



Men's Crops? Women's Crops? The Gender Patterns of Cropping in Ghana

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Summary. — Cultural distinctions between men's crops and women's crops are found frequently in the literature on agriculture in West Africa. This paper uses nationally representative household survey data from Ghana to examine whether crops can be divided into men's and women's crops. Three definitions of farmer are used: the gender of the household head, the gender of the plot holder, and the person who keeps the revenue from the plot. Few crops can be defined as men's crops and none are clearly women's crops.

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1. INTRODUCTION

In Ghana, as in much of Africa, researchers and policymakers are increasingly aware of the need to incorporate gender issues into their analyses and programs. Gender often enters discussions within agricultural development programs either through distinctions between male- and female-headed households or through distinctions between men's and women's crops. Men are often viewed as being responsible for producing cash crops, while women are viewed responsible for producing subsistence crops for home consumption.¹ Other characterizations of men's and women's crops are often based on cultural norms.² One frequent critique of agricultural development programs has been that they have focused on men's crops rather than women's crops.

If crops could be categorized as men's and women's crops, this would simplify many things for both policy makers and development economists. We could then distinguish the effects of agricultural policies on men and women, simply by examining the effects of policy on different crops. It would be easy to determine how men and women would be affected by price, weather or pest shocks. Policies could target either men or women, simply by targeting their crops. One of the challenges of doing intrahousehold analyses of agricultural households is allocating the agricultural income across individuals. It would greatly simplify data collection needs for intrahousehold ana-

lyses if we could assume that women kept the money from some crops and men kept the money from other crops. We could identify the gender effects of different policies or shocks simply by comparing the effects on different crops.

Economists have referred to the anthropological literature on West Africa to justify assumptions about men's and women's crops.³ The cultural constructs of crops as men's and women's crops may not, however, match current practices in African households. For example, while in Techiman, Ghana, I spoke with a woman who worked on women's programs for the government. She emphatically explained that yams were a man's crop. In the same sentence, she invited me to see *her* yam farm.

Little documentation exists as to whether the distinctions between men's and women's crops are related to current agricultural practices. This paper seeks to remedy this lack of information by examining the gender patterns of cropping in Ghana. Ghana is fairly representative of West African countries where many crops are culturally defined as men's crops and women's crops. The data available through the 1991–92 Ghana Living Standards Survey (GLSS3) make this analysis possible for Ghana. Most household survey data sets only

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collect agricultural production data at the household level, which does not allow this type of analysis. The GLSS3 data include information by plot holder. Within each household, everyone who held a plot of land was interviewed. A total of 3,278 plot holders were interviewed. Thus, in this paper, we can examine whether any of the commonly accepted patterns of cropping by gender are visible in large-scale household survey data and whether these cultural definitions are useful for economic analyses.

In this paper, I address three related questions regarding gender patterns of cropping. First, can we distinguish between men's crops and women's crops? Are there crops that are exclusively or primarily grown by women or by men? Second, which crops are important for women farmers? Are these crops different from those that are important to men farmers? Finally, who are the women who grow crops that are more typically grown by men? Do they differ in observable ways from other women farmers?

The data allow us to draw three conclusions. First, in Ghana, most crops cannot be classified as either men's crops or women's crops. Only a few crops are grown only by men and no crops are grown only by women. Most crops are grown by both men and women, regardless of how we define the farmer. Nonetheless, there are patterns of cropping by gender. The proportion grown by women varies across crops when we look at the number of women growing the crop either as a proportion of all farmers growing the crop or as a proportion of all women farmers. Third, the definition of farmers does matter. Different results are obtained depending on whether we compare crops grown by male- and female-headed households, crops grown on land held by men and women, or crops grown on land where men and women keep the revenue. Thus, there are gendered patterns of cropping, but the patterns are more complex than simply that specific crops are grown by either men or women.

2. DEFINING MALE AND FEMALE FARMERS

Before we begin to answer these questions, we must first examine what we mean for a crop to be grown by a male or a female farmer. What does it mean that an individual grows a particular crop? Three definitions of farmer can

clearly be distinguished using the GLSS3 data. A farmer may be the head of a farming household. (Farming households in Ghana are small-scale producers who typically produce for both home consumption and market sale.) A farmer may be the individual who holds the plot of land.⁴ Or a farmer may be the individual who keeps the revenue from the plot of land.⁵ In other places in the world, other definitions may be needed, especially where agricultural production is done on large farms or plantations using wage labor or where it is share-cropped. We also need to define what it means for a farmer to be growing the crop. Given the available data, I consider a farmer to be growing the crop if he or she has harvested any in the 12 months prior to the interview.⁶

Significant variations in women's roles and participation in agriculture occur across Ghana. Thus, much of the analysis will disaggregate the data by ecological zone. Three distinct agro-ecological zones are present in Ghana. The coastal zone includes a narrow belt of savannah that runs along the Atlantic coast, widening toward the east of the country. The principle staples are maize and cassava, which are often intercropped. The forest zone is immediately inland from the coastal zone. Most of Ghana's forest is semi-deciduous, with a small area of high rain forest remaining only in the southwestern part of the country. The staple crops of the forest region are maize intercropped with cassava, plantain, yam or cocoyam. Finally, the savannah zone occupies most of the northern part of the country. Sorghum and millet⁷ are the dominant cereals in the drier areas, with cassava, maize and yams grown in areas with more rainfall.⁸ Table 1 presents descriptive statistics on the percentage of female farmers and the language and religion of farmers by zone.

The first definition of a farmer is as the head of a farming household. Studies of gender issues in agricultural production often simply compare the behavior of households headed by men with those headed by women. Data on the sex of the household head are frequently one of the few demographic variables available in agricultural household surveys. It provides an easy way to make some generalizations about gender. There is evidence that male- and female-headed households face different constraints and make different decisions. For example, in Ghana, after controlling for access to resources, one study finds that the gender of the farmer was not significant in determining

Table 1. *Descriptive statistics, farmers in Ghana, by zone, 1991-92*

	Ghana	Coast	Forest	Savannah
<i>% of farmers that are female when farmer is defined as</i>				
Household head	26	32	32	12
Land holder	32	38	37	18
Revenue keeper	28	37	33	14
<i>Language</i>				
Akan	45	47	67	10
Ewe	12	22	8	12
Ga	6	15	4	3
Other	36	15	20	75
<i>Religion</i>				
Christian	58	64	35	32
Muslim	13	5	10	25
Other	27	30	17	41

Source: Ghana Living Standards Survey 1991-92.

the adoption of improved maize technologies. The gender of the household head, however, did matter. Farmers in female-headed households were less likely to adopt improved varieties of maize (Doss & Morris, 2001).

The definition of female-headed household varies across surveys. As Rogers (1995) demonstrates in a study in the Dominican Republic, different definitions of female-headed households may result in significantly different households falling into the category. In the GLSS3, the interviewers were asked to determine the head of the household. They were told

Usually the head of the household is the person who provides most of the needs of the household and is familiar with all the activities and occupations of the household members. He will be the person named when you ask the question, "Who is the head of the household" (Republic of Ghana Statistical Service, 1990).

