

Exploring farmers' willingness to pay for small scale maize shelling machines in Tanzania

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Challenges & Study objective

- ✓ High labor shortage during harvesting season as farmers cultivate multiple crops and activities are overlapping
- ✓ Agricultural operations are arduous by their nature
- ✓ There is high postharvest grain loss
- ✓ The use of engine-powered machines have been limited to large-scale commercial farms
- ✓ Smallholder farmers who contribute to the large part of the total production in these countries are out of reach of mechanization

Main study objective: This study was initiated to explore smallholder farmers' WTP for small scale maize shelling machines

Introduced technologies

- (i) Diesel engine maize shelling machine
- (ii) Electric engine maize shelling machine

Evidence

Table 1: Farmers' responses to bids

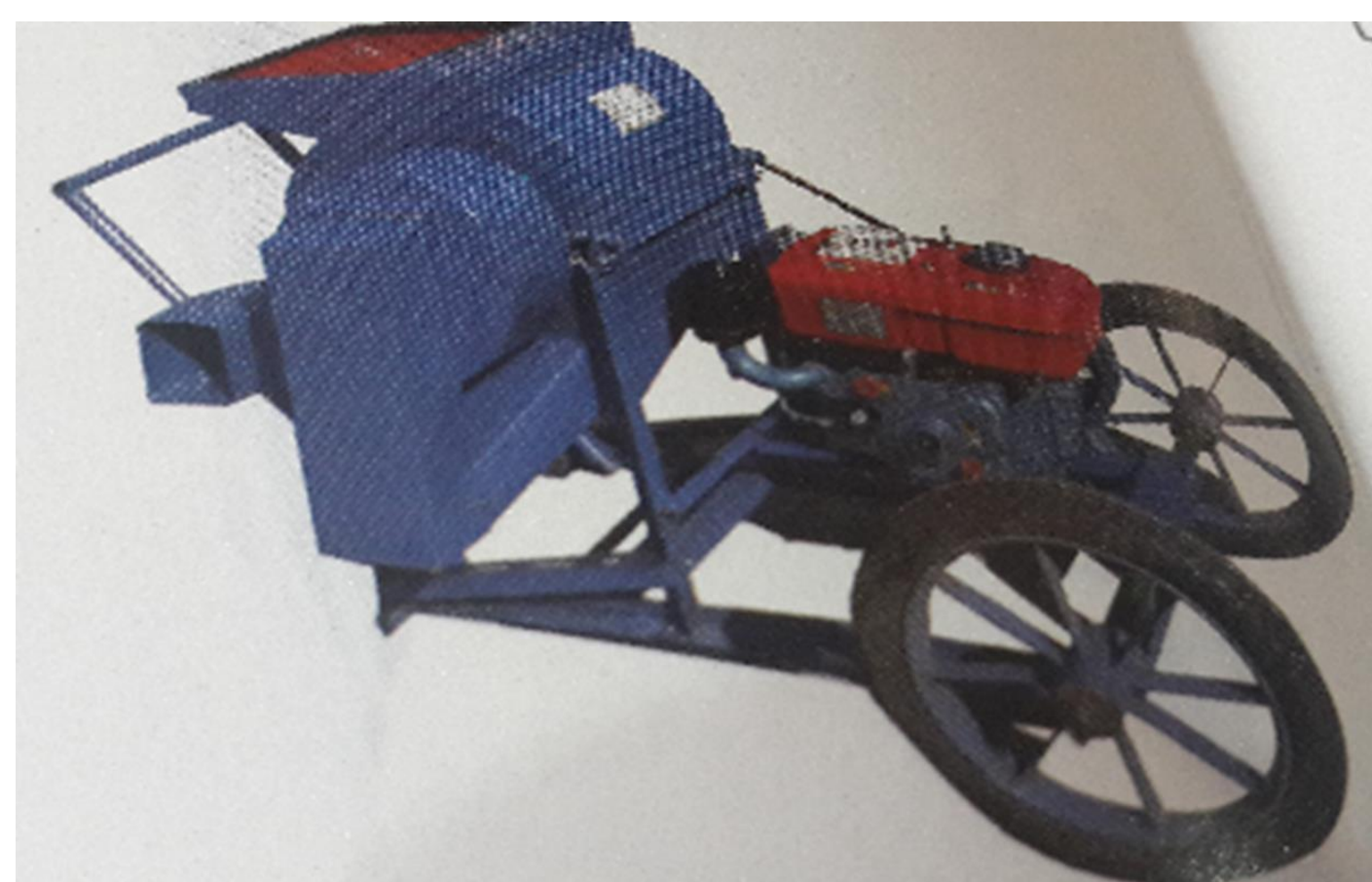
Response category	Mechanization models				
	Rental service	Group ownership – diesel machine	Group ownership- Electric machine	Private ownership- diesel machine	Private ownership- electric machine
Yes-Yes	30.6	30.9	54.0	9.4	26.5
Yes-No	48.9	30.9	23.1	20.3	26.0
No-Yes	19.5	16.2	10.3	21.3	18.2
No-No	1.0	22.0	12.6	49.1	29.3

