

Household Effects of African Community Initiatives:

Evaluating the Impact of the Zambia Social Fund

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July 10, 2001

The authors would like to thank the staffs of the social fund and the Central Statistics Office of the Government of the Republic of Zambia for their help with survey and sample design, data collection and institutional insights; Kalpana Mehra for extensive and invaluable data management and analysis expertise; and the Norwegian government for financial support to the multi-country Social Funds 2000 study which formed the impetus for this paper. We have benefited from comments of seminar participants at the World Bank, the Johns Hopkins School of Public Health, the Johns Hopkins School for Advanced International Studies and the International Food Policy Research Institute. The views expressed herein are those of the authors and do not necessarily represent the World Bank or the Zambian government. We are wholly responsible for all errors.

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Abstract

The Zambia social fund provides financial support to communities' education and health initiatives. In Zambia the social fund encourages communities to organize projects that rehabilitate primary schools and health clinics, financing approximately 80 percent of initiatives that communities design and implement. This study considers the targeting and household impact of Zambia's social fund activities. To collect appropriate data, we augmented a nationally representative household survey, over-sampling in areas where the social fund was active. Using propensity and pipeline match techniques to control for community self-selection, we evaluate household impacts of rehabilitating schools and health posts. The social fund reached poor households, particularly in rural areas. Compared with control groups, education projects increased school attendance and households' education expenditures to a significant degree. Health projects increased use of primary health facilities and child vaccinations. Compared with alternative efforts with similar objectives, community participation in social fund projects was superior in rural areas and inferior in urban areas.

I. Introduction

Development scholars and practitioners seek strategies to support the poor with sustainable initiatives. One of the more promising approaches to effective sustainable development is to build partnerships between governments, lending institutions and civil society. Through social funds operating in 58 countries, governments, the World Bank and other donors have for the last decade sought to create such partnerships. The World Bank has supported more social funds in Africa than in any other region.¹ While quantitative impact analyses of Latin American social funds have been recently undertaken in a number of countries, data limitations have made it difficult to conduct similar research on African social funds. The "Social Funds 2000" multi-country study supported a detailed impact evaluation of the Zambia social fund, one of the Africa

¹Although it has disbursed more resources through Latin American social funds.

region's earliest funds receiving World Bank support. Based on extensive household data, this study provides the first quantitative impact evaluation of an African social fund.

With support from international donors, governments administer social funds, which in turn provide resources directly to communities. They devolve to those communities responsibility for choosing, designing and implementing sub-projects. Local participation seeks to ensure that initiatives address priority community needs and that the community feels ownership of the resulting investment. To direct resources toward the poor, social funds establish menus of eligible project types intended to be especially attractive to poorer areas. Often these include support to build, expand or rehabilitate small social and economic infrastructure such as primary schools, health posts, water systems, roads, and markets.

With social funds becoming more frequently used tools in government poverty reduction and development strategies several questions arise. While many governments use poverty maps to identify where they allocate resources, particularly in Latin America, an alternative strategy is to spread resources fairly equally across regions, relying on self-targeting to reach poorer areas. Zambia has adopted this latter strategy. Does restricting projects to those types most likely to solicit demand only from poorer communities successfully reach the poor and avoid elite capture? The poor state of infrastructure may partially explain low use of education and health services. When a social fund rehabilitates local infrastructure, do households enjoy identifiable benefits? Do education projects increase education demand or health projects increase demand for health services? Social funds involve communities in identifying, designing and implementing projects. This is a very different approach from the more traditional top-down sectoral development programs. To what extent does this involvement build social capital, leading communities to take their own future infrastructure initiatives?

Having financed social funds in several dozen countries, over the past decade the World Bank and the Inter American Development Bank have asked similar questions in numerous internal

evaluations (see, for example, Marc *et. al.* 1993, and Khadiagala, 1995, Goodman *et. al.*, 1997). These studies adopted a variety of different evaluative approaches, including analyses of fund disbursement patterns, institutional inquiries of effects on governments, and sociological studies of participants' attitudes towards infrastructure changes. However, as of the mid-1990s, there was only one evaluation started based on household data, for the Bolivia social fund. To expand upon this analysis, in 1997 the World Bank initiated a multi-country analysis of social funds that, among other objectives, would use household survey data to isolate statistically significant effects of community interventions. The Social Funds 2000 study includes country analyses of Armenia (Chase, 2001), Bolivia (Newman, *et. al.*, 2000), Honduras (Walker, *et. al.*, 2000), Nicaragua (Pradhan and Rawlings, 1999), Peru (Schady and Paxson, 1999) and Zambia (Chase and Sherburne-Benz, 2001).

Using Zambian household survey data specially designed for this inquiry, this research addresses these questions of social fund effects. It is organized as follows. Section II describes the operations of the Zambia social fund, administered by the Micro Projects Unit (MPU). The next section describes data and methodology. Section IV considers the success of the social fund's self-targeting. Section V presents evidence of the differences between education and health outcomes from households in treatment and matched control communities. The next section discusses the social capital impact of community initiatives. Section VII concludes.

II. The Zambia Social Fund

Though social funds share common characteristics across countries, each government designs the fund operating in its country to fit its particular objectives and institutions. In Zambia the Micro Projects Unit (MPU) of the Ministry of Finance administers the social fund. The MPU receives funding from many sources including the Government of the Republic of Zambia, the

European Union, FINNIDA, NORAD, SIDA, and the World Bank. However, the World Bank provides the majority of its funding for community sub-projects.

In 1991, the GRZ and the World Bank launched the Social Recovery Project. With this project, they expanded the existing MPU, which had previously received only European Union funding. By supporting communities' efforts to address local issues, the project sought to ease the difficulties facing Zambia's poor during the country's economic crisis. Through their social fund experience communities would learn to work together to improve their livelihoods. The project financed small, simple and locally generated community initiatives in education, health, nutrition and economic infrastructure. After four years of operation, in 1995 the Government assessed the social fund's efforts as successful and, with World Bank financing, continued to support the MPU through a second Social Recovery Project. With objectives similar to the first project, the second aimed to assist the Government of Zambia's poverty reduction program during structural adjustment. In July 2000, the government launched the next iteration of the social fund, with an expanded set of objectives.

Although the Micro Projects Unit is part of the Ministry of Finance, it enjoys considerable autonomy of operation, being free of many of the administrative and legal requirements of typical government agencies. As a result, the MPU attracted high caliber staff and functions with speed and effectiveness. In addition to a central administrative unit, nine regional offices work directly with communities and local authorities.

