leader) about local services. In 2013 and 2014, we conducted follow-up interviews with community leaders, including the key informant for each village, the area's representative in the district government (the district assemblyperson) and the individual who placed second in the election for the district assemblyperson.

Administrative data on local election returns and candidates (2010/2011 elections). We obtained the official local election returns and candidate forms for the local government elections held in the end of 2010 and the beginning of 2011 from the Electoral Commission of Ghana. By the time of these elections, the vast majority of the treated communities had been exposed to THP's programming, as figure 3 illustrates.

Qualitative interviews and focus groups (endline only, subsample of villages). The statistical analysis of the effects of the NGO's programming is complemented with evidence from a qualitative follow-up study conducted in 12 communities in 2015. In order to better understand the mechanisms behind the quantitative findings, we conducted focus groups with citizens and in-depth interviews with community leaders, including individuals who took leadership positions in THP's activities, the elected district assemblyperson and district officials. Seven treatment villages were randomly selected from the districts with earliest exposure to THP in order to trace the effects of THP over the longest duration possible.[9] The selected villages fell in five districts, and we randomly selected one control village in each of these districts for a total of five control villages.

C. Orthogonality of Treatment and Control

Table 1 shows that households in the treatment and control groups were well-balanced at baseline on our main outcomes of interest. Each of the outcomes in this table except past voting behavior is an index, constructed from all component variables for which we had baseline data. On average, treatment and control households demonstrated similar levels of civic participation and had similar perceptions of their

[8] These results are available in table A1 in the appendix.

[9] We focused on communities with earliest exposure to THP in order to trace the effects of THP over the longest duration possible.

village and district-level leaders. They also showed similar levels of food security, similar health and nutritional access and behaviors, similar access to services related to water, environment and sanitation, and similar economic livelihoods. The only outcome index on which they significantly differed at baseline was literacy and education, with control communities achieving higher baseline outcomes on this index. Where baseline levels of the outcomes variables are available, we control for them in estimating effects, as described in more detail in the next section.

[INSERT TABLE 1 ABOUT HERE]

D. Econometric Specifications

Due to the imperfect take-up of the programming among communities invited to the initial VCA workshop, we estimate both the "intent to treat" (ITT) and" treatment on the treated" (TOT) effects, using assignment to treatment as an instrument for mobilizing to receive programming from THP in the latter case. The ToT estimates scale up the ITT estimates by the inverse of the participation rate, providing an estimate of the average treatment effect for those village groupings that actually mobilized to receive programming. This estimate requires two comments: first, we must assume that being invited to participate in THP's programming did not itself generate a treatment effect, irrespective of whether the community received programming. Second, the ToT estimate informs us only about the effect of THP on those communities that were willing to receive programming in response to the invitation from THP; it does not provide us with information on the effect of THP programming on the communities who were not willing to participate (as they may not be as eager to participate specifically because they know the program will not work as well for them).

We generally evaluate the program's effects by constructing indices for each area of hypothesized impact. This provides a clearer picture of the overall effect of the program in each area, and also helps address the problem of multiple hypothesis testing. Each index is created from a group of variables measuring outcomes associated with the particular programming area by averaging the standardized sub-components, and then re-standardizing the index.[10] As a result, the effect of the program on the indices should be interpreted in terms of standard deviations of the index within the control group.

We examine the effects of THP's programming at two different levels of analysis, depending on the unit of measurement. Many of our measures come from our household survey, in which case outcomes are measured at the household level. In addition, we have measures of engagement with government and the quality of political representation measured at the level of the electoral district (called "electoral areas").

The Intent to Treat (ITT) estimate of the effect of THP on household-level outcomes is $\hat{\beta}_1$ from the following OLS regression specification:

$$y_i = \beta_0 + \beta_1 THP_j + \beta_2 X_i + D_k + \epsilon_i \qquad \text{(Equation 1)}$$

where *i* indexes households, *j* indexes village groupings, and k indexes districts. THP_j is an indicator variable that takes a value of 1 if the village grouping was assigned to treatment in the lottery, X_i is the baseline measure of the outcome variable (where available), and D_k are district fixed effects. In cases where baseline data was available for some but not all observations, we dealt with missing data using

[10] In some cases, the sub-components are also themselves indices of variables, as explained in the appendices.

dummy variable adjustment (Cohen and Cohen 1983). The error term is clustered at the village grouping level. In the Treatment on the Treated (ToT) estimate, THP_j is replaced with an indicator variable equal to 1 if the village grouping created an epicenter, and is instrumented by the THP_j.[11]

The ITT estimate of the effect of THP on outcomes measured at the electoral district level is $\hat{\beta}_1$ from the following OLS regression specification:

$$y_{EA} = \beta_0 + \beta_1 THP_j + D_k + \epsilon_{EA} \qquad \text{(Equation 2)}$$

where *EA* indexes electoral areas, *j* indexes village groupings, and k indexes districts. In this case, THP_j is a variable that takes a value of 1 if all sampled villages in the electoral area were assigned to treatment and 0 if all sampled villages in the electoral area were assigned to control. In three instances, this variable takes on the value of .5, because one sampled village was assigned to treatment and one sampled village was assigned to control. As above, D_k are district fixed effects, and standard errors are clustered by village groupings.[12] In the ToT estimate, THP_j is replaced with an indicator variable equal to 1 if the village grouping mobilized to receive programming, and is instrumented by the THP_j.

V. RESULTS

A. Participation in THP's Empowerment Programming

We begin by considering the effect of the treatment on the adult population's exposure to THP's empowerment programs and leadership activities in table 2. These results can be viewed as a manipulation check, testing whether THP exposed significant proportions of adults in treatment communities to its empowerment programming.

The first thing to note is that almost no one in the control communities participated in THP's empowerment programming. For each of the empowerment measures we consider, the control means approximate zero, and just 1 percent of the adults in the control communities had exposure to any of the programs or activities run by THP.

The ITT effects confirm that assignment to the treatment resulted in significant proportions of the adult population of these village groupings being exposed to THP's programming. In particular, 6 percent of adults in village groupings assigned to treatment attended a VCA session at some point, and on average, adults had attended 0.2 workshops in the past year. Rates of contribution to THP's activities were also significant in treatment communities, with 3 percent of all adults contributing to an animator-led project and 5 percent attending THP fundraisers. About 1.5 percent of all adults had served as a THP animator

[11] The first stage results are included in table A2 in the appendix.

[12] In the cases where villages in the same electoral area fall in different village groupings, we have joined the two village groupings for the purpose of calculating standard errors.

and about 1.5 percent had served as THP a committee member. Altogether, 21 percent of adults in village groupings assigned to the treatment had participated in some kind of programming run by THP.

Despite only modest levels of program take-up across the village groupings assigned to treatment, THP programming involved broad swaths of the general population in the village groupings that accepted treatment, as calculated by the TOT effects. More than 11 percent of adults participated in VCA sessions in villages that accepted treatment, almost 10 percent contributed to a THP fundraiser, and 40 percent had participated in some kind of THP programming. THP's mobilization effort within the communities that accepted treatment is particularly impressive when one considers participation rates in other community-based development programs; for example, only 0.7 percent of the population is estimated to have participated in village development committee (VDC) member trainings as part of the Tuungane CDD program in the Eastern DRC (Humphreys et al. 2012, p. 18).

[INSERT TABLE 2 ABOUT HERE]

B. Civic Participation, Village Leadership and Decentralized Contributions to Public Goods

The intention of THP's programming is to build skills and norms that translate outside of THP's direct activities to the governance of the community more broadly. In this section, we examine whether THP's empowerment programming resulted in communities becoming better able to achieve development through self-governance at the community level and the decentralized provision of public goods. To this end, we examine the effect of THP treatment on village-level civic participation, leadership and voluntary contributions to public goods in table 3 and table 4.

The results in the top portion of table 3 indicate that THP's programming did not significantly increase civic participation within the village or village grouping. Our index of civic participation has three sub-components – the proportion of community members who reported being active members of local associations, the proportion who said they had attended the last village assembly meeting and the proportion who said they had raised an issue at that meeting. The treatment did not significantly increase any of these forms of participation.

