

Impact Evaluation Design for the Lesotho-MCA Land Reform and Administration Project

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In order to establish the nature and extent of causal relationships between the Land Project interventions related to ‘area-wide formalization of land rights in greater Maseru’ and changes in key outcome indicators, and behavioral and economic impacts on beneficiaries, MCA-Lesotho and MCC plan to support an independently conducted rigorous impact evaluation (IE). Michigan State University has been contracted by MCC to design the impact evaluation of this component of the Land Project, conduct regular field visits for quality control and technical guidance, analyze data, and write up results. A local or a regional firm contracted by MCA-Lesotho will carry out the baseline and follow-up surveys.

Key questions:

The impact evaluation is designed to test the following key economic hypotheses associated with area-wide registration of urban land parcels. It is hypothesized that land with formally recognized titles will result in:

1. Increased number of land parcels used as collateral for mortgage
2. Increased investment in the property, increased frequency of transfers, subletting, rentals, and other economic activities
3. Increased value of land
4. Reduction in land related conflicts
5. Increase in income of beneficiaries

The baseline and follow-up surveys to be undertaken for the IE purpose will also contribute towards evaluating some of the M&E indicators in a before/after framework that relate to the efficiency and effectiveness of the functioning of the newly established Land Administration Authority (LAA).

Methodology:

The IE is based on the *difference-in-difference* (DiD) analysis approach. The DiD approach essentially measures the difference of outcome indicators between participants (treatment group) and nonparticipants (comparison group) before and after program intervention. In the context of panel data (with a baseline survey and a follow up survey of the same households), DiD is a common and valid method to estimate the impact of an intervention if the assumption that unobserved heterogeneity is time invariant and uncorrelated with the treatment effect is satisfied. While the main advantage of DiD is its ability to allow for selection on unobserved factors, its assumption of constant selection bias over time may be unrealistic in practice.

Let Y be the outcome of interest (i.e., land investment, land market participation, household income, off-farm employment, etc.). Our goal is to evaluate the impact of a specific intervention T (i.e., issue land titles to urban residents) on Y after a time period 1. Specifically, we can achieve this evaluation through DiD as:

$$DD = E[Y_1^T - Y_0^T] - E[Y_1^C - Y_0^C] \quad (1),$$

where the superscripts T and C refer to treatment and control households, respectively; the subscripts 1 and 0 refer to time period 1 (after the intervention) and time period 0 (the baseline period), respectively; T=1 refers to Treatment group. The regression counterpart of (1) is the following:

$$Y_i = \alpha + \beta T_i + \gamma t + \delta(T_i * t) + \varepsilon_i \quad (2)$$

Where T_i is the dummy to distinguish treatment group ($T=1$) from control groups ($T=0$), t is a time dummy ($t=0$ for before treatment and $t=1$ for after the treatment). In (2), we can further add other control variables (X) to increase the efficiency of the estimation. DiD is widely used in impact evaluation of policy interventions especially when the experimental data are not available (see discussion by Duflo, Glennerster and Kremer 2007; Ravallion 2005). The DiD approach was also used by similar studies on land titling projects in other countries (Deininger et al. 2011, Di Tella 2007; Field 2007).

Identifying the treatment and comparison communities:

There are two things needed to implement the DiD IE design:

1. Identification of treatment and comparison sites, and
2. Data collection from both treatment and comparison sites before and after intervention.

Since the whole city of Maseru is designated as the treatment site, the option of assigning some villages within Maseru city as control villages has been ruled out. However, the project implementers have agreed to exclude one of the Maseru Municipal Council (MMC) from the land regularization plan for the next few years (at least 3 years). This is MMC 27 that is located in the north/northeast part of Maseru city (Figure 1). For this IE, MMC 27 is thus designated as the control/comparison area. The villages in the neighboring MMCs (1, 2, and 3) that are not yet regularized are designated as treatment areas for this impact evaluation. The list of villages that fall within the treatment and control areas as per this plan is given in Table 1.

Sample size and sampling strategy

To detect the project's likely impacts on key economic behavioral and outcome indicators among beneficiaries, it is indicated by the power calculations that a cluster random sample would require a sample size of 40 clusters (i.e. villages or sub-villages) with observations from at least 45 households per cluster, or a sample size of 1,800 households. This estimate of sample size accounts for the design effect of the experiment (two-stage cluster sampling), potential non-responsiveness and attrition problems (13%), and is based on a minimum detectable effect size of key outcome variables of 0.32. It also assumes an unbalanced sample design with a 70/30 split between treatment and control clusters. Thus the IE will consist of 28 treatment clusters (i.e., villages/sub-villages) and 12 control clusters (i.e., villages/sub-villages), with 45 households selected for data collection from each cluster.

