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## **SERA – World Bank Policy Brief**

### *The Effects of Gender on Maize Production and Marketing in Southern Tanzania<sup>1</sup>*

Maize is grown by an estimated 80% of farmers in Tanzania and about 20% of those farmers are in female-headed households. Most of these females were widowed or divorced and are disadvantaged compared to male-headed households with respect to knowledge of production practices, land holdings, use of improved inputs, yields, and prices received for marketed maize. Better understanding of these female maize farmers and their characteristics and endowments could help Government, NGOs, and donors provide better services such as extension, access to inputs, and information on marketing and business practices with the objective of raising incomes and reducing poverty. Higher incomes would also contribute to increased food security among this vulnerable segment of the rural population.

The USAID-funded Tanzania SERA Policy Project and the Finance & Markets Global Practice of the World Bank Group engaged TNS Social Research in Nairobi, Kenya, to survey 600 male and 600 female maize farmers in four regions of southern Tanzania's maize producing regions. The results of that survey are presented in this report along with recommendations of how to better support female maize farmers. The findings may have implications for female farmers producing other crops in Tanzania who face similar circumstances and for female farmers throughout the region.

### **Survey of Maize Farmers in Southern Tanzania**

A survey of maize farmers in the main producing regions of southern Tanzania was conducted in 2015 to compare male and female maize farmers and identify differences that could be addressed through policy interventions. A total of 1,219 maize farmers were surveyed in two rounds; the first in July during the harvest in Mbeya and Rukwa regions, and the second in Iringa and Ruvuma regions in October after the harvest. The

<sup>1</sup> This Policy Research Brief was prepared by Don Mitchell, Senior Advisor of the SERA Project, in collaboration with Panos Varangis and Valleriya Goffe of the World Bank Group Finance & Markets Global Practice. The SERA Policy Project is a USAID-funded Feed the Future Project that seeks to improve agricultural policies in Tanzania and build capacity for policy analysis and advocacy. It is implemented by Booz Allen Hamilton.

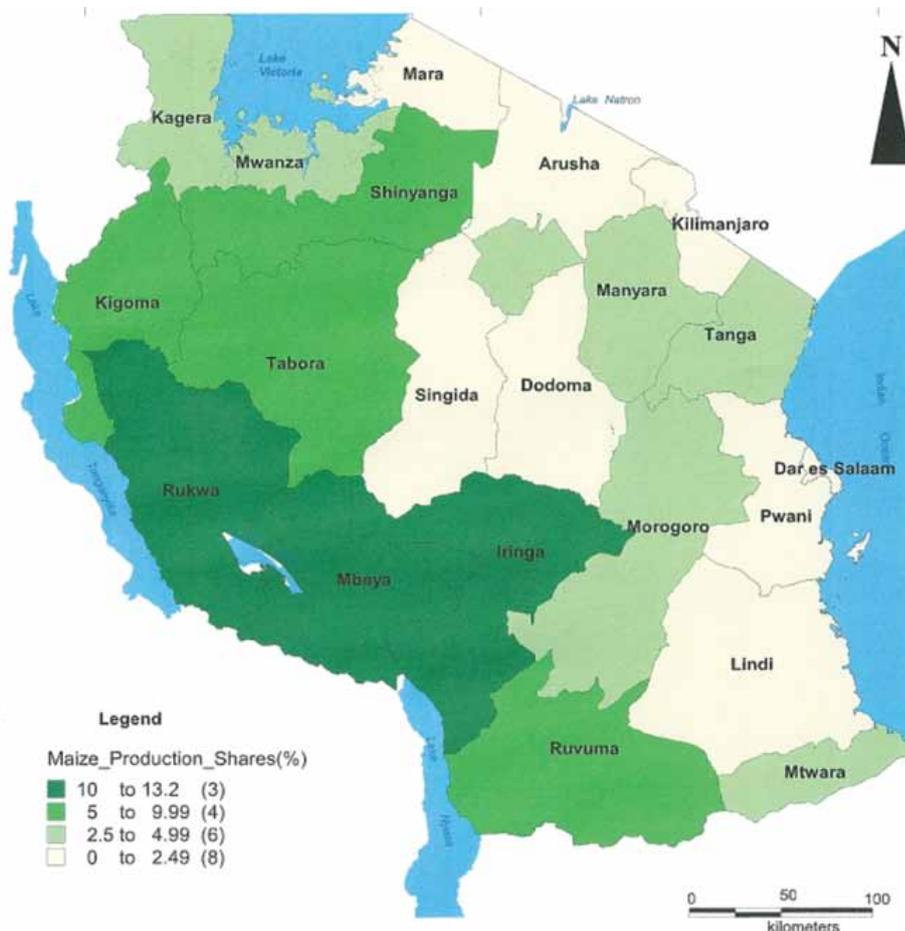
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regions were selected to reflect those well connected to the national and regional markets (Iringa and Mbeya) and those more remote without good transportation linkages to national or regional markets (Rukwa and Ruvuma). The survey in July included 613 maize farmers, of which 314 were male and 299 were female, and the survey in October was of 606 maize farmers, of which 314 were male and 292 were female.