[INSERT TABLE 3 ABOUT HERE]

The results in the bottom portion of table 3 show the intervention did improve the quality of village leadership. Our index of village leadership quality also has three sub-components – the frequency with which community members communicated with the village chief, their perceptions of their ability to disagree with the village chief and their trust in the village chief. The effect of the treatment on the treated is a 0.21 standard deviation increase in this index, which is statistically significant at the 95 percent confidence level. We also find positive changes on two of the index sub-components, engagement with and trust in the village chief, both of which are statistically significant at the 95 percent confidence level. There is less movement on the third component measuring willingness to disagree with the village chief.

However, the results in table 4 also suggest the intervention *decreased* individuals' voluntary contributions to public goods other than the epicenter. We calculate the value of each household's contributions to public goods as the sum of their monetary and labor contributions to local public goods other than the epicenter in the previous 12 months.[13] The effect of the treatment on the treated is a 10 GHS decrease in the value of contributions, which is statistically significant at the 90 percent confidence level. If we distinguish between voluntary contributions to projects in sectors in which THP explicitly works (health, water, micro-finance, sanitation and community center construction) and projects in sectors in which THP does not work, we see a larger decrease in contributions to projects in sectors in which THP is working but the point estimate on contributions to public goods in other sectors is also negative (though measured with a large amount of error).

[INSERT TABLE 4 ABOUT HERE]

Together, this suggests that although the skills and norms inculcated by THP's programming may have improved perceptions of village-level leadership, this was not associated with increased ability to mobilize resources behind community-level projects; in fact, THP's programming appears to have displaced voluntary contributions from other community projects. These findings are broadly consistent with the results of evaluations of community-driven development (CDD) programs in Afghanistan, Liberia, Sierra Leone and Sudan (Avdeenko and Gilligan 2015; Beath, Christia and Enikolopov 2015; Casey, Glennerster and Miguel 2012; Fearon, Humphreys and Weinstein 2015); collectively, the evidence suggests community-based development often introduces or changes institutional structures but these programs have little positive impact on the allocation of resources within communities.

C. Political Participation, Government Representation and Centralized Investment in Public Goods

THP's empowerment programming could also result in better socioeconomic outcomes through changes in political engagement with government. The need for more effective engagement with government is emphasized by THP in its programming documents. Indeed, in poor communities in countries with strong states, improvements in the centralized provision of public goods by governments are likely to have larger impacts on socioeconomic well-being than improvements in the decentralized provision of public goods by community members.

THP could potentially improve the quality of representation through two mechanisms – by improving the ability of citizens to demand better leadership or by improving the supply of high quality political leaders contesting for office. As a result, we examine whether THP's programming increased political

[13] We impute the value of labor contributions by multiplying the number of (eight hour) days worked by the typical daily wage for an unskilled agricultural task (weeding) in the village; data on the typical daily wage for men and women was collected as part of our community survey.

participation at two levels – among voters and among candidates for office – in the 2010/2011 local government elections in table 5.

[INSERT TABLE 5 ABOUT HERE]

The results show no increase in voter turnout as a result of THP's programming. We have two separate measures of voter turnout, one based on whether individuals' reported voting in the last election and one based on aggregate voter turnout in treatment communities. When citizens are asked to self-report whether they voted in the last election, we find little effect of THP's programming on voter turnout; however, these null findings may be upward biased by social desirability pressures in treated communities. In contrast, when we examine the effect of treatment on aggregate voter turnout in THP communities, we find a significant negative effect. The effect of the treatment on the treated is a 10 percent decrease in voter turnout, which is statistically significant at the 95 percent confidence level. We return to the perverse finding that treatment depresses aggregate turnout in our discussion of the results.

In contrast, the treatment has spurred increased entry into political candidacy. We consider two measures of the breadth of candidate-level political participation, the number of candidates on the ballot and whether the incumbent was replaced. The effect of the treatment on the treated is a 0.55 increase in the number of candidates running for office, and a 19 percentage point increase in the likelihood of the incumbent being replaced in the election, both of which are statistically significant at the 90 percent confidence level. Thus, THP treatment appears to have been effective in bringing new leaders into the political process.

Next, we consider the effect of THP's participatory approach on the quality of political representation. Even without an increase in the level of voter turnout, it is possible that citizens became more effective at selecting and sanctioning politicians as a result of THP programming, causing improved political representation. In addition, the increased supply of political candidates could have resulted in improved political representation. We create two separate indices of the quality of political representation, one based on citizens' perceptions of their district assembly member and one based on the district assembly member's reports of their own activities. The effect of THP programming on both of these indices is reported in table 6.

The results indicate that THP's programming resulted in a positive but statistically insignificant improvement in citizens' perceptions of their political representation. This index of political quality has three sub-components – the frequency of citizens' interactions with the district assembly member, their satisfaction with their ability to influence the district assembly member, and their trust in the district assembly member. Although the ToT effect on each of these sub-components is positive, it is statistically insignificant in all instances.

The effect of THP's programming on district assembly members' self-reported level of activity is also positive. We measure the level of activity of district assembly members by constructing an index made up of seven sub-components -- the district assembly members' attendance at district assembly meetings, the number of times they raised issues in district assembly meetings, the number of times they met one-on-

one with their DCE, the number of times they met with community leaders, the number of times they met with voters, the number of infrastructure projects they facilitated and the number of NGOs (excluding THP) whose activities they facilitated. Focusing on the effect of the treatment on the treated, we find THP increased the elected representative's reported activity level by 0.8 of a standard deviation, an effect that is substantively large and statistically significant at the 90 percent confidence level. THP's programming had positive effects on all of these outcomes except for meetings with community leaders, where it had a negative effect. However, none of the effects on the component variables are statistically significant at the 90 percent confidence level, and it is possible the observed effect on the overall index is the result of increases in the perceived desirability of activities rather than increases in actual activity levels.

[INSERT TABLE 6 ABOUT HERE]

Finally, we consider the effect of THP programming on the scope of projects financed by the local government in the electoral area in the most recent electoral term (2011-2014). As part of our community survey, we collected information on whether the local government financed projects in nine different sectors during this time period -- health, water, sanitation, childcare, micro-finance, education, road, power and agricultural processing . We measure local government investment as the proportion of these sectors in which they financed a project between 2011 and 2013.[14] The effect of the treatment on the amount of projects financed by the local government is reported in table 7.

[INSERT TABLE 7 ABOUT HERE]

The top row of table 7 shows that the treatment had a small and statistically insignificant negative effect on the proportion of these sectors in which the local government financed projects. However, the effect on overall government investment hides important differences between government investment in sectors in which THP was working and sectors in which THP was not working. A comparison of the second and third rows of table 6 indicates that the treatment had a negative effect on government investment in THP sectors but a positive effect on government investment in non-THP sectors. Focusing on the effect of the treatment on the treated, we see a reduction of about seven percentage points in the proportion of THP sectors with local-government financed projects and an increase of about five percentage points in the proportion of non-THP sectors with local-government financed projects. Both of these effects are statistically significant at the 90 percent confidence level.

Thus, THP programming brings more candidates into the political process and resulted in elected representatives who report being more active in office, even at the same time that it might depress overall levels of voter turnout. However, the treatment does not result in absolute increases in local government financing for community projects; it decreases local government investment in THP sectors and increases local government investment in non-THP sectors.

D. Socioeconomic Outcomes

Did the THP programming, either through the direct results of the programming itself or through its indirect effects on leadership at the community and district level, cause any measurable improvement in

[14] Unfortunately, we were unable to collect reliable data on the amount invested in each project.

the lives of citizens? We consider the socioeconomic impact of THP in five broad areas – food security, education and literacy, health and nutrition, environment, and economic livelihoods. We focus on these five outcome areas because they are highlighted in THP's programming documents and because they are encompassing goals, related closely to the sectors emphasized in the millennium development goals and related conceptions of human development. For each area of potential impact, we created an index based on variables measuring numerous related outcomes, often combined into sub-indices, as shown in the appendix.[15] Collectively, these indices captured specific improvements in well-being in the sectors targeted by THP's programming – for example, better access to health care, the adoption of specific agricultural practices, and access to credit – as well as broader measures of households' well-being, such as household income, expenditure and the value of total food consumption.

