

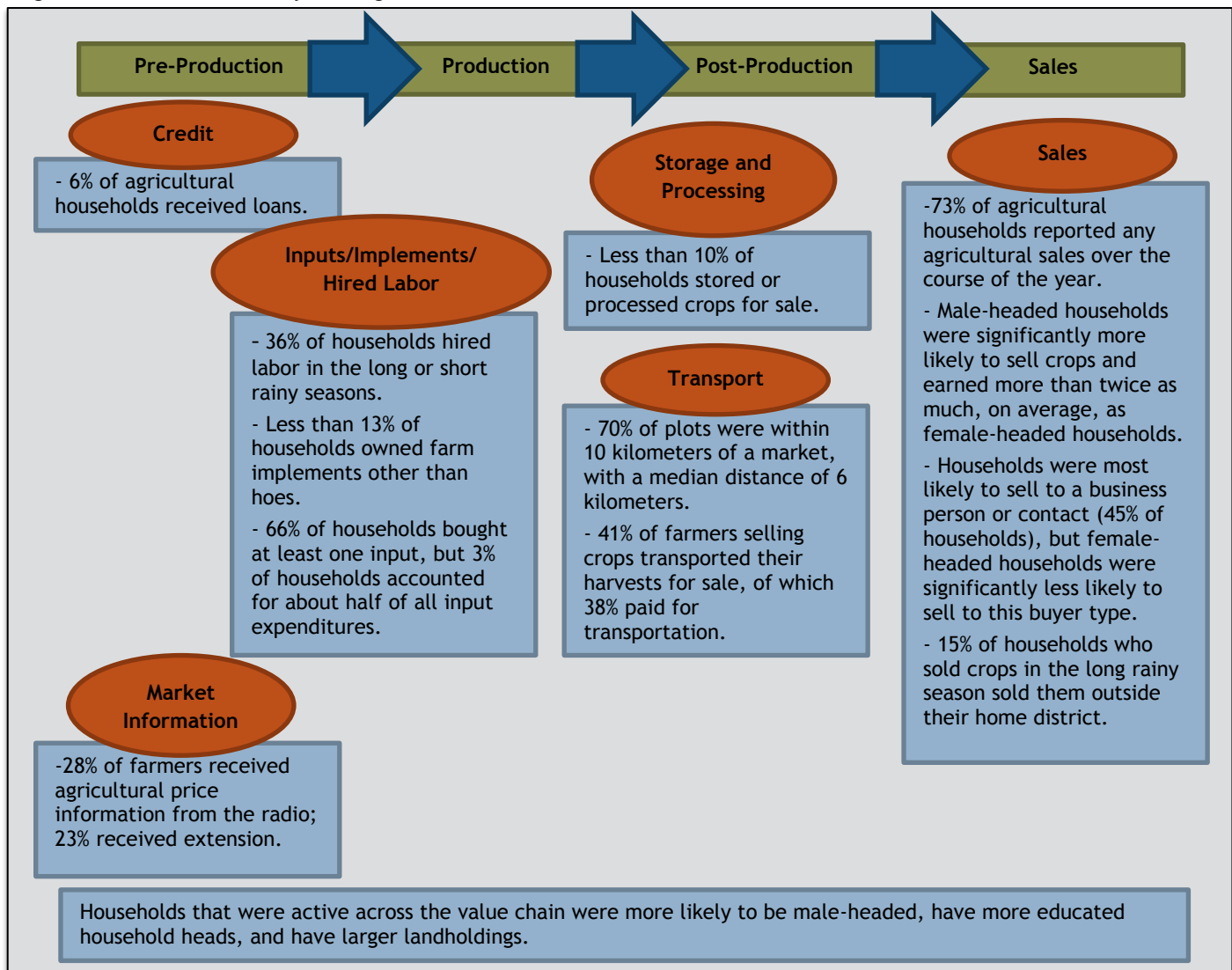
Tanzania National Panel Survey**Living Standards Measurement Study- Integrated Surveys on Agriculture
MARKET ACCESS**Professor Leigh Anderson, *Principal Investigator*Associate Professor Mary Kay Gugerty, *Principal Investigator**Elysia Slakie, Kathryn Bergh, Amy Pennington, C. Leigh Anderson, & Mary Kay Gugerty**Prepared for the Agricultural Policy Team of the Bill & Melinda Gates Foundation*

Tanzania National Panel Survey

LSMS-ISA: Market Access

The TZNPS asked few direct questions about market access. However, farmers reported information about market participation that sheds light on several important components of the value chain: input markets, including both goods and services; crop storage, processing, and transport; and sales of outputs. *Figure 1* shows components of the value chain that were captured in the survey and key findings from the survey.

Figure 1: Value Chain and Key Findings



PRE-PRODUCTION AND PRODUCTION

About Two-Thirds of Households Purchased at Least One Input

Sixty-six percent of households purchased at least one input, including inorganic fertilizer, organic fertilizer, improved variety (IV) seed, traditional seed, and pesticides, herbicides, or fungicides in the long or short rainy season.¹ This section describes the purchase and use of these seven inputs.

Tanzanian farmers who bought inputs spent an average of USD\$10.43. The majority of money spent went to inorganic fertilizer, which accounted for 59% of the total value of inputs purchased. However, only 13% of farmers reported using inorganic fertilizer, making it the least widely used of any input. IV seed purchases made up 10% of the total value spent on inputs. Eighteen percent of households bought IV seed, the majority of which was maize seed. IV maize seed was available for sale in 41% of villages/urban neighborhoods² and cost an average of USD\$1.91 per kg.³ Ninety-six percent of households used traditional seed, but only 49% of farmers purchased this seed and expenditures for traditional seed accounted for only 13% of all money spent by farmers on inputs. Two percent of farmers received government vouchers for fertilizer or seed.

Just 3% of agricultural households accounted for almost half (49%) of total expenditure on inputs. These high-spending households, defined as being in the top 5% of total input expenditure among input-buying households, were more likely to grow tobacco and sunflowers than households that spent less on inputs. This finding suggests input use may be more common for cash crops. On average, high-spending households were also

more likely to use all types of agricultural inputs, had larger average landholding sizes, and household heads with more years of education than other households. Over 80% of high-spending households were located in the Southern Highlands, Western, and Northern zones, and 87% were male-headed compared to 75% overall.