Maize producing districts were selected randomly in each region and two or three wards were randomly selected to survey within each district. Local leaders were engaged to identify concentrations of maize producing households, and a random procedure was used to select households to be surveyed. In addition to the household surveys, key informants were interviewed to gain an understanding of the overall situation and focus groups were conducted to refine the questionnaires and obtain qualitative information. The study considered female-headed households as those that were run and represented by a widowed, divorced, or single woman without a husband, father, or male relative involved in the routine day-to-day activities of the household. Male-headed households were those where a husband was present and was the final decision maker on the important issues of the household. Survey results are presented for each region and a weighted average of all regions based on the number of households responding to the survey in each region.

The four regions selected for the survey are located in the main maize producing regions of southern Tanzania and account for approximately 50% of national production (Figure 1). Iringa and Mbeya are better served by roads to urban markets in Tanzania and export markets in Kenya and Mozambique while Rukwa and Ruvuma are less well connected to those markets. The average wholesale maize price during the 2015 harvest was about 60% higher in Iringa and Mbeya than in Rukwa and Ruvuma. That difference would affect profitability of maize production and input use. Consequently, input use was expected to be lower in Rukwa and Ruvuma than in Iringa and Mbeya and that should be reflected in yields.

**Figure 1. Maize Producing Regions of Tanzania and Production Shares.**



## Demographic Characteristics and Endowments

The characteristics of households obtained from the surveys are shown in Table 1 along with the number of households surveyed in each region. Female-headed households were on average 48 years old compared to 42 years old for male-headed households. Seventy-one percent of the male maize farmers had completed primary education compared to 53 percent of female maize farmers. Only 7% of males on average had finished secondary education compared to 4% of females. Educational attainment was similar for all regions except Rukwa where the percentage of male and female maize farmers completing primary education was substantially lower.

Ninety percent of male farmers were married as compared to 2% of female maize farmers and this was similar in all regions. Agriculture was reported as the primary occupation of more than 90% of farmers. Sixty-nine percent of women maize farmers were widowed compared to 3% of male maize farmers. A slightly higher percentage of female than male maize farmers reported agriculture as their primary occupation, and only 4% of male and 3% of female maize farmers reported business as their primary occupations. The more well connected regions of Iringa and Mbeya had more male and female maize farmers reporting business as their primary occupation than the more remote regions of Rukwa and Ruvuma and that difference may reflect better off-farm opportunities in Iringa and Mbeya.

