

PRE-ANALYSIS PLAN

Strengthening Community Resilience in Conflict-affected Societies: A Randomized Controlled Trial of a CDD Intervention with a Conflict Resolution Dimension in Eastern DRC

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Abstract

This document describes the pre-analysis plan for a randomized impact evaluation of a Community-Driven Development (CDD) program in Democratic Republic of Congo (DRC). The project sought to strengthen community resilience in the conflict-ravaged eastern part of the country. The CDD program was randomly assigned to about two thirds of 400 communities with eligible project proposals. The selected communities received a budget of up to \$100,000 to finance an infrastructure project. Furthermore, the members of each CDD community received training to select and manage the project in an inclusive and participatory way. A random half of CDD communities received a third component, namely the conflict mitigation component, which consisted of conflict prevention and management activities, identified and led by NGOs specialized in the matter. According to the theory of change the CDD program would lead not only to improvements in community infrastructure but also to more social cohesion, because of the adopted inclusive and participatory process, and the demonstration effect this entails (when it leads to a successful project implementation). The conflict mitigation component would enhance both of these effects, by reducing internal divisions that could work against the effective implementation of the CDD project. Our impact evaluation puts this theory of change to a test. The outcomes of interest that we will evaluate are situated within two outcome families: access to and quality of infrastructure, and social cohesion.

Keywords: Development Interventions; Community-Driven Development; Resilience; Conflict; Violence; Conflict Resolution Mechanisms; Social Cohesion; Fragile States; DRC.

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1 Introduction and background

Community resilience refers to the ability of a community to respond and adapt to changes and shocks through learning and collaboration with all relevant stakeholders ([Matarrita-Cascante, 2017](#)). How to bring about community resilience? Community-driven development (CDD) programs are a popular model for providing economic infrastructure. In addition, through their inclusive and participatory community-driven approach towards the realization of the infrastructure project, they also seek to improve social cohesion and therefore the ability of communities to respond to disturbances. The twin goals of infrastructure and social cohesion are especially appealing in countries experiencing or recovering from violent strife. At the same time, it is in these fragile and conflict-affected contexts that injecting additional resources into communities may exacerbate existing tensions leading to more conflict and social division, or the already existing internal divisions may work against the effective implementation of the project. This is why our CDD augments the classic CDD approach with a third pillar in the form of activities to strengthen local conflict prevention and resolution mechanisms.

The Democratic Republic of Congo (DRC) has been home to over a decade of conflict, including the First (1996-7) and Second (1998–2003) Congolese Wars. The latter, with the direct involvement of eight African nations and 25 armed groups, has been the deadliest war in modern African history ([IRC, 2007](#)). Despite the formal end to the war in July 2003, the east of the country continues to be an epicenter of violence. The conflict has resulted in a massive loss of life, large displacements of people and considerable declines in welfare. With poverty being both a result and a predictor of violent conflict there is a real fear that communities in Eastern Congo can be caught in a violence–poverty trap. Basic infrastructure such as roads, schools, and health facilities are lacking, either due to outright destruction or a lack of investment. These challenges have been compounded by protracted conflict and violence, often based on old but unresolved grassroots conflicts over land and between ethnic groups and at times used opportunistically to mobilize support ([Autesserre, 2010](#)). The conflict also let many individuals to flee from one community to another, which has the potential to create fertile ground for further disputes, conflict and violence within and between communities.

Against this backdrop, the international community has been actively involved in efforts to end conflict and to support economic recovery in Eastern DRC, as part of broader efforts to reestablish peace and security in the region. The World Bank has supported these efforts in part through the IDA-funded Productive Opportunities for Stabilization and Recovery in the DRC (STEP, in its French acronym)—an \$80 million project, being implemented since 2014 by the Social Fund of the DRC (FSRDC, in its French acronym) in the Congolese provinces of South Kivu,

North Kivu, Bas Uele, Haut Uele, Ituri and Tshopo.¹ The STEP project aims to strengthen community resilience through: (a) improving access to community infrastructure; (b) facilitating and improving inclusive community participation processes; and (c) strengthening local conflict prevention and resolution mechanisms.