While the Micro Projects Unit administers social fund resources, it funnels them to communities that identify and implement initiatives of their choosing. The MPU appraises communities of funds available to support their initiatives. The social fund circumscribes the menu of potential projects to self-target poorer communities, focusing primarily on rehabilitating primary schools and health clinics. After learning about this opportunity, communities must organize a project committee, establish a project bank account, and agree to contribute up to 20 percent of

implementation costs. The regional social fund representative works with communities to develop an infrastructure maintenance plan. The MPU disburses resources to project committees in tranches, withholding future funding if the project committee cannot demonstrate successful completion of prior stages. The community, regional social fund officers, district line ministry staff, and local government officers monitor projects.

Between the launch of the first Social Recovery Project and July 1, 2000, the social fund supported approximately 1400 community initiatives. . Seventy-six percent of these were school rehabilitations. Health projects made up 14 percent and water supply projects seven percent². This research evaluated the education and health interventions of the social fund as they account for 90 percent of the social fund's activities.

III. Data and Evaluation Methodology

The primary source of household data is the Zambia Living Conditions Monitoring Survey (LCMS). The third in a series of similar data-collection exercises in Zambia³, this comprehensive survey allows in-depth welfare analysis across the Zambian population. Among other topics, the core survey instrument probes household composition, income, expenditures, education, health, child nutrition and mortality. Conducted in the second half of 1998, its main sample of roughly 13,500 households offers information representative of the entire population and each of Zambia's districts.

The LCMS survey was modified in two ways for the impact evaluation. First, it added an extra survey module addressing issues specific to social infrastructure. This module asked households to report changes to community facilities occurring in the previous five years. Further,

² Many of the primary school rehabilitation projects included efforts to improve school water supply by digging stand-pipes, so the 7 percent of water supply projects understates the social fund's support for water provision.

³ The other nationally representative household surveys were conducted in 1991 and 1995.

it asked households to report their participation in the effort to change that infrastructure and their attitudes towards those changes.

Beyond the base sample representative of the Zambian population, the LCMS over-sampled an additional 2950 households in 99 communities where the social fund had been active. At the time of data collection, the social fund had completed projects in approximately seven percent of communities, and LCMS visited five percent of communities. Thus, the representative LCMS sample would overlap with very few social fund communities, yielding a miniscule sample of treatment households. Further, the LCMS visited 15 households in rural standard enumeration areas (SEAs) and 25 in urban SEAs. To improve the likelihood that household data would generate representative community characteristics, in these over-sampled SEAs the survey visited 30 households.

The over-sampled communities reflect the geographic and sectoral distribution of the social fund's activities. We stratified the population of all completed projects into rural and urban projects, then into each of nine regions, then into education and health projects. We drew 80 percent of the over-sampled communities from this population of completed projects. As discussed below, an alternative control group consisted of communities where the social fund had approved a project but had not yet started working on it. To create these "pipeline match" communities, we drew twenty percent of the over-sampled communities from this population.

A crucial component of the household analysis is to define appropriate community boundaries. We identify communities strictly on geography. From the above sample of active social fund projects, we locate facilities on census maps that partition the country into Standard Enumeration Areas. The Central Statistical Office functionally defines an SEA as the area that a survey enumerator can cover in a day. To obtain the over-sample of households in treatment communities, survey teams visited these SEAs where the social fund operated. In the analysis of community characteristics, we assume that SEAs correspond to communities.

Households in communities where the social fund supported initiatives constitute the treatment group for the impact evaluation. To isolate the social fund's effects, it is imperative to create an appropriate control group. As discussed extensively in the evaluation literature, households in randomly chosen communities would not be an adequate control group. Communities completing a social fund sub-project would likely have characteristics that make them unusual, such as strong social capital or better access to information about the social fund's activities.

An alternative control group consists of communities with projects approved in the social fund pipeline. These demonstrated they can complete a successful sub-project proposal but had not started the project when data was collected. The over-sampled data contains information about households in these "pipeline match" communities.

The other approach is propensity score community matching⁴. To create a control group, we first analyze the process that determines which communities can participate in the social fund. From this, we generate a propensity function, which connects community characteristics Z with the probability that a community will submit a successful social fund sub-project.

$$[1] \quad \Pr(P_j = 1|Z_j) = \Phi(Z_j \mathbf{b}), \forall j$$

where for community j the indicator variable P takes on a value of 1 if the community participated in the social fund, zero otherwise. Pooling data from the nationally representative LCMS data and the treatment over-sample, we use the estimated probit coefficients \mathbf{b} to predict the propensity score for every community in the pooled sample.

$$[2] \quad \hat{\Phi}_j = \Phi(Z_j \hat{\mathbf{b}}), \forall j$$

To create a control group with the same propensity to participate in the social fund, we match communities by propensity scores. This group results from matching to each participating

⁴ Several studies have used this approach to evaluate impact including for individual-level interventions, such as Heckman, Ichimura, Todd (1997, 1998) and Ravallion et. al. (1997). For community-level

community ($P_i = 1$) a non-participating community ($P_j = 0$) with the minimum distance in propensity score. The control group consists of communities just as likely to participate in the social fund as those in the treatment group, but did not participate. The difference between treatment and control seeks to isolate the effect of actually doing the social fund sub-project, abstracting away from the traits that determine selection into the treatment group. Appendix I presents probit estimates of coefficients used for propensity score matching.

The propensity score match technique seeks to ensure that treatment and control communities differ only in that one did the social fund and the other did not. Across groups it equalizes the distribution of participation probability. Figures I and II illustrates kernel densities of the probabilities of doing a social fund sub-project. The pre-match information in Figure I shows the different distributions of propensity scores between communities that did participate and all communities. Figure II shows post-match distributions: the close similarity between treatment and control groups indicates that the two do not differ significantly in their estimated likelihood of participating in the social fund.

The analysis of social fund impact compares mean values of the treatment group with three separate control groups: propensity score match communities, pipeline-match communities, and a representative sample of Zambian households. While the first two comparisons seek to show the impact of the social fund, including the means for the representative sample allows one to consider the effect of creating pipeline and propensity score control groups.

IV. Community Self-Targeting

The Zambia social fund relies on self-targeting and outreach activities to reach the poor. The choice of sub-projects type that the social fund can support – such as rehabilitation of primary

interventions contributing to the Social Fund 2000 study, Newman, Pradhan, Rawlings, Coa and Evia (2000) address Bolivia and Rawlings and Pradhan (1999) consider Nicaragua.

schools and health facilities -- is posited to extend automatically to relatively less affluent communities. Relatively better-off households typically go to higher quality facilities that need fewer basic improvements of the sort the social fund supports. This section presents information about whether the Zambia social fund's targeting approach allowed it to reach Zambia's absolutely and relatively poor households.

The Zambia social fund reached absolutely poor households. The absolute poverty line for Zambia is approximately KW46,000⁵, and the extreme poverty line is KW32,000.⁶ Based on these national poverty lines, Table I reports Zambia's national poverty headcount ratios to be 72 percent. Among households in areas where the social fund operated, approximately 71 percent of households are poor. Nationally, 56 percent of households are extremely poor, and 57 percent of households in social fund areas are extremely poor. While the social fund has reached the poor, this success results primarily from Zambia's high overall poverty incidence.