**Table 1: Demographic Characteristics of Male and Female Maize Farmers.**

	----- Total -----		---- Iringa----		----- Mbeya----		-----Rukwa----		----Ruvuma----	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
<b>Number of households surveyed</b>	628	591	162	140	158	153	156	146	152	152
<b>Demographic Characteristics</b>										
<i>Age of Household</i>	42	48	41	49	43	48	40	46	43	47
<i>Primary Education (%)</i>	71	53	73	49	74	50	59	51	76	62
<i>Secondary Ed (%)</i>	7	4	12	3	4	2	9	3	4	8
<i>Married (%)</i>	90	2	88	3	89	1	89	3	94	1
<i>Widowed (%)</i>	3	69	3	72	1	72	6	69	1	62
<i>Primary Occupation</i>										
<i>Agriculture (%)</i>	93	96	81	91	96	95	99	99	98	99
<i>Business (%)</i>	4	3	10	7	4	5	0	1	0	0

Notes: Age of household is the age of the household head. Primary and Secondary education is the percent of the household heads that have completed primary and secondary education. Marital status is the percent of households heads who are in each category, and primary occupation is the percent of household heads who list agriculture and business as their primary occupations.

Land quality, size, and tenure arrangements were found to be important determinants of productivity for Ugandan cotton farmers, and many of the differences found among male and female cotton farmers in Uganda were also found among male and female maize farmers in southern Tanzania (Table 2). Female-headed maize growing households in southern Tanzania had only 60% as much land as male-headed households, had less land planted to maize, and slightly fewer female maize farmers had land titles than their male counterparts. There were significant regional differences, with larger land holdings for both male and female maize farmers in

Ruvuma region, and more land planted to maize. On average, female maize farmers planted 67% of their land to maize compared to 54% for male maize farmers. Farmers in Mbeya had the smallest land holdings and were relatively diversified with 53% of their land planted to maize for male farmers and 60% for female farmers. Only 13% of male maize farmers and 10% of female maize farmers reported renting land, and the average acres rented for male maize farmers was 2.0 acres compared to 1.7 acres for female maize farmers. A higher percentage of male and female maize farmers in Mbeya and Iringa rented land compared to Rukwa and Ruvuma which may reflect the relative abundance of land for maize growing in Rukwa and Ruvuma compared to Mbeya and Iringa; and therefore, the need to rent land in order to expand their farming.

**Table 2: Land Holdings of Male and Female Maize Farmers.**

	----- Total -----		---- Iringa----		----- Mbeya-----		-----Rukwa-----		----Ruvuma----	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
<b>Land characteristics</b>										
<i>Land Size (acres)</i>	3.5	2.1	3.3	2.2	1.9	1.5	2.9	2.0	5.8	2.8
<i>Land Planted to Maize (acres)</i>	1.9	1.4	2.3	1.8	1.0	0.9	1.7	1.3	2.7	1.7
<i>Land Planted to Maize (%)</i>	54	67	70	82	53	60	59	65	47	61
<i>Land Owned (acres)</i>	3.5	2.2	3.3	2.2	1.9	1.5	2.9	2.2	5.8	2.8
<i>Rented Land (%)</i>	13	10	18	11	19	13	10	9	6	7
<i>Land Rented (acres)</i>	2.0	1.7	2.7	2.1	1.0	1.1	1.7	1.3	2.5	2.6
<i>Land Title Deed (%)</i>	12.5	11.3	19	12	16	14	5	7	10	12

**Note:** Land rented is the average acres rented for the 13% of male maize farmers and 10% of female maize farmers who rented land.

## Input Use

Female maize farmers reported using less improved inputs of all types (Table 3). For seed use, for example, 76% of female maize farmers reported using local varieties compared to 62% of male maize farmers. Only 13% of female maize farmers reported using hybrids compared to 17% of male farmers. The use of hybrid seeds among female maize farmers was especially low in Ruvuma, where only 4% of female maize farmers reported using hybrids compared to an average of 15% in other regions.

A smaller percentage of female maize farmers used urea and DAP fertilizers than male maize farmers and those female maize farmers who reported using fertilizer reported using less fertilizer per acre. The combined results reported for all four regions were that about half of maize farmers used urea fertilizer compared to about 15% who used DAP. For those farmers who reported using urea or DAP, the average application rate was about 40 kilograms per acre, with female maize farmers using slightly less per acre than male maize farmers. The percentage of farmers who reported using DAP in Rukwa and Ruvuma was too low to allow an accurate estimate of application rates.