One of STEP's two key components is the Community-Driven Development (CDD) component – with an envelope size of \$30 million. It provides communities with an envelope of up to \$100,000 to select and manage an infrastructure project, as well as trainings to do so through an inclusive and participatory process. In addition, a random half of CDDs come with a conflict mitigation component. This research seeks to identify causal impacts of the CDD intervention in its basic form as well as the CDD with the add-on component (henceforth referred to as 'CDD +'). 1) *Does the CDD program improve access to community infrastructure?* 2) *Does it enhance social cohesion?* 3) *Are CDD projects implemented with an explicit conflict resolution mechanism more effective in improving access to infrastructure and social cohesion?* The goal is thus not only to investigate whether a CDD program can improve community resilience, but also to understand how CDD programs can be improved and their impact enhanced; in this case by adding a conflict mediation component.

2 The Intervention and Experimental Design

2.1 Interventions

From 2016 to 2020, FSRDC implemented a CDD program in six provinces of Eastern Congo: South Kivu, North Kivu and Haut-Uele, Bas-Uele, Ituri, and Tshopo. The FSRDC financed the construction and rehabilitation of community infrastructure of up to \$100,000. Communities could select projects from the following categories: health, education, water and sanitation, trade (markets, storage of agricultural products), rural transport (small bridges), energy, and protection of the environment.

To enhance inclusive and participatory community involvement in the selection and management of the infrastructure, the following activities were organized: i) community sensitization; ii) organization and training of community members to prioritize and select community infrastructure needs, iii) training and assistance of the community after the disbursements of funds (e.g. to develop a structure for the maintenance of the infrastructure). These activities were undertaken with the active engagement of the FSDRC and a local NGO in order to ensure participation of the whole community, including the most vulnerable, such as women, internally displaced and youth at risk. Furthermore, each recipient community was

¹ Bas Uele, Haut Uele, Ituri and Tshopo made up Oriental Province, prior to the 2015 administrative reorganization.

expected to raise funds and co-contribute to finance 10% of the project cost, in cash or in kind (labor, material).

In contrast to many other CDD programs, this program did not create new community development structures. FSRDC, local NGOs and construction agencies worked together with Local Development Committees (LDCs) – already existing development committees that were created by the populations themselves. The LDCs had to take the lead in identifying the community's needs, participate in the selection of the contractor, organize the community participation and collect contributions. In addition, LDCs had to monitor project implementation and set up a structure for project maintenance and the collection of user fees where possible. Moreover, the LDCs were responsible for the accounting and financial management of the project funds. Throughout all of these steps, the LDCs benefited from training and assistance from FSRDC and the NGO, as specified above.

To identify beneficiaries, FSRDC conducted a community sensitization campaign throughout the five provinces to share information about the program, and to organize and train communities to prioritize and select community infrastructure needs and develop a project proposal. In the months after this sensitization campaign, the FSRDC received these project proposals, and judged their quality. Only those that passed a set of predetermined criteria were eligible for the CDD project. To implement the CDD program the FSRDC recruited local NGOs and construction agencies that worked directly with the communities and their representatives.

Among those communities that received the CDD program, an additional set of communities received the conflict prevention and resolution add-on intervention seeking to address local conflict and violence.² The Eastern DRC context – a context that mirrors many other conflict-affected societies – requires that risks of conflict at the local level be taken into consideration in the project design despite the urgent need of improving basic infrastructures. To implement this component the FSRDC contracted NGOs specialized in conflict prevention and management. Targeted activities were identified by these NGOs, but included: (i) In-depth and ongoing conflict-sensitivity analysis; (ii) Mediation and conflict resolution efforts to resolve disputes before escalation; and (iii) Conflict management training and support, involving the identification and training of key stakeholders in conflict assessment and management. These activities could operate at multiple levels if necessary. At first, instance conflict resolution mechanisms that already exist in villages and communities were used, to the extent that due diligence had

² A survey conducted in 2012 in three hundred villages of South Kivu finds that over 25% of the village chiefs reported to have intervened in one or more disputes between village inhabitants in the month preceding the survey. One major reason for these conflicts was disputes over land ([Humphreys et al, 2012](#)).

demonstrated their legitimacy. If necessary, however, the conflict mediation process could evolve to higher levels if the conflict could not be resolved at the village level.