The effect of THP on the main indices is reported in table 8. The results suggest the net effect of THP's programming was disappointing, with none of the five indices showing significant improvement over time as a result of assignment to THP's programming. Three of the five indices show negative changes (literacy and education, health and nutrition, environment).

THP's programming was not found to have a significant impact on food security and agricultural production due to conflicting impacts in two areas, shown in the appendix. On the one hand, it increased the number of agricultural improvements made by households (statistically significant at the 90 percent confidence level). On the other hand, the program significantly reduced food consumption (statistically significant at the 95 percent confidence level). The negative effect of the programming on the value of household food consumption is particularly disappointing, as this is a particularly important goal of the NGO.

THP's programming had negative but statistically insignificant effects on the literacy and education, health and nutrition, and environment indices, due to differing effects of the program on different components of the main indices, shown in the appendix. The negative effect on the literacy and education index is driven by lower levels of adult literacy and female adult literacy in treated villages (both effects statistically significant at the 90 percent confidence level). In the case of health and nutrition index, the programming had a significant positive effect on mortality (statistically significant at the 95 percent confidence level) but a significant negative effect on access to postnatal care (statistically significant at the 99 percent confidence level) and a significant negative effect on HIV knowledge (statistically significant at the 95 percent confidence level). The negative but statistically insignificant effect on the environment index masks a positive effect on agricultural conservation (statistically significant at the 99 percent confidence level) but negative effects on the other subcomponents, including a reduction in public sanitation improvements (statistically significant at the 90 percent confidence level).

THP's programming also had a positive but statistically insignificant effect on the economic livelihood index. The positive effect is driven mainly by the subcomponent of the index measuring improved access

[15] Specifically, table A3 in the appendix shows the components of the main indices and table A4 shows the components of any sub-indices. The construction of the indices was not pre-registered, as the practice was not common at the time this study began in 2008. We based the construction of the indices on indicators emphasized in THP's own theory of change and programming.

to credit (statistically significant at the 95 percent confidence level), as shown in the appendix. THP's programming did not have significant positive effects on any other subcomponent of the index and actually had a negative (but statistically insignificant) effect on household income.

[INSERT TABLE 8 ABOUT HERE]

The fact that we do not see significant improvements in outcomes in any of these five sectors is disappointing but largely consistent with the effects of THP programming on levels of investment in public goods observed in previous sections. Citizens reduce their contributions to other decentrally funded public goods in communities in which THP is working. Governments do not change their level of public investment but change the sectors in which they invest, moving from sectors in which THP is working (health, water, microfinance, sanitation and childcare) to sectors in which they are not working (education, roads, power, agricultural processing). In view of this movement of government funds, one might expect the biggest effect of THP to be in these latter areas. However, in evidence presented in the appendix, we see no evidence of this. [16]

VI. DISCUSSION

CBD may improve socioeconomic outcomes directly through the material outputs of CBD programming and indirectly by increasing community capacity in other spheres of actions. Specifically, we have considered whether CBD results in improvements in community capacity that increase local public goods provision in communities either from decentralized contributions or through centralized government funding. We have found evidence that the CBD program on which our study is based improved village-level leadership and may also have improved political representation in district-level government, yet we find little evidence that this resulted in improved public goods provision or subsequent socioeconomic well-being. In this section, we consider why these improvements in leadership did not result in increases in investment in local public goods drawing on additional quantitative and qualitative evidence.

We begin by revisiting the evidence for the improvements in village-level leadership and district-level political representation. The evidence that the programming improves village-level leadership is clearest. THP's programming is associated with significantly improved perceptions of the village chief; these leaders are more accessible and more trusted as a result of the CBD programming. The evidence that the programming improves district-level political representation is more ambiguous. The programming increases the number of candidates contesting office, and it increases the self-reported levels of activity of elected representatives (both statistically significant at the 90 percent confidence level). However, it does not significantly improve citizens' perceptions of their elected representatives, and it appears to depress voter turnout. The latter effect is potentially suggestive of citizens becoming less concerned with

[16] The effects of the intervention on school quality and electricity availability are in table A3.

government oversight in communities where non-governmental actors are alternative providers of local public goods.[17]

We try to further adjudicate whether THP's programming improved district-level political representation by considering its effects on the characteristics of elected district assembly members in table 9. The programming appears to have had little effects on the demographics and background of the individuals elected to office; it may have resulted in slightly more educated political representatives and it significantly increased the proportion of elected politicians who reported previous involvement in THP, but it did not significantly change the gender, age, occupation or organizational background of these leaders. Yet, importantly, the programming did change the campaign activities of the elected representatives; it made representatives more likely to be endorsed by a major political party, more financially invested in their campaigns, and less likely to say they emphasized their experience leading community development initiatives during their campaign. This suggests THP programming caused a "professionalization" of political representation. As Gugerty and Kramer (2008) have shown, NGO programming can privilege leaders with the skills necessary to liaise with international donors and marginalize leaders without these traits. In this case, the programming resulted in the election of leaders with more education, political connections and money to spend on campaigns.

Why did these changes in village-level and district-level leadership not lead to improvements in public goods provision? At the village level, THP programming displaced contributions to other types of community projects, rather than serving as an example that inspired further community efforts to work together for collective benefit. This suggests that the benefits to improving leadership without increasing the resources at their disposal are likely to be small in resource-poor communities. The amount of resources captured by village-level leaders may be small even absent the intervention (Alatas 2013), and good leadership will not be able to squeeze new resources from impoverished households. The trade-off in the amount of time and money individuals could devote to THP and other activities was noted in both our interviews with community leaders and focus groups.[18]

At the district level, the more professionalized politicians elected in THP communities were also unable to secure increases in absolute levels of public investment for their communities. Instead, the district government moved money between different sectors as a result of THP's activities, an adjustment that was also explicitly described by one of the district budget officers we interviewed.[19] The inability of the more active and professionalized politicians to secure significantly more resources for their communities may partly be the result of norms of equality in spending across district assembly member's areas, but it may also reflect the limited power of the average district assembly member over district budgets. In our interviews with district assembly members, they emphasized their efforts to lobby for projects like clinics,

[17] Although reduced citizen oversight would appear undesirable, see Grossman and Hanlon 2013 for a model of how this might result in higher quality leaders.
[18] Interview with assemblyman, community 1, August 2015; focus group discussion, community 4, August 2015.
[19] Interview with District Planning Officer, August 2015.

boreholes, electricity, roads and school feeding programs for their communities, but most also acknowledged they have limited power to change budgetary allocations by themselves.[20]

Together, this suggests the limits of local-level institutional reforms as a mechanism of reducing poverty. In the past two decades, both scholars and practitioners have given increasing emphasis to the importance of getting institutions right (Acemoglu, Reed and Robinson 2002; Rodrik, Subramanian and Trebbi 2002; World Bank 2000). Yet, the improvements in village-level leadership and the changes in district-level representation caused by the CBD program we studied have not resulted in the mobilization of more resources to provide public goods and services. Indeed, in our qualitative interviews with community leaders, they repeatedly noted the need for larger external influxes of resources if the program were to be effective in meeting its goal.[21] These findings fit with the growing recognition that institutional reforms, especially reforms that are externally triggered, are unlikely to be a panacea for poverty reduction (Andrews 2013).

VII. CONCLUSION

We have assessed whether CBD programming is effective in empowering citizens to improve their socioeconomic outcomes using a randomized evaluation in Ghana. A number of recent evaluations of CDD programs in weak states have suggested they have minimal impact. However, there have been no rigorous evaluations of these programs in contexts with stronger (non-failed) states. Given claims that CBD programming can improve citizens' ability to engage with government institutions, it is important that CBD programs are also evaluated in this context.

