

# **Household Effects of Community Education and Health Initiatives:**

## ***Evaluating the Impact of the Zambia Social Fund***

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# **Household Effects of Community Education and Health Initiatives: Evaluating the Impact of the Zambia Social Fund**

## **Abstract**

The Zambia social fund provides financial support to communities' education and health initiatives. Consistent with an approach which the World Bank supports in more than 50 countries, in Zambia the Micro Projects Unit encourages communities to organize projects that rehabilitate primary schools and health clinics, financing 80% of initiatives that communities design and implement. As part of a multi-country inquiry, this study considers the household impact of the Zambia MPU's activities. To collect appropriate data, we augmented a nationally representative household survey, oversampling 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. 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 is to build partnerships between governments, lending institutions and civil society. Through lending instruments called social funds, multilateral development institutions have for the last decade sought to create such partnerships. Social funds are currently active in 57 countries, mostly in Latin America and Africa.

With support from international donors, governments administer social funds, which in turn provide resources directly to communities, devolving to those communities responsibility for choosing, designing and implementing projects. Community participation helps ensure that

initiatives address community needs and that it feels ownership of the result. To control the scope of local initiatives, social funds establish menus of projects from which communities choose. 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.

Several questions arise about social funds, particularly if they indicate an important new current in development assistance. Restricting projects to those likely relevant only to poorer communities, social funds seek to encourage these communities to reveal themselves as poor and to avoid “elite capture.” Do social funds resources reach less well off members of society? If inadequate school buildings and health posts are detrimental to the poor, presumably the harm results from decreased demand for education and health services. When 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. 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 have 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, only one evaluation based on household data had been done, 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, Mehra, and Sherburnebenz, 2000), Bolivia (Newman, et. al, 2000), Honduras, Nicaragua (Pradhan and Rawlings, 1999), Peru (Schady and Paxson, 1999) and Zambia (Chase and Sherburnebenz, 2000). Building upon the Zambia analysis presented to the World Bank, this paper presents the first household level findings of the effects of an African social fund.

Using Zambian household survey data specially designed for this inquiry, this paper will address these questions of social fund effects. It is organized as follows. Section II describes the operations of the Zambia social fund, which is administered by the Micro Projects Unit (MPU). The next section describes the data and methodology used in this study. Section IV considers the degree to which communities that implemented a social fund sub-project are less well-off than average Zambian communities. 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 impact of social fund initiatives on the likelihood that communities will take other community infrastructure activities. 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 SRP sought to ease the difficulties facing Zambia's poor during the country's economic crisis. According to the project

approach, through their experience, communities would learn to work as a group 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.

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 has 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 tells communities of available funds that they can use to support their initiatives. The social fund circumscribed the menu of potential projects to self-target poorer communities, funding efforts to rehabilitate 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% of implementation costs. After the first Social Recovery Project, the MPU 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, line ministry staff at the district level and local government officers keep track of the projects.

Between the launch of the first Social Recovery Project and July 1, 2000, the social fund supported approximately 1400 community initiatives. The World Bank provided \$45 million to

communities, plus substantial support to the MPU administration. Seventy-six percent supported education rehabilitations. Health projects made up 14 percent and water supply projects seven percent<sup>1</sup>. Because they account for 90% of the project activities, we consider the impact of the Zambia social fund's support for community interventions to improve education and health infrastructure.

### ***III. Data and Evaluation Methodology***

The primary source for household data is the Zambia Living Conditions Monitoring Survey (LCMS). The third in a series of similar data-collection exercises in Zambia, 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 core sample of roughly 13,500 households offers information representative of the entire population and each of Zambia's 56 districts.

For the impact evaluation we modified the LCMS survey in two ways. First, we added an extra survey module addressing issues specific to social infrastructure. This module asked households to report changes to community infrastructure that had taken place in the previous five years. Further, it asked households to report their participation in the effort to change that infrastructure and their attitudes towards those changes.

Second, beyond the base sample representative of the Zambian population, the LCMS oversampled an additional 2950 households in 99 communities where the social fund had been active. The social fund had completed projects in approximately seven percent of communities. LCMS would visit five percent of communities. Thus, the representative LCMS sample would

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<sup>1</sup> 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.

overlap with very few social fund communities, yielding an unusably small sample of social fund communities. Further, in each community or Standard Enumeration Areas (SEA), the LCMS normally visited 15 households in rural 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. Eighty percent of the over-sampled communities were drawn 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 oversampled communities from the population of approved but not yet started projects.

