

# CASE STUDY

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## Environmental and Gender Impacts of Land Tenure Regularization in Africa

### Pilot Evidence from Rwanda

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#### ABSTRACT

Although recent developments have increased interest in African land tenure, Rwanda's nation-wide Land Tenure Regularization (LTR) program is one of a few models to address these issues at the required scale. A rigorous empirical analysis that is used to evaluate the pilot for this program highlights four main effects; namely, (i) significant and large investment impacts that are particularly pronounced for women; (ii) improved land access for legally married women and better recordation of inheritance rights; (iii) a reduction in the probability of having documented land ownership for legally unmarried women; and (iv) a reduction in land market activity rather than distress sales. The encouraging policy implications of the first two and the challenges as well as contextual understanding of the latter two are discussed below.

#### BACKGROUND

The right to land has become an increasingly contentious topic in Sub-Saharan Africa as the regional population continues to grow at significant levels, urban expansion continues to intensify, and the global demand for agricultural commodities and environmental services continues to rise. Land cultivation is marked by substantial gaps in productivity, and investments required to close these gaps will require secure rights. Additionally, the structural transformation from an agrarian to a manufacturing and service based economy will require shifts of population and associated transfers of land to other producers.

Rwanda's Economic Development and Poverty Reduction Strategy (EDPRS) identifies land registration as a critical element to improve productivity of land use, functioning of land markets, reduce conflicts, empower women, and improve overall governance. To

provide secure land tenure to all Rwandans in the context of development and economic growth, and with the goal of creating the preconditions for rapid structural transformation, far-reaching legal and institutional changes were embarked upon. Adoption of the 1999 inheritance law, key provisions of which were also incorporated into the 2003 constitution, aimed to eliminate bias against female land ownership. It was followed by the 2004 land policy and its codification in the 2005 organic land law (OLL). Establishment of institutional structures at national and local level then created the preconditions for the extensive piloting of the Land Tenure Regularization (LTR) program, and the national program. The main objective was to create the precondition for formalization and full legal recognition of rights in the form of title certificates to land holders. The program design relied on the experience acquired during the pilot exercises



conducted in 2007/2008 in four cells which were chosen to reflect the country's different realities (Nyamugali in Kigali City, Kabushinge in the North, Biguhu in the West and Mwoga in the East). Subsequently, in 2009, the government started the national roll-out of the LTR program to register the estimated 10 million parcels in a decentralized manner at a cost well below any existing land registration initiative (USD 5 per parcel). High precision aerial photographs and satellite imagery are used by locally recruited and trained para-surveyors to demarcated general boundaries (as opposed to GPS measurements) while the process relies heavily on local authorities for both demarcation and adjudication. Rwanda is the first African country to implement such an approach and the evaluation of the pilots, on which this note is based, and subsequently the national program can shed light on best practices.



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## DESIGN

The evaluation was designed to assess the impact of LTR on: (i) land related investment; (ii) female land ownership; (iii) female inheritance; and (iv) the frequency of land transactions. The pilot took place 2.5 years before the national rollout.

A key methodological challenge in undertaking a rigorous socio-economic impact assessment of the pilots was lack of baseline data. To address this caveat, we interviewed 3,554 households with some 6,330 parcels of land on both sides of the boundaries of the four pilot cells to allow comparison between treated and non-treated households (inside and outside of the borders of the pilot cells, respectively) close to the borders of the pilot cells. We thus exploit the discontinuity which administrative boundaries created in the introduction of the pilot program as an identification strategy. The key assumption is that before the start of the program, households close to a cell boundary were similar in unobservable and observable factors affecting relevant outcomes. Data was collected in 2010, 2.5 years after the start of LTR in the pilot cells. To sample inside pilot cells, we used parcel index maps created by the program. As no such maps were available

for the adjacent (control) cells, we used high resolution satellite imagery to identify dwellings and establish a sample frame<sup>1</sup>. The figure below illustrates the identification strategy.

As tenure regularization was compulsory and covered all private land in each pilot cell, but not beyond their administrative boundaries, the decision to participate in the program was unlikely to be related to potential outcome variables such as investment and land market activity. The spatial discontinuity generated by this allocation rule thus can be used to allow identification of program effects by comparing individuals who live within a band on either side of the border following Magruder (2011). This approach requires that communities on either side of the border have to be identical and cell-level effects that could drive our results need to be absent. To assess the validity of this assumption, we note that key policies with respect to land rights and use (e.g., land inheritance and soil conservation policies) are set and enacted at the national level and planning and coordination of socio-economic activities are done at the district level. Although the cell administration plays an important role in key aspects of implementing the LTR process such as public sensitization, conflict resolution, display, and registration, all of these are part of the treatment of interest and there are no

significant cell level interventions that could drive our results. However, local variations in soil quality, market conditions or other factors that could have remain a concern were addressed using spatial fixed effects to control for unobservable local level characteristics in line with the existing literature (Conley and Udry 2010, Goldstein and Udry 2008, Magruder 2011).