This clearly leads interviewers to look for a male household head. This definition means that we would expect only *de jure* female heads of households to be included in the category of female heads of households in this survey. Households that are *de facto* headed by women may still be counted as male headed. Yet a surprising number of women in the GLSS3 (616 out of 4,552 households) report being both married and the head of the household. This may be due to the complexity and fluidity of households in Ghana and may also include women in polygamous marriages whose husbands reside separately. As Table 1 indicates,

many fewer households are headed by women in the savannah zone than in either the coast or forest zones.

Data on the head of the household, however, tell us nothing about crops grown by women in male-headed households. Thus, as a second approach, farmers are defined as the person holding the land. Within each surveyed household, each person who held land was asked a number of questions regarding all of the crops that were harvested from their land in the previous year. Thus, we can identify which crops were grown on plots held by men and by women. To the extent that women farm plots of land for which they are not designated as the plot holder, the crops grown by these women will not be counted as women's crops.

Finally, for each plot of land, the person holding the land was asked, "Who decides what crops to grow?" "Who decides what purchased inputs to use?" and "Who kept the revenue from the sale of the produce?" The answers to these three questions are highly correlated. Thus, I focus on the question regarding the gender of the individual who keeps the revenue from the plot on which the crop was grown. Ideally, it would be useful to have this information by crop, but the data were collected by plot. Some farmers reported that no revenues were received from crops grown on particular plots.

In this paper, I will refer to women and men farmers as the general categories. Household head, holder of land, and keeper of revenue are three ways to define farmers and, thus, to assign crops by gender.

3. MEN'S CROPS? WOMEN'S CROPS?

The first question is whether we can distinguish men's and women's crops in the data. For each crop, we can examine the proportion of farmers who grow the crop who are women. Figure 1 presents the number of male and female farmers growing each crop, where the farmer is defined as the holder of the plot. The initial result should be clear; there are almost no crops, and no crops of any major importance, that are grown exclusively by either men or women in Ghana.

To examine this issue in more detail, we can break this information down by ecological zone. In Table 2, I present detailed results of the proportion of women growing each crop, for each of the three definitions of farmer and

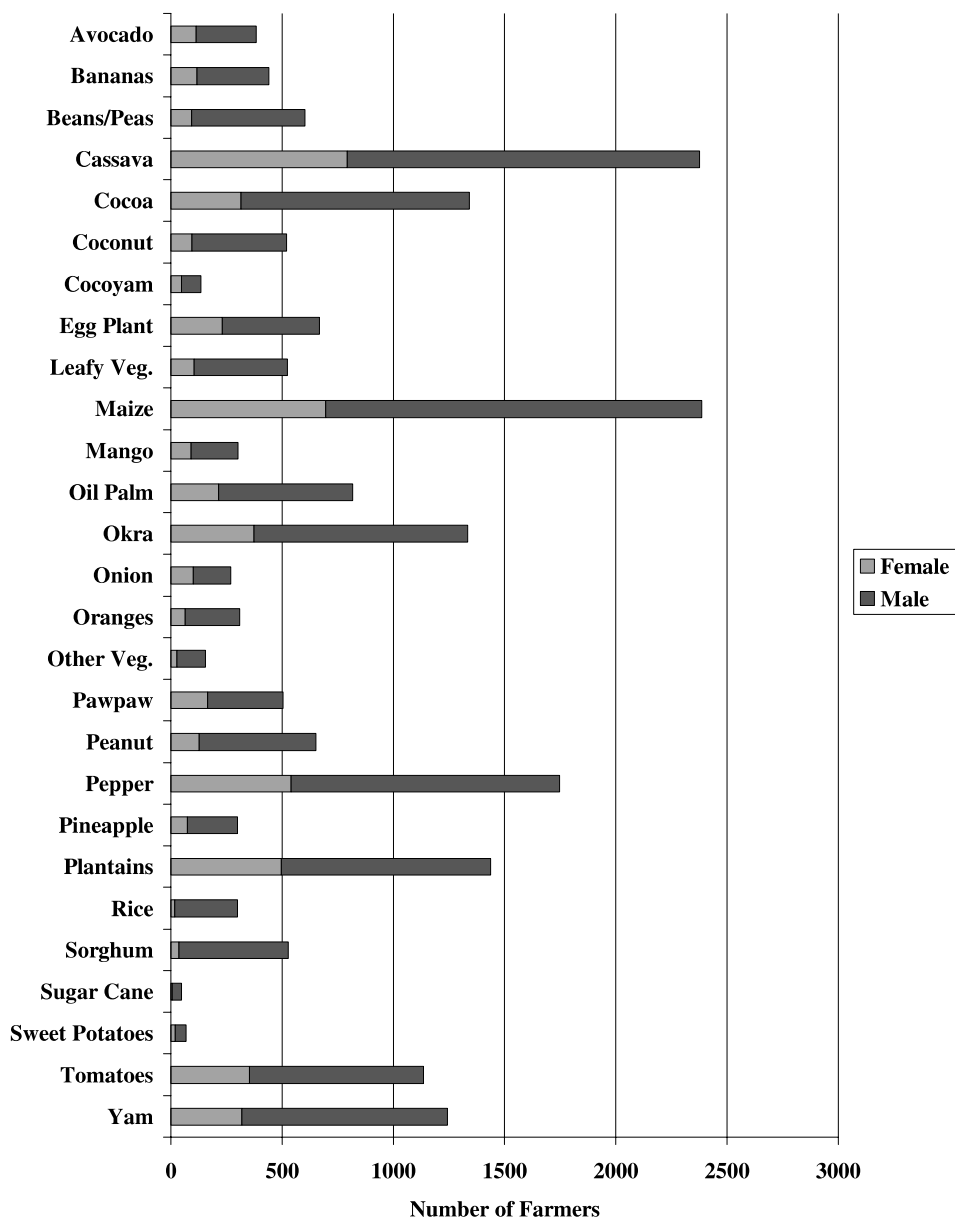


Figure 1. Number of farmers (plot holders) growing crops, Ghana 1991-92.

for each of the three ecological zones. The following calculation is presented in the table:

$$F_i^f / F_i$$

where F is the total number of farmers, of whom F^f are women and F^m are male. F_i is the number of farmers growing crop i . F_i^f is the number of women farmers growing crop i and

F_i^m is the number of male farmers growing crop i . If few of the farmers who are growing a crop are women, we can define it as a man's crop. Similarly, if most farmers growing the crop are women, we would define it as a woman's crop.