Our findings from Ghana suggest that CBD programming is no more successful in improving material outcomes in contexts with established governments. Although we find evidence that these programs improve village-level leadership and also "professionalize" political representation in district-level government, we find little evidence that this results in improved public goods provision or subsequent socioeconomic well-being. Improvements in leadership at these levels do not appear to translate into improved resource allocations, suggesting the limits of local-level institutional reforms as a panacea for poverty reduction.

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[20] Interview with assemblyman, community 1, August 2015; interview with assemblyman, community 2, August 2015; interview with assemblyman, community 3, August 2015; interview with assemblyman, community 4, August 2015.

[21] Interview with THP animator, community 2, August 2015; interview with THP animator, community 3, August 2015; interview with assemblyman, community 2, August 2015.

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TABLES

Table 1. Balance Statistics on Baseline Measures

	Treatment (standard dev.)	Control (standard dev.)	Difference (standard error)	p-value	N
Civic Participation Index	-0.277	-0.278	0.000	0.995	3230
	(1.208)	(1.219)	(0.079)		
Quality of Village Leadership Index	0.408	0.406	0.001	0.985	3745
	(1.015)	(1.018)	(0.062)		
Voted in district assembly election (binary)	0.702	0.685	0.017	0.534	3658
	(0.393)	(0.409)	(0.028)		
Citizens' Perceptions of District Representation Index	0.452	0.437	0.016	0.862	3647
	(1.384)	(1.431)	(0.092)		
Food Security Index	-0.955	-0.964	0.008	0.874	3645
	(0.701)	(0.715)	(0.053)		
Literacy and Education Index	-0.201	-0.020	-0.181	0.043	3786
	(0.990)	(1.086)	(0.088)		
Health and Nutrition Index	0.550	0.487	0.063	0.859	3786
	(3.406)	(1.706)	(0.353)		
Water, Environment and Sanitation Index	-1.257	-0.952	-0.305	0.253	3582
	(1.751)	(1.436)	(0.265)		
Livelihoods and Financial Inclusion Index	-0.080	-0.199	0.119	0.626	3786
	(1.723)	(0.041)	(0.244)		

Notes: This table reports baseline summary statistics from the main outcome measures at the household level. Columns (1) and (2) present means (with standard errors in parentheses) of the treatment and control groups, respectively. Column (3) presents the difference and the standard error of the difference, clustered at the unit of randomization (village cluster). Column (4) presents the p-value of the difference and Column (5) indicates the N.

Table 2. Participation in THP's Empowerment Programming

	ITT Effect (standard error)	TOT Effect (standard error)	Control mean (standard dev.)	N	Data source
Attended any Vision, Commitment and Action (VCA) session (binary)	0.058*** (0.011)	0.111*** (0.017)	0.000 (0.000)	2744 HHs	HH survey
Number of VCA sessions attended in last 12 months	0.213*** (0.052)	0.406*** (0.086)	0.000 (0.000)	2744 HHs	HH survey
Contributed to animator-led project (binary)	0.026*** (0.005)	0.050*** (0.009)	0.004 (0.049)	2744 HHs	HH survey
Attended THP fundraiser (binary)	0.050*** (0.010)	0.095*** (0.014)	0.001 (0.015)	2744 HHs	HH survey
THP animator (binary)	0.014*** (0.003)	0.027*** (0.005)	0.000 (0.014)	2744 HHs	HH survey
THP committee member (binary)	0.016*** (0.004)	0.031*** (0.007)	0.000 (0.000)	2744 HHs	HH survey
Any contact with THP programming (binary)	0.208*** (0.034)	0.396*** (0.046)	0.010 (0.089)	2744 HHs	HH survey
Value of contributions to epicenter and associated programming (GHC)	30.7*** (7.0)	58.5 (11.4)	0.8 (13.5)	2744 HHs	HH survey

Notes: *significant at 10%; ** significant at 5%; *** significant at 1%. Column (1) presents OLS estimates (with standard errors reported in parentheses), clustered at the unit of randomization (village cluster), and controlled for district effects. Each row reports results for a single OLS regression. Column (2) reports 2SLS treatment-on-the-treated estimates (with standard errors reported in parentheses) with receiving an epicenter being the first stage clustered at the unit of randomization (village cluster). Column (3) reports endline control means (with standard deviations reported in parentheses). Column (4) reports the number of observations and the unit of observation. Column (5) reports the data source used to code the outcome measure.

Table 3. Community Empowerment

	ITT Effect (standard error)	TOT Effect (standard error)	Control mean (standard dev.)	N	Baseline Measure	Data source
Civic Participation Index	0.054	0.103	0.000	2746 HHs	Yes	HH Survey
	(0.045)	(0.082)	(1.000)			
Active membership in community organizations (binary)	0.009	0.016	0.585	2745 HHs	No	HH Survey
	(0.016)	(0.030)	(0.430)			
Attended a community meeting (binary)	0.021	0.040	0.472	2746 HHs	Yes	HH survey
	(0.019)	(0.036)	(0.407)			
Raise issued in a community meeting (binary)	0.018	0.035	0.362	2745 HHs	Yes	HH survey
	(0.017)	(0.032)	(0.397)			
Quality of Village Leadership Index	0.111**	0.211**	0.000	2744 HHs	Yes	HH Survey
	(0.047)	(0.090)	(1.000)			
Frequency of talk with village chief (1-8)	0.283**	0.539**	4.767	2742 HHs	No	HH survey
	(0.142)	(0.272)	(2.279)			
Can disagree with village chief (1-5)	0.046	0.087	2.530	2741 HHs	Yes	HH survey
	(0.049)	(0.093)	(1.249)			
Trust in village chief (1-5)	0.087**	0.166**	3.667	2707 HHs	Yes	HH survey
	(0.042)	(0.082)	(1.097)			

Notes: *significant at 10%; ** significant at 5%; *** significant at 1%. Each cell in Columns 1 and 2 report results for a single regression. Column (1) presents OLS estimates (with standard errors reported in parentheses), clustered at the unit of randomization (village cluster), and with controls for district effects. Column (2) reports 2SLS treatment-on-the-treated estimates (with standard errors reported in parentheses, and district fixed effects), with active mobilization of an epicenter as the endogenous variable and the instrument is the random assignment. Column (3) reports endline control means (with standard deviations reported in parentheses). Column (4) reports the number of observations and the unit of observation. Column (5) reports the data source used to code the outcome measure.

Table 4. Decentralized Investment

	ITT Effect (standard error)	TOT Effect (standard error)	Control mean (standard dev.)	N	Baseline Measure	Data Source
Contributions to public goods (GHS)	-5.103* (2.895)	-9.727* (5.710)	15.313 (84.004)	2745 HHs	No	HH Survey
Contributions to public goods in THP sectors (GHS)	-3.726 (2.410)	-7.103 (4.659)	4.237 (67.314)	2745 HHs	No	HH Survey
Contributions to public goods in non-THP sectors (GHS)	-1.377 (1.974)	-2.625 (3.783)	11.075 (50.453)	2745 HHs	No	HH Survey

Notes: *significant at 10%; ** significant at 5%; *** significant at 1%. Each cell in Columns 1 and 2 report results for a single regression. Column (1) presents OLS estimates (with standard errors reported in parentheses), clustered at the unit of randomization (village cluster), and with controls for district effects. Column (2) reports 2SLS treatment-on-the-treated estimates (with standard errors reported in parentheses, and district fixed effects), with active mobilization of an epicenter as the endogenous variable and the instrument is the random assignment. Column (3) reports endline control means (with standard deviations reported in parentheses). Column (4) reports the number of observations and the unit of observation. Column (5) reports the data source used to code the outcome measure.