Rural social fund projects are targeted particularly well, for the depth and severity of poverty in these social fund areas are more acute than in Zambia's rural areas overall. Presenting Foster-Greer-Thorbecke measures of average distance from the poverty line and the average of that squared distance, Table I also includes information about the depth and severity of poverty in social fund (MPU) and nationally representative households. With the exception of urban poverty measures, households where the social fund operated had larger average poverty gaps and poverty gaps squared.

Beyond absolute poverty measures, relative welfare measures shed further light on Zambia's community self-targeting strategy. Table II presents expenditure differences for households in communities where the social fund was active compared to nationally representative

⁵ This measure includes a basic food basket to maintain nutritional requirements of an average Zambian family plus an additional 30 percent to account for basic non-food needs.

⁶ The extreme poor are those with only enough money to cover their basic food needs. Given non-food demands on their resources, these households likely do not meet their basic food needs.

households. Normalizing household expenditures by the number and age of household residents, it presents average expenditures per adult equivalent. Because of Zambia's important rural-urban differences, it stratifies the sample, with a separate partition for the capital city Lusaka.

For the targeting analysis, we compare social fund beneficiaries against a random sample of the population, designated "Non-MPU". To examine whether households in social fund communities spent different amounts, Table II compares this standard with all households in communities where the social fund was active, "All MPU". Further, it also includes the subset of those communities where the social fund completed an education project, "Education MPU" and where it completed a health project, "Health MPU". The table reports T-tests of whether earnings in social fund communities differ from the whole population to a statistically significant degree. Finally, in its upper panel it includes information about arithmetic mean values of expenditures, while its lower panel presents information about geometric means.

Overall, social fund beneficiaries spent 8 percent less than non-social fund beneficiaries. Based on differences in mean log expenditures, this result is highly significant. Rural households where the social fund operated had 12 percent lower expenditures than average Zambian rural households. In rural areas, mean expenditures were KW45,000 for the population as a whole, and KW40,000 for social fund communities. Thus outside of cities, social fund resources reached relatively less-well-off households.

However, urban social fund beneficiaries were relatively better off than average urban households revealing that urban self-targeting was less effective. While urban expenditures in Zambia averaged KW80,000, in social fund areas expenditures were KW89,000. Using log expenditures, households in urban communities where the social fund operated were 9 percent richer than most Zambian urban households. Most of this urban difference results from a particularly strong focus on wealthier communities in Lusaka. Average expenditures in Lusaka were KW94,000, while households in Lusaka's social fund areas earned KW124,000. There,

social fund households earned 22.5 percent more than average. A likely explanation is that the social fund's implementing agency was also asked to take responsibility for the Ministry of Education's mandate to refurbish virtually all of Lusaka's schools. Because these schools were not rehabilitated according to the social-fund self-targeting procedure, there was opportunity for elite capture in Lusaka's schools. Instead, older, more established schools were rehabilitated, schools unlikely to serve Lusaka's poorer, newly-settled peri-urban areas. In cities other than Lusaka, social fund resources reached households who spent amounts statistically indistinguishable from non-Lusaka urban households.

Beyond these overall rural and urban differences in social fund targeting, Table I offers evidence about the relative effectiveness of education and health social fund projects in reaching the poor. Expenditures for education sub-project beneficiaries were 9 percent lower than average non-social fund beneficiaries. Health sub-project beneficiaries spent 3 percent less than non-social fund beneficiaries.

The social fund targeted rural poor through its education projects, though it was not as effective in reaching urban poor. When we stratify the sample by rural and urban areas, we find important differences between targeting outcomes in education and health projects. In rural areas, the social fund's education projects reached communities with 30 percent lower expenditures than average Zambian rural areas. Rural self-targeting of schools reached much poorer households. By contrast, social fund schools in Lusaka were located in communities with 23 percent higher expenditures than other Lusaka households. These urban schools appear to have benefited better off areas of Lusaka. Again, this may be due in some measure to the social fund being the executing agency for the Ministry of Education's urban school rehabilitation program.

By contrast, health interventions reached urban poor with greater effectiveness than rural poor. Rural health facilities receiving social fund assistance were located where households spent

23 percent more than average Zambian rural areas. In cities social fund health assistance reached households spending 18 percent less than other urban households.

Demography might explain “regressive” rural health targeting. Outside cities, health facilities are likely located in more densely populated areas, serving as a first point of care for a broader rural catchment area. Because our definition of community was based on geographic proximity through SEAs, the immediate area near a health post excludes remote rural areas. Poverty in these remote areas is more severe, so that expenditures in the immediate area of social fund health interventions would be higher than the average for households and individuals actually using these rural health facilities.

While Table I provides evidence concerning differences in mean expenditures, concentration curves presented in Figure III illustrate relative expenditures across their distribution⁷. In general, poverty targeting is mildly progressive for Zambia’s social fund, for the overall and rural curves are slightly above the 45-degree line, particularly at lower percentiles. However, in line with the mean differences presented in Table II, urban households that received social fund assistance occupy lower percentiles than their expenditures would place them in the national distribution, suggesting mildly regressive targeting. The social fund was, however, successful at reaching the poorest of the poor with 15 percent of its resources going to households in the poorest 10% of the population and 25% of its resources going to those in the poorest 20% of the population.

⁷ The concentration curve compares the entire distribution of earnings for households in social fund communities with those from the population as a whole. The horizontal axis represents the cumulative percent of the population from poorest on the left moving to richest on the right. The vertical axis is the distribution of expenditures for those in areas where the social fund was active. The 45 degree line from bottom left to top right is a benchmark for equal access to social fund resources across the entire income distribution. For example, it represents that at the 10th percentile of the social fund distribution, household expenditures are equal to those of the 10th percentile in the entire population’s distribution. At a given expenditure level, the concentration curve plots the percentile of the entire population below that level against the percentile of the social fund distribution below it. When the concentration curve lies above the 45-degree line, it shows that, for example, an expenditure level that would place a household in

V. Household Education and Health Outcomes

Using evidence from household-level data and evaluation approaches described in Section III above, this section summarizes how the Zambia social fund’s support of education and health rehabilitations impacted household behavior and outcomes.

Did improved community education facilities translate into identifiable household changes? Table III summarizes these findings, considering five variables constructed from the LCMS survey data. For each household, “Attendance” records the percentage of children between the ages of 7 and 12 in school. As a longer-term indicator of whether the household kept their children progressing in school, “Attendance in grade” measures the percentage of school-age children in the household whose age is within one year of the appropriate age for their reported grade. As an indicator of how much the household spends on education, “Education Shares” is the share of total expenditures the household allocated to education. “Expenditure” measures expenditures, normalized for the household’s size and age composition. “Expenditure (Affected)” indicates the expenditures of those households with primary-school-age children.