A crucial component of the household analysis is to define appropriate communities. We identify communities based strictly on geography. From the above sample of projects where the social fund was active, we locate these facilities on census maps that partition the country in Standard Enumeration Areas (SEA). The Central Statistical Office functionally defines an SEA as the area that a survey enumerator can cover in a day. To obtain the oversample 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.

The LCMS over-sampled communities where the social fund had supported community initiatives to improve education and health infrastructure. These households make up the treatment group for the impact evaluation. To isolate the social fund's effects, it is imperative to create an appropriate control group. Households in randomly chosen communities would not be an adequate control group, because 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 in the social fund project pipeline. These communities demonstrated they can organize themselves to complete a successful sub-project proposal, but have not yet started the project. The over-sampled data contains information about households in these "pipeline match" communities.

The other approach is propensity score community matching<sup>2</sup>. 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.

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

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" oversample, we use the estimated probit coefficients  $\delta$  to predict the propensity score for every community in pooled sample.

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

To create a control group that has the same propensity to participate in the social fund, we match communities by propensity scores. This group results from matching to each participating community ( $P_i = 1$ ) a non participating community ( $P_j = 0$ ) that has the minimum distance in propensity score. The control group consists of communities just as likely to participate in the social fund as the treatment group, but did not. The difference between treatment and control

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<sup>2</sup> Several studies have used this approach to evaluate impact including for individual-level interventions Heckman, Ichimura, Todd (1997, 1998) and Ravallion et. al. (1997). For community-level interventions contributing to the Social Fund 2000 study, Newman, Pradhan, Rawlings, Coa and Evia (2000) address Bolivia and Rawlings and Pradhan (1999) consider Nicaragua.

isolates the effect of actually doing the social fund sub-project, abstracting away from the traits that determine selection into the treatment group.

Apart from enabling us to create a matched control set, the propensity function itself includes information useful to understanding the social fund's operation. The estimates of the propensity function indicate which characteristics significantly increase the probability that a community will successfully complete a social fund sub-project. Table I presents estimates of the community propensity function for the Zambia social fund.

One of the factors with the largest effect on the probability that a community will participate is the percentage of people in the community that have heard of the Micro-Projects Unit (social fund). From the statistically significant positive coefficient on this variable, we learn that the more people in the community that know of the social fund, the more likely they are to participate. This suggests that community outreach and marketing are essential for involving communities. Other significant variables in the propensity function include the negative significant coefficient on the mean distance to the primary school. If the community is closely clustered around the school, they are more likely to do a sub-project, a finding not surprising given the high proportion of primary schools financed by the Zambia social fund. There is also a positive coefficient on the mean share of household expenditures on food, which is a proxy for poverty. Communities where households spend more of their income on food are also more likely to participate in the social fund.

Beyond the distance to facilities variables, Table I also includes geographic indicators, only a few of which are statistically significant. It is worth noting that none of the coefficients on these geographic variables in rural areas is significant: if in rural Zambia, the likelihood that a community will participate in the social fund depends little on its, controlling for other community characteristics. In urban areas, it is to your community's detriment to be in either Central or

Western province, for these dummy variables have negative significant coefficients compared to urban Lusaka.

The objective of the propensity score match technique is to help make treatment and control communities differ only in that one did the social fund and the other did not. They should be equivalent in the probability that each group had of participating in the program. Figures I and II illustrate the distribution of different 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 likelihood of participating in the social fund.

#### ***IV. Community Self-Targeting***

The Zambia social fund relies on self-targeting to reach the poor. The choice of type of sub-projects that the social fund can support – such as rehabilitation of primary schools and health facilities -- is thought to extend automatically to relatively less affluent communities, for relatively ‘rich’ 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 “self-targeting” approach allowed it to effectively reached Zambia’s lower expenditure households.

Table II presents expenditure differences for households in areas where the social fund was active compared to nationally representative 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 specific partition for the capital city Lusaka.