No crops are grown primarily by women, regardless of the definition of farmer. For

Table 2. *Percentage of crops grown by women, by zone, using three definitions of farmer, Ghana*

	Female-headed households				Woman holds the land				Woman keeps revenue from plot			
	Ghana	Coast	Forest	Savannah	Ghana	Coast	Forest	Savannah	Ghana	Coast	Forest	Savannah
Avocado	0.28	0.23	0.30	0.00	0.30	0.23 ^d	0.31 ^c	— ^a	0.29	0.22 ^d	0.31 ^c	0.00
Pear												
Bananas	0.25	0.26	0.27 ^c	0.12	0.27 ^d	0.30	0.27 ^d	0.15	0.26 ^d	0.29	0.26 ^d	0.13
Beans/peas	0.13 ^d	0.35	0.21 ^c	0.08 ^d	0.16 ^d	0.40	0.28 ^c	0.10 ^d	0.14 ^d	0.36	0.26 ^c	0.08 ^d
Cassava	0.35	0.32	0.32	0.16 ^b	0.33	0.38	0.36	0.21 ^c	0.23 ^d	0.42	0.32 ^d	0.18
Cocoyam	0.30 ^b	0.28	0.32	0.18 ^c	0.35 ^b	0.35	0.37	0.24 ^c	0.33	0.34	0.35	0.22
Cocoa	0.22 ^c	0.25	0.22 ^d	0.20	0.23 ^d	0.25 ^d	0.23 ^d	0.33	0.23 ^d	0.26 ^c	0.22 ^d	0.40
Coconut	0.17 ^d	0.19 ^d	0.14 ^d	—	0.18 ^d	0.22 ^d	0.12 ^d	0.25	0.18 ^d	0.20 ^d	0.17 ^d	—
Coffee	0.10	—	0.11 ^c	—	0.10 ^d	—	0.11 ^c	—	0.12 ^c	—	0.13 ^c	—
Cola nut	0.14	—	0.12 ^c	—	0.17 ^d	—	0.16 ^c	—	0.14 ^c	—	0.13 ^d	—
Cotton	0.06 ^c	—	—	0.00	0.06 ^d	—	—	0.00 ^c	0.17	—	—	0.00
Egg plant	0.29 ^c	0.32	0.31	0.15	0.35	0.42	0.34	0.24	0.31	0.37	0.31 ^d	0.20
Leafy veg.	0.16 ^d	0.29	0.38	0.08 ^d	0.20 ^d	0.29	0.38	0.14 ^c	0.17 ^d	0.29	0.37	0.07 ^d
Maize	0.24 ^c	0.45	0.30 ^c	0.10	0.29 ^d	0.37	0.34 ^c	0.14 ^d	0.27 ^d	0.34	0.32 ^d	0.12 ^d
Mango	0.29	0.30	0.32	0.07	0.30	0.31	0.33	0.10	0.28	0.27 ^c	0.31	0.07
Oil palm	0.24	0.25 ^c	0.25 ^d	0.08	0.26 ^d	0.28 ^d	0.27 ^d	0.13	0.25 ^d	0.25 ^d	0.26 ^d	0.11
Okra	0.22 ^d	0.34	0.32	0.09 ^d	0.28 ^d	0.42	0.36	0.15 ^c	0.26 ^d	0.39	0.34	0.12 ^d
Onion	0.32 ^b	0.37	0.36	0.13	0.37 ^c	0.39	0.41	0.25	0.34	0.39	0.36	0.22
Oranges	0.21 ^c	0.14 ^d	0.23 ^d	0.15	0.21 ^d	0.16 ^d	0.23 ^d	0.15	0.21 ^d	0.16 ^d	0.22 ^d	0.08
Other veg.	0.18 ^c	—	0.34	0.08	0.19 ^d	—	0.32	0.10 ^d	0.14 ^d	—	0.26	0.06 ^d
	0.31 ^b	0.39	0.32	0.08	0.33	0.44	0.33	0.08 ^c	0.31	0.40	0.31 ^c	0.08
Peanut	0.15 ^d	—	0.34	0.09 ^c	0.19 ^d	0.51 ^c	0.37	0.14 ^d	0.18 ^d	—	0.35	0.13 ^d
Pepper	0.25	0.30	0.32	0.07 ^d	0.31	0.38	0.36	0.14 ^c	0.28 ^d	0.39	0.34	0.11 ^d
Pineapple	0.23	0.29	0.20 ^d	0.11	0.25 ^d	0.33	0.22 ^d	0.11	0.23 ^d	0.29	0.22 ^d	0.11
Plantains	0.30 ^b	0.30	0.32	0.14	0.34 ^c	0.34	0.36	0.21	0.32	0.32 ^c	0.33 ^c	0.17
Rice	0.06 ^d	—	0.06 ^d	0.05 ^d	0.06 ^d	—	0.08 ^d	0.04 ^d	0.04 ^d	1.00	0.07 ^d	0.03 ^d
Sorghum	0.06 ^d	—	—	0.06 ^d	0.07 ^d	—	—	0.07 ^d	0.05 ^d	—	—	0.05 ^d
Sugar cane	0.12 ^c	0.15 ^c	—	—	0.14 ^d	0.15 ^d	0.05 ^d	—	0.13 ^d	0.17 ^c	—	—
Sweet	0.18	0.23	0.29	0.04	0.29	0.36	0.43	0.12	0.25	0.24	0.43	0.15
Potatoes												
Tobacco	0.00 ^d	—	—	0.00 ^c	0.04 ^d	—	—	0.04 ^c	0.00 ^d	—	—	0.00 ^c
Tomatoes	0.25	0.31	0.29	0.10	0.31	0.41	0.33 ^c	0.17	0.28 ^d	0.36	0.30 ^d	0.15
Yam	0.23 ^d	0.29	0.31	0.08 ^d	0.26 ^d	0.33	0.34 ^c	0.10 ^d	0.24 ^d	0.30	0.31 ^d	0.09 ^d
% Female	0.26	0.32	0.32	0.12	0.32	0.38	0.37	0.18	0.28	0.37	0.33	0.14

^a Indicates that five or fewer households/farmers grow the crop.

^b Proportion of women growing the crop is greater than the proportion of women in the population at the 0.01 level of significance.

^c Proportion of women growing the crop is greater than the proportion of woman in the population at the 0.05 level of significance.

^d Proportion of men growing the crop is greater than the proportion of men in the population at the 0.01 level of significance.

^e Proportion of men growing the crop is greater than the proportion of men in the population at the 0.05 level of significance.

Ghana as a whole, women are at most 37% of the farmers growing any particular crop; the proportion increases to a maximum of 51% when the data are disaggregated by zone. A few crops may be considered men's crops, including rice, sorghum, tobacco and coffee, but relatively few farmers grow the latter two. Most crops cannot be distinguished as being grown primarily either by men or by women.

In addition, I test the null hypothesis

$$F_i^f / F_i = F^f / F$$

which simply tests whether the proportion of women growing the crop is the same as the proportion of women farmers. If the null hypothesis is rejected, then I conclude that the crop is disproportionately grown by either men

or women. A number of crops are disproportionately grown by men and a few are grown disproportionately by women. Once we disaggregate by zone, however, for the majority of crops we cannot reject the null hypothesis that the proportion of the crops grown by women is equal to the proportion of farmers that are women.