For each variable there are four columns of statistics. The “Treatment” column reports the mean value for households in communities where the social fund rehabilitated a school. As outlined in the methodology section above, these households are compared with households in matched communities that did not implement a social fund sub-project, though had the same propensity to do so as one of the social fund sampled communities. Statistics for these communities are reported in the “Propensity Match” column, along with t-tests for statistically significant differences between treatment and control. The second comparison is with “Pipeline Match” communities that successfully applied for social fund support, though their sub-projects had not yet begun at the time of the survey. Finally, as a measure of the differences between matched

the 10th percentile nationally that would place a household with in the 15th percentile within the social

evaluation techniques and a simple comparison of randomly chosen households, the final column includes means for the entire LCMS sample.

Social fund school rehabilitations increase education demand. In urban communities where the social fund rehabilitated schools, children are more likely to attend school. In treatment communities 86 percent of children were in school, compared to 82 percent in communities that did not participate in the program but had equal propensity and 78 percent in communities that had a project approved but had not yet rehabilitated their school. The enrollment effect is limited to urban areas: in rural areas, 70 percent of children attended school in social fund areas, a rate not statistically different from control communities.

There is some evidence that social fund school rehabilitations increase the proportion of children attending their appropriate grade, particularly in rural areas. In social fund communities, 30 percent of children are in grades appropriate to their age. This differs robustly from 23 percent in rural communities about to start a social fund rehabilitation and weakly from the 26 percent in matched communities.

Evidence in Table III also suggests that social fund households spend a greater proportion of their expenditures on education. In social fund communities, households spent an average of 4.6 percent of their earnings on education, which differs from 3.9 percent in match communities and 2.4 percent in pipeline communities. Increased education spending likely reflects that parent teacher associations of rehabilitated schools increase their school dues. Some might question whether having households pay more for education is a welfare improvement. Bringing together this information with increasing attendance, it appears that social fund interventions help satisfy unmet demand among Zambian households for improved education services.

Household data also offer an opportunity to investigate the health effects of social fund-supported efforts to rehabilitate health posts. Table IV presents evidence concerning health output

fund distribution. Concentration curves above the 45 degree line suggest progressive targeting.

variables. Like Table III, it compares households in the “Treatment” group, with both “Propensity Match” and “Pipeline Match”, and “Non-matched” households.

Overall, in communities where the social fund supported a health project, households were more likely to report that someone had been sick in the past two weeks. In the treatment group, 49 percent of households reported sickness, which differs significantly from the 41 percent rate in the two control groups. This is consistent with much of the developing country health economics literature. Health interventions increase awareness of health issues, so that people more frequently report themselves sick when they have minor maladies that previously they would not have considered worthy of mention. It may also reflect that social fund health interventions have reached areas with higher rates of sickness.

However, among those in social fund areas reporting someone sick, fewer respondents reported the specific illness of diarrhea, nor were they as likely to seek treatment. Compared to 14 percent in the two control groups, 8.6 percent of households reporting sickness had cases of diarrhea, a significantly lower incidence. Considering the proportion of households reporting sickness, 38 percent of social fund households sought treatment, versus 49 percent for both control groups.

This evidence creates a confusing impression. Social fund households were more likely to say someone was sick, though those reporting sickness did not have as much diarrhea nor seek treatment as often. However, when one considers the incidence of diarrhea or likelihood of seeking treatment among all households, not conditioning on reporting sickness, there is no significant difference between social fund households and control groups. This suggests that the social fund intervention had no effect on the actual level of sickness in communities, though it did increase community awareness of health issues.

While social fund households seek treatment no more or less than their comparators, when they do, they are more likely to go to health posts and less likely to go to hospitals. Where the

social fund rehabilitated a health post, 72 percent of those who sought treatment went to a health center, compared with only 60 percent and 57 percent in the propensity and pipeline match communities, respectively. This treatment group went to the hospital 31 percent of the time, versus 46 percent and 45 percent for control groups.

Often in the Zambian health system, people by-pass local health posts, for they are seen to offer no effective treatment. Hospitals see patients whose treatment could be handled more efficiently at less sophisticated centers or those whose health status is already so dire that the hospital can do little. In this context, it is encouraging to see that social fund health interventions encourage patients to seek treatment first from health posts.

Social fund interventions also may affect child health variables. Table V presents evidence on differences in vaccinations and child-anthropometry for treatment and control groups. Rehabilitating health posts with social fund support increases the incidence of some types of childhood vaccinations. For example, in treatment communities Diphtheria vaccinations per child increased to 2.99 from 2.67 and 2.76 in control communities. There is limited evidence of increased BCG and polio vaccinations.

VI. Community Participation Effects

The above analysis suggests social fund interventions increased demand for primary education and some health services. Beyond these effects, however, social funds are reputed to benefit communities in ways external to household impacts. Social fund school and health post interventions require substantial community involvement. In the Zambia social recovery project, communities are actively involved in soliciting the social fund for resources to finance the community investment of their choice and contribute up to 25 percent of the project cost, usually in the form of donated labor or raw materials. This demand driven nature of social funds and the level of participation potentially affects social capital. It helps to ensure that projects meet

community needs. It could improve the ownership the community feels for the facility, increasing the likelihood that communities maintain it. Further, if the social fund demonstrates to community members that they can work together to improve community conditions, it might encourage them to undertake other initiatives.

This section offers evidence on several of these social capital effects. Surveys asked households to report changes to community infrastructure in the past five years and their involvement in those changes. One interesting and fortuitous result of these questions is that 30 percent of households outside of social fund communities reported that a school had recently-been refurbished in their community. As a result, we can analyze the impact on community participation when the social fund supported school rehabilitations compared to similar projects completed by other means. Further, the data on recent infrastructure changes gives evidence concerning whether social fund support for an education or health rehabilitation encourages or discourages other community initiatives.

Table VI compares responses between households in areas where the social fund was active and those control households living in communities with equal propensity to get social fund support, but have not received it. Households in social fund areas were more likely to report school rehabilitation than in control households: in treatment areas, 60 percent of households said a school had recently been rehabilitated, compared with 43 percent in control areas. This difference is not surprising given that the treatment group contains households in communities selected because the social fund completed a sub-project there and the control group contains communities that had not received social fund support, so they may or may not have rehabilitated their school.

In communities where the social fund rehabilitated schools, a fairly low percentage of households (60 percent) reported knowing of such change to their community infrastructure. Several factors could account for this. The social fund might not be particularly effective in spreading information about its activities. Further, in the entire population 45 percent of

households have no primary school age children. Absent children using facilities, households might not pay particular attention to primary school rehabilitations.