The standard against which social fund beneficiaries are compared is 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 first 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 that 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, and in its lower panel it includes information about geometric means, presented by the means of log expenditures.

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. 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. 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 about 9% richer than most Zambian urban households. Most of this urban difference results from a particularly strong focus on wealthier communities in the capital city of Lusaka. Average expenditures in Lusaka were KW94,000, while households in Lusaka’s social fund areas earned KW124,000. In Lusaka, social fund households earned 22.5% more than average. In urban areas other than Lusaka, social fund

resources reached households who spent amounts statistically indistinguishable from non-Lusaka urban.

Beyond these overall rural and urban differences in social fund targeting, Table II 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% lower than average non-social fund beneficiaries. Health sub-project beneficiaries spent 3% less than non-social fund beneficiaries.

Through its education projects, the social fund targeted rural poor, 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% lower expenditures than average Zambian rural areas. Rural targeting of schools reached poorer households very effectively. By contrast, social fund schools in Lusaka were located in communities with 23% 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 in urban school rehabilitations.

By contrast, health interventions reached urban poor with greater effectiveness than rural poor. If school resources, which accounted for about 76% of social fund interventions, reached poorer households in rural areas and wealthier households in urban areas, the opposite is true for health resources. Rural health facilities receiving social fund assistance, which accounted for 14% of social fund interventions, were located where households spent 23% more than average Zambian rural areas. In cities social fund health assistance reached households spending 18% less than other urban households

The Zambia social fund appears much less successful in targeting education resources to poorer communities in Lusaka or health resources to rural areas. In large part the urban education

finding result from the social fund implementing the Zambia Education Rehabilitation Project (ZERP) for the government. This project's goals were not poverty targeting or enhancing community self-help. It was a top-down school rehabilitation program where the social fund implemented a Ministry of Education project because of its relative efficiency in doing so. According to social fund staff, the social fund rehabilitated the majority of Lusaka's primary schools. In addition, it was most likely to rehabilitate older schools through the ZERP. On these criteria, in Lusaka the social fund reached schools located in more established areas of Lusaka. It would not reach the poorer, newly-settled peri-urban areas where poverty is concentrated.

A similar phenomenon might explain the targeting findings of rural health interventions. 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.

## ***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.

Household-level analysis seeks to discern whether improvements in the quality of community education facilities translate into identifiable changes in household behavior and outcomes. 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 who were reported to be in school. As a longer-term indicator of whether the

household has kept their children in 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.

There are three columns of statistics for each variable. 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 evaluation techniques and a simple comparison of randomly chosen households, the final column includes means for the entire LCMS sample.

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% of children were in school, compared to 82% in communities that did not participate in the program but had equal propensity to and 78% in communities that had a project approved but had not yet rehabilitated their school. In rural areas, 70% 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% of children are in grades appropriate to their age. This differs robustly from 23% in rural communities about to start a social fund rehabilitation and weakly from the 26% in matched communities.

Evidence in Table III also suggests that social fund households are willing to spend a greater proportion of their expenditures on education. In social fund communities, households spent an average of 4.6% of their earnings on education, which differs from 3.9% in match communities and 2.4% in pipeline communities. Increased education spending likely reflects that 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 and increasing share of earnings on education, it appears that social fund interventions help to meet unmet demand among Zambian households for improved education services.

Household data also offers an opportunity to investigate whether social fund-supported efforts to rehabilitate and construct health posts affected people's health. Table IV presents evidence concerning health output variables. Like Table III, it compares households in the "Treatment" group, where the social fund supported health initiatives, with two types of control groups, "Propensity Match" and "Pipeline Match". The former includes communities that did not do social fund sub-projects but had the same propensity to participate in the program as the treatment group. The latter includes communities that had a sub-project approved but had not yet started working on it at the time of the survey. For comparison, it also includes means from unmatched random 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% of households reported sickness, which differs significantly from the 41% rate in the two control groups. However, those in social fund areas reporting someone sick did not as often report the specific illness of diarrhea nor were they as likely to seek treatment. Compared to 14% in the two control groups, 8.6% of households reporting sickness had cases of diarrhea, a significantly lower incidence. Considering the proportion of households reporting sickness, 38% sought treatment, versus 49% for both control groups.