Table 5. Political Engagement

	ITT Effect (standard error)	TOT Effect (standard error)	Control mean (standard dev.)	N	Baseline Measure	Data Source
Citizen Engagement						
Voted in district assembly election (binary)	0.013 (0.017)	0.025 (0.032)	0.730 (0.376)	2741 HHs	Yes	HH survey
Voter turnout in district elections (proportion)	-0.054** (0.025)	-0.099** (0.044)	0.502 (0.143)	111 Electoral Areas	No	Election results
Candidate Engagement						
Number of candidates in district assembly election	0.298* (0.172)	0.553* (0.312)	2.526 (0.804)	122 Electoral Areas	No	Election results
Whether incumbent replaced in election (binary)	0.104 (0.064)	0.194* (0.116)	0.772 (0.23)	122 Electoral Areas	No	Election results

Notes: *significant at 10%; ** significant at 5%; *** significant at 1%. Column (1) presents OLS estimates (with standard errors reported in parentheses), clustered at the unit of randomization (village cluster), and controlled for district effects. Each row reports results for a single OLS regression. Column (2) reports 2SLS treatment-on-the-treated estimates (with standard errors reported in parentheses) with receiving an epicenter being the first stage clustered at the unit of randomization (village cluster). Column (3) reports endline control means (with standard deviations reported in parentheses). Column (4) reports the number of observations and the unit of observation. Column (5) reports the data source used to code the outcome measure.

Table 6. Quality of Political Representation

	ITT Effect (standard error)	TOT Effect (standard error)	Control mean (standard dev.)	N	Baseline Measure	Data Source
Quality district representative index (citizens' perceptions)	0.069 (0.072)	0.131 (0.131)	0.000 (1.000)	2743 HHs	Yes	HH survey
Talk to district assembly member (1-8)	0.062 (0.147)	0.118 (0.274)	3.460 (2.134)	2743 HHs	No	HH survey
Satisfaction with ability to influence district assembly member (1-4)	0.070 (0.051)	0.132 (0.095)	2.088 (0.916)	2742 HHs	No	HH survey
Trust in district assembly member (1-5)	0.059 (0.078)	0.112 (0.144)	2.812 (1.293)	2708 HHs	Yes	HH survey
District representative's activity index (self-reported)	0.446* (0.231)	0.801* (0.414)	0.000 (1.000)	106 Electoral Areas	No	Survey of District Assembly members
Assembly meeting attendance (-3-0)	0.208 (0.168)	0.373 (0.287)	-0.333 (0.883)	106 Electoral Areas	No	Survey of District Assembly members
Number contributions at meetings	0.562 (1.922)	1.010 (3.201)	8.750 (7.242)	106 Electoral Areas	No	Survey of District Assembly members
Number meetings with District Chief Executive	4.469 (2.871)	8.021 (5.068)	10.918 (11.152)	106 Electoral Areas	No	Survey of District Assembly members
Number meetings with community leaders	-2.250 (2.880)	-4.038 (4.735)	16.490 (15.674)	106 Electoral Areas	No	Survey of District Assembly members
Number meetings with voters	3.915 (2.523)	7.053 (4.452)	5.875 (8.361)	105 Electoral Areas	No	Survey of District Assembly members
Number of infrastructure projects facilitated	0.332 (0.272)	0.596 (0.470)	1.898 (1.358)	106 Electoral Areas	No	Survey of District Assembly members
Number of NGOs helped (excluding THP)	0.218 (0.161)	0.391 (0.271)	0.542 (0.743)	105 Electoral Areas	No	Survey of District Assembly members

Notes: *significant at 10%; ** significant at 5%; *** significant at 1%. Column (1) presents OLS estimates (with standard errors reported in parentheses), clustered at the unit of randomization (village cluster), and controlled for district effects. Each row reports results for a single OLS regression. Column (2) reports 2SLS treatment-on-the-treated estimates (with standard errors reported in parentheses) with receiving an epicenter being the first stage clustered at the unit of randomization (village cluster). Column (3) reports endline control means (with standard deviations reported in parentheses). Column (4) reports the number of observations and the unit of observation. Column (5) reports the data source used to code the outcome measure.

Table 7. Local Government Investment

	ITT Effect (standard error)	TOT Effect (standard error)	Control mean (standard dev.)	N	Data source
Proportion of Sectors with Local Government-Funded Projects	-0.010 (0.028)	-0.017 (0.046)	0.073 (0.163)	117 Electoral Areas	Community Survey
Proportion of THP Sectors with Local Government-Funded Projects (Health, Water, Sanitation, Childcare, Micro-Finance)	-0.040* (0.023)	-0.068* (0.037)	0.052 (0.159)	116 Electoral Areas	Community Survey
Proportion of Non-THP Sectors with Local Government-Funded Projects (Education, road, power, agricultural processing)	0.030* (0.018)	0.051* (0.028)	0.028 (0.049)	115 Electoral Areas	Community Survey

Notes: *significant at 10%; ** significant at 5%; *** significant at 1%. Column (1) presents OLS estimates (with standard errors reported in parentheses), clustered at the unit of randomization (village cluster), and controlled for district effects. Each row reports results for a single OLS regression. Column (2) reports 2SLS treatment-on-the-treated estimates (with standard errors reported in parentheses) with receiving an epicenter being the first stage clustered at the unit of randomization (village cluster). Column (3) reports endline control means (with standard deviations reported in parentheses). Column (4) reports the number of observations and the unit of observation. Column (5) reports the data source used to code the outcome measure.

Table 8. Socioeconomic Outcomes

	ITT Effect (standard error)	TOT Effect (standard error)	Control mean (standard dev.)	N	Data source
Food Security Index	0.046	0.086	0.000	2749 HHs	HH Survey
	(0.046)	(0.087)	(1.000)		
Literacy and Education Index	-0.089	-0.171	0.000	2792 HHs	HH Survey
	(0.077)	(0.149)	(1.000)		
Health and Nutrition Index	-0.064	-0.121	0.000	2792 HHs	HH Survey
	(0.087)	(0.166)	(1.000)		
Water, Environment and Sanitation Index	-0.107	-0.199	0.000	2792 HHs	HH Survey
	(0.118)	(0.219)	(1.000)		
Livelihoods and Financial Inclusion Index	0.103	0.194	0.000	2792 HHs	HH Survey
	(0.087)	(0.160)	(1.000)		

Notes: *significant at 10%; ** significant at 5%; *** significant at 1%. Column (1) presents OLS estimates (with standard errors reported in parentheses), clustered at the unit of randomization (village cluster), and controlled for district effects. Each row reports results for a single OLS regression. Column (2) reports 2SLS treatment-on-the-treated estimates (with standard errors reported in parentheses) with receiving an epicenter being the first stage clustered at the unit of randomization (village cluster). Column (3) reports endline control means (with standard deviations reported in parentheses). Column (4) reports the number of observations and the unit of observation. Column (5) reports the data source used to code the outcome measure. Full details on the construction of each index and the ITT effect and TOT effect on each sub-component are reported in the appendix.

Table 9. Characteristics of District Assemblymembers

	ITT Effect (standard error)	TOT Effect (standard error)	Control mean (standard dev.)	N	Baseline Measure	Data Source
Demographics						
Female (binary)	-0.039	-0.073	0.088	122	No	Election results
	(0.052)	(0.092)	(0.285)	Electoral Areas		
Age (years)	0.538	0.991	43.74	118	No	Election results
	(1.941)	(3.360)	(8.09)	Electoral Areas		
Completed 12+ years	0.148	0.270*	0.529	109	No	Community survey
education (binary)	(0.089)	(0.162)	(0.504)	Electoral Areas		
Administrative, clerical or	-0.011	-0.021	0.382	118	No	Election results
teaching profession (binary)	(0.091)	(0.156)	(0.490)	Electoral Areas		
Community organization	0.081	0.146	0.063	106	No	Survey of District
leader, pre-election (binary)	(0.092)	(0.155)	(0.487)	Electoral Areas		Assembly members
Involved in THP, pre-election	0.088*	0.157**	0.000	106	No	Survey of District
(binary)	(0.046)	(0.073)	(0.000)	Electoral Areas		Assembly members
Campaigning Activities						
Endorsed by major party	0.141*	0.254*	0.188	105	No	Survey of District
(NDC or NPP) (binary)	(0.083)	(0.139)	(0.394)	Electoral Areas		Assembly members
Money spent on campaign	593.6**	1066.3***	1219.4	103 Electoral	No	Survey of District
(GHS)	(297.9)	(516.1)	(819.0)	Areas		Assembly members
Main emphasis on	-0.177*	-0.321*	0.688	104 Electoral	No	Survey of District
community leadership	(0.102)	(0.175)	(0.468)	Areas		Assembly members
experience in campaign						
(binary)						

Notes: *significant at 10%; ** significant at 5%; *** significant at 1%. Column (1) presents OLS estimates (with standard errors reported in parentheses), clustered at the unit of randomization (village cluster), and controlled for district effects. Each row reports results for a single OLS regression. Column (2) reports 2SLS treatment-on-the-treated estimates (with standard errors reported in parentheses) with receiving an epicenter being the first stage clustered at the unit of randomization (village cluster). Column (3) reports endline control means (with standard deviations reported in parentheses). Column (4) reports the number of observations and the unit of observation. Column (5) reports the data source used to code the outcome measure.