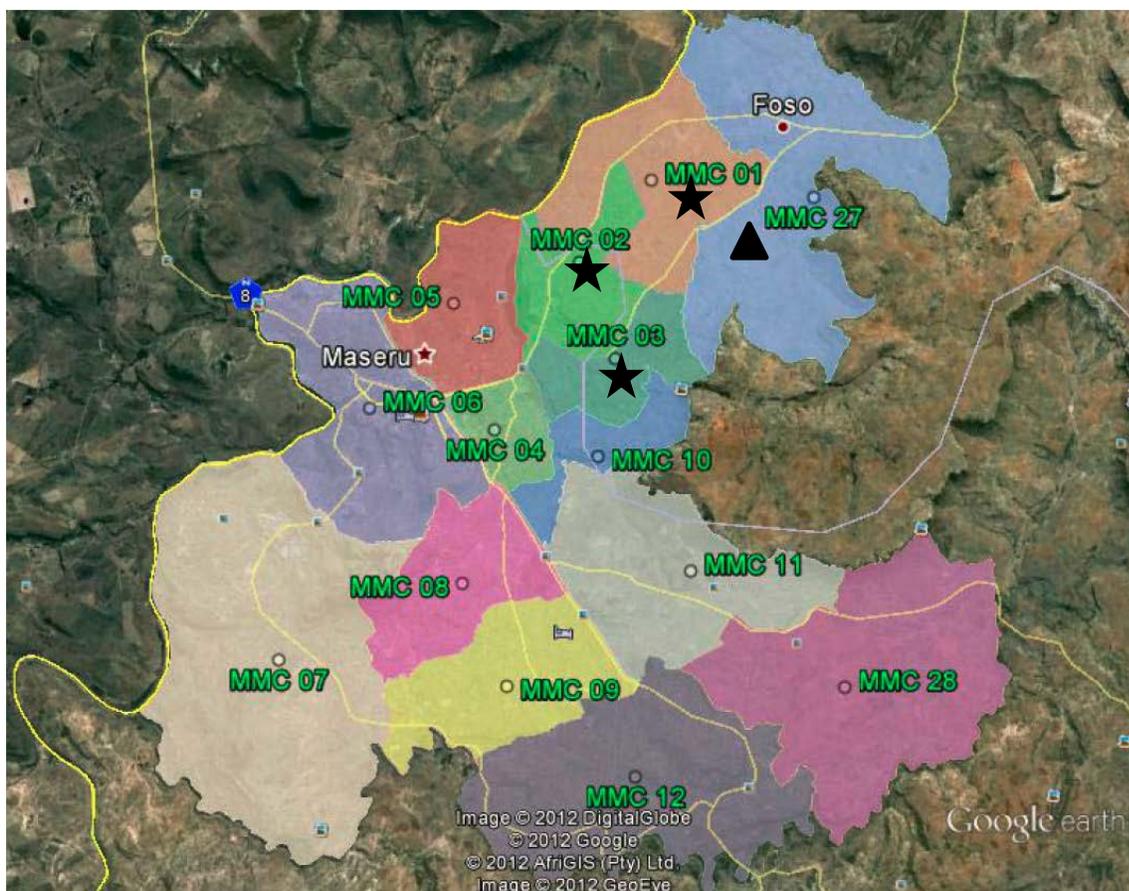


Figure 1. Map of Maseru city and designated treatment (parts of MMC 1, 2, and 3) and control MMCs (MMC 27)

The sample selection process will require two steps. In the first step, the 22 treatment villages identified in Table 1 have been divided into 28 clusters (or sub-villages) and the 6 control villages have been divided into 12 clusters (or sub-villages) such that each cluster has at least 100 households and belongs to only one village. In other words, big villages have been subdivided into smaller clusters (or sub-villages) for sampling purpose. Each of these village or sub-villages will be considered as units of intervention for the IE design (and statistics analysis). Based on the village boundaries identified in the field (with help from PIU), and using the GPS coordinates of this boundary and superimposing it on the satellite imagery of the MMC map that shows the density of land parcels with structures (i.e., roof outlines), the 40 sub-villages have been mapped and labeled as per Table 2. The maps of these 28 treatment and 12 control sub-villages is given in Appendix 1.