A Lack of Agricultural Tools and Equipment was a Constraint to Fully Planting Plots

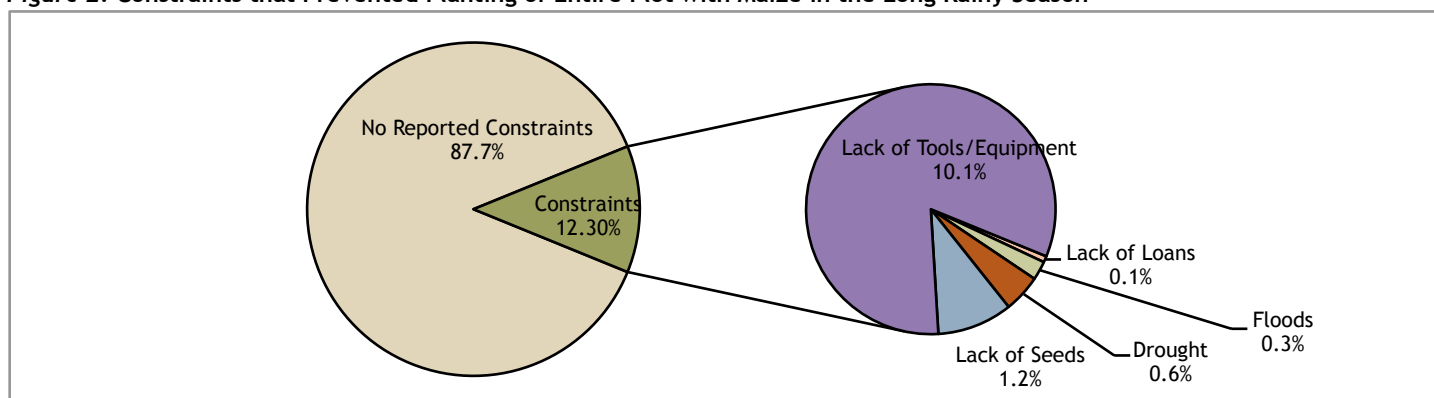
Ninety-seven percent of households owned at least one hand hoe, but no other farm implement was owned by more than 13% of households.⁴ Nine percent of households owned an ox in the 12 months preceding the survey and 10% owned an ox plough. Eleven percent of households rented or borrowed an ox and/or an ox plough.

A lack of tools and equipment was the primary reason given by farmers unable to plant their entire plot due to constraints.⁵ For example, about 11% of households that grew maize reported that a lack of tools, equipment, and/or seeds prevented them from planting their entire plot in the long rain rainy season (see *Figure 2*).

Around One-Third of Households Hired Labor in the Long or Short Rainy Seasons

Over one third (36%) of households hired agricultural labor in the long and/or short rainy season.⁶ Male-headed households were significantly more likely to hire labor than female-headed households (37% and 31%, respectively).⁷ The average total expenditure for agricultural labor in the long rainy season was

Figure 2: Constraints that Prevented Planting of Entire Plot with Maize in the Long Rainy Season



4 The TZNPS tracked the following farm implements: hand hoes, hand-powered sprayers, oxen, ox ploughs, ox seed planters, ox carts, tractors, tractor ploughs, tractor/harrow, sheller/thresher, watering can, farm buildings/storage facilities, and Geri cans/drums.

5 The survey recorded two separate categories ("Lack of Agricultural Equipment" and "Lack of Tools/Equipment") that are combined in this analysis.

6 This analysis does not include households that did not pay wages to any of its hired laborers. We also excluded one household that reported an implausibly high cost for hired labor in the long rainy season despite a small household landholding size.

7 $P < 0.0072$.

1 For more information about Input Adoption in Tanzania, refer to EPAR Brief #179.

2 Village/urban neighborhood information was taken from the community survey. In urban areas, the community information refers to the entire neighborhood, which may encompass more than one Enumeration Area or more than one neighborhood located in the Enumeration Area.

3 Median price: USD\$2.09.

USD\$59.69 (median: USD\$25.03). Male-headed households spent more than female-headed households on labor in the long rainy season (Medians USD\$25.14. and USD\$19.19).⁸ However, a large part of this difference may result from the larger average landholding size of male-headed households (2.6 hectares, compared to 1.4 for female-headed households).⁹ When wages per hectare of household landholding are compared, the difference between male-headed and female-headed households is reduced to about USD\$3 per hectare and is not significant.¹⁰

Only 5% of households that owned livestock reported hiring livestock labor in the 12 months preceding the survey. On average, male-headed households that owned livestock were more likely to hire livestock labor than female-headed households that owned livestock (5% and 3%, respectively).¹¹ The average reported expenditure for livestock labor in the past 12 months was USD\$80.82.

Most Farmers did not Participate in Savings and Credit Cooperatives or Use Credit

The following sections draw from both the community and the household surveys of the National Panel Survey, providing information on both access (from the community survey) and rates of household participation in credit and saving services and extension across Tanzania.

Thirty percent of villages/urban neighborhoods reported the presence of any Savings and Credit Cooperatives (SACCOs) in their village. In villages/urban neighborhoods that had SACCOs, an average of 213 members participated in at least one group (median: 80), including an average of 59 female participants (median: 30). However, only 5% of agricultural households reported at least one SACCO member, indicating that the presence of a SACCO in the village/urban neighborhood did not necessarily result in widespread participation.

Six percent of agricultural households received a loan of cash, goods, or services in the year prior to the survey. Almost half (45%) of these loans were from neighbors or friends, 12% were from self-help groups, 7% were from microfinance institutions, and 12% were from commercial banks. Twenty-two percent of loans were taken out primarily to purchase agricultural inputs, 16% to purchase other business inputs, and 1% to purchase agricultural machinery. The median loan value was USD\$58.39. Some households had multiple loans and the median loan value per household was USD\$75.08.¹²

8 P<0.0000. Mean of USD\$66.69 for male-headed households and USD\$33.79 for female headed households.

9 P<0.0000.

10 Mean for male-headed households: USD\$31.92/hectare (median: USD\$14.99/hectare). Mean for female-headed households: USD\$29.38/hectare (median: USD\$16.49/hectare). For this analysis, we excluded two households that reported implausibly small landholding sizes given the reported expenditure on labor.

11 P<0.0729.

12 Nine households received two loans and five households received three loans.

Farmers' Cooperatives Played a Role in Market Participation

Forty-one percent of villages/urban neighborhoods reported the presence of a farmers' cooperative and 16% of farmers attended cooperative/farmers' association meetings in the year before their interview.¹³ In villages/urban neighborhoods that had these groups, an average of 112 farmers participated in at least one group (median: 75 farmers). The cooperatives appeared to play a role in market access. Selling outputs was the most commonly reported group activity (74% of communities with at least one group), followed by buying inputs (48%), crop storage (36%), and irrigation (30%).