APPENDICES

APPENDIX I. ATTRITION ANALYSIS

Table A1. Household Attrition

	(1) Completed endline survey	(2) Completed endline survey	(3) Completed endline survey
Treatment	-0.007	-0.016	-0.023
	(0.018)	(0.018)	(0.030)
Treatment*Civic participation index			0.024*
			(0.014)
Treatment*Quality of village leadership index			-0.005
			(0.014)
Treatment*Perceptions of district leadership index			-0.012
			(0.011)
Treatment*Food security index			0.001
			(0.022)
Treatment*Literacy and education index			-0.001
			(0.013)
Treatment*Health and nutrition index			0.008*
			(0.005)
Treatment*Environment index			-0.017
			(0.011)
Treatment*Livelihoods index			-0.001
			(0.008)
Control mean	0.742	0.742	0.742
Straight effects for 8 indices	No	Yes	Yes
Treatment interacted with index effects	No	No	Yes
Observations	3786	3786	3786
p-value from F-test that treatment equals zero	0.721	0.387	
p-value from F-test that treatment interacted with indices jointly equals zero			0.360

Notes: * significant at 10%; ** significant at 5%; *** significant at 1%. OLS intent-to-treat estimates (with standard errors in parentheses), clustered at the unit of randomization (village cluster). Each column reports results for a single OLS regression of the dependent variables listed in the columns. The dependent variable (non-attrition) is binary, taking 1 if the household was reached for both baseline and endline survey, and 0 if the household was only reached for the baseline and not the endline. All baseline control variables correspond to the outcome variables in Table 4, as measured at baseline, with indices standardized to the endline control mean with mean 0 and standard deviation 1. For baseline observations that are missing, the variable is recoded to zero when missing, and a binary indicator of being missing is included into the regression.

APPENDIX II. FIRST-STAGE OF INSTRUMENTAL VARIABLE RESULTS

Table A2. TOT first stage regression

	(1) Mobilized
Treatment	0.530***
	(0.069)
N	2792

Notes: * significant at 10%; ** significant at 5%; *** significant at 1%. Treatment is defined as having received an invitation to mobilize the community to build an epicenter. Standard errors, clustered at the unit of randomization (village cluster), are reported in parentheses. The first stage is calculated using OLS with district fixed effects. The unit of observation is the household.

APPENDIX III. COMPLETE SOCIOECONOMIC RESULTS

TABLE A3. COMPONENTS OF MAIN SOCIOECONOMIC INDICES

	ITT Effect (standard error)	TOT Effect (standard error)	Control mean (standard dev.)	N	Baseline data
Food Security Index	0.046	0.086	0.000	2749	Yes
	(0.046)	(0.087)	(1.000)		
Market price and access	0.032	0.058	0.000	2206	No
improvement	(0.050)	(0.092)	(1.000)		
(subindex of 2 indicators)					
Value of food consumption	-4.937**	-9.395**	73.1	2738	Yes
(weekly, GHC)	(2.061)	(4.118)	(56.4)		
Agriculture improvements	0.157***	0.298***	0.000	2739	Yes
(subindex of 5 indicators)	(0.057)	(0.110)	(1.000)		
Literacy and Education Index	-0.089	-0.171	0.000	2792	Yes
	(0.077)	(0.149)	(1.000)		
Education	0.005	0.010	0.000	2528	Yes
(subindex of 2 indicators)	(0.094)	(0.178)	(1.000)		
School quality	-0.116	-0.224	0.000	2116	Yes
(subindex of 3 indicators)	(0.135)	(0.256)	(1.000)		
Adult literacy/numeracy	-0.060*	-0.113*	0.000	2745	Yes
(subindex of 2 indicators)	(0.033)	(0.064	(1.000)		
Female adult literacy/numeracy	-0.069*	-0.130*	0.000	2326	Yes
(subindex of 2 indicators)	(0.039)	(0.075)	(1.000)		
No child labor	-0.046	-0.086	0.692	2792	Yes
	(0.063)	(0.118)	(0.462)		
Health and Nutrition Index	-0.064	-0.121	0.000	2792	Yes
	(0.087)	(0.166)	(1.000)		
Infant survival	-0.002	-0.003	0.993	250	Yes
	(0.010)	(0.016)	(0.086)		

Child anthropometry	-0.000	-0.000	0.000	1535	Yes
(subindex of 6 indicators)	(0.060)	(0.109)	(1.000)		
Health access	-0.088	-0.172	0.000	2792	Yes
(subindex of 7 indicators)	(0.157)	(0.311)	(1.000)		
Government health services	-0.082	-0.155	0.000	2792	Yes
(subindex of 9 indicators)	(0.141)	(0.268)	(1.000)		
Contraception usage	-0.012	-0.022	0.808	1005	No
	(0.027)	(0.050)	(0.385)		
Prenatal care	-0.034	-0.060	0.000	346	Yes
(subindex of 4 indicators)	(0.096)	(0.167)	(1.000)		
Postnatal care	-0.362***	-0.581***	0.000	213	Yes
(subindex of 9 indicators)	(0.135)	(0.211)	(1.000)		
Number of times immunized	0.308*	0.561*	9.195	1022	Yes
	(0.163)	(0.305)	(3.039)		
Survival	0.007**	0.012**	0.972	2792	Yes
	(0.003)	(0.006)	(0.085)		
HIV Knowledge	-0.091**	-0.173**	0.000	2758	Yes
(subindex of 4 indicators)	(0.041)	(0.080)	(1.000)		
Water, Environment and Sanitation Index	-0.107	-0.199	0.000	2792	Yes
	(0.118)	(0.219)	(1.000)		
Public sanitation improvements	-0.211*	-0.398*	0.000	2792	Yes
(subindex of 2 indicators)	(0.120)	(0.226)	(1.000)		
Number of public water facility	-0.074	-0.137	0.859	2686	No
improvements	(0.104)	(0.190)	(0.884)		
Electricity availability (subindex of	-0.162	-0.302	0.000	2763	Yes
4 indicators)	(0.136)	(0.257)	(1.000)		
Agriculture conservation	0.183***	0.342***	0.000	2418	No
(subindex of 3 indicators)	(0.058)	(0.122)	(1.000)		
Livelihoods and Financial Inclusion Index	0.137	0.260	0.000	2792	Yes
	(0.102)	(0.185)	(1.000)		
Enterprise growth	0.022	0.042	0.000	2747	Yes
(subindex of 4 indicators)	(0.031)	(0.057)	(1.000)		
Durable assets	-0.027	-0.052	0.000	2750	Yes
(subindex of 7 indicators)	(0.050	(0.094)	(1.000)		
Farm investment	26.412	49.304	557.4	2396	Yes
(annual, GHC)	(71.389)	(132.695)	(1287.1)		
Household income	-59415.6	-113612.9	70222.8	2750	Yes
(annual, GHC)	(39428.5)	(75177.1)	(1710983.8)		
Financial inclusion - savings	0.062	0.116	0.000	2792	Yes
(subindex of 5 indicators)	(0.125)	(0.228)	(1.000)		
Financial inclusion - credit	0.294**	0.556**	0.000	2792	Yes
(subindex of 4 indicators)	(0.131)	(0.237)	(1.000)		
Non-food household	6.740	12.793	538.4	2741	Yes
expenditures (monthly, GHC)	(16.902)	(31.685)	(421.9)		

Notes: *significant at 10%; ** significant at 5%; *** significant at 1%. Column (1) presents OLS estimates (with standard errors reported in parentheses), clustered at the unit of randomization (village cluster), and controlled for district effects. Each row reports results for a single OLS regression. Column (2) reports 2SLS treatment-on-the-treated estimates (with standard errors reported in parentheses) with receiving an epicenter being the first stage clustered at the unit of randomization (village cluster). Column (3) reports endline control means (with standard deviations reported in parentheses). Column (4) reports the number of observations and the unit of observation. Column (5) reports the data source used to code the outcome measure. Full details on the construction of each index and the ITT effect and TOT effect on each sub-component are reported in the appendix.