Table 2: Farmers WTP for small scale maize shelling machines

	Amount (TZS)	Std. err	%farmers
Rental service model	1,268	22	98.7
GOM-Diesel machine	155,848	6036	64.4
GOM-Electric machine	64,698	2459	91.7
POM-Diesel machine	710,317	59161	7.6
POM-Electric machine	379,309	17101	63.1

Note: GOM= Group Ownership Model; POM= Private Ownership Model

- Diesel engine machine**
- 4HP
 - 1.5t shelling capacity per hour
 - Price about \$650



- Electric engine machine**
- 1.5HP (single phase)
 - 0.5t shelling capacity per hour
 - Price about \$160



Table 3: Factors influencing farmers WTP, alternative mechanization models

	Rental service model		GOM-diesel machine		GOM-electric machine		POM-diesel machine		POM-electric machine	
	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
Livestock_wealth	3.7	4.3	1981	1349	694	483	28667**	12712	5434	3930
Gender	-44.9	42.1	16970	12602	4675	4669	451345***	111818	61085*	36099
Machine Exp.	152.4***	48.6	47196*	15169	11869**	5459	366222***	139655	77508*	42846
Active_Male	-7.5	19.9	-5541	6039	-2643	2142	-21690	53340	-11094	16914
Active_Female	-53.9***	20.6	1599	6249	-3950*	2239	15519	52722	-15723	17521
Age	-1.9	1.4	-938**	430	-376**	153	-7186*	3954	-5560***	1266
Maize production	-9.1	19.0	7957	5880	1090	2212	141655***	52465	43007***	16687
Hired labor cost	62.9	51.1	42957***	14864	11527**	5666	-12764	125199	61031	41950
Off-farm inc. H.	5.2	7.5	1988	2309	-1406	873	17662	20076	-9053	6328
Off-farm inc. OH.	-0.2	7.0	647	2139	1694**	814	12956	18623	9343	5863
Long	121.4*	66.2	22653	20717	16449**	7778	360602**	180860	128354**	58811
Sabulo	227.5***	72.9	10770	20788	264	7515	147040	183531	48156	58811
Seloto	124.3*	65.8	38764*	20695	7285	7505	299404*	181344	91610	58578
Ndurugumi	78.4	63.0	14574	19631	4567	7133	51752	184248	1928	56683
_cons	1242***	142.0	48201	43755	55791***	16134	-1022933**	400708	159562	123061
/Insigma	5.6***	0.1	11.6***	0.1	10.5***	0.1	13.7***	0.1	12.6***	0.1
sigma	276.1	17.7	107134	6171	36516	2432	886423	54553	299603	17500
Number of obs.	396		396		396		396		396	
LR Ch ² (14)	38.76***		70.82***		45.01***		91.93***		75.96***	

Note: *,**,*** imply statistical significance at 10%, 5% & 1% alpha levels.

Proposals for the future

- ✓ Encourage and support the private sector to experiment the mechanization options studied in a few intervention areas. Providing backstopping through R-in-D and address the problems associated with the mechanization process.
- ✓ Research (particularly on the supply side of the market) to complement this study.

Scaling Approaches

Maize shelling mechanization can be scaled through one (or combinations) of the following approaches:

- ✓ Supporting the private business entities outside of the farming communities to provide rental shelling services
- ✓ Supporting farmers to purchase the shelling machines in groups
- ✓ Supporting those farmers who are interested and capable to engage in the provision of rental shelling services
- ✓ Training technicians to realize efficient maintenance services for the machines

Partners



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