Only 6% of households reported selling crops to farmers' groups¹⁴ in the long rainy season, but some crops were bought more frequently by farmers' groups. For example, 48% of cotton buyers in the long rainy season were reported as farmers' groups, compared to less than 2% of buyers of any priority crop.¹⁵ Sales to farmers' groups did not vary significantly by head of household gender, but households in the Western Zone were significantly more likely to sell to farmers' groups (21% of households) than households in other zones (less than 10%).¹⁶

Around One-Third of Extension Services Included Advice on Marketing and Agro-processing

Less than a quarter of households (23%) received advice about their agricultural/livestock activities from any source in the past 12 months. The predominant sources of advice were government extension workers, who reached 19% of households; only 1-3% of households reported receiving advice from NGOs, farmers' cooperatives, large scale farmers, or other sources.

As shown in *Figure 3*, while agricultural production was the primary topic of extension services received by farmers, households also received advice on other stages of the value chain. Thirty-seven percent of those receiving extension reported getting advice about marketing and 28% reported getting advice about agro-processing. Extension from farmers' associations, which reached 3% of households, was more likely to include marketing (66% of households) and agro-processing (52%) than government extension (36% and 27%, respectively).

Among households that received advice from any source, the reported quality of services was generally positive: 83% rated the advice as good, 17% rated it as average, and less than 1%

13 Questions about meeting attendance were directed to one randomly selected adult household member.

14 This includes farmers who reported selling to "Cooperative Union" or "Farmers Party".

15 Priority crops include maize, paddy, cassava, sorghum, millet, beans, groundnuts, sweet potatoes, yams, cowpeas, and mangoes.

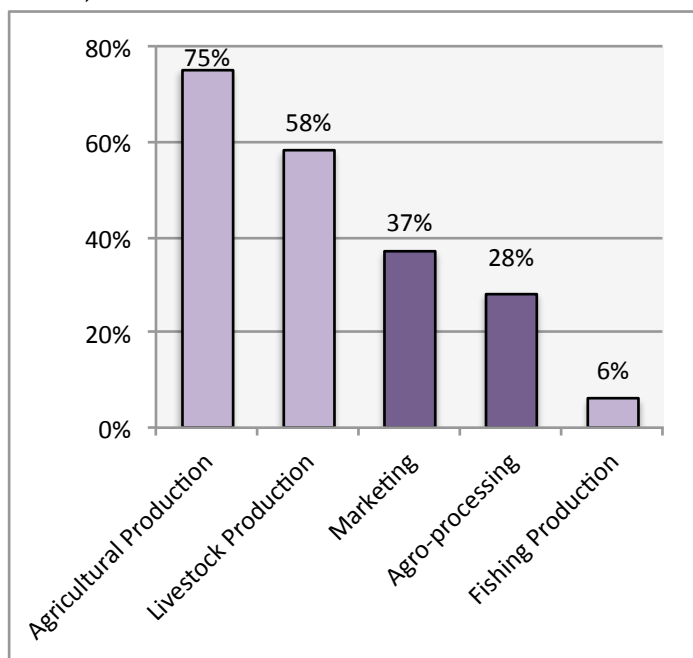
16 P-values: Central: 0.0194, Eastern: 0.0015, Southern Highlands: 0.0045, Lake: 0.0090, Northern: 0.0004, Southern: 0.0680, Zanzibar: 0.0004.

rated it as bad. The reported quality of advice provided by farmer's associations was slightly higher than the quality of advice provided by government sources (88% rated as good for cooperatives, versus 80% for government sources), but that difference was not statistically significant.

Just Over Half of Households Received Information about Agricultural Prices

Fifty-three percent of farmers reported receiving information about agricultural prices in the previous 12 months. Households most commonly received this information from the radio (28%) and from neighbors (36%). Other sources of price information included cooperatives/farmers' associations (6%), government extension agents (5%), publications (5%), large scale farmers (2%), and NGOs (1%). Only 3% of households paid for price information and aside from one observation of paid information from a large scale farmer, all paid information sources were publications. There were insufficient observations (25) to report mean and median prices paid.

Figure 3: Proportion of Households that Received Extension by Topic (Among Households Receiving Extension from Any Source)



POST-PRODUCTION

The Majority of Farmers did not Store or Process Crops for Sale

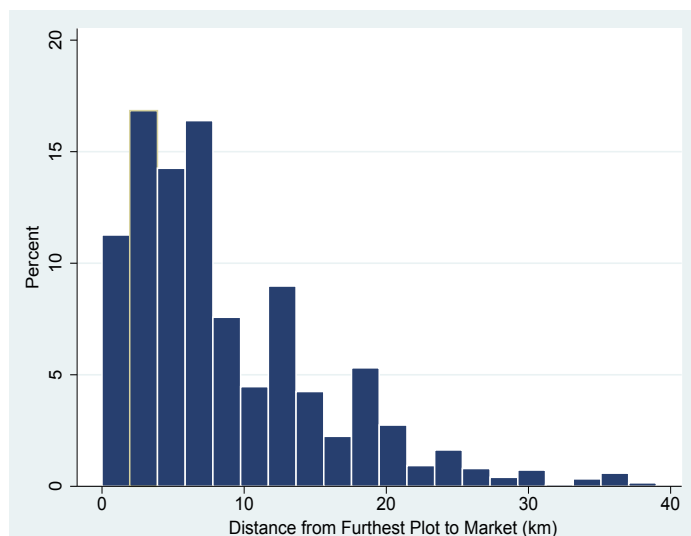
Few farmers stored or processed harvested crops for sale. Of farmers storing their maize harvest in the long rainy season,

only 4% reported storing it to sell at a higher price; the vast majority (94%) stored it for food. Eighty-three percent of agricultural households that grew crops processed one or more of those crops in some way (into flour, seeds, maize bran, etc.), but only 9% of these households sold the resulting product.¹⁷ The median sales value of processed crops for those that sold them was USD\$29.20 for all sales, while the median cost of processing all products combined was USD\$11.26 for households with processing expenses. Male- and female-headed households processed crops and sold the resulting product at similar rates.

Most Plots were within 10 Kilometers of Roads and Markets

Seventy percent of long rainy season plots were within 10 kilometers of a market; only seven percent were further than 20 kilometers (see *Figure 4*). The median distance was 6 kilometers to a market and 1 kilometer to a road.¹⁸ However, road quality and terrain were not measured, nor were details about the size or activity of the closest market. Without controlling for other factors, distance to market did not appear to influence the total sales value or quantity sold for households in the long rainy season.¹⁹

Figure 4: Distribution of Distance from Furthest Household Plot to Market in Long Rainy Season



*To maintain a scale on the chart that can be easily viewed, 26 observations above 40 km are not shown

¹⁷ The survey distinguished between agricultural products, which were produced purposely for sale, and by-products, which were produced as a consequence of processing another good. For this analysis we combined agricultural products and by-products.