At first, these three pieces of evidence create 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. On reflection, however, one could surmise that in communities where a health project had recently been completed, Zambian households were more likely to say that someone was sick. 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.

Evidence in Table IV supports this explanation. When one considers the incidence of diarrhea or likelihood of seeking treatment among all households, not just those who said a member was sick, 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 had rehabilitated a health post, 72% of those who sought treatment went to a health center, compared with 60% and 57% in the propensity and pipeline match communities, respectively. This treatment group went to the hospital 31% of the time, versus 46% and 45% for

control groups. Similar differences in where social fund households seek treatment emerge when looking at all households.

In Zambia, the health system is burdened by people by-passing lower levels of health services [citation?] because they are seen to offer no 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.

Household-level data also sheds light on how social fund interventions 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. For some comparisons, social fund support increases vaccination to a significant degree, e.g., for polio, though the significance is not consistent between the propensity and pipeline comparisons. The effect of social fund intervention on child anthropometric measures is inconsistent, perhaps because of the low quality of these data. In urban areas, there are no significant differences across treatment and control groups in the long-term nutrition indicator of height for age Z-scores, nor in the short-term nutrition indicator of weight for height Z-scores. In rural areas, however, there is evidence for less stunting in social fund communities: average height for age Z scores are  $-1.99$  in the treatment group and  $2.48$  for the control groups. This suggests that the long-term nutrition of children in social fund communities is significantly better, though it is worth noting that a mean Z-score of negative two indicates half the population is severely stunted. By contrast, in rural areas, social fund communities appear to have more wasting than their comparators. Weight for height Z-scores average  $0.15$  in social fund communities, versus  $0.61$  in control communities. Without

impugning the quality of the anthropometric data, it is difficult to reconcile this improvement in long-term nutrition with a reduction in short-term nutrition in social fund areas.

## ***VI. Community Participation Effects***

The above analysis shows that social fund interventions increased demand for services. Beyond these effects, however, social funds are reputed to have beneficial effects on how communities operate. Social funds interventions are designed to require substantial community involvement: in the Zambia social recovery project, communities contributed up to 25% of the project cost. Such participation potentially has several effects on social capital. It could help to promote projects that meet community needs. It might improve the ownership the community feels for the facility, so that it is more likely to maintain it. Further, if the social fund demonstrates to community members that they can work together to improve community livelihood, it might encourage them to undertake other initiatives.

This section offers evidence on several of these effects. The household surveys included a section which asked for information about changes to community infrastructure in the past five years and household involvement in those changes. Because a relatively large number of households reported that a school had recently-been refurbished in their community, there is adequate household information to analyze the impact on community participation of education rehabilitated by the social fund and those supported by other sources. Further, we get insight into whether social fund support for an education or health rehabilitation encourages or discourages other community initiatives.

Many communities rehabilitated primary schools in Zambia. While the household survey specifically oversampled households where the social fund was active, in the general population outside of those communities, 30% of households reported that a school had been rehabilitated in

the past five years. Because they are so prevalent, Zambia offers an excellent opportunity to compare rehabilitations done through social fund support and those done by other means.

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 the treatment group were more likely to report school rehabilitation than in control households: in treatment areas, 60% of households said a school had recently been rehabilitated, compared with 43% 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.

It is more interesting that communities where the social fund rehabilitated schools, a fairly low percentage of households (60%) reported knowing of such an innovation 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 whole population 45% of households do not have children of primary school age. Absent children who would use the facilities, households might not pay particular attention to primary school rehabilitations.

Table VI also indicates that many communities have rehabilitated schools without social fund support. In communities where the social fund was not active, school rehabilitations were fairly prevalent, with 42% reporting such innovations. Some proportion of these respondents may live in areas adjoining communities where the social fund rehabilitated a school. To support this possible explanation, such spillovers would be more likely in cities, and 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. That evidence suggests that urban households were not as involved in social fund-supported school rehabilitations as they were in similar sub-projects carried out by other means. While only 19% said they helped decide what activity the social fund carried out, when school rehabilitations took place under other auspices, 25% of households were involved in the decision. Similarly, 23% of households provided inputs to the school rehabilitation when supported by the social fund compared to 39% 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 more top-down Education Reform project where the Ministry choose the schools to be rehabilitated rather than following a demand driven approach. In rural areas, social fund interventions appeared to involve the community better than comparators, though not to a statistically significant degree. Work on the cost-efficiency of social fund interventions compared to others (findings remain to be integrated) found that the social fund accounts for about three-quarters of all classroom construction financed through the Ministry of Education and/or donors. One hypothesis for further testing may be that these other rehabilitations were undertaken through community self-help activities that are quite participatory.

