

Economic evaluation of improved grain storage technology in Tanzania

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Key messages

- ✓ It is profitable for farmers to invest in PICS for maize storage given the current output prices and cost of the storage
- ✓ Benefits increase monotonically with maize production indicating that farmers would not have equal incentive to adopt the technologies.
- ✓ The storage bags are not feasible for low maize producers given their current level of production
- ✓ Targeting is necessary during upscaling

Objectives and approach

The objective of the study is to quantify the financial gains from the improved storage technologies and to examine how they compare with the traditional technology. It compares Purdue Improved Crop Storage (PICS) bags with the traditional polypropylene (PP) bags. The analysis is based on data collected through group interviews and a household survey in Babati district of Tanzania. We conducted participatory cost benefit analyses (PCBA) with groups of farmers who had experiences in using both the traditional bags and the improved bags. The PCBA data were supplemented by survey data collected from 175 households using a structured questionnaire. Partial budget analysis approach was used to evaluate the economic advantage of PICS over the PP bags.

Key results

Maize producers on average would save about 19% of stored maize by using the new storage bags (Table 1). The mean discounted net benefit is about 67,000TZS per season (Table 2). Benefits increase monotonically with maize production indicating that farmers would not have equal incentive to adopt the technologies. Indeed, the bags are not economically feasible for small maize producers. The sensitivity analysis with respect to changes in maize price and price bags show that the storage bags remain economically feasible even if the price of maize declines by 20% or the price of bags increases by 20% indicating that our conclusion is stable (Figure 1).

Significance and scaling potential

Storage losses are high in Tanzania which ranges from 20 – 40%. This high loss suggests the need for greater attention on postharvest grain losses in order to address the problem of food insecurity. By adopting the PICS bags farmers can save about 19% of their maize output which means that an average household will have about 350kg of more maize for consumption or sale.

Table 1: Maize production and storage losses

Farmers category (Quantiles)	Quantity produced & stored (kg)	Estimated Quantity of loss (kg)	
		Traditional bags	PICS bags
Low producers (LP)	335	1.6 (0.5%)	0 (0%)
Lower middle producers (LMP)	741	75 (10.1%)	0.9 (0.1%)
Medium producers (MP)	1168	222 (19%)	2.6 (0.2%)
Upper middle producers (UMP)	2024	384 (19%)	4.5 (0.2%)
Top producers (TP)	4782	918 (19.2)	10.7 (0.2%)
Average	1826	355 (19.4%)	4.1 (0.2%)

Table 2: Financial benefits from new storage bags

Farmers Category	Net return (TZS)	BCR	IRR (%)
Low producers (LP)	(1,650)	0.5	(10)
Lower middle producers (LMP)	12,073	2.8	114
Medium producers (MP)	41,582	5.1	228
Upper middle producers (UMP)	71,808	5.1	225
Top producers (TP)	178,810	5.7	254
Average	67,087	5.4	243

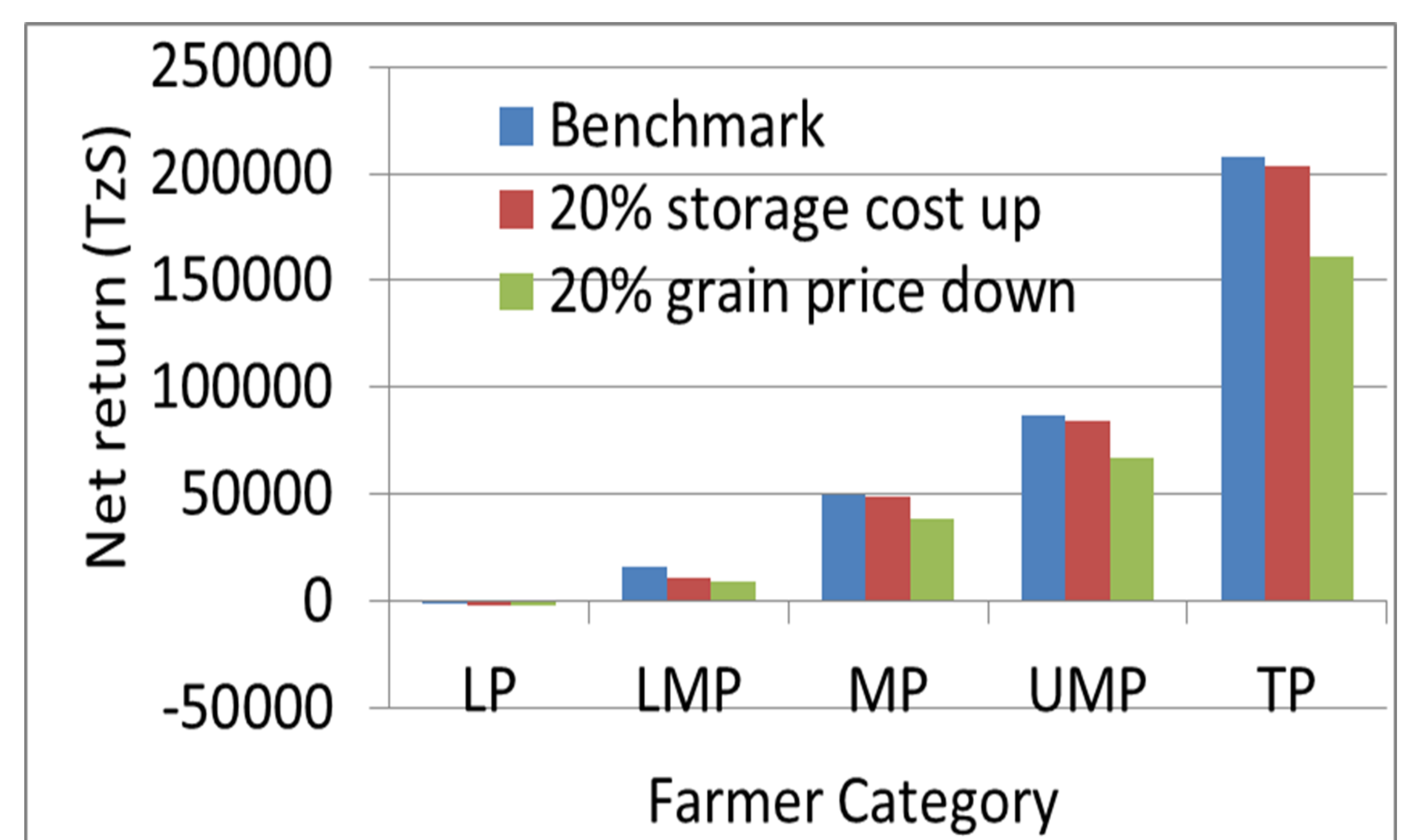


Figure 1: Sensitivity Analysis

Partners