2.2 Experimental Design

The CDD program was implemented on a phased-in yearly basis, with a new enrollment period at the beginning of each year. Project implementation started each time upon the community's proposal passing the quality threshold set by DRC's Social Fund and obtaining approval from the provincial authorities (Comité Consultatif Provincial). As a result, in some months only one new project started, while in other months ten projects started. In order to keep randomization logistically feasible, all provincial headquarters of Fonds Social received a "randomization list". New communities were added to this list as they came in (row 1, row 2, etc.). Every subsequent three rows on the list were assigned randomly to CONTROL, CDD or CDD+. In total, 400 villages were assigned across these three categories. For 35 among these 400 villages, project implementation was impossible due to security, inaccessibility and other operational challenges. Table 1 shows their distribution across CONTROL, CDD or CDD+.³

Table 1: Evaluation Design and Villages per Treatment Arm

Control communities	CDD Treatment Communities	
	No conflict mitigation	Conflict mitigation
<u>A:</u> 127 communities	<u>B:</u> 138 communities	<u>C:</u> 135 communities

Note: The Table presents the number of communities assigned to control and each of the two treatment arms, over the period 2016 to 2019.

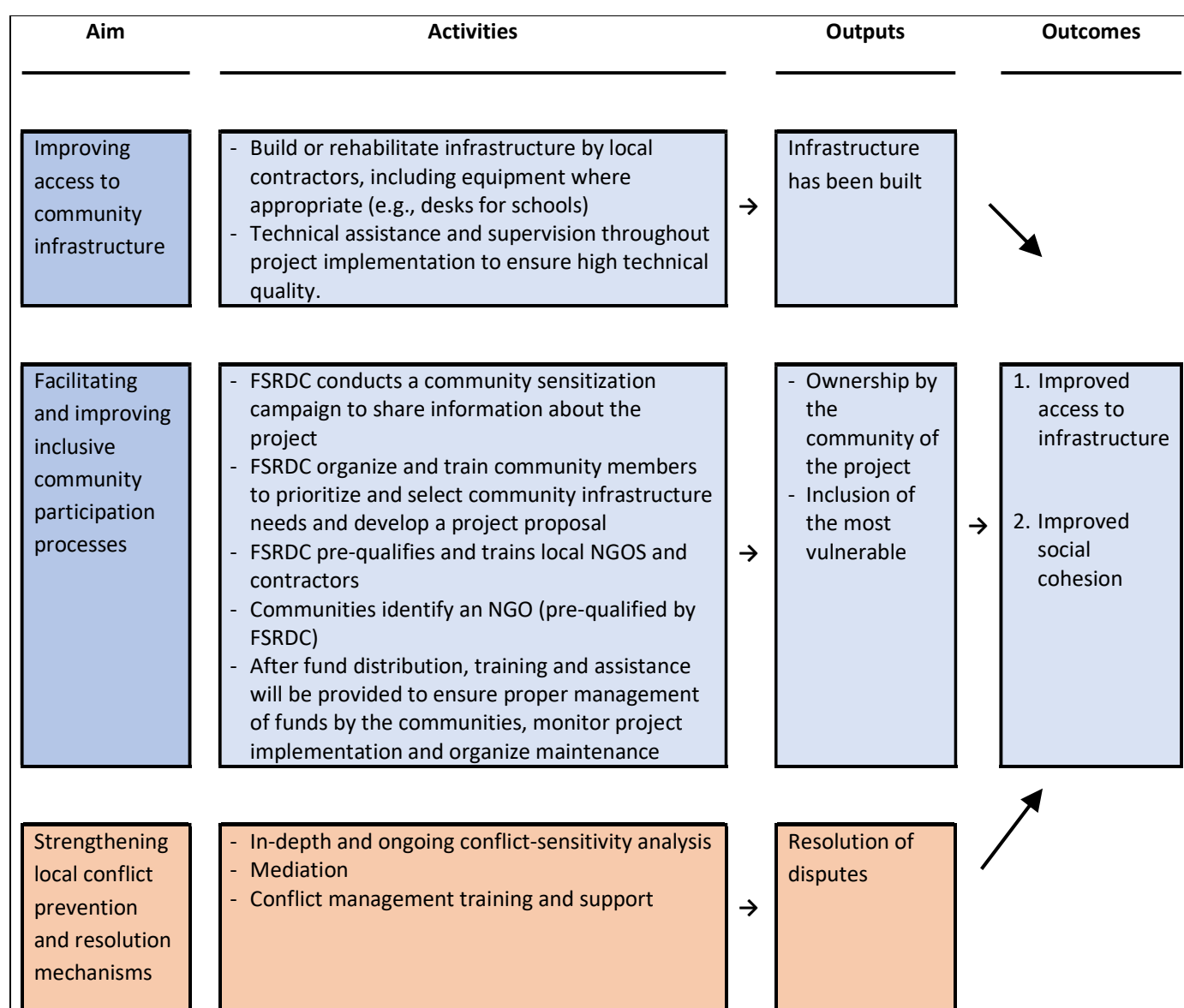
In addition to the primary list of randomized CDD and CDD + communities, more CDD and CDD+ projects from the list were randomly selected as replacement projects, to be used in case a primary community dropped. Following a drop-out, a replacement project would be picked in the same geographic area, and in order of the random rank allocated to it.