The survey also included several opportunities for households to express their opinions about how the school rehabilitation affected their lives. For example, 68% 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. Very few households felt that the social fund school rehabilitation raised their income (8%) or increased employment (5%) While these proportions were also small in comparator projects, they were significantly larger 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 construct 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 together. 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% of households in control communities said the school rehabilitation increased *kugwilizana* some or a great deal, 60% 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% of households felt the urban social fund projects increased social capital, a proportion significantly less than for comparator projects.

When asked whether the school rehabilitation reduced the household's worries, urban households again were significantly less positive about the social fund sub-projects than comparator projects. In rural areas, households more frequently reported that the social fund efforts reduced worries than other equivalent interventions.

The above evidence on community participation suggests significant differences between the social capital effects of social fund sub-projects and big differences in how the social fund may have operated 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, had smaller impacts on community togetherness and did less to reduce household worries. 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 hope to empower communities by demonstrating that they can address pressing needs by organizing themselves. One indicator of this empowerment could be that communities successfully completing sub-projects would be more likely to undertake other sub-projects: the enthusiasm generated from bringing the community together would carry over into efforts to take some other community initiative. The household surveys offer opportunities to test whether the social fund empowers communities to undertake new initiatives.

Tables VII and VIII present that evidence for communities that received social fund support to rehabilitate schools and health posts, respectively. They compare the likelihood of the community undertaking additional infrastructure initiatives beyond that which the social fund financed. For example, investigating those communities where the social fund had rehabilitated a school, Table VII presents the percentage of households reporting that its community had also recently built a new school or health post or rehabilitated a health post. The prevalence of these additional infrastructure activities indicates the degree to which the social fund empowered communities. The first column contains information about the treatment group, reporting 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 presents indicators about how often alternative projects were done.

Supporting earlier evidence about differences between the social fund's community impact on rural and urban areas, these data suggest that the social fund empowered 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% also rehabilitated a health post. Within non-social fund match communities, a significantly higher proportion of households (37%) reported health post rehabilitations. When we compare households in urban match communities that had also reported having rehabilitated schools without social fund support, those direct comparators were much more likely to rehabilitate health posts: 50% 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% 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%. 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 empowering communities to take additional infrastructure initiatives. In rural social fund communities that rehabilitated their school, 12% 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% also built new schools, significantly more than the 12% that also built new schools in equivalent non-social fund communities. However, these rural improvements in community empowerment are not uniform, for 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 them to upgrade a school.

## **VII. Conclusions**

This study presents an in-depth analysis of the Zambia social fund's household impact, considering 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 newly-collected household level data, it has addressed these issues using three evaluative approaches, including 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 MPU operated where households had smaller earnings. However, in urban areas, households in social fund communities were better off than urban households overall. This is particularly true in Lusaka. The MPU has rehabilitated nearly every school in Lusaka, and with respect to the rest of Zambia, Lusaka is not the home of the country's poorest people. If the MPU is to focus more of its attention on Zambia's poorer communities, it needs to reach out beyond Lusaka. Because communities must first learn that the social fund exists, it is possible that this information is more available in the capital city. Without an effective public awareness program, information constraints might hinder more remote communities from gaining information about the social fund and participating in it.

The social fund improved the quality of community education and health facilities. As a result, communities that received support from the social fund demanded improved education and health services to a greater degree. 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 lower level 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, 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 MPU did not involve as many community members in decision-making, in implementation nor was it as effective at spurring the community to undertake other initiatives.