More than 90% of farmers reported hiring labor and a slightly smaller percentage of female maize farmers reported hiring labor than males. Only 3% of male maize farmers reported using irrigation compared to 2% of

female maize farmers. More female farmers used a hand hoe for land preparation and a smaller percentage used animal traction than male farmers and almost none of the female farmers used tractors for land preparation while some male farmers used tractors. Female maize farmers were less likely to intercrop than male maize farmers which may reflect greater reliance on maize for household food security among female-headed households compared to male-headed households and the importance of achieving adequate production for household food security. Overall the survey results are consistent with the conclusion that female maize farmers have more limited resources than male farmers and that is reflected in lower input use. Further, input use among both male and female maize farmers in more remote Rukwa and Ruvuma was lower than in Iringa and Mbeya.

**Table 3: Input Use of Male and Female Maize Farmers.**

	----- Total -----		---- Iringa----		----- Mbeya----		-----Rukwa----		----Ruvuma----	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
<b>Seed Use</b>										
<i>Local Varieties (%)</i>	62	76	69	78	49	67	61	80	68	81
<i>Improved OPV (%)</i>	31	22	17	8	53	37	33	29	18	14
<i>Hybrids (%)</i>	17	13	16	14	20	15	21	17	12	4
<b>Fertilizer Use</b>										
<i>Urea (%)</i>	52	45	57	51	49	47	n.a.	n.a.	49	38
<i>DAP (%)</i>	18	11	42	32	16	11	6	1	5	1
<i>Urea (kg/acre)</i>	43	40	33	35	52	45	n.a.	n.a.	43	38
<i>DAP (kg/acre)</i>	42	39	33	35	55	n.a.	n.a.	n.a.	n.a.	n.a.
<b>Hired Labour</b>										
<i>Hired Labour (%)</i>	92	90	98	96	85	83	87	84	98	98
<b>Land Preparation</b>										
<i>Hand Hoe (%)</i>	76	82	62	65	91	95	56	66	98	99
<i>Animal Traction (%)</i>	20	16	30	26	6	5	41	33	0	1
<i>Tractor (%)</i>	3	0	8	1	2	0	0	0	2	0
<b>Irrigation</b>										
<i>Use Irrigation (%)</i>	3	2	4	6	3	1	3	0	1	0
<b>Cropping Pattern</b>										
<i>Intercropped (%)</i>	77	70	57	46	96	90	91	85	66	59
<i>Pure Stand (%)</i>	23	31	42	53	8	16	10	16	29	39

Note: n.a. (not available) indicates that the number of farmers reporting was too small to provide reliable estimates or that no survey results were available.

## Credit

Credit is available to smallholder farmers in Tanzania from a range of institutions and programs (Table 4). However, only 9% of male and 4% of female farmers applied for credit. There were large differences between regions with farmers in Iringa and Ruvuma more likely to apply for credit than farmers in Mbeya and Rukwa.

About one-third of both male and female farmers reported no need for credit as the reason for not applying for credit. However, this varied greatly among regions. In Mbeya, for example, 61% of male and 54% of female maize farmers reported no need for credit, and only 6% of male and 3% of female farmers applied for credit. In Rukwa, 16% of male and 13% of female farmers reported no need as the reason for not applying for credit and 42% of male and 35% of female farmers reported that credit services were not available as the reason for not applying for credit. Only 3% of male and female farmers applied for credit in Rukwa. Of those farmers who applied for credit, most were successful. Among the four regions 95% of male and 83% of female farmers who applied for credit were successful. The two regions where applications were highest also had the highest approval rates. In Iringa and Ruvuma, 95-100% of applications were approved while in Mbeya and Rukwa, approval rates were lower which may suggest that lenders in those regions were less strict in their lending requirements.