Table VI also indicates that many communities rehabilitated schools without social fund support. In communities where the social fund was not active, school rehabilitations were fairly prevalent, with 42 percent reporting such innovations. Control households in urban areas report more rehabilitations than in rural areas. However, non-social fund support for school upgrades could also be more prevalent in urban areas.

For those households reporting recent school rehabilitation, Table VI summarizes responses about household involvement in the sub-project and evaluations of how that sub-project affected them. Urban households were less involved in social fund-supported school rehabilitations than in similar projects carried out by other means. While only 19 percent said they helped decide what activity the social fund carried out, when school rehabilitations took place with alternative funding, 25 percent of households were involved in the decision. Similarly, 23 percent of households provided inputs to the school rehabilitation when supported by the social fund compared to 39 percent of households under comparator projects.

This evidence suggests that in urban areas, the social fund did not encourage community participation as much as alternative means of rehabilitating schools. This may have been in part, or largely, due to the social fund's implementation of the Zambia Education Reform Project, where the Ministry of Education chose schools to rehabilitate rather than allowing communities to come forward with proposed projects. In rural Zambia, social fund interventions appeared to involve the community more than comparators, though not to a statistically significant degree.

The survey also included information about households' subjective evaluations of school rehabilitations. For example, 68 percent of households in social fund areas aware of the sub-project said it improved service "some" or "a great deal", a significantly higher proportion than for

comparator projects. The improvement in service was particularly large in rural areas and significantly larger than in comparator rural areas.

With respect to income and employment very few households felt that the social fund school rehabilitation raised their income (8 percent) or increased employment (5 percent) though alternative approaches seemed to have more marked income and employment effects in urban areas. Difference in the income and employment effects of social fund school rehabilitations likely reflects that the social fund required community contributions to help rehabilitate the school. If other means of rehabilitating the school hired contractors, some local households whose members were hired to work for those contractors would enjoy higher income and employment.

The survey also asked for respondent's subjective opinion of how the change in community infrastructure affected how the community operated. The term "kugwilizana" connotes the degree of community cohesion, one dimension of social capital. Households were asked whether the school rehabilitation increased *kugwilizana*. Social fund-supported sub-projects affected this social capital in different ways in urban and rural areas. In rural areas, social fund efforts appeared to increase social capital to a greater degree than comparators. While 44 percent of households in control communities said the school rehabilitation increased *kugwilizana* some or a great deal, 60 percent of households in social fund communities felt this improvement in social capital. In urban areas, the social fund was less effective than comparators in pulling the community together. Only 25 percent of households felt the urban social fund projects increased social capital, a proportion significantly less than for comparator projects.

The above evidence on community participation suggests significant differences between the social capital effects of the social fund in treatment and control communities. Further, it indicates large differences in social fund effects in urban and rural areas. Compared with other approaches to rehabilitating schools, social fund sub-projects in urban areas involved households less in the decision of what to do, used their inputs less, and had smaller impacts on community

togetherness. By contrast, evidence suggests that rural social fund sub-projects were more effective in bringing the community together and reducing household worries than alternative approaches to rehabilitating schools.

Social funds aim to build social capital by demonstrating that communities can address pressing needs by organizing themselves. One indicator of this augmented social capital is community willingness to take other initiatives if they successfully completed a first community project. The enthusiasm generated from bringing the community together could carry over into efforts to take some other community initiative. The household surveys offer opportunities to test whether the social fund spurs communities to undertake new initiatives.

Tables VII and VIII present that evidence on social capital accumulation in communities that received social fund support to rehabilitate schools and health posts, respectively. They present data on the likelihood that social fund communities will undertake infrastructure initiatives beyond that which the social fund financed. The table also presents how likely were alternative projects in communities that did not get social fund support. Table VII shows the percentage of households reporting that their community also recently built a new school or health post or rehabilitated a health post. The first column reports the likelihood of other initiatives where the social fund had rehabilitated a school. To provide context about the overall prevalence of these types of infrastructure projects, the second column presents the proportion of households reporting that such projects had taken place in match communities that did not get social fund support. The third column offers a direct comparison of the social funds community empowerment between social fund and non-social fund match communities. It considers only those households in match communities that reported recent school rehabilitation and indicates the prevalence of alternative projects.

Supporting earlier evidence about differences between the social fund's community impact on rural and urban areas, these data suggest that the social fund encouraged rural communities to

take new initiatives though was less successful in empowering urban communities. When an urban community rehabilitated a school with social fund support, 27 percent also rehabilitated a health post. Within non-social fund match communities, a significantly higher proportion of households (37 percent) also rehabilitated a health post. Comparing households in urban match communities that rehabilitated schools without social fund support, those direct comparators were significantly more likely to rehabilitate health posts: 50 percent of households reported this type of project above and beyond the school rehabilitation. From Table VIII, when an urban community rehabilitated a health post with social fund support, they also rehabilitated a school 39 percent of the time. This is significantly less likely than when equivalent communities rehabilitated health posts without social fund support, where the likelihood of also rehabilitating a school is 71 percent. From this evidence, urban social fund communities are less likely to undertake new projects than when equivalent projects are undertaken by other means.

Social fund efforts in rural areas appeared to be more successful in encouraging communities to take additional infrastructure initiatives. In rural social fund communities that rehabilitated their school, 12 percent also built a new health post, making such additional efforts significantly more likely than when communities rehabilitated schools through non-social fund initiatives. When rural communities received social fund support to rehabilitate health posts, 41 percent also built new schools, significantly more than the 12 percent that also built new schools in equivalent non-social fund communities. However, these accumulations of rural social capital are not uniform. Tables VII and VIII also show that communities are less likely to rehabilitate a school when they have already upgraded a health post with social fund support and less likely to rehabilitate a health post when the social fund helped upgrade a school.

VII. Conclusions

This study presents an in-depth analysis of the Zambia social fund's household impact. It considers the effectiveness of these initiatives in self-targeting poorer communities, increasing household demand for primary and education services, and strengthening community inclinations to work collectively to address pressing development issues. Using household data, it addressed these issues using the three evaluative approaches of propensity score community matching, pipeline matching and with/without comparisons.

Despite no effort to focus social fund resources on poorer communities, in rural areas the Zambia social fund operated where households had lower earnings. However, in urban areas, households in social fund communities were better off than urban households overall. This is only true, however, in the capital city of Lusaka. The social fund rehabilitated nearly every school in Lusaka. With respect to the rest of Zambia, Lusaka is relatively wealthy. Given the social fund's implementation of the Ministry's rehabilitations in Lusaka for the education reform program, this may account for much of the difference. In addition more generally, because communities must first learn that the social fund exists, it is possible that this information is also more available in the capital city. With an effective public awareness program, information about the social fund could improve targeting to poorer rural and urban communities. The social fund improved the quality of community education and health facilities. As a result, communities that received social fund support increased demand for primary education and some health services. Households where the social fund operated were more likely to enroll their children in primary school and spent a larger percentage of their earnings on education. When the social fund improved primary health centers, households were more likely to attend these health providers rather than going directly to hospitals.