Several opportunities to expand on this research present themselves. For example, the study has not yet made use of additional data sources. A parallel study (Chase and Sherburnebenz, 2000) analyzes the sample of education and health facilities. Those treatment facilities surveyed are located where household oversampling took place. As a result, there are opportunities to integrate community variables from the facilities survey into the household level analysis. Further, household level surveys were conducted in Zambia in 1991 and 1994. While these surveys visited only a limited number of communities where the social fund later operated, from that overlap, we can create community fixed effects comparisons of the social fund. Finally, given the multi-country design of the Social Funds 2000 inquiry, there are several other sets of household level data available for comparison. In the short term, we are completing a parallel study of household social fund impact in Armenia. However, we intend to integrate these country studies more fully.

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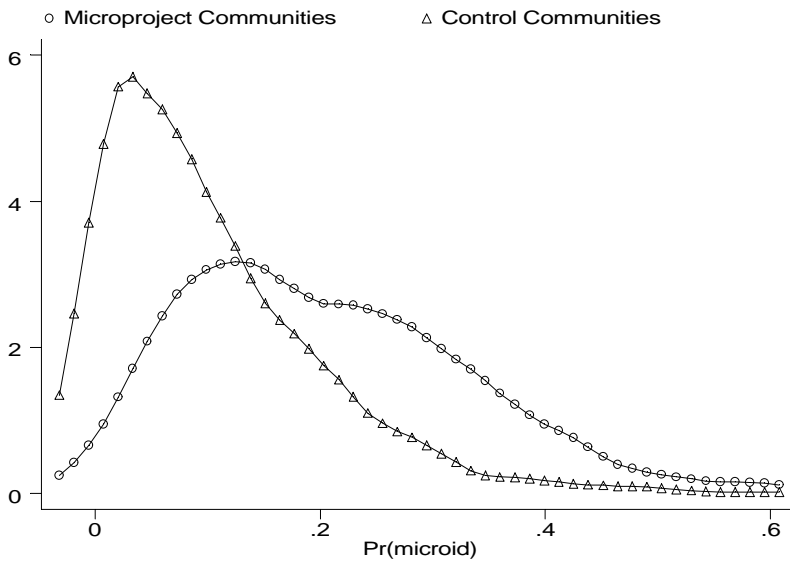
**Table I: Community Propensity Function Parameter Estimates**

Probit on Community Participation in Zambia Social Fund

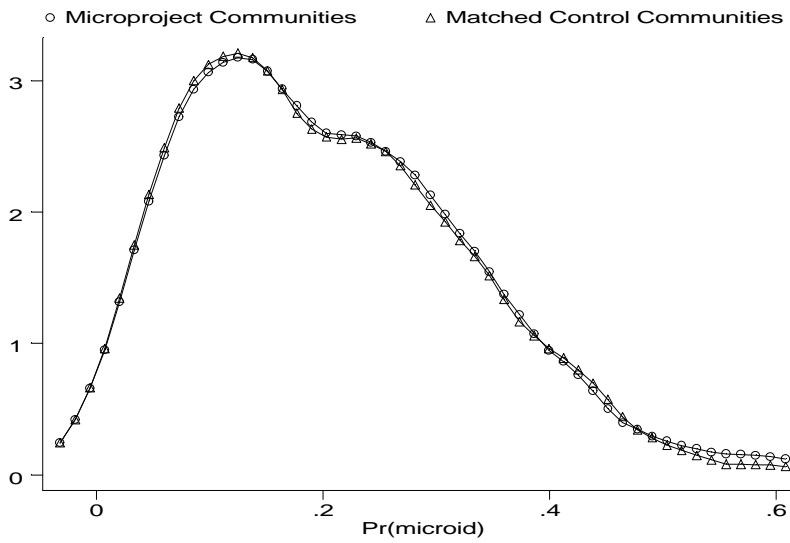
Community Variable	Coefficient	Z-stat
Mean Education of Heads of Household	0.095	1.28
Mean Education of Spouses	-0.089	-1.11
Percentage of Female Headship	0.56	1.02
Mean Share of Expenditures on Food	0.018	2.32 **
Mean Household Expenditure Levels	0.000	0.37
Percentage Who Have Heard of MPU	0.011	4.68 **
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
<b>Province Indicators (versus Lusaka)</b>		
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%