³ The imbalance of communities across the three experimental groups relates to the phase-in design and specificities of the randomization: from 2016 to 2019, 4 randomization occurred (over the 6 provinces). Moreover, the randomization was stratified by project type, to make sure we would have an even number of project type by territories.

3 Theory of Change

The theory of change was summarized in the introduction, and is illustrated in Figure 1. The first component is the construction and rehabilitation of community infrastructure. The second component of the project, and central to the CDD approach, is the process of participatory and inclusive implementation. The third component is the conflict mediation component. The different components strengthen each other and contribute to the twin goals of improved (access to) economic infrastructure and social cohesion both directly and indirectly.

FIGURE 1: THEORY OF CHANGE



3.1 Improved (access to) economic infrastructure

A key characteristic of communities in Eastern Congo is the lack of infrastructure such as schools, health facilities and paved roads, which is the result of outright destruction by the conflict or a persistent lack of investments. As a result, the construction and/or reconstruction of infrastructure that is envisioned by the first component should have a direct impact on the presence of infrastructure. Furthermore, the emphasis on (inclusive) community participation processes by the second component may indirectly contribute to improved infrastructural outcomes by improving the quality of the implementation and the level of ownership that community members feel they have over the project. This proposition is based on the idea that participatory approaches to development yield better results than traditional top-down approaches (e.g. Scott, 1998). In particular, by including the voices of local beneficiaries, the distance between principal and agent would decrease, which is likely to produce choices that better reflect their needs (Mansuri and Rao, 2013). Finally, insofar as local divisions undermine successful project implementation, the third component - strengthening local capacity to prevent and manage conflicts within communities and mediating existing conflicts – could also indirectly contribute to improvements in access to infrastructure.

3.2 Improved social cohesion

The building of infrastructure through an inclusive community participation process could serve as a vehicle for improving social cohesion. In so far this process is successful in improving infrastructure and the accessibility to it by everybody in the community, it may result in more acceptance and trust among individuals within the community; decrease the extent to which villages are divided along social, economic or other lines; and increase propensities to work collectively within the community to address development challenges. The mechanism behind this idea is that the CDD project can marshal a type of demonstration effect: experience with working cooperatively with all members of the community for a limited period leads to the adoption of similar practices also outside of the CDD project. Optimistic as this may sound, the idea underlies a large class of development aid projects including many of the largest interventions in post-conflict areas (Mansuri and Rao, 2013). At the same time, however, fragile and conflict-affected communities may be less well equipped to cooperatively and inclusively work towards a successful implementation of the infrastructure project. Moreover, the injection of additional resources may exacerbate existing tensions or create new ones. This is why the third component seeks to strengthen local conflict prevention and resolution mechanisms, and by doing so enhance the twin goals of improving access to infrastructure and social cohesion

4 Hypotheses and outcomes of interest

4.1 Hypotheses

- **H1:** *The community-driven development program leads to improvements in the quality, access and use of community infrastructure.*
- **H2:** *The community-driven development program leads to improvements in social cohesion.*
- **H3.** *Communities that implement CDD projects with an explicit conflict mediation/resolution mechanism should see more improvement in access to community infrastructure and social cohesion than communities that receive CDD projects without conflict resolution mechanisms.*

4.2 Key outcomes of interest

The study focuses on two primary outcomes of interest. The first is related to infrastructure while the second one relates to social cohesion. We divide each of them in more precise outcome families to capture a more detailed picture of the intervention effect on the main outcomes of interest.