Finally, the study demonstrated that the Zambia social fund had important impact on social capital, working in rural areas to bring communities together. In rural households where the social fund operated, households were more likely to have participated in the project. Subjective

measures of community togetherness increased. Further, those communities were more likely to undertake other initiatives. While the social fund sub-projects were comparatively effective in building social capital in rural areas, in urban areas, they did not appear as effective. Compared to other means of undertaking rehabilitation, in cities the fund did not involve community members in decision-making or implementation as frequently nor was it as effective at spurring the community to undertake other initiatives.

While there are several opportunities to deepen and expand this analysis of Zambia's social fund, these findings suggest that support for community initiatives has significant effects. As a means of reaching poorer communities, meeting unmet demand for primary education and health services, and building social capital, the social fund approach appears particularly effective in rural areas. However, in cities, when compared to alternatives, the fund's impact is less positive, meriting a close examination of how to improve urban operations.

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Figure I: Pre-Match Kernel Densities of Participation Propensity

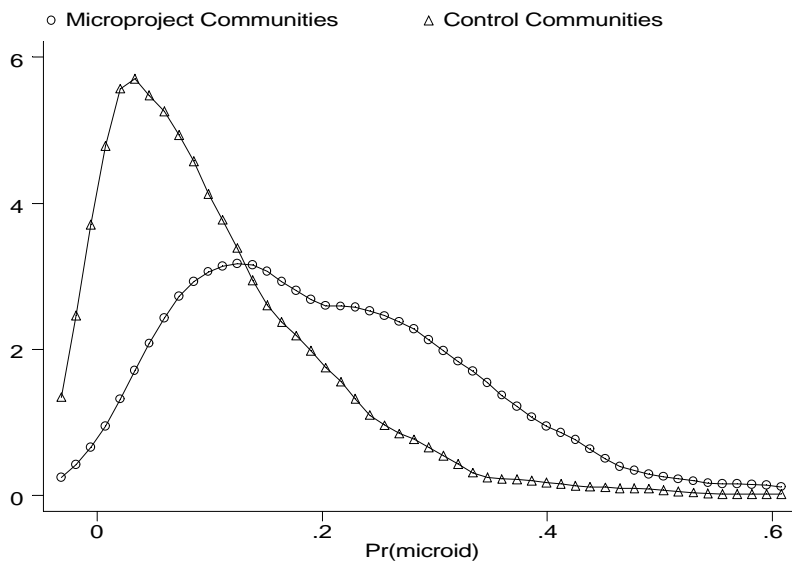


Figure II: Post-Match Kernel Densities of Participation Propensity

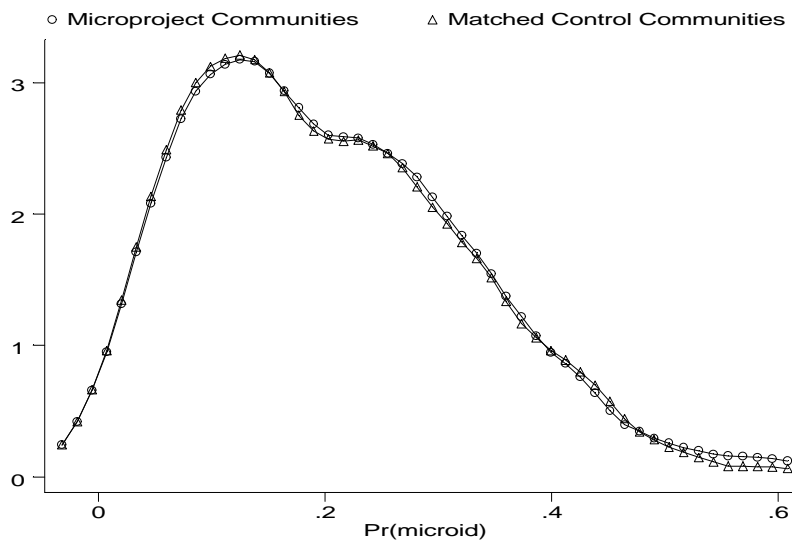


Figure III: Social Fund Targeting
Concentration Curves

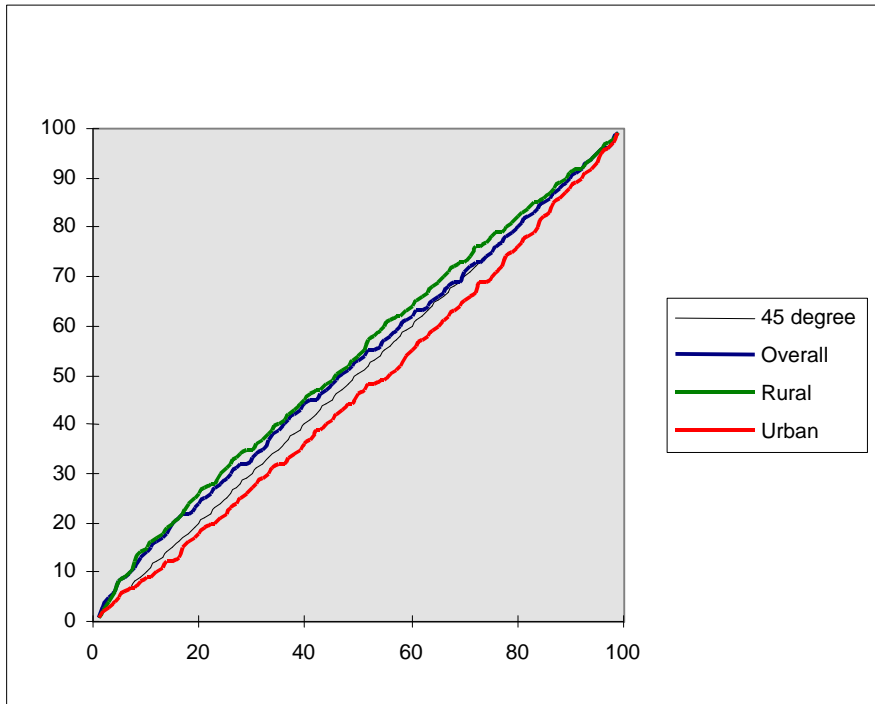


Table I: Effectiveness of Community Self-Targeting: Absolute Poverty

Headcount Ratios, Poverty Gap and Poverty Severity Measures using Per Adult Equivalent Expenditures, by Area