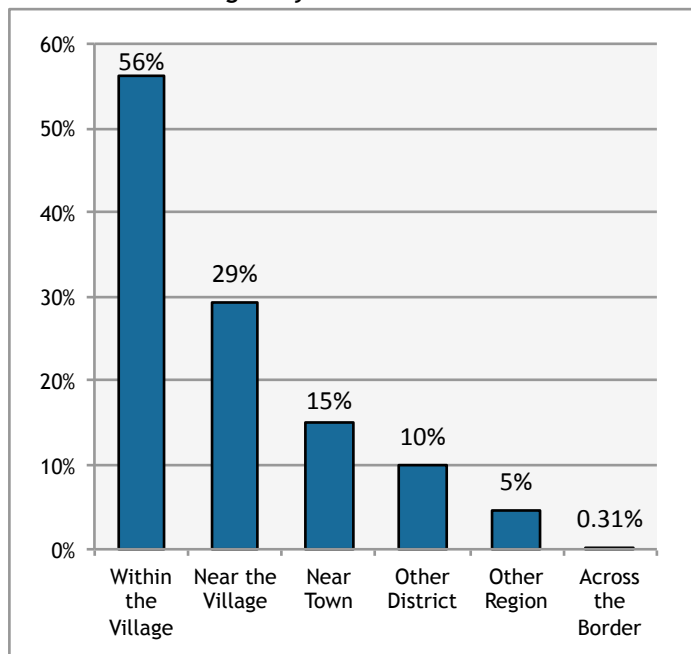
¹⁸ Seven percent of plots were reported as 0km from a market and 22% of plots were reported as 0km from a road.

¹⁹ When the distance from plot to market was collapsed to the household level, it had a correlation coefficient of 0.0327 with the total sales value and 0.0248 with the total sales quantity in the long rainy season (neither were statistically significant). For this collapse, we used the largest reported distance from plot to market as the distance for the household.

Most Farmers Sold their Crops within their Home District

Ninety percent of households selling crops in the long rainy season reported sales within their own district,²⁰ while 15% sold outside their district.²¹ Households were most likely to sell within their own village (56%). *Figure 5* shows a more detailed breakdown of where farmers reported selling their crops in the long rainy season.

Figure 5: Proportion of Households that Sold in Each Location in the Long Rainy Season



Farmers Used Diverse Modes of Transportation for Crops

Forty-one percent of households who sold crops in the long rainy season reported transporting their crops for sale. The most common mode of transportation to point of sale was bicycle (42% of households), followed by walking (28%), car (15%), animal (13%), and other (7%). Most priority crops were transported for sale only once in the long rainy season. Almost 60% of transporting farmers did not pay to transport their crops. Households who did pay spent a median of USD\$4.17 for all crops transported in the long rainy season.²² Some households paid for all reported methods of transportation, potentially indicating that farmers paid to rent bicycles or paid others to carry crops to market on foot. Unsurprisingly, car transportation was most expensive at a median of USD\$12.51 for those who paid. All other modes of transportation had

20 Includes farmers reporting sales “Within the village”, “Near the Village”, and “Near the Town”.

21 Includes farmers reporting sales “Other District”, “Other Region”, and “Across the Border”.

22 The mean household expenditure was USD\$15.34. However, three households reported spending over USD\$250.00 to travel by car 5 to 10 thousand km.

median total costs of under USD\$5.00 in the long rainy season.

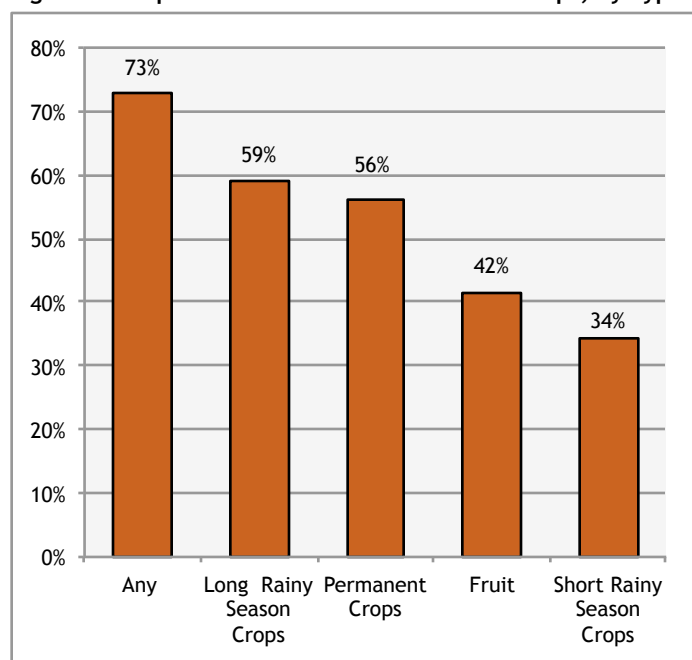
Forty-four percent of households owned at least one bicycle, while fewer than 3% of households owned any other transportation asset.²³ Over half (52%) of male-headed households owned bicycles compared to only 20% of female-headed households.²⁴ Bicycle owners were significantly more likely to transport crops (45% of households versus 37% of households that did not own bicycles).²⁵

SALES

A Majority of Farmers Sold at least one Crop

Seventy-three percent of agricultural households reported some agricultural sales over the course of the year. *Figure 6* shows the proportion of households that sold each crop type of those that grew that type.

Figure 6: Proportion of Households that Sold Crops, by Type*



*Of households growing each crop type.

Households that sold any crops sold an average of 45% of the crop value harvested (median: 42%).²⁶ The average total value of these long rainy season crop sales was USD\$191.14

23 Includes motor vehicles, motorcycles, carts, animal carts, boats, outboard motors, or donkeys.

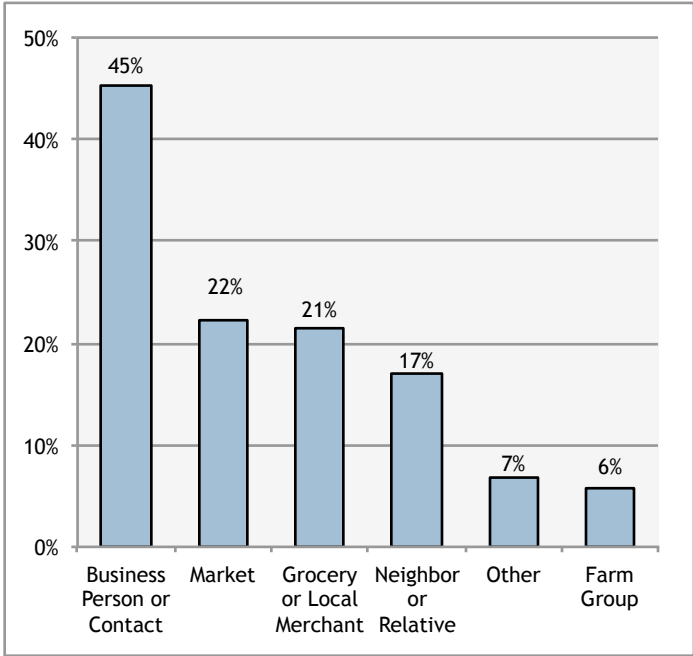
24 $P < 0.0000$.