**Table 4: Access to Credit.**

	----- Total -----		---- Iringa----		----- Mbeya---		-----Rukwa----		----Ruvuma----	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
<b>Applied for Credit (%)</b>	9	4	19	19	6	3	3	3	11	7
<i>Successful (%)</i>	95	83	100	95	80	100	80	75	95	100
<b>Received Credit (%)</b>	8	3	19	18	5	3	2	2	10	7
<b>Source of Credit (%)</b>										
<i>Groups (%)</i>	26	40	17	28	20	50	40	50	27	33
<i>SACCO (%)</i>	12	23	16	25	10	25	0	25	21	17
<i>VICOBA (%)</i>	15	6	33	12	0	0	0	0	25	10
<i>Commercial Banks (%)</i>	9	4	5	8	10	0	n.a.	n.a.	0	0
<b>Purpose of Credit</b>										
<i>Agriculture (%)</i>	44	38	23	43	30	50	60	25	63	33
<i>Business (%)</i>	34	12	15	18	40	0	20	25	16	8
<i>Household Needs (%)</i>	17	12	20	15	n.a.	n.a.	n.a.	n.a.	13	10
<i>School Fees (%)</i>	12	21	7	27	30	25	0	0	0	30
<b>Reasons for Not Seeking Credit</b>										
<i>No Need (%)</i>	36	33	36	34	61	54	16	13	21	28
<i>No Collateral (%)</i>	17	22	21	38	2	5	25	26	20	20
<i>Service Unavailable (%)</i>	27	20	16	11	6	3	42	35	46	30
<i>Outstanding Loan (%)</i>	10	11	5	4	12	17	20	20	4	3

Note: n.a. (not available) indicates that the number of farmers reporting was too small to provide reliable estimates or that no survey results were available.

Commercial banks accounted for less than 10% of loans to farmers surveyed and there was little difference between male and female farmers. Informal financial service providers, such as the Village Community Banks (VICOBA) and Savings and Credit Cooperatives (SACCOs), offer loans, and SACCOs were more popular with female farmers while male farmers were more likely to borrow from VICOBA. There are also donor programs and non-profit organizations, such as One Acre Fund, that offer inputs and training to smallholders. The

Alliance for Green Revolution (AGRA) offers financing through the Innovative Financing Program and the Farmer Organization Support Centre for Africa (FOSCA). The Agriculture Inputs Credit Fund established by government is another agricultural finance facility available to farmers. However, formal and informal groups accounted for the largest share of loans to farmers, and the survey results indicated that those farmers that received credit from groups most often obtained it through religious groups. Groups were popular among female farmers (accounting for 40% of lending) while male farmers received 26% of their credit from groups, but were also more diversified in their borrowing than female farmers. There were also differences between regions, with Iringa and Mbeya regions having more diversified credit sources than the relatively more remote regions of Rukwa and Ruvuma.

The primary use of credit was for agriculture, with 44% of male farmers and 38% of female farmers listing agriculture as the purpose of the credit. Male farmers borrowed more often for business (34%) than female farmers (12%) while both male and female farmers borrowed for household needs and school fees. Regional differences were apparent, with male farmers in the more remote regions of Rukwa and Ruvuma more likely to borrow for agriculture than those in Iringa or Mbeya where borrowing for agriculture was a smaller percentage of borrowing and business was a larger percentage.

About one-third of male and female farmers reported no need for credit and both male and female farmers in Mbeya gave this as the main reason for not seeking credit while a much smaller percentage of farmers in Rukwa and Ruvuma gave this reason for not applying for credit. Lack of collateral accounted for 17% of the reasons given for not seeking credit for male farmers and 22% for female farmers. The unavailability of credit services was the most common reason given by both male and female farmers in Rukwa and Ruvuma for not seeking credit but was that was less commonly reported in Iringa and Mbeya.

## Sources of Information

Other farmers were reported as the source of information on production, market information, and prices by 52% of female maize farmers and 45% of male farmers (Table 5). Radio was the second most common source of information followed by mobile phones, but a lower percentage of female farmers received information from those sources than male farmers. Female farmers in more remote Ruvuma reported receiving information from input dealers, NGOs, and Government/Farmer Organizations less often than female farmers in Iringa and less often than male farmers in Ruvuma.

