

Targeting and bias in participatory research

Evidence from Malawi



A farmer standing next to a maize-pigeon pea intercrop demonstration plot in Ntcheu District, Malawi.

Photo credit: Kathy Lopez/IITA

Key messages

- Farmers testing agricultural innovations as part of the Africa RISING Malawi project (beneficiary farmers) are systematically different from the broader population of smallholders.
- Beneficiary farmers had a higher value harvest and maize yield, relative to randomly drawn non-beneficiary farmers.
- While these early results are encouraging, it should be noted that what worked with better-off farmers may not work (as much) for the broader population of less-endowed smallholders for whom innovations deemed successful are scaled up.

The issue

Evidence on the productivity and poverty effects of agricultural technologies has been built largely around a single class of discrete, embodied technologies (e.g., high-yielding cultivars and synthetic fertilizers) whose advantages are directly realized by the use of the input. On the other hand, systems-based technologies rely on a complex set of tangible and intangible elements combined with scientific guidance to bring about the desired outcomes.

These technologies are different propositions from many others promoted during the past five decades and may require fundamental changes to how farmers participate in managing their farms and resources. Field station agronomy trials controlled by researchers under near-perfect conditions do not displace the need to test under real-world conditions by (usually progressive) farmers.

This interim step is crucial to generate accurate and generalizable evidence on the returns to technology options. When farmers are selected using criteria that may not always be visible to the evaluator, analysis of the determinants and agro-economic effects of technology choices becomes challenging. This is because it is difficult to know whether observed changes in outputs and outcomes are due to the agricultural innovations being applied, other confounding factors, or both. In addition, when an agricultural program aims to promote diffusion of successful innovations, either explicitly or implicitly, there is a need to also measure possible spillovers to accurately capture program effects and policy implications. This study examined targeting and bias within the Africa RISING Malawi project.

Findings

As shown in Table 1, the beneficiary group appears to differ from the other two randomly sampled groups along socioeconomic variables that were unlikely to have been affected by the program. This suggests a possible systematic targeting of beneficiary households.

After controlling for observable differences through matching-based regression analysis, beneficiaries had higher maize yield and harvest value, on average and across quartiles, relative to non-beneficiaries during the cropping season October 2012-May 2013 (Figs. 1 and 2).

Table 1: Mean differences in selected variables

	Group				
	B	NB	C	1 vs 2	1 vs 3
	(1)	(2)	(3)	(4)	(5)
Household size	4.97	4.55	4.59	**	***
Avg. adult yrs of education	5.20	4.51	4.72	***	***
Age of household head(years)	45.8	46.1	45.3		
% with married head	0.75	0.60	0.65	***	***
% with female head	0.27	0.36	0.34	**	**
% in the lowest two quintiles of agr wealth index	0.27	0.46	0.47	***	***
Tropical livestock units	0.45	0.28	0.21	***	***
Per capita land operated(ha)	0.29	0.23	0.23	***	***
Distance to basic services index	0.0015	0.027	-0.013		
% with the closest parcel within 15 minutes travel	0.74	0.57	0.54	***	***
Travel time to seed supplier(min)	42.9	41.7	38.9		
Elevation of residence(meters)	864.6	980.4	945.6	***	***
Observations	397	199	538		

Note: B = Africa RISING (AR) beneficiary, NB = Non-beneficiary in AR villages, C=Non-beneficiary in non-AR villages. ** significant at 5%; *** significant at 1%.