**Figure I: Pre-Match Kernel Densities of Participation Propensity**



**Figure II: Post-Match Kernel Densities of Participation Propensity**



**Table II: Community Self-Targeting Effectiveness**

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

	<b>Non-MPU</b>	<b>All MPU</b>		<b>Education MPU</b>		<b>Health MPU</b>	
			<b>T-stat</b>		<b>T-stat</b>		<b>T-stat</b>
<b>Expenditures (Per Adult Equiv.)</b>	62,360	61,307	0.38	61,251	0.30	59,096	0.42
<b>+ Rural</b>	44,662	40,073	1.48	29,954	3.56 **	51,603	0.84
<b>+ Urban</b>	79,681	88,669	1.88 *	93,791	2.38 **	72,270	0.50
<b>- Lusaka</b>	93,540	124,107	4.28 **	125,286	3.91 **	-.	
<b>- Urban Non-Lusaka</b>	75,311	68,018	1.18	72,400	0.37	-.	
<b>Log Expenditures (Per Adult Equiv.)</b>	10.47	-8.1%	3.71 **	-9.0%	3.22 **	-3.1%	0.52
<b>+ Rural</b>	10.08	-11.9%	3.96 **	-29.5%	7.38 **	23.0%	3.01 **
<b>+ Urban</b>	10.85	8.9%	3.28 **	14.6%	4.43 **	-18.4%	2.26 **
<b>- Lusaka</b>	11.07	22.5%	5.25 **	23.4%	4.70 **	-.	
<b>- Urban Non-Lusaka</b>	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		Pipeline Match		Non - Matched	
		Control	T-stat	Control	T-stat	T-Stat	
<b>Attendance</b>	78%	75%	1.40	71%	2.68 **	71%	4.93 **
<b>+ Urban</b>	86%	82%	1.68 *	78%	1.80 *	82%	2.39 **
<b>+ Rural</b>	70%	67%	1.32	69%	0.27	59%	5.16 **
<b>Attendance in grade</b>	37%	35%	1.24	25%	3.86 **	33%	2.75 **
<b>+ Urban</b>	44%	40%	1.07	33%	1.69 *	39%	1.88 *
<b>+ Rural</b>	30%	26%	1.52	23%	1.91 *	24%	2.98 **
<b>Education Shares</b>	4.6%	3.9%	2.13 **	3.4%	2.43	4.1%	2.07 **
<b>+ Urban</b>	5.1%	4.5%	1.52	3.7%	1.66 *	5.0%	0.28
<b>+ Rural</b>	4.1%	3.2%	1.87 *	3.3%	1.19	3.0%	2.70
<b>Expenditure (log PAE)</b>	10.38	10.45	2.12 **	10.18	3.30 **	10.47	3.22 **
<b>+ Urban</b>	10.99	10.79	5.01 **	10.79	2.03 **	10.85	4.43 **
<b>+ Rural</b>	9.78	10.07	5.49 **	10.06	4.17 **	10.08	7.38 **
<b>Expenditure (Affected)</b>	10.20	10.27	1.72 *	10.09	1.38	10.29	2.76 **
<b>+ Urban</b>	10.77	10.57	4.15 **	10.70	0.68	10.65	2.95 **
<b>+ Rural</b>	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	
<b>HH member sick</b>	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 **
<b>Diarrhea (if sick)</b>	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
<b>Diarrhea (all households)</b>	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
<b>Treatment (if sick)</b>	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
<b>Treatment (all households)</b>	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
<b>Went to hospital (if treated)</b>	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
<b>Went to health center (if treated)</b>	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
<b>Went to hospital (all hhds)</b>	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
<b>Went to health center (all hhs)</b>	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
<b>Health Expenditures (Log)</b>	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
<b>Health Share of Expenditure</b>	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
<b>Expenditure (Log PAE)</b>	10.44	10.45	0.30	10.38	0.76	10.47	0.52
+ Urban	10.66	10.79	1.46	10.90	2.51 **	10.85	2.26 **
+ Rural	10.30	10.07	2.82 **	10.08	2.54 **	10.08	3.01 **