25 $P < 0.0185$.

26 Fifty-five households reported a higher sales value than total value. For the 10 observations where the proportion was between 1 and 1.1, we changed the proportion to 1. We dropped the remaining 45 observations (with a proportion greater than 1.1) from the analysis.

(median: USD\$62.56).²⁷ Households sold crops in both formal and informal markets. Seventeen percent of sellers sold to neighbors or relatives in the long rainy season, while 45% sold to a business person or contact (see Figure 7).²⁸ Maize made up the largest proportion of sales by crop for each buyer type except farm group or “other”, reflecting its dominance in the market. Only one percent of households reported participating in an outgrower scheme.²⁹

Figure 7: Proportion of Households that Sold to Each Buyer Type in the Long Rainy Season



Female-headed Households were Less Likely to Sell Crops and Earned Less from Overall Sales³⁰

Female-headed households reported selling crops less frequently than male-headed households. Sixty-two percent of male-headed households sold long rainy season crops, compared to only 51% of female-headed households. With the exceptions of sweet potatoes and cassava, male-headed households that grew each of the priority crops during the long rainy season were more likely to sell those crops than female-headed households. However, maize was the only priority crop

27 We used the same exclusion criteria for this analysis as the proportion of crop value that was sold. We changed the difference to zero for 10 households that reported a proportion between 1 and 1.1, and dropped 45 observations that reported a proportion greater than 1.1.

28 Farmers reported the relationship of the primary and (if applicable) secondary buyers by crop. These were divided into six categories for analysis: 1. Relative or Neighbor: “Relative” or “Neighbor”, 2. Market: “Market”, “Open Market”, or “Main Market”, 3. Grocery or Local merchant: “Grocery/Local Merchant” 4. Farmers’ Group: “Cooperative Union” or “Farmers Party”, 5. Business Person or Contact: “Private Business Person” or “Business Contact” and 6. Other: “Abattori/ Factory”, “Employer”, “Religious Institution”, “Bank (Commercial)” , “Money Lender”, “NGO”, “Distribution Officer”, or “Other”.

29 There were too few observations (21) to conduct further analysis, but all reported crops were tobacco.

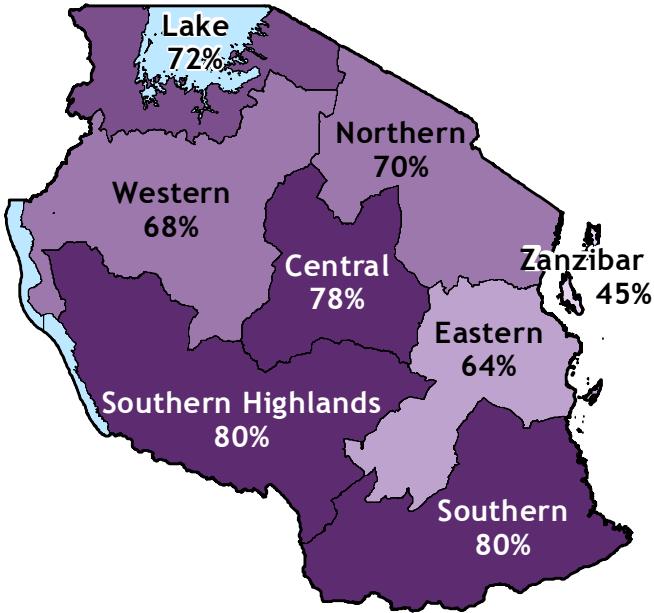
30 For more information about gender, refer to EPAR Brief #190.

for which the difference was statistically significant.³¹ Female-headed households were significantly less likely to sell to a business person or contact (38% of female-headed households versus 47% of male-headed households in the long rainy season),³² but sold to other types of buyers at similar rates. In the long rainy season, the average sales value for male-headed households (USD\$215.44; median: USD\$75.08) were significantly higher than the average sales value for female-headed households (USD\$102.33; median: USD\$33.38).³³

Market Participation Varied by Zone

The proportion of households selling crops differed by zone. While only 45% of Zanzibari households sold crops throughout the year, 80% of households in the Southern Highlands and Southern Zone sold at least one crop (see Figure 8).

Figure 8: Proportion of Households that Sold at least One Crop by Zone



There were also zonal differences in buyer type. In the long rainy season, farmers in the Lake Zone were less likely to sell to a business person or contact (10% of sellers) than farmers in other zones (30% of sellers) and farmers in the Western Zone were significantly more likely to sell to a farmers group (21% of sellers), than farmers in other zones (less than 10% of sellers).

Market Participation Varied Across the Priority Crops

Figure 9 shows the proportion of households that sold a

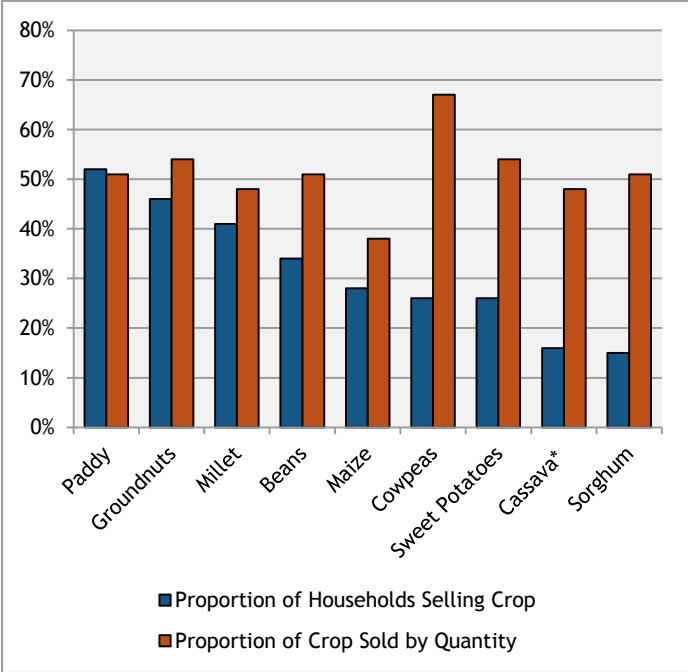
31 31% of male-headed households that grew maize sold some of their crop, compared to 21% of female-headed households (p-value: 0.0011).