The preferred source of information for both male and female maize farmers was radio, with 69% of male maize farmers and 64% of female maize farmers reporting that as their preferred source of information. The second most commonly reported preferred source of information was face-to-face communication, with 40% of female and 35% of male maize farmers reporting this as a preferred source of information. Farm visits were reported as the preferred source of information by 20% of male and 22% of female maize farmers, respectively, and group discussions, field days, newspapers, and group meetings were less popular with each accounting for roughly 10% of male and female farmer's survey responses.

The survey responses on marketing reflect the different periods of the surveys with Mbeya and Rukwa regions having been surveyed during harvest and Iringa and Ruvuma regions having been surveyed in October, which was after the harvest. Responses showed that farmers had little knowledge of prices or buyers during harvest but acquired that knowledge prior to marketing. Sixty-nine percent of male maize farmers in Iringa and 58% of male farmers in Ruvuma reported having advanced knowledge of prices compared to 52% and 49% of female maize farmers, respectively, in those regions. Prior to harvest, only 5-10% of farmers reported having advanced knowledge of maize prices and no more than 5% reported knowing the buyer.

Regional differences were apparent and farmers in the more remote region of Ruvuma had less knowledge of

market prices and were less likely to know the buyer prior to selling. In Iringa, for example, 60% of male and 55% of female maize farmers reported arranging sales in advance compared to 42% and 44% of male and female maize farmers, respectively, in Ruvuma. These lower percentages in more remote Ruvuma may indicate fewer regular buyers who were known to farmers and perhaps the greater prevalence of buyers who came only during harvest periods. Three-quarters of the male farmers reported negotiating prices compared to 70% and 93% of female maize farmers in Iringa and Ruvuma, respectively.

**Table 5: Sources of Production and Market Information and Knowledge of Prices.**

	----- Total ----		---- Iringa----		----- Mbeya---		-----Rukwa---		----Ruvuma---	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
<b>Sources of Information</b>										
<i>Other Farmers (%)</i>	45	52	49	60	30	35	58	60	41	52
<i>Radio (%)</i>	43	34	44	40	40	30	35	27	51	38
<i>Mobile Phones (%)</i>	20	18	27	21	13	10	12	12	28	28
<i>Input Dealers (%)</i>	8	5	17	13	5	3	4	1	8	3
<i>NGOs (%)</i>	6	6	10	16	2	1	3	3	9	3
<i>Government/Farmer Organizations (%)</i>	6	6	9	12	1	3	6	5	5	3
<b>Preferred Source of Information</b>										
<i>Radio (%)</i>	69	64	76	78	66	58	62	52	70	68
<i>Face to Face (%)</i>	35	40	48	47	20	31	27	34	44	47
<i>Mobile Phone (%)</i>	36	28	40	24	26	23	40	24	38	39
<i>Farm Visits (%)</i>	20	22	31	39	8	10	8	5	34	32
<i>Group Discussions (%)</i>	11	12	23	24	1	1	8	12	7	14
<i>Field Days (%)</i>	10	13	15	22	7	16	10	12	7	13
<i>Newspapers (%)</i>	11	6	15	6	4	2	5	8	20	9
<i>Group Meetings (%)</i>	8	10	15	19	1	0	7	11	6	9
<b>Knowledge of Buyer and Prices</b>										
<i>Knowledge of Price (%)</i>	74	48	69	52	10	11	5	4	58	44
<i>Knows Buyer (%)</i>	42	57	52	61	4	5	3	2	32	54
<i>Negotiated Price (%)</i>	76	82	75	70	13	14	8	6	77	93
<i>Advanced Sales (%)</i>	50	49	60	55	10	7	3	3	42	44

Note: The Total results are for Iringa and Ruvuma regions only since the survey in those regions was conducted after the harvest and responses were more reflective of knowledge of buyers and prices when farmers were ready to market their maize.