TABLE A4. COMPONENTS OF SUBINDICES

	ITT Effect (standard error)	TOT Effect (standard error)	Control mean (standard dev.)	No. HHs	No. Villages	Baseline available	Level of data collection
Market price and access improvement subindex	0.032 (0.050)	0.058 (0.092)	0.000 (1.000)	2206	194	No	
Maize market price (GHC)	-55.4 (41.2)	-105.179 (78.316)	136.3 (1103.8)	1048	187	No	Household
Sold maize (binary)	0.030 (0.029)	0.056 (0.054)	0.476 (0.540)	2206	194	No	Household
Agriculture improvements subindex	0.157*** (0.057)	0.298*** (0.110)	0.000 (1.000)	2739	194	Yes	
Number of farm improvements	0.286*** (0.082)	0.535*** (0.168)	1.165 (1.421)	2418	194	No	Household
Farm output market value (annual, GHC)	121.9 (241.4)	221.861 (433.276)	2294.3 (5491.3)	2126	192	Yes	Household
Number of cultivated acres	0.242 (0.396)	0.452 (0.733)	5.029 (12.2)	2412	194	No	Household
Current livestock value (GHC)	272.1 (179.3)	510.514 (346.837)	791.8 (1941.5)	2251	194	No	Household
Number of types of livestock owned	0.086 (0.054)	??	1.480 (1.085)	2738	194	Yes	Household
Education subindex	0.005 (0.094)	0.010 (0.178)	0.000 (1.000)	2528	194	Yes	
Highest number of years of education	-0.039 (0.129	-0.071 (0.234)	3.322 (2.794)	2004	194	Yes	Household
Average school attendance percentage in community	0.015 (0.013)	0.032 (0.026)	0.572 (0.393)	1938	132	Yes	Village
School quality subindex	-0.116 (0.135)	-0.224 (0.256)	0.000 (1.000)	2116	144	Yes	
Hours in school day	-0.149* (0.088)	-0.310 (0.194)	6.460 (0.862)	1695	115	Yes	Village
Years of education of instructors	0.326 (0.244)	0.704 (0.548)	9.740 (6.133)	1882	129	Yes	Village
Teacher-student ratio	-0.048 (0.032)	-0.084 (0.058)	0.101 (0.245)	1890	129	Yes	Village
Adult literacy/numeracy subindex	-0.060* (0.033)	-0.113* (0.064	0.000 (1.000)	2745	194	Yes	
Literate (binary)	-0.021* (0.012)	-0.040 (0.024)	0.439 (0.385)	2745	194	Yes	Individual
Numerate (binary)	-0.019 (0.014)	-0.036 (0.027)	0.623 (0.381)	2745	194	Yes	Individual
Female adult literacy/numeracy subindex	-0.069* (0.039)	-0.130* (0.075)	0.000 (1.000)	2326	194	Yes	
Literate (binary)	-0.036** (0.016)	-0.068** (0.031)	0.319 (0.408)	2326	194	Yes	Individual
Numerate (binary)	-0.016 (0.018)	-0.031 (0.034)	0.520 (0.448)	2326	194	Yes	Individual
Child anthropometry subindex	-0.000 (0.060)	-0.000 (0.109)	0.000 (1.000)	1535	194	Yes	

Height (cm), age 2 through 5	-0.836	-1.544	96.9	821	186	Yes	Individual
	(1.008)	(1.849)	(12.4)				
Weight (kg), age 2 through 5	-0.090	-0.163	12.6	821	186	Yes	Individual
	(0.239	(0.426)	(3.247)				
Arm circumference (cm), age 2 through 5	-0.064	0.118	15.8	819	186	Yes	Individual
	(0.109)	(0.199)	(1.833				
Height (cm), age 6 through 12	0.972	1.807	124.6	1315	193	Yes	Individual
	(1.083)	(2.011)	(17.8)				
Weight (kg), age 6 through 12	0.284	0.524	23.2	1315	193	Yes	Individual
	(0.381)	(0.704)	(6.926)				
Arm circumference (cm), age 6 through 12	0.049	0.091	18.2	1315	193	Yes	Individual
	(0.139)	(0.257)	(2.289)				
Health access subindex	-0.088	-0.172	0.000	2792	194	Yes	
	(0.157)	(0.311)	(1.000)				
Health center built since 2008	0.043	0.081	0.159	2792	194	No	Village
	(0.066)	(0.123)	(0.366)				
Number of types of immunizations available in nearest health center	-0.788*	-1.235*	6.072	1721	116	Yes	Village
	(0.434)	(0.747)	(1.633)				
Number of average patients (daily) treated in nearest health center	-5.538	-8.399	23.9	1690	114	Yes	Village
	(4.355)	(6.485)	(23.3)				
Prenatal care availability in nearest health center (binary)	-0.040	-0.063	0.853	1745	118	Yes	Village
	(0.069)	(0.111)	(0.354)				
Delivery availability in nearest health center (binary)	0.013	0.021	0.573	1745	118	Yes	Village
	(0.097)	(0.154)	(0.495)				
Number of beds in nearest health center	0.188	0.285	3.047	1676	113	Yes	Village
	(0.658)	(0.978)	(3.554)				
Number of days per week head of nearest health center works	0.358*	0.540*	6.200	1734	117	No	Village
	(0.204)	(0.323)	(1.115)				
Government health services subindex	-0.141	-0.215	0.000	1717	116	No	
	(0.152)	(0.224)	(1.000)				
Frequency of visits to chlorinate wells (0 = never, 7 = once a week)	-0.143	-0.215	0.566	1702	115	No	Village
	(0.226)	(0.330)	(1.460)				
Frequency of visits to provide malaria eradication services (0 = never, 7 = once a week)	0.181	0.276	2.006	1717	116	No	Village
	(0.394)	(0.598)	(2.207)				
Frequency of visits to provide pre- and post-natal care (0 = never, 7 = once a week)	-0.199	-0.303	1.402	1717	116	No	Village
	(0.411)	(0.614)	(2.138)				
Frequency of visits to provide nutritional supplements (0 = never, 7 = once a week)	0.010	0.014	0.813	1717	116	No	Village
	(0.360)	(0.542)	(1.785)				
Frequency of visits to provide general health education (0 = never, 7 = once a week)	-0.313	-0.476	1.926	1717	116	No	Village
	(0.360)	(0.537)	(2.259)				
Frequency of visits to provide family planning education (0 = never, 7 = once a week)	-0.408	-0.620	2.044	1717	116	No	Village
	(0.411)	(0.594)	(2.331)				
Frequency of visits to distribute condoms (0 = never, 7 = once a week)	-0.373	-0.568	1.020	1717	116	No	Village
	(0.331)	(0.486)	(1.973)				