In step two, 45 households from each cluster will be randomly selected. To aid in this selection process, a GIS based method of ‘listing’ will be undertaken. This will involve using orthophotos to pre-vectorise land parcels (to be provided by COWI) and using them to produce GIS maps for sample selection. This method will be used to randomly select the required numbers of households (and replacement households) in each cluster across all MMCs. To augment the number of parcels in the survey sample that will be used for commercial purposes, a field based listing exercise will be undertaken to identify all the parcels in each cluster where some kind of

commercial activities would be taking place. About 4-6 additional parcels identified as commercial plots (but were not part of the sample selection based on the GIS method) will be randomly selected to increase the number of observations for commercial parcels. For the purpose of this IE, in either of the two methods to be used for sample selection, the sampling frame will be defined as “households that have land parcels that belong to them in the same village where they are being interviewed, and for which they have not yet obtained any Lease. The land parcel could be either occupied by the HH or rented to others for housing or commercial purpose.”

Table 1: List of treatment and control villages in the proposed impact evaluation design

TREATMENT VILLAGES	CONTROL VILLAGES
MMC01 Selakhapane	MMC27 Sekhutlong
MMC01 Rasetimala	MMC27 Koalabata
MMC01 Le-coop	MMC27 Marabeng
MMC01 Phomolong	MMC27 Ikheteleleng
MMC01 Pecha	MMC27 Ha Foso
MMC01 Thoteng-Khubetsoana	MMC27 Khopane
MMC01 Kuroane	
MMC01 Boiketlo	
MMC02 Maqalika	
MMC02 Bochabela II	
MMC02 Bochabela III	
MMC02 Bochabela I	
MMC02 Lifelekoaneng-Mabote	
MMC02 Mapaleng-Mabote	
MMC02 Taung-Mabote	
MMC02 Phahameng-Khubetsoana	
MMC03 Tsosane (part that is not regularized)	
MMC02 Rural	
MMC02 Sebaboleng	
MMC02 Phpoletsa-Mabote	
MMC02 Thoteng-Mabote	
MMC03 Naleli-Tsosane	

Data collection

The evaluation will use household level surveys that will include interviewing the head of the household based on a detailed instrument which will be translated into Sesotho. The survey has detailed sections for each of the outcomes to be evaluated, both intermediate and final outcomes, and some M&E indicators to be monitored. In addition, each of the survey households will be geo-referenced for ease of locating the household for a follow-up survey. A separate module targeted towards women will be administered separately with the women head of the family.

After the listing, to be completed between March and April 2013, the survey will be implemented in the selected villages. This will represent baseline data for this IE design. Ideally, the follow-up survey should be planned after a few years to allow the observation of outcomes and impact (but before any land regularization activities take place in MMC 27). Currently, the

plan is to have the follow-up survey in 2016 around the same time as the baseline survey was conducted in 2013.

Table 2: List of clusters or sub-villages identified for sample design

MMC #	Village name	Group	Name of the cluster (sub-village)
MMC01	Boiketlo	Treatment	Boiketlo
MMC01	Kuroane	Treatment	Kuroane
MMC01	Rasetimala	Treatment	Rasetimela 1
MMC01	Pecha	Treatment	Pecha
MMC01	Phomolong	Treatment	Phomolong 1
MMC01	Phomolong	Treatment	Phomolong 2
MMC01	Le-coop	Treatment	Le-coop
MMC01	Rasetimala	Treatment	Rasetimela 2
MMC01	Selakhapane	Treatment	Selakhapane
MMC01	Thoteng-Khubetsoana	Treatment	Thoteng-Khubetsoana
MMC02	Bochabela I	Treatment	Bochabela I (1)
MMC02	Bochabela I	Treatment	Bochabela I (2)
MMC02	Bochabela II	Treatment	Bochabela II
MMC02	Bochabela III	Treatment	Bochabela III
MMC02	Phpoletsa-Mabote	Treatment	Phpoletsa-Mabote
MMC02	Lifelekoaneng-Mabote	Treatment	Lifelekoaneng-Mabote
MMC02	Mapaleng-Mabote	Treatment	Mapaleng-Mabote
MMC02	Maqalika	Treatment	Maqalika
MMC02	Phahameng-Khubetsoana	Treatment	Phahameng-Khubetsoana
MMC02	Rural	Treatment	Rural
MMC02	Sebaboleng	Treatment	Sebaboleng
MMC02	Taung-Mabote	Treatment	Taung Mabote
MMC02	Thoteng-Mabote	Treatment	Thoteng-Mabote 1
MMC02	Thoteng-Mabote	Treatment	Thoteng-Mabote 2
MMC03	Tsosane (part not regularized)	Treatment	Tsosane (not reg) 1
MMC03	Tsosane (part not regularized)	Treatment	Tsosane (not reg) 2
MMC03	Naleli-Tsosane	Treatment	Naleli-Tsosane 1
MMC03	Naleli-Tsosane	Treatment	Naleli-Tsosane 2
MMC27	Ha Foso	Control	Ha Foso 1
MMC27	Ha Foso	Control	Ha Foso 2
MMC27	Ikhedeleng	Control	Ikhedeleng 1
MMC27	Ikhedeleng	Control	Ikhedeleng 2
MMC27	Ikhedeleng	Control	Ikhedeleng 3
MMC27	Khopane	Control	Khopane
MMC27	Koalabata	Control	Koalabata 1
MMC27	Koalabata	Control	Koalabata 2
MMC27	Koalabata	Control	Koalabata 3
MMC27	Koalabata	Control	Koalabata 4
MMC27	Marabeng	Control	Marabeng
MMC27	Sekhutlong	Control	Sekhutlong

