

Annex 3: How can titling be translated into poverty reduction?

For simplicity, the titling program is assumed to work in the following way: households affected by the program initially have none of their plots titled, and will have all their plots titled after the intervention. The assumption implies that the number of households affected by the program will equal the number of titles issued divided by the average number of plots per household among potential program beneficiaries. We also assume that poor households are equally likely as non-poor households to have their plots titled.

The poverty impact of the program is calculated in the following way: The poverty rate among potential beneficiaries (households that own land without titles), is estimated to be 42 percent. Then, we estimate how much agriculture income would increase as a result of titles. Then, we simulate the increase of total income, which is proportionate to the share of agriculture income in total income. The increase in total income is assumed to translate fully to household consumption. Based on simulated post-titling consumption of these households, we calculate the poverty rate among beneficiaries after the program has been implemented. Note that all this is based on the assumption that beneficiary selection is uncorrelated with pre-program poverty status. The number of people escaping poverty as a result of the titling program is computed as the number of households escaping poverty times the average household size among potential beneficiary households that are poor before the program (this number is 5.7). The change in the national poverty rate is computed as the total number of poor divided by the total population.

This model of simulation ignores the following effects that are potentially important:

- *Multiplier effects.* The increased consumption of farmers will spill over into the non-farm sector. This is not taken into account in the model, which is a source of downward bias in the impact estimates.
- *Effects on other non-crop income.* Land titles might affect the ability to invest in other sectors than crop agriculture, because land can be offered as collateral for loans. Therefore titling might also affect income from non-agricultural enterprises, livestock-raising and so on. This is not accounted for in the simulation.
- *General equilibrium effects.* Imagine that titling works by increasing agricultural investment. Then if massive titling were to take place, aggregate demand for agricultural investment goods would increase, which would affect the price of those goods might and production could increase, which in turn prompts more investment and further multiplier effects in the economy.
- *Network-effects.* Titles to some extent have the properties of “network goods” – the more other people have them, the more valuable a title is for an owner. One reason for this is that titles make it easier to transact land. Therefore, the more other people have titles, the more potential transaction partners one has, but this potential can only be realized, if one has titled land. These effects would imply increasing marginal returns to titling.