## PROGRAM IMPACT

**Land Tenure Security:** A primary reason for the Government of Rwanda to initiate LTR was to increase levels of land tenure security. As expected, a negative relationship between LTR and the subjective expropriation risk (for the purpose of public interest) was observed even if it was not statistically significant. Possible reasons for the absence of significant impact on expropriation risks include the fact that LTR does not change overall policy and that households' knowledge of the policy may be limited, or that it is difficult to capture a complex measure such as perceived expropriation risks with a single question.

**Soil Conservation Investments:** When assessing the program's impact on soil conservation measures, the analysis found household behavior that is consistent with a lengthening of time horizons due to LTR-induced increase in tenure security. Households affected by LTR are almost 10 percentage points more likely to make soil conservation investments – building or maintain structures such as bunds, terraces and check dams. This is about double the change in investment in the control group, representing a staggering effect. Women seem to benefit even more in this respect; estimated effects of LTR on such investments by female headed households is double that of men headed households, with the former exhibiting a 19 percentage point increase in the likelihood of investment in soil conservation. This suggests that low levels of tenure security acted as an obstacle to investment and that LTR's increased tenure security can

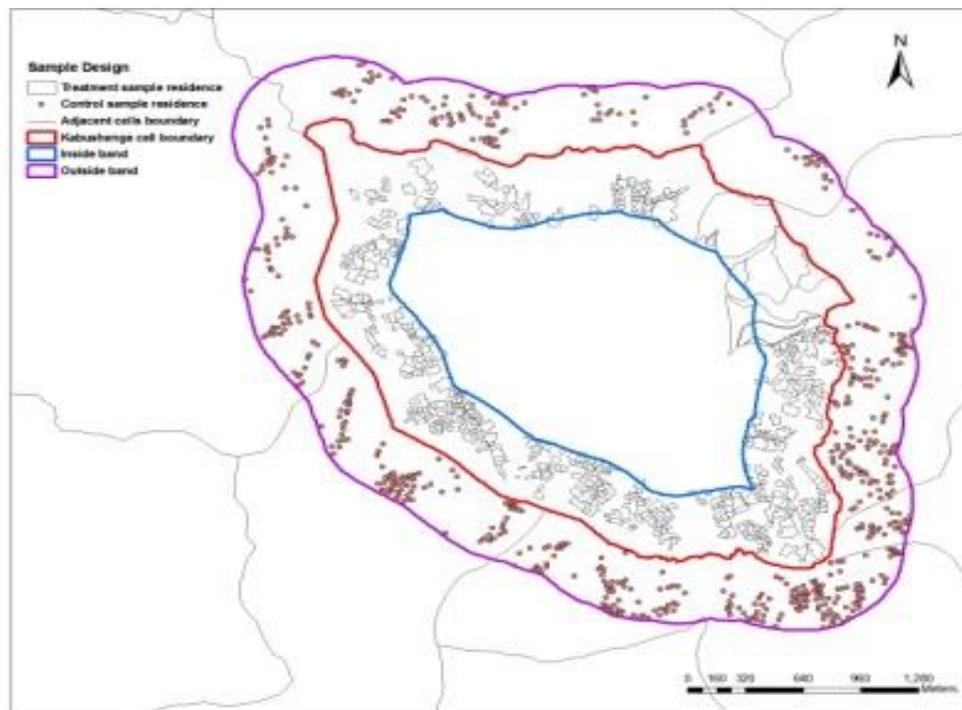


Fig. 1. Example of Sample Design from Kabushinge Cell  
(Source: 2011 World Bank Land Tenure Regularization Survey)

efficiently remove such constraints.

**Gender Equity and Access to Land:** Prior to the introduction of the 1999 Inheritance Law, customary law reigned and dictated that women in Rwanda have usufruct rights to land only through their husbands whose lineage controlled the land. The 1999 law changed this by granting sons and daughters equal rights to inherit their parents' property, subject to the provisions of the family law (which under the most common conjugal property regime mandates equal shares), protecting property rights of women under a legally registered marriage and requiring spousal consent for transaction (e.g., sale, mortgage or exchange) of matrimonial property by any of the marriage partners. Nevertheless, the law does not protect property rights by women who live with partners or are in marriages that are unregistered. Arrangements such as consensual unions, customary or religious marriages, and polygamous unions are not formally recognized by the law. For women who were part of a union formalized through a marriage certificate (76 percent of the sampled couples), the effect of the program was overwhelmingly positive. They were 17 percentage points more likely to be regarded as joint land owners after LTR than before. However, the analysis revealed that LTR resulted in a small but statistically significant reduction (of eight percentage points) in the likelihood legally unmarried women to become documented owners.