Appendix 1:
Maps of selected sub-villages for treatment and control groups by MMC

Figure 1.1: MMC 01—10 clusters (Treatment group)

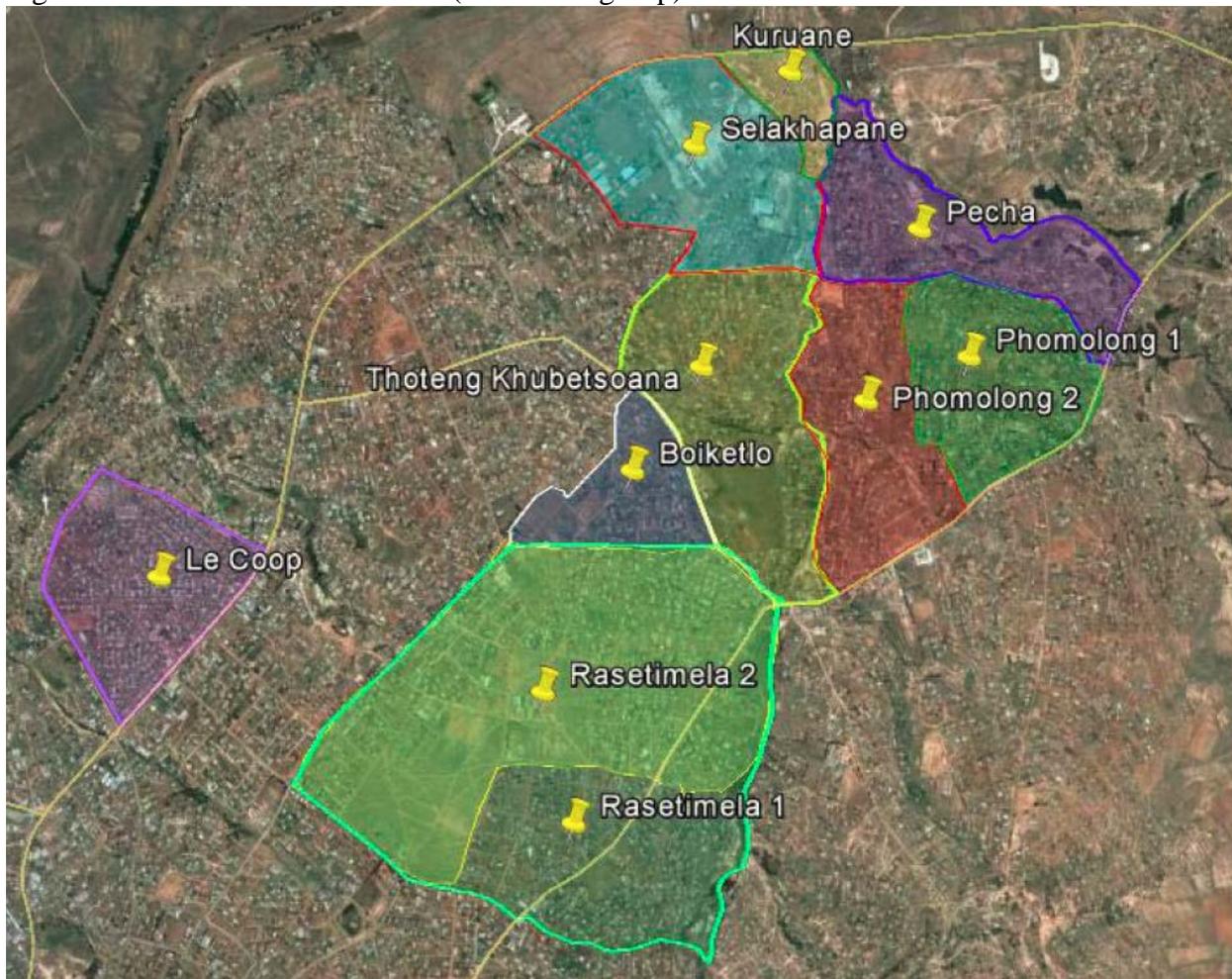