	Total		Rural		Urban	
	MPU	Non-MPU	MPU	Non-MPU	MPU	Non-MPU
Poverty Line: K46,286						
+ Headcount (%)	70.5	71.5	83.8	81.7	51.3	54.1
+ Poverty Gap Index	40.5	38.1	53.4	47.3	22.1	22.5
+ Squared Poverty Gap Index	28.3	24.9	39.3	32.3	12.6	12.4
Extreme Poverty Line: K32,232						
+ Headcount (%)	56.7	55.6	73	67.8	33.3	34.6
+ Poverty Gap Index	30.3	26.8	42.3	35	22.1	12.8
+ Squared Poverty Gap Index	20.3	16.4	29.6	22.1	12.6	6.6
N	3,185	13,484	1,816	6,641	1,369	6,843

Table II: Effectiveness of Community Self-Targeting: Relative Poverty

Mean Expenditures per Adult Equivalent Between Households in MPU and Non-MPU Communities

	Non-MPU	All MPU		Education MPU		Health MPU	
			T-stat		T-stat		T-stat
Expenditures (Per Adult Equiv.)	62,360	61,307	0.38	61,251	0.30	59,096	0.42
+ Rural	44,662	40,073	1.48	29,954	3.56 **	51,603	0.84
+ Urban	79,681	88,669	1.88 *	93,791	2.38 **	72,270	0.50
- Lusaka	93,540	124,107	4.28 **	125,286	3.91 **	-.	-.
- Urban Non-Lusaka	75,311	68,018	1.18	72,400	0.37	-.	-.
Log Expenditures (Per Adult Equiv.)	10.47	-8.1%	3.71 **	-9.0%	3.22 **	-3.1%	0.52
+ Rural	10.08	-11.9%	3.96 **	-29.5%	7.38 **	23.0%	3.01 **
+ Urban	10.85	8.9%	3.28 **	14.6%	4.43 **	-18.4%	2.26 **
- Lusaka	11.07	22.5%	5.25 **	23.4%	4.70 **	-.	-.
- Urban Non-Lusaka	10.78	-5.0%	1.48	0.6%	0.15	-.	-.

** denotes difference significant at 5%, * denotes difference significant at 10%

Table III: Impacts on Education Outputs

Differences in Means Between Households in Treatment and Control Communities

	Treatment	Propensity Match Control T-stat	Pipeline Match Control T-stat	Non - Matched T-Stat
Attendance	78%	75% 1.40	71% 2.68 **	71% 4.93 **
+ Urban	86%	82% 1.68 *	78% 1.80 *	82% 2.39 **
+ Rural	70%	67% 1.32	69% 0.27	59% 5.16 **
Attendance in grade	37%	35% 1.24	25% 3.86 **	33% 2.75 **
+ Urban	44%	40% 1.07	33% 1.69 *	39% 1.88 *
+ Rural	30%	26% 1.52	23% 1.91 *	24% 2.98 **
Education Shares	4.6%	3.9% 2.13 **	3.4% 2.43	4.1% 2.07 **
+ Urban	5.1%	4.5% 1.52	3.7% 1.66 *	5.0% 0.28
+ Rural	4.1%	3.2% 1.87 *	3.3% 1.19	3.0% 2.70
Expenditure (log PAE)	10.38	10.45 2.12 **	10.18 3.30 **	10.47 3.22 **
+ Urban	10.99	10.79 5.01 **	10.79 2.03 **	10.85 4.43 **
+ Rural	9.78	10.07 5.49 **	10.06 4.17 **	10.08 7.38 **
Expenditure (Affected)	10.20	10.27 1.72 *	10.09 1.38	10.29 2.76 **
+ Urban	10.77	10.57 4.15 **	10.70 0.68	10.65 2.95 **
+ Rural	9.63	9.89 3.93 **	9.94 3.45 **	9.897 5.21 **

** denotes difference significant at 5%, * denotes difference significant at 10%

Table IV: Impacts on Health Outputs

Differences in Means Between Households in Treatment and Control Communities

Variable	Treatment	Propensity Match		Pipeline Match		Non-Matched	
		Control	T-stat	Control	T-stat	T-Stat	
HH member sick	49%	41%	2.87 **	41%	2.63 **	41%	2.77 **
+ Urban	44%	39%	1.04	37%	1.49	38%	1.40
+ Rural	52%	42%	2.54 **	43%	2.15 **	45%	1.95 **
Diarrhea (if sick)	8.6%	14%	1.80 *	14%	1.63 *	14%	1.85 *
+ Urban	7.5%	16%	1.55	12%	0.82	15%	1.44
+ Rural	9.2%	12%	0.81	15%	1.42	13%	1.15
Diarrhea (all households)	4.2%	5.6%	1.01	5.5%	0.92	5.6%	1.10
+ Urban	3.3%	6.1%	1.22	4.2%	0.43	5.5%	1.04
+ Rural	4.7%	5.0%	0.16	6.3%	0.83	5.8%	0.64
Treatment (if sick)	38%	49%	2.64 **	49%	2.33 **	46%	2.09 **
+ Urban	51%	53%	0.25	58%	0.83	54%	0.39
+ Rural	31%	46%	2.61 **	44%	2.28 **	40%	1.73
Treatment (all households)	18%	20%	0.62	20%	0.55	19%	0.29
+ Urban	23%	21%	0.47	21%	0.33	20%	0.60
+ Rural	16%	19%	0.98	19%	0.96	18%	0.64
Went to hospital (if treated)	31%	46%	2.29 **	45%	1.95 **	37%	0.97
+ Urban	48%	55%	0.65	64%	1.47	46%	0.18
+ Rural	16%	36%	2.24 **	32%	1.80 *	25%	1.24
Went to health center (if treated)	72%	60%	1.66 *	57%	2.02 **	66%	0.88
+ Urban	59%	51%	0.77	41%	1.60	59%	0.06
+ Rural	82%	72%	1.17	67%	1.67 *	75%	0.89
Went to hospital (all hhds)	5.4%	9.1%	2.21 **	8.6%	1.83 *	6.7%	0.88
+ Urban	10.8%	11.2%	0.12	13.2%	0.68	9.0%	0.69
+ Rural	2.4%	6.7%	2.42 **	5.8%	1.99 **	4.2%	1.34
Went to health center (all hhs)	13%	11%	1.04	11%	1.17	12%	0.48
+ Urban	13%	10%	1.24	8%	1.79 *	11%	0.66
+ Rural	13%	13%	0.11	12%	0.20	13%	0.02
Health Expenditures (Log)	3.08	2.97	0.46	2.88	0.81	3.12	0.21
+ Urban	3.81	3.66	0.38	4.49	1.54	3.64	0.44
+ Rural	2.66	2.18	1.82 *	1.92	2.66 **	2.60	0.24
Health Share of Expenditure	0.94	1.26	1.42	1.26	1.40	1.40	1.96 **
+ Urban	1.33	1.54	0.52	1.65	0.81	1.54	0.56
+ Rural	0.72	0.93	0.87	1.03	1.12	1.25	1.79