32 P<0.0154.

33 P<0.0000.

crop in the long rainy season of those growing it and the average portion of their harvest sold. Paddy was the most commonly sold of the priority crops, with 52% of paddy farming households selling an average of 51% of their harvest in the long rainy season. Sorghum was least commonly sold; only 15% of households that grew sorghum sold an average of 51% of their yields. Thirty-four percent of maize growing households sold an average of 38% of their harvests.

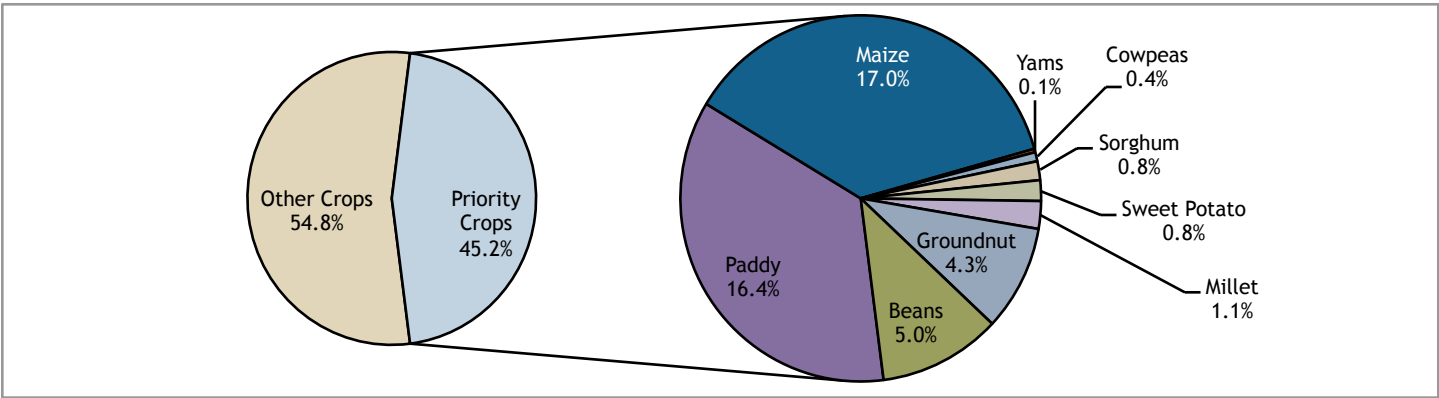
Figure 9: Proportion of Households Cultivating Crops that Sold them and Average Amount of Crop Sold (by Sellers) as a Proportion of Harvest Quantity in the Long Rainy Season



*Permanent Crop Observations

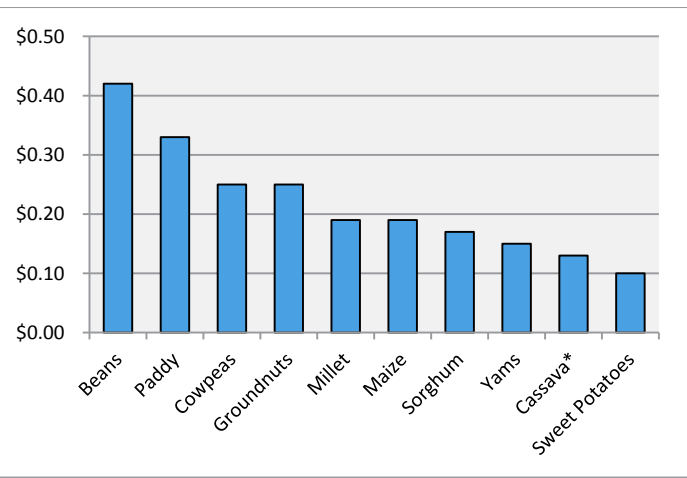
Though four other priority crops were more likely to be sold, maize was the most commonly grown crop in the country (83% of households), and it accounted for the largest proportion of sales value among priority crops in the long rainy season (see Figure 10). Although only 17% of households cultivated paddy, it contributed nearly the same sales value as maize in the long

Figure 10: Proportion of Total Sales Value in the Long Rainy Season (Priority Crops Highlighted)



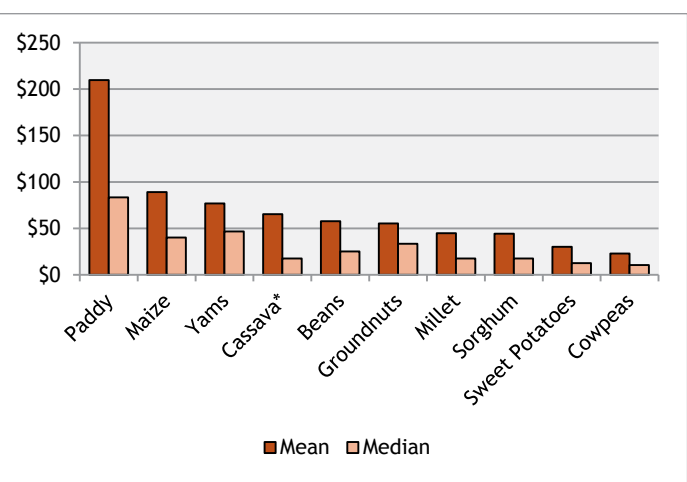
rainy season due to its high sales price. Tobacco (18%), cotton (12%), sunflower (4%), Irish potato (3%), and onions (3%) made up the majority of the value sold of non-priority crops.³⁴

Figure 11: Median Price per Kilogram in the Long Rainy Season



*Permanent Crop Observations

Figure 12: Mean and Median Value of Crop Sold in the Long Rainy Season of Households Growing Each Crop



*Permanent Crop Observations

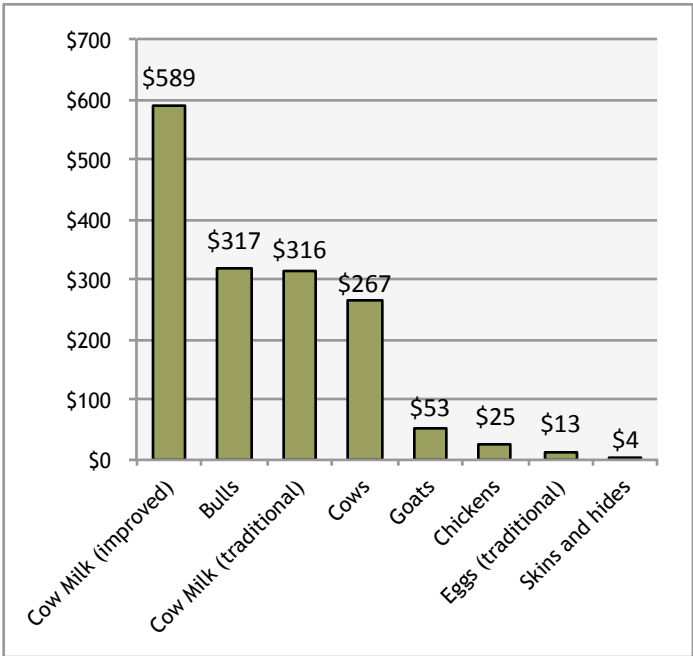
34 There were few observations of tobacco (27), Irish potato (25), and onions (10).