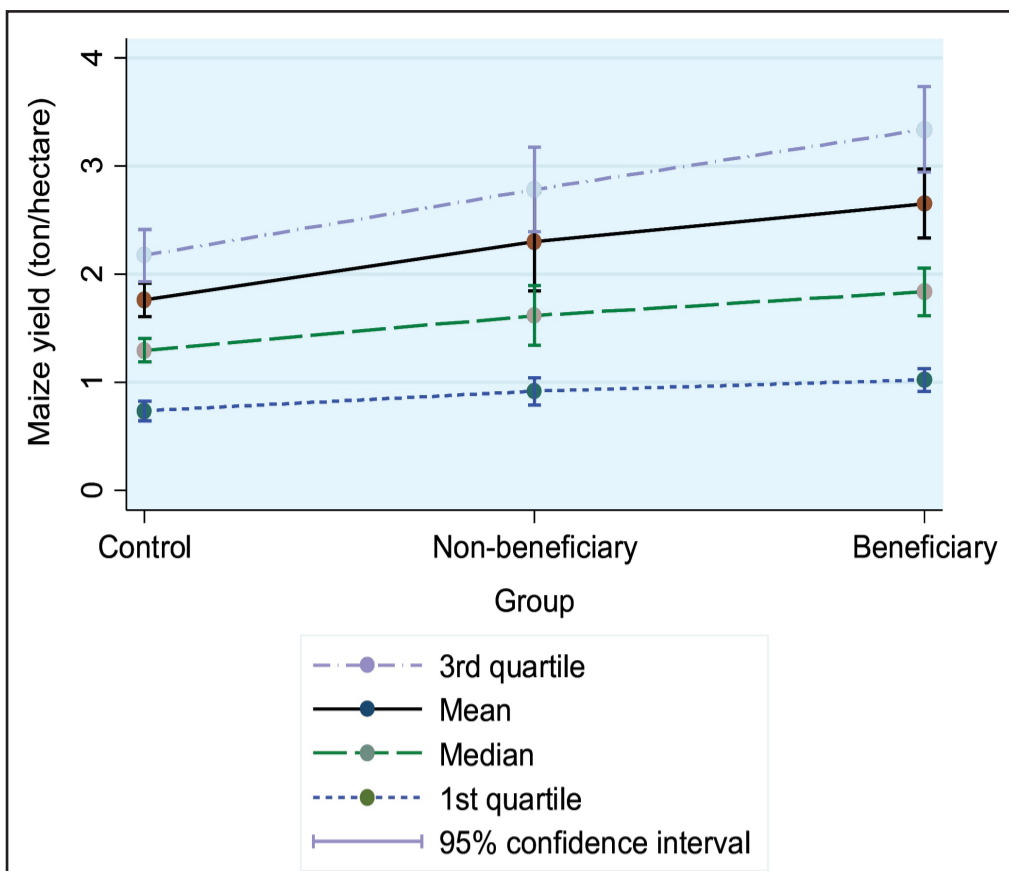


Figure 1: Maize yield

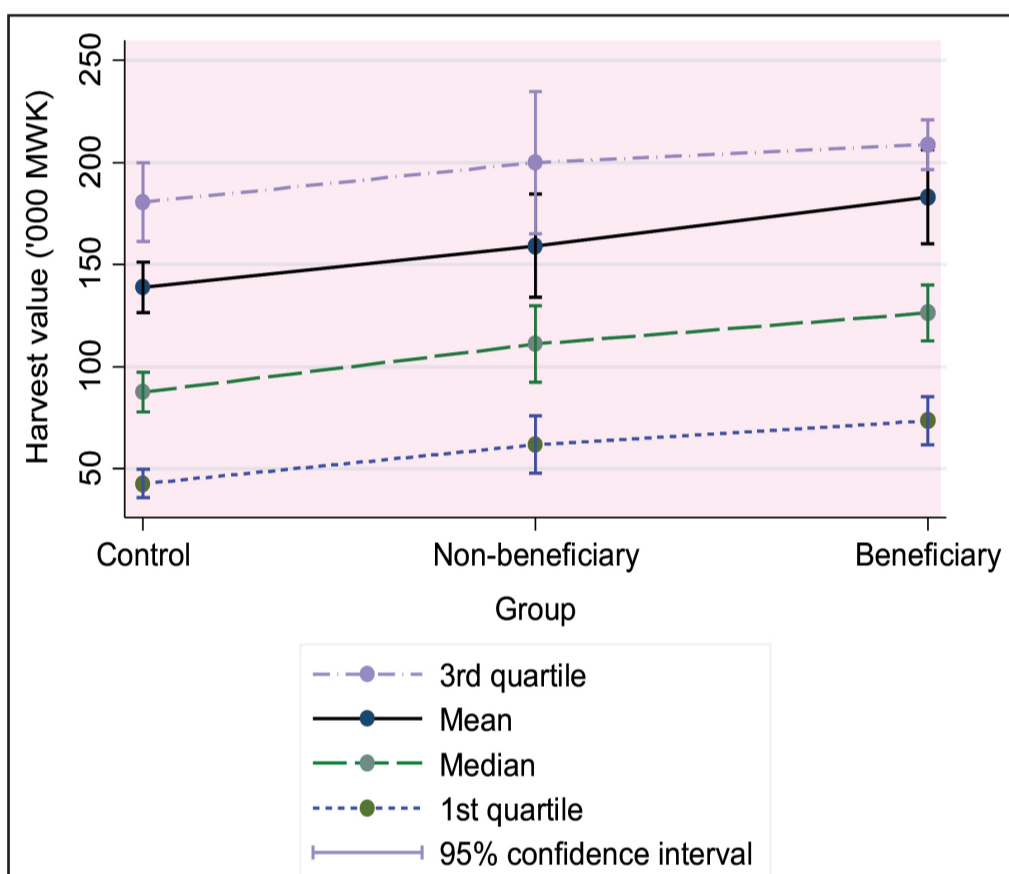


Figure 2: Harvest value

Recommendations

- Attention should be given not only to correcting sample selection biases, but also to the design of programs that aim to test and identify innovations for subsequent scaling up.
- Household targeting criteria should be improved, for example, by developing a typology of rural households to help identify homogeneous socioeconomic sub-groups and better analyze the factors that could affect

technology choices and subsequent outcomes for different types of households.

- Programs like Africa RISING should strive to embed rigorous evaluation designs to improve the validity of findings on the returns to technology options and subsequent outcomes and to minimize the unintended consequences of promoting solutions—including systems-based technologies—without strong evidence of impact or cost-effectiveness.

Methodology

Using geographic information systems (GIS), the two study districts (Dedza and Ntcheu) were stratified using temperature-adjusted rainfall and elevation. Subsequently, three “development domains” were identified based on historical average rainfall (R) and elevation (E): low R and low E; medium R and medium E; and high R and high E. After project managers identified four program-target sections, the M&E team randomly selected four control sections such that they represent similar development domains as program sections, while distant enough from program-target sections to avoid contamination.

Next, three groups of households were recruited into this research study; all households who were testing innovations as of June 2013 (“beneficiary” group), randomly sampled households in project villages who did not participate in the project (“non-beneficiary” group), and randomly sampled households from non-project villages representing similar development domains as Africa RISING villages (“control” group).

Finally, a detailed socioeconomic survey was conducted between August and October 2013 covering 54 villages (including 26 project targets) and 1,149 households (397 beneficiaries, 199 non-beneficiaries, and 538 controls). Agricultural production data refer to the cropping season October 2012 to May 2013 - the first main harvest season since beneficiaries joined the program. The analysis here excludes eight farmers testing mother trials as of June 2013.

Limitation

The analyses is based on one wave of data, and the usual limitations with cross-section based analysis apply, including selection based on unobservable factors and the inability to capture possible longer term effects.



The Africa Research In Sustainable Intensification for the Next Generation (Africa RISING) program comprises three research-for-development projects supported by the United States Agency for International Development as part of the U.S. government’s Feed the Future initiative.

Through action research and development partnerships, Africa RISING will create opportunities for smallholder farm households to move out of hunger and poverty through sustainably intensified farming systems that improve food, nutrition, and income security, particularly for women and children, and conserve or enhance the natural resource base.

The three projects are led by the International Institute of Tropical Agriculture (in West Africa and East and Southern Africa) and the International Livestock Research Institute (in the Ethiopian Highlands). The International Food Policy Research Institute leads an associated project on monitoring, evaluation and impact assessment.

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