Briefly, we can also look at each of the three definitions of farmer. There are no crops that are grown mainly by female-headed households. For Ghana as a whole, at least 65% of all of the households growing any crop are male headed. Several crops, many of them minor crops, are primarily grown in male-headed households. For example, all of the 26 sampled households who grew tobacco were male headed and 18 of the 20 sampled households growing coffee were male headed. A number of crops, however, are disproportionately grown in either male-headed households or female-headed households using the definition above. Female-headed households in Ghana disproportionately grow cocoyam, plantain, onions and eggplant. But, we would not want to call these "women's crops" since only 30–31% of the households growing them are female headed. This proportion, however, is significantly higher than percentage of households headed by women overall, which is only 26%. Male-headed households all disproportionately grow the other staples—maize, yams, rice and sorghum. The latter two might be considered "men's crops" since few female-headed households grow them. They are also grown primarily in the savannah zone, which is the zone with relatively fewer female-headed households. Although several crops that are typically considered "men's crops," including yams and cocoa, are disproportionately grown by male-headed households, many of the households growing them are female headed.

Disaggregating by zone demonstrates that some of the patterns that are observed for a Ghana as a whole are a result of different proportions of women farmers across the zones. Several crops that are disproportionately grown by female-headed households in Ghana as a whole, are not disproportionately grown by female-headed households once we disaggregate by zone. These include onion, pawpaw and plantain. A few crops that are not disproportionately grown by men overall, are disproportionately grown by men in specific zones, notably oil palm in the coast and forest

zones, pepper in the savannah zone, and pineapple in the forest zone.

Some changes occur when we define the farmer as the one holding the land. Among the staple crops, there are changes in the gender patterns of cropping for maize and yams. Maize is grown disproportionately on land held by men in the savannah zone and yams in the forest zone. Again, many of the differences that appear in the national level data disappear when we consider the patterns by zone. One notable exception is that tomatoes are disproportionately grown on plots held by men in the forest zone, although male-headed households do not disproportionately grow them.

Finally, we define the farmer as the person who keeps the revenue from the plot on which the crop was grown. The most striking thing about these results is that no crops are disproportionately grown on plots from which women keep the revenue. In addition, a number of crops move into the category of being disproportionately grown by men when this definition is used.

Cocoyam is disproportionately grown by female-headed households and on plots held by women; however, it is not disproportionately grown on plots for which women keep the revenue. Cassava is disproportionately grown on plots where men keep the revenue, both for Ghana as a whole and for the forest zone. Thus, when these crops are grown as cash crops, they are more likely to be grown by men.

Tomatoes, for both Ghana as a whole and for the forest zone, are grown disproportionately on plots where men keep the revenue. This is consistent with the story that I heard from many farmers that in the forest zone tomatoes were traditionally considered a women's crop but are now increasingly being grown by men as a cash crop. Similarly, pepper is disproportionately grown on plots where men keep the revenue for Ghana as a whole and for the savannah zone, even though it is not grown disproportionately on men's plots in these areas. This suggests that they are more likely to be grown by men when they are grown as cash crops.

No crops stand out as being either men's crops or women's crops, other than rice and sorghum in the savannah zone. Yet, the proportion of women as farmers varies across crops. This implies that although there are no clearly defined men's and women's crops, agricultural policies are not gender neutral if they focus on some crops rather than others.

4. WHICH CROPS ARE IMPORTANT FOR WOMEN FARMERS? FOR MEN FARMERS?

The second issue is determining which crops are important to women farmers. This may be very different from the first question discussed above. For example, 35% of households growing cassava are headed by women. Thus, female-headed households are important as growers of cassava, but men head a much greater proportion of the households growing cassava. Thus, a program designed to improve cassava production might be considered a project that would benefit male-headed households more than female-headed households. Yet, 87% of female-headed households grow cassava.⁹ Thus, if we wanted to target female-headed households, a program on cassava might be appropriate. To benefit women farmers, we need to know which crops are important to them.

Instead of looking at the proportion of women growing the crop as a proportion of all farmers growing a crop, we want to examine it as the proportion of all women farmers. We can define this proportion, η^f :

$$\eta^f = F_i^f / F^f$$

We can define a similar term for male farmers, η^m :

$$\eta^m = F_i^m / F^m$$

Again, it is useful to disaggregate by zone and to look at each of the three definitions of farmers. The results are presented in Table 3 (household head), Table 4 (holder of land) and Table 5 (keeper of revenue). These tables also report the results of the test of the null hypothesis that the importance of the crop is equal for men and women:

$$\eta^f = \eta^m$$

Although there are some crops that are more important for women and others that are more important for men, it should be noted that overall the big differences are across crops rather than across gender. The crops that are the most important for men, especially the staple crops, are also the most important for women. This is true across zones and definitions of farmer.

Maize is more important for male than female farmers, with 75% of male farmers and only 67% of female farmers growing maize in

Ghana (farmers defined as land holders). Yet maize is still one of the most important crops for women, with only cassava being grown by a greater proportion of women farmers. Many of the crops that are thought to be grown on women's plots, such as vegetables for sauces to accompany starchy staples, are equally important for men. For example, 54% of male farmers (land holders) grow peppers while 52% of female farmers do so.

Defining farmers as household heads, there are no crops for which $\eta^f > \eta^m$ in either the coastal or forest zone. The only crops for which $\eta^f > \eta^m$ (at a statistically significant level) are cassava and cocoyam in the savannah zone. The same holds true when we define the farmer as the person holding the plot of land. When we define the farmer as the individual who keeps the revenue from the plot, there are no crops for which $\eta^f > \eta^m$, either for individual zones or for Ghana as a whole.

In this section, we see that there are some gender patterns of cropping, but they are not the most important patterns. Basically, the same crops are important for men and women farmers. The magnitude of the differences between η^f and η^m are small, even when they are statistically significant.

We observe some differences in whether the crops are disproportionately grown by men and women depending on the manner in which we assign crops to individuals. The data suggest that in Ghana women farmers are less likely to use their plots to grow crops for sale. Yet women are clearly involved in cash cropping—the claim that men grow cash crops and women grow subsistence crops is not substantiated. Relative to men, women are less likely to grow crops for sale, but nonetheless, they do so. The gender patterns are important, but gender is only one of many factors that determine what crops a farmer will grow and sell.