Of the priority crops, paddy and legumes (beans, groundnuts, and cowpeas) received the highest price per kilogram (see *Figure 11*) and paddy sellers received on average, the highest amount for sales of all priority crops (see *Figure 12*).

Sales of Livestock and Animal By-Products

Chickens were the most frequently owned and sold livestock. Fewer than a quarter of households owned cows (19%), 30% owned goats, and 68% owned chickens. Eleven percent of cow-owning households sold live cows within the 12 months preceding the survey, 34% of goat owning households sold goats, and 41% of chicken-owning households sold chickens. The value of household sales of cattle and milk were higher than the value of household sales of chickens or other animals and animal by-products (see *Figure 13*).

Figure 13: Mean Value of Sales of Livestock and Animal By-Products over the Past 12 Months



*Only includes livestock and animal products with 30 or more observations.

Consumption

Food consumption patterns are likely to be seasonally dependent, but in the survey consumption was reported only over the last seven days; in addition, households were surveyed at different points in the year. For most foods, households consumed substantially more in the past week if they had produced the food than if they bought it. On average, agricultural households bought USD\$11.07 worth of food in the week preceding their interview.³⁵

35 For more information on food consumption, refer to EPAR Request # 165.

ANALYSIS OF MARKET-ACTIVE

HOUSEHOLDS

We used three criteria to define “market-active” households:

Sold any crop, including long rainy season, short rainy season, fruit, and/or permanent crops - 73% of households met this criterion.

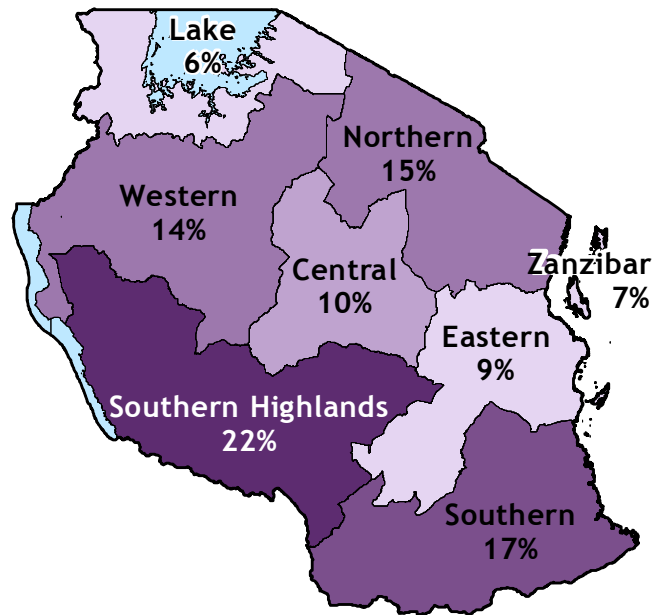
Bought any of the following inputs, fertilizer, pesticides, herbicides, fungicides, and/or IV seeds - 35% of households met this criterion.

Hired paid labor for crops (long rainy season or short rainy season) and/or livestock - 36% of households met this criterion.

Fourteen percent of households met all three of these criteria. This section compares these market-active households with the other 86% of households.

The Southern Highlands Zone contained the highest proportion of market-active households (22%), and Lake Zone contained the lowest (6%) (see *Figure 14*).