\*\* 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	
<b>BCG Vaccinations/Child</b>	1.07	1.05	0.46	1.02	1.90 *	1.05	0.60
<b>+ Urban</b>	1.08	1.08	0.09	1.04	0.86	1.07	0.09
<b>+ Rural</b>	1.06	1.01	1.32	1.01	1.78 *	1.02	0.99
<b>DPT Vaccinations/Child</b>	2.99	2.67	3.49 **	2.76	2.56 **	2.66	3.74 **
<b>+ Urban</b>	3.34	2.76	3.85 **	2.67	4.45 **	2.80	3.79 **
<b>+ Rural</b>	2.81	2.56	2.18 **	2.81	0.04	2.51	2.68 **
<b>Polio Vaccinations/Child</b>	2.97	2.87	1.16	2.91	0.64	2.78	2.21 **
<b>+ Urban</b>	3.19	3.01	1.18	2.93	1.71 *	2.91	1.94 **
<b>+ Rural</b>	2.87	2.69	1.67 *	2.90	0.33	2.64	2.14 **
<b>Measles Vaccinations/Child</b>	0.93	1.00	1.48	0.97	0.97	0.97	1.00
<b>+ Urban</b>	1.01	1.04	0.39	0.98	0.32	1.01	0.10
<b>+ Rural</b>	0.89	0.95	0.99	0.97	1.30	0.93	0.72
<b>Height for Age Z-scores</b>	-2.01	-2.24	1.34	-2.26	1.40	-2.19	1.20
<b>+ Urban</b>	-2.05	-2.06	0.03	-1.92	0.38	-1.99	0.24
<b>+ Rural</b>	-1.99	-2.48	2.37 **	-2.47	2.30 **	-2.42	2.32 **
<b>Weight for Height Z-scores</b>	0.26	0.64	2.76 **	0.59	2.32 **	0.48	1.75 *
<b>+ Urban</b>	0.46	0.65	0.82	0.55	0.35	0.47	0.02
<b>+ Rural</b>	0.15	0.61	2.72 **	0.61	2.68 **	0.50	2.20 **

\*\* 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
<b>Prevalence of Educ. Rehab.</b>	60%	43%	10.06 **
+ Urban	62%	48%	6.19 **
+ Rural	58%	38%	8.39 **
<b>Helped Decide?</b>	28%	29%	0.16
+ Urban	19%	25%	2.53 **
+ Rural	38%	34%	1.36
<b>Add Inputs?</b>	44%	48%	1.16
+ Urban	23%	39%	3.98 **
+ Rural	64%	57%	1.60
<b>Save Time?</b>	43%	48%	1.91 *
+ Urban	35%	47%	3.36 **
+ Rural	52%	51%	0.26
<b>Reduce Costs?</b>	31%	30%	0.15
+ Urban	27%	31%	0.97
+ Rural	34%	30%	1.10
<b>Improve Service?</b>	68%	57%	4.49 **
+ Urban	65%	61%	1.42
+ Rural	71%	51%	5.25 **
<b>Raise Income?</b>	8%	15%	3.89 **
+ Urban	7%	16%	4.25 **
+ Rural	10%	12%	1.06
<b>Bring Community Together?</b>	42%	44%	0.72
+ Urban	25%	44%	5.71 **
+ Rural	60%	44%	3.99 **
<b>Reduce Worries?</b>	48%	53%	1.94 **
+ Urban	39%	55%	4.47 **
+ Rural	57%	50%	1.67 *
<b>Increase Employment?</b>	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
<b>Build New School</b>	16%	18%	1.29	19%	1.60
+ Urban	13%	22%	4.94 **	25%	5.74 **
+ Rural	20%	14%	3.27 **	10%	4.03 **
<b>Build New Health Post</b>	9%	6%	4.09 **	7%	1.53
+ Urban	7%	5%	1.43	8%	1.08
+ Rural	12%	6%	3.96 **	6%	2.92 **
<b>Rehabilitate Health Post</b>	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
<b>Build New School</b>	27%	18%	3.59 **	30%	1.18
+ Urban	1%	22%	5.51 **	37%	8.20 **
+ Rural	41%	14%	9.28 **	12%	5.99 **
<b>Rehabilitate School</b>	42%	43%	0.42	69%	8.02 **
+ Urban	39%	48%	1.81 *	71%	6.43 **
+ Rural	44%	38%	1.54	65%	3.95 **
<b>Build New Health Post</b>	18%	6%	7.63 **	7%	4.43 **
+ Urban	0%	5%	2.57 **	10%	3.68 **
+ Rural	27%	6%	9.42 **	0%	6.92 **