5. WHICH WOMEN GROW MEN'S CROPS?

The final question examines whether women who grow crops that are typically grown by men are observably different from other women farmers. We can return to our original definitions of men's and women's crops and look at some of the crops that are disproportionately grown by men and ask who the women are that grow these crops. Table 6 presents the mean characteristics of women farmers by zone, for

Table 3. *Gender patterns of cropping, by zone and head of household, Ghana, 1991-92*

Crop name	Ghana			Coastal zone			Forest zone			Savannah zone		
	No. of HHs growing	% of MHHs growing	% of FHHs growing	No. of HHs growing	% of MHHs growing	% of FHHs growing	No. of HHs growing	% of MHHs growing	% of FHHs growing	No. of HHs growing	% of MHHs growing	% of FHHs growing
Avocado	383	0.12	0.14	40	0.07	0.04	334	0.24	0.21	9	0.01	0.00
Bananas	441	0.15	0.14	61	0.10	0.07	339 ^c	0.25	0.20	41	0.04	0.05
Beans/peas	604 ^d	0.24	0.10	68	0.10	0.11	80 ^c	0.06	0.04	456 ^d	0.52	0.33
Cassava	2375 ^b	0.75	0.87	585	0.88	0.87	1340	0.93	0.92	450 ^b	0.47	0.68
Cocoyam	1341 ^b	0.42	0.52	198	0.31	0.26	1017	0.70	0.71	126 ^a	0.13	0.21
Cocoa	519 ^d	0.18	0.15	52	0.09	0.06	462 ^d	0.37	0.22	5	0.00	0.01
Coconut	136 ^d	0.01	0.03	85 ^d	0.15	0.07	49 ^d	0.04	0.02	2	0.00	0.00
Coffee	20	0.01	0.00	1	0.00	0.00	18	0.02	0.00	1	0.00	0.00
Cola nut	29	0.01	0.01	2	0.00	0.00	25	0.02	0.01	2	0.00	0.00
Cotton	16	0.01	0.00	1	0.00	0.00	0	0.00	0.00	15	0.02	0.00
Egg plant	668 ^a	0.21	0.25	178	0.27	0.27	395	0.28	0.27	95	0.10	0.13
Leafy veg.	524 ^d	0.20	0.10	17	0.03	0.02	125	0.08	0.10	382 ^d	0.43	0.29
Maize	2384 ^d	0.80	0.74	517	0.79	0.75	1181 ^d	0.84	0.76	686 ^c	0.76	0.65
Mango	301	0.10	0.11	61	0.09	0.08	211	0.15	0.15	29	0.03	0.02
Oil palm	817	0.28	0.25	201 ^d	0.33	0.23	568 ^d	0.43	0.31	48	0.05	0.04
Okra	1334 ^d	0.46	0.38	177	0.26	0.28	594	0.41	0.41	563 ^d	0.64	0.45
Onion	269 ^a	0.08	0.11	51	0.07	0.09	170	0.11	0.13	48	0.05	0.06
Oranges	310 ^c	0.11	0.08	58 ^d	0.11	0.04	239 ^d	0.18	0.09	13	0.01	0.02
Other veg.	154 ^c	0.06	0.04	1	0.00	0.00	62	0.04	0.05	91	0.10	0.07
Pawpaw	504 ^b	0.15	0.20	96	0.13	0.17	368	0.25	0.26	40	0.05	0.03
Peanut	650 ^d	0.25	0.13	53	0.06	0.11	70	0.05	0.05	527 ^d	0.59	0.46
Pepper	1746	0.58	0.56	355 ^c	0.55	0.50	933	0.64	0.66	458 ^d	0.53	0.29
Pineapple	300	0.10	0.09	95	0.15	0.13	186 ^d	0.15	0.08	19	0.02	0.02
Plantains	1436 ^b	0.45	0.55	263	0.41	0.36	1063	0.74	0.73	110	0.12	0.14
Rice	299 ^d	0.13	0.02	2	0.00	0.01	71 ^d	0.07	0.01	226 ^d	0.27	0.10
Sorghum	528 ^d	0.22	0.04	0	0.00	0.00	3	0.00	0.00	525 ^d	0.61	0.32
Sugar cane	49 ^c	0.02	0.01	26	0.05	0.02	19 ^d	0.02	0.00	4	0.00	0.02
Sweet potatoes	68	0.02	0.02	22	0.04	0.02	21	0.02	0.01	25	0.03	0.01
Tobacco	26	0.01	0.00	0	0.00	0.00	0	0.00	0.00	26	0.03	0.00
Tomatoes	1134	0.38	0.37	289	0.44	0.42	575	0.41	0.37	270	0.30	0.25
Yam	1242 ^d	0.43	0.37	103	0.16	0.14	734 ^d	0.49	0.42	405 ^d	0.46	0.31
<i>n</i>	3027 ^e	2245 ^f	782 ^g	667 ^c	453 ^f	214 ^g	1446 ^e	985 ^f	461 ^g	914 ^e	807 ^f	107 ^g

^a $F_i^f / F^f > F_i^m / F^m$ at the 0.05 significance level.^b $F_i^f / F^f > F_i^m / F^m$ at the 0.01 significance level.^c $F_i^f / F^f < F_i^m / F^m$ at the 0.05 significance level.^d $F_i^f / F^f < F_i^m / F^m$ at the 0.01 significance level.^e Total number of households.^f Number of male-headed households.^g Number of female-headed households.

Table 4. *Gender patterns of cropping, by zone and farmer (plot holder), Ghana, 1991-92*