Regarding infrastructure access and quality, we measure

- a) *Existence/creation of socioeconomic infrastructure as well as its quantity and quality;*
- b) *Quantity & type of infrastructure obtained on request of village or NGO (vs. government);*
- c) *Household access to this infrastructure;*
- d) *Use of this infrastructure by household (and frequency);*
- e) *Satisfaction with the infrastructure;*
- f) *Health indicators;*
- g) *Education indicators.*

This study thus does not only focus on whether infrastructure has been built, but also in how far individuals (particularly the most vulnerable) have access to this infrastructure, make effectively use of it, and whether it has led to improvements in outcomes such as health and education. At the village level we will also study the effect of the intervention on the provision of infrastructure by different actors (village member, government, NGO).

The second main outcome of interest is social cohesion. We decided to divide it in the following families:

- a) *Trust in another village member;*
- b) *Community organization;*
- c) *Ethnic/social cleaves;*
- d) *Social cohesion;*
- e) *Information transmission;*

- f) *Conflict (within community members and between villages)*
- g) *Inclusion of outsiders (e.g., IDPs; refugees; ex-fighters);*
- h) *Participation in community meeting/collective action;*
- i) *Civic engagement/political participation;*

The table below lists our primary outcomes.

Table 3. Key outcomes of interest

Primary outcomes		
Theory of change: Aim	Main outcome domain or family	Outcome level
Improving access to community social and economic infrastructure	Access to and quality of socioeconomic Infrastructure	Infrastructure access (HH & Village level)
		Infrastructure use (HH level)
		Health Infrastructure (HH level)
		Education Infrastructure (HH level)
		Satisfaction with infrastructure (HH level)
		Infrastructure provision (village level)
Facilitating and improving inclusive community participation processes	Social cohesion	Community organization (within village)
		Cooperation & collective action (village level)
		Information transmission (within village)
		Trust (within village and between villages)
		Ethnic division/cleavages
		Social cohesion
Strengthening local conflict prevention and resolution mechanisms		Conflict & disputes (within village)
		Conflict & disputes (between villages)
		Dispute resolution (between villages)
		Inclusion of the most vulnerable (within village)

To capture the effect of the intervention on the economic life of the participants, we will perform additional analyses on variables characterizing socioeconomic well-being. Those include measures of economic welfare, income generating activities, and subjective well-being, as presented in Table 4.

Table 4. Secondary outcomes of interest

Secondary outcomes		
Theory of change: Aim	Main outcome domain or family	Outcome level
Socio-economic well-being	Economic Welfare	HH assets ownership (HH level) HH consumption expenditures (HH level)
	Income Generating Activities	Employment (HH level) Working Hours (HH level) Earnings (HH level)
	Subjective Well-Being	Self-Perception of life conditions (HH level)

In **Error! Reference source not found.** and Table A3, of Appendix 1, we provide a careful mapping between our outcomes of interest and the variables collected through the surveys.

5 Data collection

This study relies on two data collection rounds. In each community, a village chief was conducted, as well as a household survey for which 10 households were selected at random.

- *Village chief survey:* A brief survey was conducted with the chiefs of both project and control communities. These surveys collected information largely related to community characteristics such as: the presence of community infrastructure, but also information about divisions in the community, disputes that took place in the community and across communities preceding the survey and the actions by the chief to overcome them, etc.
- *Household survey:* A household survey was conducted among ten randomly selected individuals per community. Questions in this survey largely focused on information related to household and individual level characteristics. The survey aims to learn about individuals' access to infrastructure, participation in community events, and perceptions, altruism and trust towards fellow villagers, etc.

The household and village chief questionnaire can be found in Appendix 2 (in French).