**Gender and Inheritance:** LTR also demonstrated significant impact on inheritance related knowledge and awareness. We found a nine percentage point increase in the likelihood that landholders in the program areas would now know who would inherit their parcel. This is most likely linked to the required explicit record of persons of interest that provides clarity on pre-existing succession-related uncertainty. This increased certainty also established security for children as they were 13 percentage points more likely to inherit their parents' land with boys and girls benefitting almost equally (10.2 compared to 9.6 percentage points). Girls in female headed households were significantly less likely to inherit their mothers' land when compared to girls in male headed households. This unforeseen finding requires further research and may



Fig. 2. Adjudication (photo credit: Marguerite Duponchel)

necessitate augmentations and enhancements to programs like LTR in order to avoid long term emulations of such practices.

**Market Activity:** A great concern for interventions seeking to improve land tenure is that they could lead to distress sales, where households without access to credit and insurance sell their land in periods of distress at below the fair market value, leading to landlessness and greater vulnerability and poverty. However, we found a significant decrease in both the land market activity and the size of land area traded as a result of LTR. To interpret this finding, two contextual factors are relevant. One possible explanation is that the low level of market activity may have been related to the transfer fee increase. Indeed, the change from a rate of six percent of the property value to a flat fee of RwF 20,000 during the pilot meant that the fee could easily exceed 25 percent of the land value of small plots. The observed decrease in transactions could also have been tied to law enforcement on small transfers as most parcels in the sample fell below the legally prescribed minimum size of one hectare for land transactions. Further, the formal system to register land transfers was not installed at the time of the survey and people did not want to risk losing their new found tenure security. Additionally, the benefits of registration were

unclear during the pilot and beneficiaries preferred holding on to their land because they expected its value to increase as others would realize the benefits of having secure land ownership documentation when LTR was to start at a large scale. The contextual background for the decrease in activity and size of land is critical when assessing the relationship between LTR and land markets. The national rollout of the program and the implications of the results will provide us with greater insight on whether the data can be viewed as contextually conditioned or whether other factors were driving the results.

## POLICY IMPLICATIONS

Increased global demand for land and higher and more volatile food prices, together with the potential prospect of payments for environmental services, have translated into higher demand for land globally. To increase productivity and prevent that this pressure deprives the most vulnerable of their land, countries need to improve their land administration institutions. Given the complexities of land tenure in most African countries, a framework and guidelines have been developed and endorsed by African heads of State but their implementation needs to be guided by evidence-based monitoring. With a massive program to register the country's

estimated 10 million parcels at a cost well below traditional norms (USD 5 per parcel in the national rollout), Rwanda is a protagonist in this area and lessons can be drawn from its experience to input land tenure regularization initiatives elsewhere.

This pilot assessment demonstrates the significant positive effects of land tenure regularization. First, improved tenure security increased land related investments, as households whose parcels had been registered through LTR, in particular female headed ones, were much more likely to invest in soil conservation. Second, clarification and documentation of rights significantly reduced uncertainty over who would inherit land, with substantial benefits for female children who might otherwise have been discriminated against. Third, the program also provided large additional gender benefits. Legally married women were significantly more likely to have their informal ownership rights documented and secured after registration. By touching on improvements in women's access to land and increased investment, especially for women, while avoiding an increase in distress sales, LTR presents considerable conduits to socioeconomic reform in the country.

LTR poses noteworthy policy implications for both Rwanda and other land scarce countries in Sub-Saharan Africa. The lessons learned and risks realized can strengthen investment, boost productivity, and promote environmental protection while implementing substantial reforms in the area of gender equity.

Results of the pilot assessment call for caution regarding vulnerable groups. While LTR significantly increases tenure security of legally married women, who are as a result more likely to have their informal ownership rights documented and secured after registration, women in consensual unions or polygamous marriage saw diminished property rights, in accordance with the law<sup>ii</sup>. To avoid increasing their vulnerability, there is clear need to raise general awareness on

family law and the importance of legal union to women during the project implementation to ensure that these women are not excluded from the land registration process. The legal recognition of customary or religious marriages could also likely prevent the observed negative impact of the program.

Further investigation will be required to identify the reasons why land tenure regularization has a depressing impact on land market activities. The evaluation of the national rollout, which is currently on-going, should shed light on the potential causes. Transaction costs and regulation related to ownership transfer registration should be reviewed and the laws amended accordingly. In particular, the minimum one hectare size restricting subdivision, on grounds of economic productivity, may require revision as it imposes a serious constraint on transactions particularly in cases where collective ownership is not feasible. As a large number of parcels lie under the one hectare threshold, this restriction could otherwise render the cadastre obsolete if households continue to subdivide land but cannot legally transfer ownership rights. In addition, it will be essential for the land administration to have the capacities and means to ensure that the flows of transactions can be efficiently and timely registered.

<sup>i</sup> *Figure 1 illustrates the procedure. To ensure that the share of households in each pilot cell corresponded to the cell's share in the target population, the width of the band from which households were selected was adjusted accordingly.*

<sup>ii</sup> *Women in unregistered marriage can be recorded as persons of interest on the land until they are legally married.*

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(Photo credit: Marguerite Duponchel)

Fig. 3. Female planting tea

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