Crop	Ghana			Coastal zone			Forest zone			Savannah zone		
	Total holders growing	% of M holders growing	% of F holders growing	Total holders growing	% of M holders growing	% of F holders growing	Total holders growing	% of M holders growing	% of F holders growing	Total holders growing	% of M holders growing	% of F holders growing
Avocado	384	0.12	0.11	40 ^c	0.07	0.03	335 ^c	0.23	0.18	9	0.00	0.00
Bananas	441 ^c	0.14	0.11	61	0.10	0.07	339 ^d	0.25	0.16	41	0.04	0.03
Beans/peas	604 ^d	0.23	0.09	68	0.09	0.10	80 ^c	0.06	0.04	456 ^d	0.51	0.25
Cassava	2377 ^b	0.71	0.77	585	0.84	0.82	1341 ^d	0.86	0.81	451 ^a	0.44	0.53
Cocoyam	1342 ^b	0.39	0.46	198	0.30	0.25	1017	0.64	0.64	127 ^a	0.12	0.17
Cocoa	520 ^d	0.18	0.12	52 ^c	0.09	0.05	462 ^d	0.35	0.18	6	0.00	0.01
Coconut	136 ^d	0.05	0.02	85 ^d	0.15	0.07	49 ^d	0.04	0.01	2	0.00	0.00
Coffee	20 ^c	0.01	0.00	1	0.00	0.00	18	0.02	0.00	1	0.00	0.00
Cola nut	29	0.01	0.00	2	0.00	0.00	25	0.02	0.01	2	0.00	0.00
Cotton	16 ^c	0.01	0.00	1	0.00	0.00	0	0.00	0.00	15	0.02	0.00
Egg plant	668	0.19	0.22	178	0.24	0.28	395	0.26	0.23	95	0.09	0.13
Leafy veg.	525 ^d	0.19	0.10	17	0.03	0.02	125	0.08	0.08	383 ^d	0.41	0.30
Maize	2387 ^d	0.75	0.67	517	0.73	0.75	1182 ^d	0.78	0.68	688 ^d	0.74	0.52
Mango	302	0.09	0.09	61	0.10	0.07	212	0.14	0.12	29	0.03	0.02
Oil palm	817 ^d	0.27	0.21	201 ^d	0.33	0.21	568 ^d	0.42	0.26	48	0.05	0.03
Okra	1335 ^d	0.43	0.36	177	0.24	0.27	594	0.38	0.36	564 ^d	0.59	0.48
Onion	269 ^a	0.07	0.10	51	0.07	0.07	170	0.10	0.12	48	0.04	0.07
Oranges	310 ^d	0.11	0.06	58 ^d	0.18	0.07	239 ^d	0.18	0.09	13	0.01	0.01
Other veg.	155 ^d	0.06	0.03	1	0.00	0.00	62	0.04	0.03	92 ^c	0.10	0.05
Pawpaw	505	0.15	0.16	96	0.12	0.15	369	0.25	0.21	40	0.05	0.02
Peanut	652 ^d	0.23	0.12	53	0.06	0.10	71	0.04	0.04	528 ^d	0.56	0.42
Pepper	1747	0.54	0.52	355	0.51	0.50	933	0.59	0.58	459 ^d	0.49	0.37
Pineapple	300 ^d	0.10	0.07	95	0.15	0.11	186 ^d	0.14	0.07	19	0.02	0.01
Plantains	1438 ^b	0.42	0.48	263	0.40	0.33	1064	0.68	0.65	111	0.11	0.13
Rice	299 ^d	0.13	0.02	2	0.00	0.01	71 ^d	0.06	0.01	226 ^d	0.27	0.06
Sorghum	529 ^d	0.22	0.04	0			3	0.00	0.00	526 ^d	0.61	0.21
Sugar cane	49 ^d	0.02	0.01	26 ^c	0.05	0.01	19 ^d	0.02	0.00	4	0.00	0.01
Sweet potatoes	68	0.02	0.02	22	0.03	0.03	21	0.01	0.02	25	0.03	0.02
Tobacco	26 ^d	0.01	0.00	0			0	0.00	0.00	26	0.03	0.01
Tomatoes	1135	0.35	0.34	289	0.39	0.44	575 ^c	0.38	0.33	271	0.28	0.25
Yam	1243 ^d	0.41	0.31	103	0.16	0	734 ^d	0.49	0.42	406 ^d	0.45	0.22
<i>n</i>	3278 ^e	2242 ^f	1036 ^g	704 ^e	433 ^f	271 ^g	1588 ^e	1001 ^f	587 ^g	986 ^e	808 ^f	178 ^c

^a $F_i^f / F^f > F_i^m / F^m$ at the 0.05 significance level.^b $F_i^f / F^f > F_i^m / F^m$ at the 0.01 significance level.^c $F_i^f / F^f < F_i^m / F^m$ at the 0.05 significance level.^d $F_i^f / F^f < F_i^m / F^m$ at the 0.01 significance level.^e Total number of farmers.^f Number of male farmers.^g Number of female farmers.

Table 5. *Gender patterns of cropping, by zone and farmer (keeper of revenue), Ghana, 1991–92*

	Ghana			Coastal zone			Forest zone			Savannah zone		
	Total MF keep revenue	% of M holders keep revenue	% of F holders keep revenue	Total MF keep revenue	% of M holders keep revenue	% of F holders keep revenue	Total MF keep revenue	% of M holders keep revenue	% of F holders keep revenue	Total MF keep revenue	% of M holders keep revenue	% of F holders keep revenue
Avocado	347	0.11	0.10	37 ^a	0.07	0.03	302 ^a	0.21	0.16	8	0.01	0.00
Bananas	396 ^b	0.13	0.10	56	0.09	0.06	302 ^b	0.22	0.14	38	0.04	0.03
Beans/peas	457 ^b	0.18	0.06	56	0.08	0.07	70 ^a	0.05	0.03	331 ^b	0.38	0.15
Cassava	1928 ^a	0.69	0.61	465 ^a	0.69	0.61	1070 ^b	0.72	0.59	393	0.40	0.40
Cocoyam	1141	0.34	0.37	176	0.27	0.22	844 ^a	0.55	0.50	121	0.12	0.15
Cocoa	431 ^b	0.15	0.10	43	0.07	0.04	383 ^b	0.30	0.15	5	0.00	0.01
Coconut	109 ^b	0.04	0.02	65 ^b	0.12	0.05	42 ^b	0.04	0.01	2	0.00	0.00
Coffee	17	0.01	0.00	1	0.00	0.00	15	0.01	0.00	1	0.00	0.00
Cola nut	28 ^a	0.01	0.00	2	0.00	0.00	24	0.02	0.01	2	0.00	0.00
Cotton	6	0.00	0.00	1	0.00	0.00	0	0.00	0.00	5	0.01	0.00
Egg plant	566	0.17	0.17	147	0.21	0.20	329 ^b	0.23	0.17	90	0.09	0.10
Leafy veg.	377 ^b	0.14	0.06	14	0.02	0.01	115	0.07	0.07	248 ^b	0.29	0.10
Maize	1944 ^b	0.63	0.51	415	0.60	0.57	967 ^b	0.66	0.53	562 ^b	0.62	0.37
Mango	274	0.09	0.07	56 ^a	0.09	0.06	189	0.13	0.10	29	0.03	0.01
Oil palm	698 ^b	0.23	0.17	168 ^b	0.29	0.15	484 ^b	0.36	0.22	46	0.05	0.03
Okra	1082 ^b	0.36	0.27	147	0.21	0.21	492	0.33	0.28	443 ^b	0.48	0.29
Onion	228	0.07	0.08	46	0.06	0.07	137	0.09	0.09	45	0.04	0.06
Oranges	278 ^b	0.10	0.06	50 ^b	0.10	0.03	216 ^b	0.17	0.08	12	0.01	0.01
Other veg.	123 ^b	0.05	0.02	1	0.00	0.00	50	0.04	0.02	72	0.08	0.02
Pawpaw	436	0.14	0.13	78	0.11	0.11	320 ^a	0.22	0.17	38	0.04	0.02
Peanut	521 ^b	0.19	0.09	44	0.05	0.08	63	0.04	0.04	414 ^b	0.45	0.30
Pepper	1420 ^b	0.46	0.38	297 ^a	0.45	0.37	749 ^b	0.50	0.43	374 ^b	0.41	0.23
Pineapple	256 ^b	0.09	0.06	79 ^b	0.12	0.06	159	0.06	0.04	18	0.02	0.01
Plantains	1198	0.36	0.37	221 ^a	0.35	0.26	874 ^b	0.58	0.50	103	0.11	0.10
Rice	245 ^b	0.10	0.01	1	0.00	0.00	61 ^b	0.06	0.01	183 ^b	0.22	0.03
Sorghum	382 ^b	0.16	0.02	0	0.00	0.00	3	0.00	0.00	379 ^b	0.45	0.11
Sugar cane	38 ^a	0.01	0.00	24	0.05	0.01	13	0.01	0.00	1	0.00	0.00
Sweet potatoes	51	0.02	0.01	17	0.03	0.01	14	0.01	0.01	20	0.02	0.02
Tobacco	23 ^b	0.01	0.00	0	0.00	0.00	0	0.00	0.00	23	0.03	0.00
Tomatoes	936 ^b	0.30	0.25	239	0.35	0.32	465 ^b	0.33	0.24	232	0.24	0.20
Yam	1048 ^b	0.36	0.24	93	0.15	0	607 ^b	0.42	0.32	348 ^b	0.39	0.18
<i>n</i>	2574 ^c	1841 ^d	733 ^c	555 ^c	352 ^d	203 ^c	1254 ^c	835 ^d	419 ^c	765 ^c	654 ^d	111 ^c

^a $F_i^f / F^f < F_i^m / F^m$ at the 0.05 significance level.^b $F_i^f / F^f > F_i^m / F^m$ at the 0.01 significance level.^c $F_i^f / F^f < F_i^m / F^m$ at the 0.01 significance level.^d Number of male farmers.^e Number of female farmers.