## Maize Production and Yields

The reduced use of improved input, and more limited access to credit and information were expected to contribute to lower yields per acre by female maize farmers than by male maize farmers and the survey results

supported that expectation (Table 6). Female maize farmers had average yields that were 74% of maize yields of male farmers in the four regions, and this varied from a low of 63% in Mbeya to a high of 79% in Rukwa. Farmers in more remote Rukwa and Ruvuma were also expected to have lower yields per acre than farmers in Iringa and Mbeya because of less access to improved inputs and lower output prices and that was generally true with the exception of female farmers in Ruvuma who had higher yields than female farmers in Iringa and Mbeya. Female maize farmers in Rukwa and Ruvuma had yields that were 79% and 82%, respectively, of male farmers yields which was higher than the comparable yields of female versus male farmer yields in Iringa and Mbeya. Female maize farmers also planted only 74% as much land to maize as male farmers. Maize production of female farmers averaged 55% of male maize farmers across the four regions as a result of both less land planted to maize and lower maize yields. The share of production of female farmers compared to male farmers varied from 51% in Ruvuma to 60% in Rukwa.

**Table 6: Maize Yields, Land Planted to Maize, and Implied Production.**

	----- Total ----		---- Iringa----		----- Mbeya---		-----Rukwa---		----Ruvuma---	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
<i>Yields (kg/acre)</i>	706	522	706	521	766	480	659	518	694	567
<i>Yields (kg/hectare)</i>	1,651	1,222	1,745	1,287	1,689	1,058	1,454	1,143	1,715	1,401
<i>Planted to Maize (acres)</i>	1.9	1.4	2.3	1.8	1.0	0.9	1.7	1.3	2.7	1.7
<i>Production (kg/acre)</i>	1,341	731	1,624	938	766	432	1,120	673	1,874	964
<i>Female Yield (% of Male)</i>		74		74		63		79		82
<i>Female Land Planted to Maize (% of Male)</i>		74		78		90		77		63
<i>Female Prod (% of Male)</i>		55		58		56		60		51

Notes: Production was not reported in the survey, but was calculated from survey reports of average land planted to maize and yields per survey respondent.

## Marketing Maize

On average female maize farmers in Iringa reported receiving 93% of the prices received by male farmers and female farmers in Ruvuma reported received 92% of the prices received by their male counterparts (results were not available for Mbeya and Rukwa). Male and female farmers in more remote Ruvuma also received only 87% and 86% of the prices, respectively, for their marketed maize of male and female farmers in Iringa. Female maize farmers sold only 42% as large of volumes as male farmers in Iringa and 63% in Ruvuma. The combination of lower volumes sold and lower prices resulted in female maize farmers in Iringa receiving 60% as much revenue as male maize farmers and female farmers in Ruvuma received only 47% of the sales revenue received by their male counterparts. Many factors contributed to these substantial differences and the lower prices received by female farmers in Ruvuma were certainly a major contributor, but lower volumes accounted for an even larger share of the decline in female sales revenue compared to their male counterparts. The quality of marketed maize was reported to be slightly higher for male farmers than female farmers, with 38% of male farmers reporting high quality compared to 31% of female farmers.

Access to market information may partially account for lower prices received by female maize farmers compared to their male counterparts, but other factors such as the type of buyer, the quality of the maize, and the volumes sold may also influence the prices received. Female farmers reported lower quality for the maize sold and were more likely to sell to consumers than traders than were male farmers. Perhaps this contributed to lower prices received by female farmers if these sales were less commercially oriented or provided as partial

payment for services received. Since Mbeya and Rukwa regions were surveyed in July, few households in those regions responded to survey questions on marketing. However, the survey in Iringa and Ruvuma occurred one to two months after harvest and the response rate to the marketing questions was good. Other attributes of maize marketing are reported in Table 7.