Frequency of visits to provide HIV/AIDS education (0 = never, 7 = once a week)	-0.836** (0.396)	-1.271** (0.628)	1.859 (2.272)	1717	116	No	Village
Frequency of visits to provide guinea worm education & eradication (0 = never, 7 = once a week)	-0.087 (0.372)	-0.134 (0.562)	2.049 (2.433)	1706	115	No	Village
Prenatal care subindex	-0.034 (0.096)	-0.060 (0.167)	0.000 (1.000)	346	162	Yes	
Received some prenatal care (binary)	-0.002 (0.035)	-0.003 (0.061)	0.839 (0.366)	346	162	Yes	Individual
Earliness of prenatal care ((40-week of pregnancy in which prenatal care began)/40)	-0.014 (0.027)	-0.024 (0.048)	0.627 (0.308)	344	162	Yes	Individual
Went to a "good" prenatal practitioner (binary)	-0.003 (0.036)	-0.006 (0.062)	0.839 (0.366)	346	162	Yes	Individual
Number of times went to prenatal care	-0.259 (0.348)	-0.456 (0.614)	4.716 (3.434)	346	162	Yes	Individual
Postnatal care subindex	-0.362*** (0.135)	-0.581*** (0.211)	0.000 (1.000)	213	213	Yes	
Received some postnatal care (binary)	-0.040 (0.039)	-0.065 (0.060)	0.900 (0.298)	131	213	Yes	Individual
Number of times went to postnatal care	-0.382 (0.595)	-0.605 (0.903)	4.752 (4.250)	131	213	Yes	Individual
Child breastfed (binary)	-0.009 (0.006)	-0.014 (0.010)	1.000 (0.000)	131	213	Yes	Individual
Child not given water before 6 months (binary)	-0.059 (0.067)	-0.093 (0.099)	0.643 (0.481)	130	212	Yes	Individual
Child not given liquid before 6 months (binary)	-0.106** (0.052)	-0.170** (0.079)	0.757 (0.431)	130	212	Yes	Individual
Child not given solid food before 6 months (binary)	-0.031 (0.031)	-0.049 (0.048)	0.956 (0.206)	129	211	Yes	Individual
Height (cm), age < 2	-3.099* (1.772)	-4.658* (2.579)	64.3 (15.3)	128	196	Yes	Individual
Weight (kg), age < 2	-0.565* (0.335)	-0.857* (0.487)	7.461 (2.485)	128	197	Yes	Individual
Arm circumference (cm), age < 2	-0.040 (0.261)	-0.061 (0.375)	14.0 (1.701)	128	197	Yes	Individual
HIV Knowledge subindex	-0.091** (0.041)	-0.173** (0.080)	0.000 (1.000)	2758	194	Yes	
Heard of HIV (binary)	-0.017** (0.007)	-0.033** (0.014)	0.931 (0.171)	2758	194	Yes	Individual
Number of accurate ways known to prevent HIV (max 3)	-0.059** (0.026)	-0.113** (0.051)	1.466 (0.658)	2758	194	Yes	Individual
Knew that a person with HIV could still look healthy (binary)	-0.009 (0.014)	-0.017 (0.026)	0.743 (0.337)	2758	194	Yes	Individual
Knew that HIV can be transmitted from mother to child (binary)	-0.015 (0.012)	-0.029 (0.023)	0.719 (0.332)	2758	194	Yes	Individual
Public sanitation improvements subindex	-0.211* (0.120)	-0.398* (0.226)	0.000 (1.000)	2792	194	Yes	
Number of improvements made to any public sanitation facilities in community	-0.206 (0.135)	-0.359 (0.239)	0.689 (1.033)	2493	174	No	Village

Number of good sanitation practices visible in community	-0.171** (0.083)	-0.322** (0.155)	5.806 (0.540)	2754	192	Yes	Village
Electricity availability subindex	-0.162 (0.136)	-0.302 (0.257)	0.000 (1.000)	2763	192	Yes	
Electricity from main grid available in community (binary)	-0.049 (0.054)	-0.092 (0.101)	0.463 (0.499)	2763	192	Yes	Village
Electricity established in past 5 years (binary)	-0.021 (0.089)	-0.035 (0.148)	0.355 (0.479)	1152	74	Yes	Village
Percentage of households connected to electricity	0.034 (4.112)	0.063 (7.510)	31.9 (37.6)	2763	192	Yes	Village
Number of days per month with no loss of electricity from more than 3 hrs	-0.378 (0.896)	-0.624 (1.451)	24.4 (5.371)	1153	74	Yes	Village
Agriculture conservation subindex	0.183*** (0.058)	0.342*** (0.122)	0.000 (1.000)	2418	194	No	
Number of agricultural improvements to farm made in past year	0.133** (0.056)	0.249** (0.109)	0.770 (1.266)	2418	194	No	Household
Number of trees planted	5.405 (4.671)	10.1 (8.939)	9.273 (56.9)	2416	194	No	Household
Soil-enriching legumes planted (binary)	0.033** (0.013)	0.061** (0.025)	0.067 (0.282)	2417	194	No	Household
Enterprise growth subindex	0.022 (0.031)	0.042 (0.057)	0.000 (1.000)	2747	194	Yes	
Business profit (monthly, GHC)	-44.2 (42.7)	-80.3 (79.0)	207.7 (932.6)	1297	192	Yes	Household
Number of days per week business runs	0.048 (0.138)	0.088 (0.247)	4.533 (2.100)	1324	192	No	Household
Number of workers at business	-0.039 (0.103)	-0.070 (0.186)	1.501 (2.854)	1326	192	No	Household
Belief that a new business can be worth the investment (binary)	0.011 (0.009)	0.021 (0.016)	0.893 (0.275)	2745	194	Yes	Individual
Durable assets subindex	-0.027 (0.050	-0.052 (0.094)	0.000 (1.000)	2750	194	Yes	
Number of TVs owned	-0.010 (0.036)	-0.018 (0.068)	0.113 (0.486)	2750	194	Yes	Household
Number of satellites owned	-0.015 (0.017)	-0.029 (0.032)	0.073 (0.434)	2750	194	Yes	Household
Number of refrigerators owned	-0.001 (0.022)	-0.003 (0.041)	0.131 (0.434)	2750	194	Yes	Household
Number of electric fans owned	-0.034 (0.030)	-0.065 (0.057)	0.192 (0.570)	2750	194	Yes	Household
Number of sewing machines owned	-0.006 (0.017)	-0.012 (0.033)	0.171 (0.478)	2750	194	Yes	Household
Number of motorcycles owned	0.013 (0.014)	0.025 (0.026)	0.013 (0.193)	2750	194	Yes	Household
Number of bicycles owned	-0.013 (0.025)	-0.026 (0.047)	0.223 (0.588)	2750	194	Yes	Household
Financial inclusion – savings subindex	0.062 (0.125)	0.116 (0.228)	0.000 (1.000)	2792	194	Yes	
Has savings (binary)	0.006 (0.021)	0.012 (0.039)	0.361 (0.480)	2792	194	Yes	Household

Savings flow (yearly, GHC)	189.0 (237.1)	349.6 (435.1)	956.0 (2757.4)	1024	189	Yes	Household
Savings balance (GHC)	-37.3 (136.4)	-67.7 (245.0)	589.6 (1954.0)	984	189	Yes	Household
Existence of local financial institution	0.018 (0.037)	0.033 (0.068)	0.045 (0.208)	2792	194	Yes	Village
Financial inclusion – credit subindex	0.398** (0.183)	0.753** (0.327)	0.000 (1.000)	2792	194	Yes	
Formal borrowing, past year (binary)	0.028* (0.015)	0.053* (0.027)	0.072 (0.259)	2746	194	Yes	Household
Amount of formal loan, past year	14.9 (18.7)	28.3 (35.7)	57.4 (362.2)	2746	194	Yes	Household
Local institution provides loans	0.041 (0.032)	0.077 (0.058)	0.014 (0.118)	2792	194	Yes	Village
100 - interest rate at local financial institution	2.917** (1.362)	3.899** (1.769)	69.9 (11.5)	760	52	Yes	Village

Notes: *significant at 10%; ** significant at 5%; *** significant at 1%. Column (1) presents OLS estimates (with standard errors reported in parentheses), clustered at the unit of randomization (village cluster), and controlled for district effects. Each row reports results for a single OLS regression. Column (2) reports 2SLS treatment-on-the-treated estimates (with standard errors reported in parentheses) with receiving an epicenter being the first stage clustered at the unit of randomization (village cluster). Column (3) reports endline control means (with standard deviations reported in parentheses). Column (4) reports the number of observations and the unit of observation. Column (5) reports the data source used to code the outcome measure. Full details on the construction of each index and the ITT effect and TOT effect on each sub-component are reported in the appendix.