Table 6. Mean characteristics of women farmers, by zone and crop, for crops disproportionately grown by men

Female farmers	Coastal zone			Forest zone									Savannah zone									
	All crops	Oil palm	Coco-nut	All crops	Co-coa	Maize	Yam	Avocado	Oil Palm	Orange	To-mato	Ba-nana	Pine-apple	All	Maize	Rice	Sorghum	Yam	Pep-per	Beans/peas	Leafy veg.	Pea-nuts
Age	46.8 (16.0)^a	47.9 (14.0)	49.4 (15.7)	43.2 (15.9)	52.4** (14.2)	43.3 (15.7)	44.4 (15.8)	45.6 (14.7)	45.0 (15.5)	48.6* (14.4)	44.4 (16.2)	45.6 (17.3)	47.3* (14.9)	43.2 (16.2)	47.6* (16.8)	43.2 (8.0)	47.3** (10.9)	41.9 (11.9)	41.2 (15.3)	45.0 (14.6)	39.8 (15.2)	41.3 (15.5)
Yrs. Ed	1.9 (3.5)	2.2 (3.7)	2.4 (3.9)	3.5 (4.2)	2.2** (3.6)	3.7 (4.2)	3.9 (4.3)	4.2 (4.5)	3.3 (4.2)	3.1 (4.2)	3.3 (4.2)	3.6 (4.2)	3.3 (4.3)	1.7 (3.5)	1.6 (3.5)	0.0** (0.0)	0.3 (1.5)	2.6 (4.0)	1.7 (3.4)	0.9* (2.7)	0.4** (1.9)	1.9 (3.5)
Household size	4.3 (2.3)	4.1 (2.2)	4.3 (1.4)	4.9 (2.6)	4.8 (2.6)	4.8 (2.5)	4.7 (2.6)	4.7 (2.60)	4.7 (2.7)	5.0 (3.1)	4.9 (2.6)	4.8 (2.5)	5.0 (3.3)	5.2 (2.9)	4.5* (2.8)	4.9 (3.0)	4.1** (2.6)	4.9 (2.4)	5.6 (2.6)	4.9 (3.0)	5.2 (3.2)	5.0 (3.0)
Female HH	0.77 (0.42)	0.82 (0.38)	0.84 (0.37)	0.79 (0.41)	0.91** (0.29)	0.84* (0.37)	0.90** (0.30)	0.93** (0.3)	0.93** (0.26)	0.98** (0.14)	0.85* (0.36)	0.91** (0.29)	0.92** (0.26)	0.58 (0.50)	0.70* (0.46)	1.00** (0.00)	0.86** (0.35)	0.85** (0.37)	0.48 (0.50)	0.8** (0.43)	0.5 (0.50)	0.6 (0.49)
Own Land-holdings	0.4 (1.1)	0.3 (1.4)	0.8 (2.2)	2.6 (5.2)	4.6** (7.0)	3.0 (5.9)	3.5 (18.7)	5.8* (12.1)	3.6* (7.2)	5.7** (8.2)	3.4 (6.7)	4.1* (6.5)	3.2 (5.5)	2.6 (4.9)	2.6 (6.1)	5.6** (3.7)	3.6** (2.9)	3.7* (2.7)	4.1 (7.3)	3.14 (2.5)	2.92 (2.61)	3.57 (6.4)
HH Land-holdings	0.8 (2.2)	0.3* (1.4)	0.8 (2.2)	3.6 (6.6)	5.2* (8.6)	3.8 (7.0)	3.9 (6.6)	4.6 (6.4)	4.0 (7.4)	6.2* (8.3)	4.1 (7.5)	4.1 (6.6)	3.4 (8.3)	5.3 (8.5)	4.5 (9.6)	5.6 (3.7)	3.8** (2.9)	5.2* (4.3)	8.2* (11.3)	4.0** (2.8)	4.3** (2.9)	5.6 (8.4)
HH Income '000 cedis	337 (335)	310 (205)	378** (282)	391 (391)	412 (342)	408 (402)	424 (404)	432 (335)	443 (436)	463 (430)	425 (435)	401 (309)	508 (510)	291 (220)	259 (203)	150** (56)	160** (161)	289 (195)	357* (243)	245.0 (203)	263.0 (236)	290.0 (233)
Language																						
Akan	0.52	0.67*	0.37**	0.72	0.73	0.75	0.78*	0.84**	0.80*	0.87**	0.69	0.74	0.88**	0.19	0.21	0.00**	0.03**	0.36**	0.27	0	0**	0
Ewe	0.22	0.07**	0.11	0.07	0.04	0.06	0.03**	0.02**	0.04	0.04	0.06	0.05	0.05	0.21	0.27	0.00**	0.03**	0.10*	0.12*	0.11	0.02**	0.20
Ga	0.14	0.12	0.00**	0.04	0.05	0.05	0.03	0.01*	0.03	0.02	0.05	0.00**	0.02	0.03	0.05	0.00*	0.00**	0.03	0.02	0.00*	0.00*	0.00*
Religion																						
Muslim	0.04	0.07	0.00	0.05	0.04	0.04	0.05	0.03	0.03	0.02*	0.07	0.04	0.02**	0.12	0.12	0.10	0.24**	0.10	0.06	0.15**	0.09	0.08
Christian	0.68	0.81*	0.74**	0.78	0.79	0.80	0.79	0.76	0.79	0.70	0.76	0.76	0.71	0.45	0.57*	0.30	0.08**	0.62*	0.47	0.28*	0.11**	0.47
n	259	57	19	593	107	403	246	105	152	54	193	95	41	181	93	10	37	39	66	46	56	76

*Indicates that it is significantly different from all farmers (first column) at the 0.05 level.

**Indicates that it is significantly different from all farmers (first column) at the 0.01 level.

^aStd. deviation in parentheses.

crops grown disproportionately by men.¹⁰ Table 6 also indicates whether these mean characteristics differ statistically from the mean for all women farmers in the zone.