The surveys were implemented in each community on a rolling basis and in two phases, shortly before the start of the CDD project, and about seven months after the project finished. Similar data collection exercises took place in control communities.

Not every single village in our sample has however both ex-ante and ex-post surveys, due to insecurity, inaccessibility and other operational challenges. In particular, ex-ante surveys are missing for 33 communities, while ex-post data is missing for 28 communities, and this out of a total of 474 communities for which data was collected (including primary as well as replacement communities).

6 Empirical Strategy

The random assignment of communities to the different treatment conditions is core to our empirical strategy. Because of this random assignment, communities with different treatment conditions are similar (in expectation) in every respect except for their treatment. Any difference in outcome between the different experimental groups can thus be attributed to the difference in treatment.

6.1 Estimation for ex-post measured outcomes

This estimation will ascertain treatment effects for both the CDD simple intervention and the CDD with conflict mitigation, relative to the control group. If we find that the different experimental groups are well-balanced, we will estimate the program effects through simple comparison of mean outcomes across the groups. If the groups are not well-balanced, we will analyze the data including the unbalanced covariates. Since we expect some non-compliance, we will estimate the intention-to-treat (ITT) effects of the intervention on the outcomes listed above, using the following linear regression:

$$Y_{ihv} = \beta_0 + \beta_1 * CDD_v + \beta_2 * CDDM_v + \gamma X_{ihv} + \epsilon_{ihv} \quad (1)$$

where Y_{ihv} is the outcome of interest for individual i in household h in village v at the ex-post survey, defined above; CDD_v is a dummy variable indicating assignment of the community to the CDD program excluding the conflict mitigation component; $CDDM_v$ is a dummy variable indicating assignment of the community to the CDD+ program; X_{ihv} is a vector of covariates (γ is a vector of the associated coefficients). This vector will include the most relevant individual- and village-level pre-program (or time-invariant) variables (e.g. age, gender, household composition, existing cleavages and infrastructure), as well as indicators for randomization strata (province-by-cohort/enrollment-year and sector of the project); ϵ_v is an idiosyncratic error term.

We use clustered standard errors at the village level for outcomes measured at the individual level, to consider the fact that randomization happened at the village level and we have multiple observations per recipient communities. Our main parameters of interest are β_1 and β_2 , the intention-to-treat effect (ITT) effects of CDD simple and CDD+ respectively. Some outcome measures are at the community level rather than the individual level; in these cases we will replace Y_{ihv} with Y_v in the equation above, and no longer use clustered standard errors.

In addition to reporting the effects of these CDD interventions on each outcome of interest, to reduce the number of statistical tests and reduce the probability of false positives (Type I errors), we will conduct 'mean effects' estimation, estimating the effects of the intervention on indices of closely related outcomes grouped together into specific outcome families. We will give each

related outcome equal weight in each sub-index, following the approach pioneered by [Kling, Liebman and Katz \(2007\)](#), and equal weight to each sub-index in each index.

6.2 Difference in difference estimation

For communities for which we have both ex-ante and ex-post survey data, we will additionally use a Difference in Difference (DiD) approach. This approach allows us to compare the average change in outcomes in treated and control communities by taking into account the baseline level of each outcome studied. We estimate the following DiD equation:

$$Y_{ihvt} = \beta_0 + \beta_1 * CDD_v + \beta_2 * CDD_v * Post + \beta_3 * CDDM_v + \beta_4 * CDDM_v * Post + \beta_5 * Post + \gamma X_{ihv} + \epsilon_{ihvt}$$

where Y_{ihv} is the outcome of interest for individual i in household h in village v at time t (ex-ante or ex-post survey), CDD_v is a dummy variable which indicates assignment to the treatment group. $Post$ is a dummy variable as well, indicating the post-treatment period. The first variable of interest, $CDD_v * Post$, is an interaction of time and group assignment dummies and isolates the treatment effect on the treated group after treatment took place. $CDDM_v$ is a dummy variable that relates to the conflict mitigation treatment assignment, and $CDDM_v * Post$ is an interaction of time and conflict-mitigation treatment which isolates the effect of the conflict mitigation treatment on the treated group after treatment.