Figure 1.2: MMC 02—14 clusters (Treatment group)

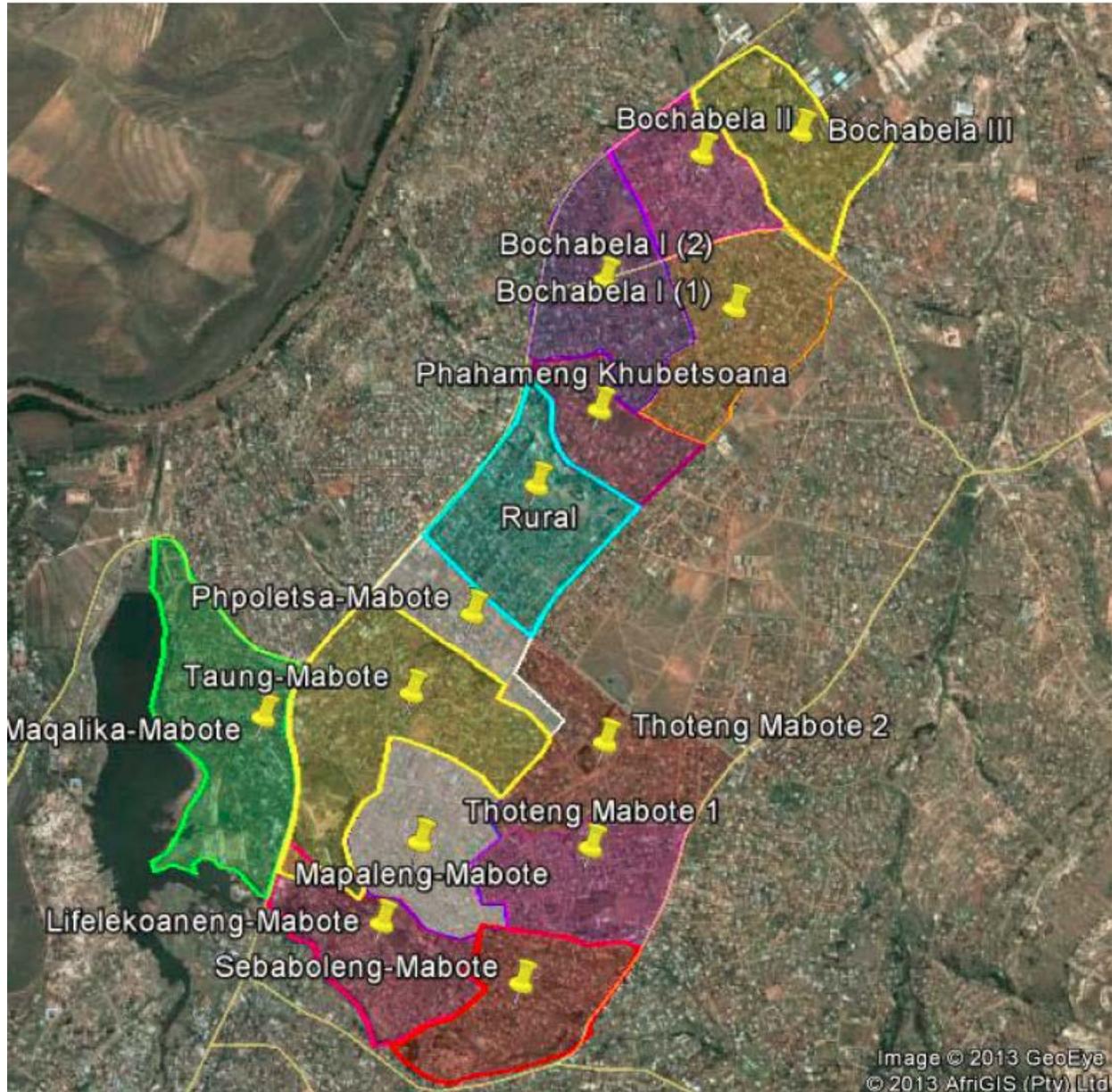


Figure 1.3: MMC 03—4 clusters (Treatment group)