One interesting crop to analyze is cocoa, which is a cash crop and typically thought of as a man's crop. Cocoa is disproportionately grown by male farmers, regardless of the method of defining the farmer. Eighty-eight percent of cocoa farmers are in the forest zone, where men disproportionately grow cocoa. In the forest zone, most of the 462 farmers growing cocoa (329 of the men, 92 of the women) were both the head of the household and the holder of the land. In addition, the same person kept the revenue, if any, from the sales from the plot.¹¹ Six women grew cocoa on their farms in male-headed households and five men grew cocoa in female-headed households. Only 22–23% of those growing cocoa in the forest zone were women, depending on the method of assigning crops by gender. Looking at the importance of cocoa to women in the forest zone, 22% of female-headed farming households grew cocoa, and 18% of women landholders. Thus, even though cocoa is a cash crop and a crop predominately grown by men, a number of women grow and sell it. The women who grow cocoa on their own plots in the forest zone are older and less educated than the average woman farmer. In addition, they are more likely to live in female-headed households and to have larger than average household and own landholdings.

In the coastal zone, men disproportionately grow only two crops. They are oil palm and coconut. Women growing oil palm are more likely to be Akan or Ewe speaking and Christian than the average women farmers in the coast. They also have smaller household landholdings on average. Women growing coconut are less likely to be Akan or Ga, and are more likely to be Christian and have higher household income than the average women farmers in the coast.

In the forest zone, men disproportionately grow many more crops. Yet there is little difference between all women farmers and women farmers who grow the two staple crops that are disproportionately grown by men, maize and yams. The only important difference is that women growing these crops in the forest zone are more likely to be in female-headed households. For all of the crops disproportionately grown by men, the women growing them on their own plots are more likely to live in female-

headed households. Akan women are more likely to grow many of these crops that are disproportionately grown by men in the forest zone and Ewe women are less likely to grow these crops. For all of the crops except pineapple, household landholdings were larger than average and the women farmers' own landholdings were larger than average. (The differences are statistically significantly for many, but not all of the crops.)

Finally, we can look at the women growing crops disproportionately grown by men in the savannah zone. For all of the staples, maize, rice, sorghum, and yams, the women growing these crops are more likely to be in female-headed households than the average women farmer in the savannah zone. For rice, sorghum, and yams, the farmers own landholdings are also larger than average. All of the 10 sampled women growing rice on their plots were the household heads. These women had plots larger than the average women farmers in the zone, but both they and the women growing sorghum were considerably poorer than average.

Overall, we see that the women growing staple crops on their land are more likely to be in female-headed households than the average women holding land. This corresponds to the pattern that within households with a male head and a female who holds land, the woman may be more likely to concentrate on non-staple crops, especially vegetables, leaving the staple crop production to her husband. However, a substantial number of women are growing staple crops, and thus, any policies that affect staple crop production and prices will have an effect on women. It is not the case that women growing staple crops are poorer than the average women landholders, except for those growing rice and sorghum in the savannah zone. This holds even though women growing staples are more likely to be in female-headed households.

6. CONCLUSION

The data presented in this paper suggests that we cannot divide crops in Ghana into those grown by men and those grown by women. The simple distinctions simply do not hold up well enough to use them to integrate gender concerns into agricultural policy simply by treating some crops as men's crops and others as women's crops. Nor can they be used to make inferences about men's and women's

agricultural production or incomes. Although men are more heavily involved in cash crop production, women are involved in the production and sales of *all* of the major crops in Ghana.

However, the data also indicate that there are gender based cropping patterns in Ghana which means that agricultural policy is not gender neutral. Many crops are disproportionately grown by men or women, depending on the ecological zone and the method of defining the farmer. Female-headed households are more likely to be directly affected by policies towards staple crops than are women farming their own land in male-headed households.

In examining the crops that are important to men and women, we find that they are basically the same crops. There are differences by gender, but these differences are overshadowed by the differences across crops.

Unfortunately, the data available through the GLSS3 do not allow us to examine all of the nuances of gender patterns of cropping in Ghana. A number of women are involved in farming but are not counted among the women farmers in this survey, either because they farm for household consumption on plots held by men or because individual plots may contain crops for which different individuals claim ownership rights. Thus, to the extent that women are not reported as heads of household, as holders of land, or as decision makers on the farm, their contribution may be underrepresented in this analysis.

The women farmers in any zone, regardless of definition, are not representative of women in general in the zone. Targeting women farmers, thus targets only a subset of women. In addition, by analyzing only whether a farmer is growing a particular crop and not the extent to which he or she is growing it, we ignore the relative importance of the different crops to individual farmers.

The data also does not allow us to examine the dynamic processes of the gender patterns. We expect that patterns of cropping change over time. There is some evidence that this is occurring in other places as the economic opportunities change.¹² The data is consistent with the idea that as crops become more profitable, men tend to move into their production. However, we cannot explicitly test this hypothesis. We do see that a number of crops are more likely to be grown on plots where men keep the revenue, even if they are not more likely to be grown on plots held by men generally. Many crops are grown both for home consumption and for market sales and the data suggest that they are more likely to be grown on men's plots when they are destined for the market. There is no easy way to categorize women who grow crops for the market, other than they are likely to be the head of household. Further exploration of the issue of which women grow crops for the market would make it possible to target policies that increase the possibilities for women to grow more crops for the market.

NOTES

1. For example, Gladwin (1992) claims that in Malawi hybrid maize is an export crop grown by men and local varieties of maize are subsistence crops grown by women. Stamp (1976) claims that men grow cash crops and women grow subsistence crops in Kenya.

2. Examples of discussions of men's and women's crops can be found in Burfisher and Horenstein (1993) and Ezumah and Domenico (1995). Spurling, Mekonen and Saito (1994) discuss how patterns of cropping by gender are changing. von Braun and Webb (1989) note that rice was traditionally a woman's crop in the Gambia.

3. For example, Hoddinott and Haddad (1995) used anthropological definitions of men's and women's crops

in Cote d'Ivoire to assign agricultural income to men and women to analyze how men's and women's incomes differently affect household expenditure patterns. Duflo and Udry (2001) also use gender patterns of cropping to separate men's and women's incomes.

4. Holding the land may involve formal title to the land or it may involve the rights to farm it.

5. Data on labor use by crop is not available, although this would be another useful way to define the farmer.

6. This means that any crop that was planted, but not harvested, is not considered a crop grown by the farmer.

7. Sorghum, millet, and guinea corn are aggregated into one crop category in the GLSS3 data.
8. The boundary between the forest and savannah zones is not clearly defined. Often this area is defined as the transition zone. Thus, some people and some crops that are not part of the true savannah zone in Ghana are defined as being in the savannah zone in this data set because they are in this wide transition area.
9. 75% of male-headed households grow cassava.
10. Where at least 10% of the farmers in the zone report growing the crop.
11. In the coastal and savannah zones, this was true for all farmers growing cocoa.
12. For example, Spurling *et al.* note that women in Malawi are increasingly growing the traditionally men's crops of tobacco and hybrid maize and women in Uganda are moving into coffee growing.

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