The Impact of Targeting Mechanisms on Efficiency and Equity of Irrigation in Mozambique

Impact Evaluation Summary
Irrigation is more important than ever in ensuring sustainable livelihoods for farmers in the face of increasing climate uncertainty. In Mozambique only 8% of all farmers have access to irrigation, partly due to an institutional inability to sustain previous investments in the sector and lack of local institutions capable of maintaining the infrastructure. This IE investigates whether prioritizing smallholders changes dynamics of water users groups and the resulting returns from irrigation. We will compare the inclusion and efficiency outcomes of communities who are assigned to scorecard based selection versus decentralized community selection. The study is embedded in the AfDB financed Sustainable Land and Water Resource Management Project (SLWRMP), which aims to place 56 small scale sprinkler irrigation installations covering five to ten hectares of land each in the southern province of Gaza in Mozambique. The evaluation is funded by the i2i trust fund and the Climate Investment Fund.

Policy Issue
Promoting sustainable irrigation and drainage is essential for making smallholder farmers resilient to intensifying climate variations, and the government of Mozambique has made the development of irrigation a priority for agriculture growth and rural development.

Irrigation interventions hold tremendous potential to help farmers cope with increasing climate variability, and to ensure food security in many poorer regions of the world. Yet, failure to properly manage irrigation schemes often limits returns to investment in this sector. Increasingly, governance models of irrigation are decentralized to local water users’ groups. The idea is that users of a scheme should be more successful in monitoring and organizing the Operation & Maintenance (O&M) activities, as they have the local information and incentives to do so. Yet, the potential for collective action failures remain, and little is known as to which governance arrangement and incentive designs can overcome commons problems.

The proposed evaluation aims to shed light on if different approaches to select beneficiaries can reduce elite capture and result in a more equitable distribution of benefits. It is often hypothesized that slightly larger farmers can get higher returns from the investment, resulting in low inclusion of marginal farmers. However, the potential trade-offs between inclusion of smaller farmers and successful management remain an empirical question. We will exploit exogenous variations in the composition of water users groups induced by the random assignment to two targeting regimes to understand the causal relation between group composition and collective action over operation and maintenance of the schemes, and final impact on production.
THE IMPACT OF TARGETING MECHANISMS ON EFFICIENCY AND EQUITY OF IRRIGATION IN MOZAMBIQUE

Context
Over three-quarters of people in Mozambique depend on agriculture as their primary livelihood (FAO, 2015). The sector is dominated by smallholder farmers – 99% of farmers cultivate <10 ha. Agricultural productivity is extremely low—labor shortages and low levels of mechanization are major constraints to extensive agricultural growth.

The majority of agricultural production is rain fed, as such rainfall patterns across agricultural seasons is still the most important factor affecting production variability (Cunguara and Kelly, 2009). This is in particular the case for the central part of the country, where agriculture is dominated by smallholder rainfed farms which have experienced significant harvest losses as a result from extreme weather like droughts and floods.

Intervention
The project will provide 56 small scale irrigation kits in the southern province of Gaza. The project will be implemented in the four drought affected districts of Guija Mabalane, Chicualacuala and Massengena. Since the number of farmers that are interested will likely exceed the number that can be covered, a within village level selection procedure is necessary. The evaluation will test two different approaches to carry out the within village selection of beneficiaries to understand how different protocols can result in a more equitable distribution of benefits and if there are potential tradeoffs between inclusion of smaller farmers and productivity gains. The main features of the models are:

Model 1 – Score-based targeting. Selection happens according to a fixed set of criteria for placing the schemes and is designed to prioritize the smaller farmers in the community, between 0.5 and 1 hectare within the kit.

Model 2 – Decentralized Community-driven targeting. The community will have the freedom to decide who they want to benefit from the kit.

Evaluation Methodology
• Does rule based targeting lead to a more equitable distribution of benefits and greater inclusion of small landholders than decentralized targeting?

• Does decentralized targeting achieve a higher average increase in yields from irrigation investments than rule based targeting?

• What is the impact of irrigation infrastructure on water availability, crop choices, yields and variability of yield?

The evaluation will aim to respond these research questions by testing two different approaches to select beneficiaries within the selected community. The identification will be based on random assignment of protocols for models 1 and 2 for each of 56 communities with equal allocation to each model. The randomization will be stratified by district and allocated kit size. Identification of the program effects will be based on comparing the outcomes of interest between communities assigned to Model 1 and communities assigned to model 1. The survey sampling frame will be based on 1) all farmers included in the irrigation kit and 2) a random sample of at least 10 farmers inside the eligible area. Data will be collected both at the community, farmer and plot level.

Results
In Progress

Policy Lessons
The research findings will inform the project and other practitioners on the benefits (and costs) of different targeting regimes when considering the provision of irrigation infrastructure to local communities. Different entities are considering expanding this program to other communities (outside the initial target area).

In the area of irrigation, we can address a long-standing puzzle on how best to provide irrigation amenities to small-scale farmers in the absence of large infrastructure projects.

Information Box
Country: Mozambique
Theme: Agriculture
Topics: Natural Resource Management, Subnational PSM/Decentralization
Timeline: March 2015–June 2018