** denotes difference significant at 5%, * denotes difference significant at 10%

Table V: Impacts on Child Health Outputs

Differences in Means Between Households in Treatment and Control Communities

Variable	Treatment	Propensity Match		Pipeline Match		Non-Matched	
		Control	T-stat	Control	T-stat	T-stat	
BCG Vaccinations/Child	1.07	1.05	0.46	1.02	1.90 *	1.05	0.60
+ Urban	1.08	1.08	0.09	1.04	0.86	1.07	0.09
+ Rural	1.06	1.01	1.32	1.01	1.78 *	1.02	0.99
DPT Vaccinations/Child	2.99	2.67	3.49 **	2.76	2.56 **	2.66	3.74 **
+ Urban	3.34	2.76	3.85 **	2.67	4.45 **	2.80	3.79 **
+ Rural	2.81	2.56	2.18 **	2.81	0.04	2.51	2.68 **
Polio Vaccinations/Child	2.97	2.87	1.16	2.91	0.64	2.78	2.21 **
+ Urban	3.19	3.01	1.18	2.93	1.71 *	2.91	1.94 **
+ Rural	2.87	2.69	1.67 *	2.90	0.33	2.64	2.14 **
Measles Vaccinations/Child	0.93	1.00	1.48	0.97	0.97	0.97	1.00
+ Urban	1.01	1.04	0.39	0.98	0.32	1.01	0.10
+ Rural	0.89	0.95	0.99	0.97	1.30	0.93	0.72

** denotes difference significant at 5%, * denotes difference significant at 10%

Table VI: Education Participation Variables

Differences in Means Between Households in Treatment and Control Communities

	Treatment	Propensity Match	
		Control	T-stat
Prevalence of Educ. Rehab.	60%	43%	10.06 **
+ Urban	62%	48%	6.19 **
+ Rural	58%	38%	8.39 **
Helped Decide?	28%	29%	0.16
+ Urban	19%	25%	2.53 **
+ Rural	38%	34%	1.36
Add Inputs?	44%	48%	1.16
+ Urban	23%	39%	3.98 **
+ Rural	64%	57%	1.60
Save Time?	43%	48%	1.91 *
+ Urban	35%	47%	3.36 **
+ Rural	52%	51%	0.26
Reduce Costs?	31%	30%	0.15
+ Urban	27%	31%	0.97
+ Rural	34%	30%	1.10
Improve Service?	68%	57%	4.49 **
+ Urban	65%	61%	1.42
+ Rural	71%	51%	5.25 **
Raise Income?	8%	15%	3.89 **
+ Urban	7%	16%	4.25 **
+ Rural	10%	12%	1.06
Bring Community Together?	42%	44%	0.72
+ Urban	25%	44%	5.71 **
+ Rural	60%	44%	3.99 **
Increase Employment?	5%	14%	5.73 **
+ Urban	4%	18%	6.46 **
+ Rural	7%	8%	0.82

** denotes difference significant at 5%, * denotes difference significant at 10%

Table VII: Likelihood of Undertaking Additional Infrastructure Projects Among Households that Reported Rehabilitated Schools

Differences in Means Between Households in Treatment and Control Communities

Additional Activities	Communities where MPU supported school rehab.	All Non-MPU Match Communities		Non-MPU Match Communities that did school rehab	
		Control	T-stat	Control	T-stat
Build New School	16%	18%	1.29	19%	1.60
+ Urban	13%	22%	4.94 **	25%	5.74 **
+ Rural	20%	14%	3.27 **	10%	4.03 **
Build New Health Post	9%	6%	4.09 **	7%	1.53
+ Urban	7%	5%	1.43	8%	1.08
+ Rural	12%	6%	3.96 **	6%	2.92 **
Rehabilitate Health Post	23%	25%	1.06	40%	8.66 **
+ Urban	27%	34%	3.13 **	50%	8.60 **
+ Rural	20%	14%	2.91 **	25%	1.98 **

** denotes difference significant at 5%, * denotes difference significant at 10%

Table VIII: Likelihood of Undertaking Additional Infrastructure Projects Among Households that Reported Rehabilitated Health Posts

Differences in Means Between Households in Treatment and Control Communities

Additional Activities	Communities where MPU supported health rehab.	All Non-MPU Match Communities		Non-MPU Match Communities that did health rehab	
		Control	T-stat	Control	T-stat
Build New School	27%	18%	3.59 **	30%	1.18
+ Urban	1%	22%	5.51 **	37%	8.20 **
+ Rural	41%	14%	9.28 **	12%	5.99 **
Rehabilitate School	42%	43%	0.42	69%	8.02 **
+ Urban	39%	48%	1.81 *	71%	6.43 **
+ Rural	44%	38%	1.54	65%	3.95 **
Build New Health Post	18%	6%	7.63 **	7%	4.43 **
+ Urban	0%	5%	2.57 **	10%	3.68 **
+ Rural	27%	6%	9.42 **	0%	6.92 **

Appendix: Community Propensity Function Parameter Estimates

Probit on Community Participation in Zambia Social Fund

Community Variable	Coefficient	Z-stat
Mean Education of Heads of Household	0.095	1.28
Mean Education of Spouses	-0.089	-1.11
Percentage of Female Headship	0.56	1.02
Mean Share of Expenditures on Food	0.018	2.32 **
Mean Household Expenditure Levels	0.000	0.37
Percentage Who Have Heard of MPU	0.011	4.68 **
Mean Distance to Primary School	-0.17	-2.73 **
Std. Dev. of Distance to Primary School	0.061	1.41
Mean Distance to Transport	-0.012	-1.39
Mean Distance to Health Facility	-0.001	-0.11
Province Indicators (versus Lusaka)		
Central Province	0.39	0.93
Copperbelt Province	-0.78	-1.35
Eastern Province	0.11	0.27
Luapula Province	0.36	0.86
Northern Province	-0.17	-0.41
Northwestern Province	0.024	0.06
Southern Province	0.26	0.66
Western Province	0.35	0.83
Urban Areas	0.41	1.01
Urban x Central Province	-1.09	-1.84 *
Urban x Copperbelt Province	0.34	0.54
Urban x Eastern Province	-0.47	-0.81
Urban x Luapula Province	-0.028	-0.05
Urban x Northern Province	-0.53	-0.87
Urban x Northwestern Province	-0.24	-0.37
Urban x Southern Province	-0.57	-1.12
Urban x Western Province	-1.22	-1.86 *
Constant	-3.1	-3.56 **
Log-Likelihood	74.6	
N	807	

** denotes significant at 5%, * denotes significant at 10%