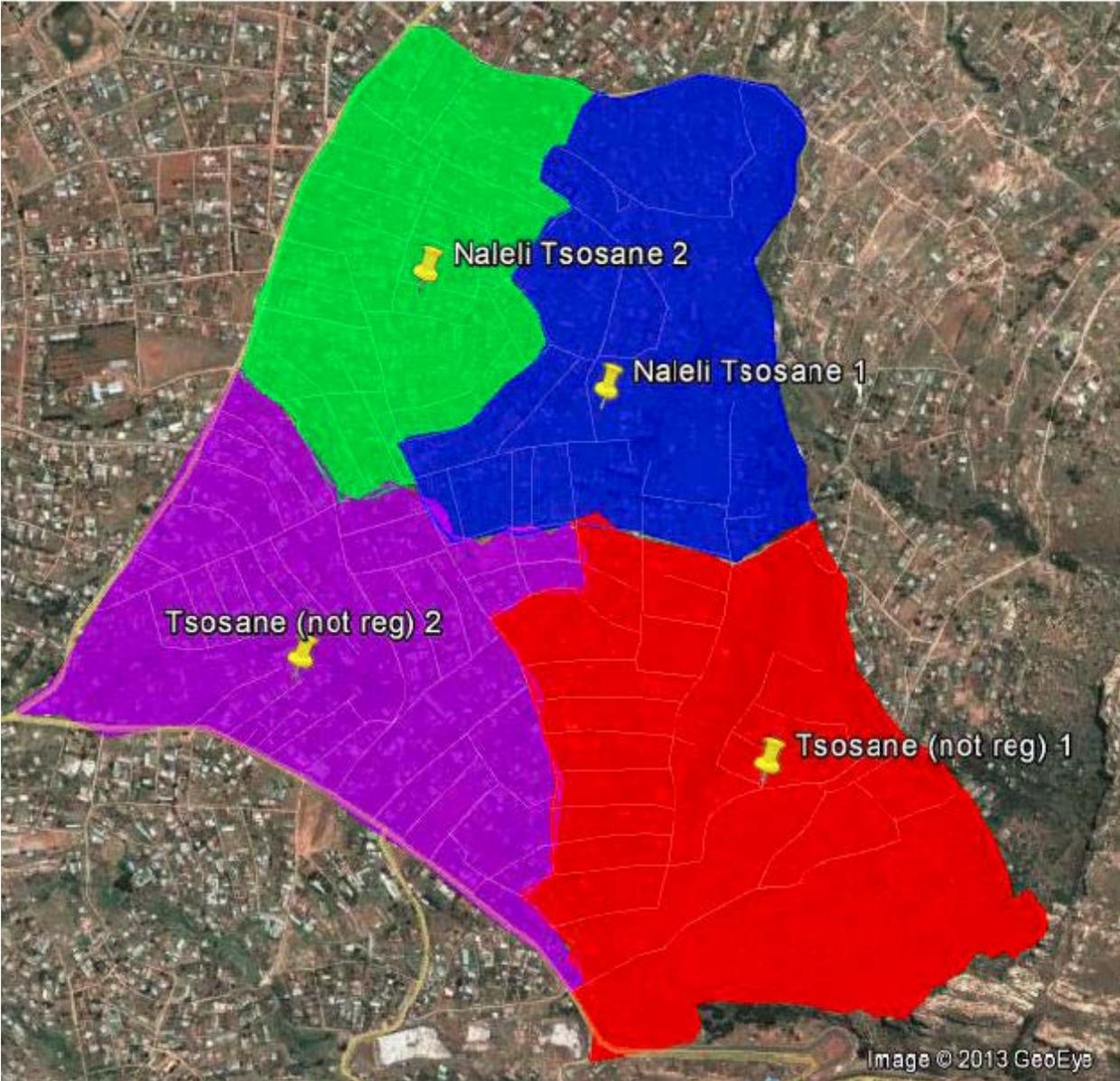


Figure 1.4: MMC 27—12 clusters (Control group)