**Table 7: Maize Marketing, Prices, and Sales.**

	----- Total -----		---- Iringa----		----- Mbeya-----		-----Rukwa-----		----Ruvuma----	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
<b>Maize Prices</b>										
<i>Prices Received (TZS/kg)</i>	342	317	364	339	n.a.	n.a.	n.a.	n.a.	316	290
<i>Female Share (%)</i>		93		93						92
<b>Quality of Maize Marketed</b>										
<i>High (%)</i>	38	31	30	26	n.a.	n.a.	n.a.	n.a.	44	36
<i>Medium (%)</i>	52	58	65	64	n.a.	n.a.	n.a.	n.a.	41	50
<i>Low (%)</i>	10	12	5	10	n.a.	n.a.	n.a.	n.a.	15	14
<b>Volume Marketed</b>										
<i>Per HH (kg)</i>	1,491	743	1,731	721	n.a.	n.a.	n.a.	n.a.	1,221	773
<i>Female Share (%)</i>		50		42						63
<b>Buyer</b>										
<i>Small Trader (%)</i>	68	62	67	60	n.a.	n.a.	n.a.	n.a.	69	63
<i>Consumer (%)</i>	20	28	23	25	n.a.	n.a.	n.a.	n.a.	17	30
<b>Maize Price Received</b>										
<i>Small Trader (TZS/kg)</i>	374	347	425	402	n.a.	n.a.	n.a.	n.a.	332	303
<i>Consumer (TZS/kg)</i>	369	378	405	377	n.a.	n.a.	n.a.	n.a.	328	379
<b>Sales</b>										
<i>Marketed Maize (Th TZS)</i>	507	267	499	300	n.a.	n.a.	n.a.	n.a.	513	241
<i>Female Share (%)</i>		53		60		n.a.		n.a.		47

Note: Results were only available for Iringa and Ruvuma which were surveyed after the maize harvest. n.a. indicates that the number of farmers reporting was too small to provide reliable estimates.

## Conclusion and Recommendations

A survey of approximately 1,200 maize farmers in southern Tanzania's maize producing region was conducted in July and October of 2015. The survey targeted an equal number of male and female farmers to allow an evaluation of the impact of gender on productivity, marketing, and incomes. The results showed that female-headed households were disadvantaged in resource endowments, input use, and access to credit compared to their male counterparts. On average they had only 60% as much land as male farmers and planted 74% as many acres to maize. They had lower input use and were more likely to use local seed varieties rather than improved OPVs or hybrids. Fertilizer use was about 75% of that of their male counterparts and they were less likely to apply for credit. They had less education and less access to information from those other than farmers. Their yields were approximately three-quarters of male maize farmers. They produced less maize, sold less maize, and

received lower prices for the maize they sold. On average they received about 92% of the price for the maize they sold as male farmers and the combination of lower land planted to maize, lower yields, and lower prices meant that their revenue from the sale of maize was about half of that of male farmers. Although the study focused on the differences between male and female maize farmers, important observations can be made between the two more well connected regions (Iringa and Mbeya) and the less well connected regions (Rukwa and Ruvuma). The less well connected regions had lower availability of financial services, less information about prices, less prior contact with buyers, and farmers in those regions received lower prices.

Erasing these differences will be nearly impossible, but there are policy actions that can help to reduce the differences and raise yields and revenue from maize for female farmers. More secure land rights would make it possible to benefit from investments in the land without concern that the land use rights are fragile and investments are risky. Social-network based training has been successful in raising yields of low-income farmers in other countries and may help raise female maize farmer's yields in Tanzania. Better market information systems could increase bargaining power of female maize farmers who now receive most of their information from other farmers. Improved investment opportunities, higher demand for improved inputs, and adoption of better technologies through training increase yields would stimulate demand for credit. In addition, programs to promote financial literacy and education, as well as strengthening local financial institutions to better reach farmers would contribute to increasing access to finance by both male and female farmers, but even more by female farmers. Finally, the findings of this survey of male and female maize farmers may provide insights into the gender difference that exist in other crops in Tanzania and the region.

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