Figure 14: Market-Active Households by Zone

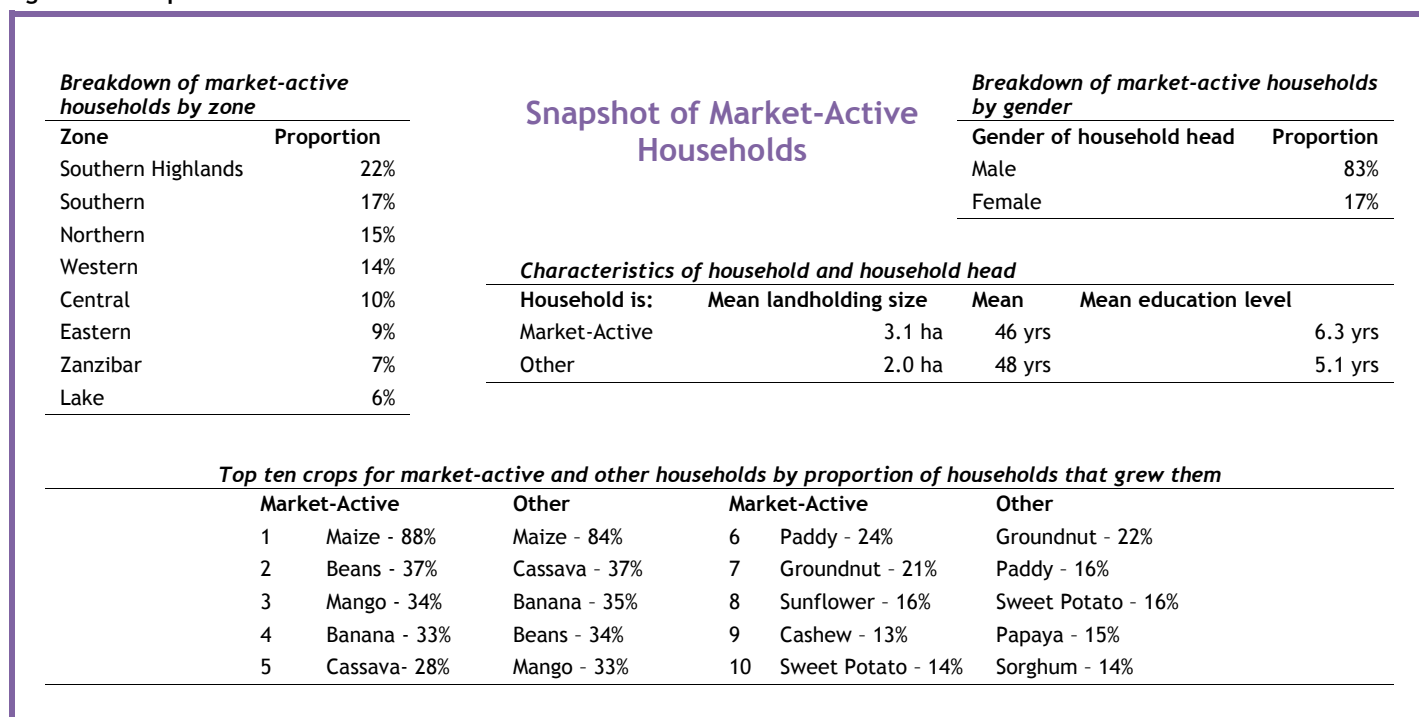


Male-headed households were significantly more likely to be market-active than female-headed households (26% compared to 17% for female-headed households).³⁶ On average, the heads of market-active households had one more year of education than the heads of other households, and this difference was also highly significant (6.3 years versus 5.1 years).³⁷ While the heads of market-active households were 1.5 years younger on

36 $P < 0.0009$.

37 $P < 0.0000$. Median for market-active households: 8 years. Median for other households: 6 years.

Figure 15: Snapshot of Market-Active Households



average (46.0 years, compared to 47.5 for other household heads), this difference was not significant.³⁸

The average landholding size for market-active households was significantly higher than for other households (3.1 hectares versus 2.0 hectares).³⁹ However, average household size for the two groups was very similar, and the difference was not significant (5.5 members for market-active, and 5.4 members for other).

Market-active households were significantly more likely to grow cotton, cashew, sunflower, paddy, and maize, and significantly less likely to grow papaya, bambara nuts, yams, cassava, and sorghum.⁴⁰

Maize was the most commonly cultivated crop in both market-active and other households, and the same five crops constituted the top five for both groups (see Figure 15). Six priority crops were among the top ten crops for both groups, but sorghum dropped from 10th place for non-active households to 16th place for market-active households (9% of households). The most commonly cultivated non-priority crops were also slightly different. Although about a third of both groups grew banana, market-active households were more likely to grow sunflower and cashew while other households were more likely to grow papaya.

STRATEGIC IMPLICATIONS AND

OUTSTANDING QUESTIONS

While over 70% of agricultural households sold at least one crop, far fewer households were consistently active across the value chain. Thirty-five percent of households purchased inputs aside from traditional seeds. Few households received vouchers for inputs, used credit, participated in outgrower schemes, or stored or processed crops for sale. Lack of available funds could be a possible explanation of lower participation in the inputs market. More detailed information regarding the availability of inputs and prices at local markets would be useful in determining whether lack of access is a constraint to buying inputs.

A substantial proportion of households that sold their crops did not sell them directly at the market. Forty-five percent sold to a business person or contact and 17% to a relative or neighbor. Since most households were not located particularly far from a market, more information on market size, activity, and prices may help to explain the incentives for farmers to grow crops for sale and explain levels of participation apart from whether or not the household had a surplus to sell.⁴¹

Disseminating market information via radio may be an effective way to reach farmers. Sixty percent of agricultural households owned radios and about a third of households received agricultural price information from a radio. Farmers were not asked if they received agricultural price information

38 P<0.1386. Median for market-active households: 43 years. Median for other households: 45 years.

39 P<0.0001. Median for market-active households: 2.0 hectares. Median for other households: 1.2 hectares.

40 Includes only crops grown on more than 100 plots. P-values: cotton: 0.0037, cashew: 0.0183, sunflower: 0.0112, paddy: 0.0423, maize: 0.0556, papaya: 0.0781, bambara nuts: 0.0228, yams: 0.0218, cassava: 0.0079, sorghum: 0.0501.

41 Some information about market prices and distance was collected in the community survey, but a large proportion of respondents reported "not applicable" for many relevant community features, and the documentation did not provide information about how to interpret those responses.

via cellphone, but 32% of households owned one. Farmers frequently reported learning agricultural price information from neighbors, suggesting that interventions may benefit farmers beyond direct program participants.

Strengthening and encouraging farmers' cooperatives and associations may also improve market participation. Six percent of farmers received market price information from groups and 3% received extension advice. Group activities were largely market-based, with about three-quarters of groups selling output as a group. Farmers reported whether they attended farmers' group meetings (16% reported attending at least one meeting), but the survey did not ask specifically about farmer group membership aside from SACCOs.

Female-headed households participated less in the agricultural value chain. This limited participation may be due in part to smaller or non-existent surpluses produced by female-headed households. Therefore, interventions pre-production and at the production phase (e.g. improved seed and fertilizer access) could be helpful in increasing market participation of female-headed households. Alternatively, some constraints may arise post-production; for example, bicycle owners transported crops to sale more frequently than non-bicycle owners, and male-headed households were more than twice as likely to own bicycles than female-headed households. Therefore, interventions focusing on strengthening market access without also addressing pre- and post-production constraints may disproportionately benefit male-headed households.

Please direct comments or questions about this research to Leigh Anderson and Mary Kay Gugerty, at eparx@u.washington.edu.

This brief presents summary statistics from the Tanzania National Panel Survey (TZNPS), which was implemented by the Tanzania National Bureau of Statistics, with support from the World Bank Living Standards Measurement Study - Integrated Surveys on Agriculture (LSMS-ISA) team. The LSMS-ISA data were collected over a twelve-month period from October 2008 through September 2009. The sample design was constructed to produce nationally representative estimates, and it consists of 3,265 households from eight administrative zones, each with a rural/urban cluster, for a total of sixteen sampling strata. The resulting data can produce nationally representative estimates at the national and zonal level. Sample size limitations preclude reliable statistics at the regional or district level. Agricultural households completed an additional farm questionnaire, resulting in 2,474 respondents who report involvement in any crop, fishing or livestock cultivation.

In 2011 EPAR completed the Tanzania LSMS-ISA Reference Report, a document consisting of eight sections that highlights specific areas such as crops and productivity, livestock, and inputs. The Reference Report provides summary statistics, detailed information on EPAR's methodology for analysis, and the opportunities and challenges that the LSMS-ISA survey data present. Please refer to Section A: Introduction and Overview, Section D: Crops and Productivity, Section F: Inputs, Section E: Livestock and Livestock Byproducts, and Section G: Food Consumption and Expenditures of the Reference Report for more information on the data and analytical methodology used in this brief.

An appendix with confidence intervals and number of observations for all data in this brief is available upon request. While LSMS-ISA data was collected in kilograms and acres, we have converted units to metric tons (t) and hectares (ha) for this brief. One hectare = 2.47 acres and 1 t = 1000 kg.