6.3 Heterogeneity analyses

As with many interventions of this kind, we expect the two CDD interventions under study to interact with a wide-range of program-level and context-level factors in influencing the outcomes. That is, either treatment variation may differentially affect individuals (and villages) of different characteristics and such heterogeneity might also be different across different outcome areas. Since differential effects may affect cost-effectiveness and distributional impacts of the interventions, we identified several factors (or subgroups) that might interact with the program and along which we will investigate possible heterogeneous effect:

- **Project type:** the sector of the project selected by the community (e.g., education, health or infrastructure sectors, etc.) and/or the overall budget of the project.
- **Other project characteristics:** other program-related dimensions such as the amount of the community contribution to the budget, as percent of the overall budget; and length of the project implementation (in months); and for CDD+ communities.
- **Ethnic division:** ethnic division in communities can be inferred from the survey data.

- **Conflict history:** previous levels of (internal) conflict can be measured from ACLED data, and based on a pre-treatment conflict mapping that took place in the communities
- **IDPs in a community:** Proportion of IDPs and/or refugees in a community, relative to village-dwellers (the so-called autochthones.)
- **Wealth/affluence:** Poor, subsistence-based farmers might not have been able to partake in many activities because of their need to make field visits. We may thus find a different impact of the program based on wealth levels.
- **Socio-Ethnic Background:** Marginalized groups including minority groups such as the Mutwa, as well as recently settled or refugee populations that have a lower social position in the village are often unable to access the benefits of community-based programs. We aim to explore whether there are different outcomes for individuals based on their ethnic background and social standing in the village.
- **Gender:** We also aim to explore whether men and women are differently affected by the intervention and its variations.
- **Distance to urban areas (province or ETD capital):** Isolated and remote communities may be particularly affected by conflict and have more struggle to be resilient. To compare remote areas with others closer to urban centers, we will construct a distance-based binary indicator by measuring the provincial median distance to urban area.

6.4 Attrition, outliers, missing data, replacements, spillovers, and non-compliance

Given the conflict-affected and fragile context, with pockets of insecurity and a high number of IDPs, we expect to encounter some attrition, both at the community and individual level. Differential non-random attrition across treatment and control may lead to biased results. Consequently, we will investigate the extent and nature of attrition. In particular, relying on pre-program and time-invariant variables as well as treatment assignment, we will model attrition, aiming to understand whether individuals/communities that attrit are different from the non-attritors, and whether individuals/communities that attrit from the treatment group are different from those that attrit from the control group. The insights obtained from these investigations will inform us about the potential size and direction of attrition bias, and guide our choice on appropriate ways to deal with it (e.g. adding additional baseline covariates to the above regression equations, using 'Lee' bounds, or relying on propensity score matching).

We will deal with outliers by winsorizing unbounded variables at the 99th percentile. To deal with missing data on outcome variables, we will follow [Kling et al. \(2007\)](#) and impute missing values by setting them equal to the mean of the variable for the relevant treatment group. We will deal with missing data on control variables by setting the missing value to an arbitrary number (e.g. zero) and including a missing value indicator for each control variable that has missing values.

While our baseline model specified above only includes initially assigned communities, we will also perform an analysis that includes communities that replaced the dropouts.

Spillovers could bias our results. Evidence from the impact evaluation of another CDD program in Eastern Congo (Humphreys et al., 2012). suggests that spillover concerns are not likely to be large since individuals in control communities (a) had limited awareness of the existence of the project in neighboring villages and (b) had limited access to services from neighboring villages. Nevertheless we exploit the exogenous component of spillovers in order to estimate spillover effects. This is done by exploiting the structure of the randomization and geographic location to identify for each unit the likelihood that they neighbor a treated area, then estimate spillover effects for strata which contain units with similar propensities to be exposed to spillovers (but for which some were and others were not).

Non-compliance of treatment or control projects may pose a problem. If a control CDD built the infrastructure before the collection of the ex-post data, the group would be contaminated. Similarly, a treatment CDD which do not construct their infrastructure is a case of non-compliance. This is why we opt in our baseline estimate for an intent-to-treat approach. As this approach may be too restrictive, in a robustness check, we will estimate the Local Average Treatment Effect which yields valid estimates under several assumptions (exclusion restrictions, no “defiers” assumption)⁴.

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