

Review

Labor input of women tobacco farmers in Tabora, Tanzania

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This study attempts to quantify the amount of labor women tobacco farmers spend in tobacco, maize and a third crop. Women labor input is measured in man-days and are compared with those of adult males and children's labor input. A sample of 408 women tobacco farmers from the Tabora region of Tanzania were selected and interviewed. The result shows that 251 man-days per year is spent on farming activities; 42 percent of this is undertaken by women farmers. 78% of time devoted to farming is earmarked for tobacco farming. Out of the 198 days devoted to tobacco farming, 43% is undertaken by women. The contribution to labor input by children is only 5%. When classified by type of agricultural activities men spend more time in land clearing and planting, while women spend more time in weeding and harvesting. When classified by age, older women spend more time than younger women. Using a multiple linear regression, the determinants of the magnitude of women labor input were identified. The results indicate that women who spend more time in tobacco farming as being poor. They are relatively old, they get less or no remittance, they reside far from major towns, they do not have much wealth and have little access to alternative employment. The amount of time women spend in tobacco farming appears to be very high, and this is likely to lead to tobacco related health hazards.

Keywords: Women, labor input, tobacco farming, Tanzania.

INTRODUCTION

In this study an attempt is made to measure the share of women's labor input in the cultivation of tobacco leaves. The study area is the Tabora region of Tanzania--a major tobacco growing area. For comparison purposes the labor input (time share) of women in maize farming (the main staple diet of Tanzania) and a third crop is also considered and quantified. A comparison is made between

the labor input of women, men and children. Labor input is also estimated at various stages of agricultural production (from land clearing to selling the final product). We hypothesize that more labor input for tobacco is not only unproductive but could have a detrimental effect on the health and well-being of women farmers.

This study has four parts; part 1 reviews women's contribution in peasant or small scale agriculture with due emphasis on tobacco farming; part 2 highlights the objectives of the study, data source and method of analysis; part 3 presents the empirical findings along with

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the discussion, while part 4 is the conclusion and policy implication.

Review of Literature: Agricultural Activities in Third World Countries

In Sub-Sahara Africa, agriculture is believed to be the engine of economic growth and a means for poverty reduction. Within household or peasant agriculture, the contribution of women in the various stages of agricultural production is substantial (Adeyonu, 2012). A recent study reveals that about 40 percent of labor force in agriculture are women (Appleton, 1996). For Latin America and Sub-Saharan Africa, the contribution of women to labor force is 20 and 50 percent respectively. Within Sub-Saharan Africa the contribution of female labor forces ranges from low 30 percent in Gambia to 60-80 percent in Cameroon (Doss *et al.*, 2011).

Women contribution of labor input may also vary by crop type, by production cycle, by age and other variables. Within a production cycle more women are involved in weeding and harvesting with less time allotted to ploughing. Besides farming, women in Sub-Saharan Africa are also involved in tending cattle, fetching water and firewood. When one compares the role of women by various types of agricultural activities, their contribution ranges from as high as 80 percent in poultry farming to as low as 12 percent in fisheries (Blackden *et al.*, 2006; Chames, 2005).

The preceding activities by women farmers are above and beyond regular household activities such as raising children, preparing food and the like. These activities are not quantified and not included in the estimation of national accounts (SNA) of nations. If all activities are included and quantified as part of labor force participation rate, women's share could be as high as 60 percent of the agricultural labor force (Fontana, 2008). Despite the high labor force participation rate, between 60-70 percent of the world poor are women (Sidney, 2013). The high poverty profiles of women tobacco farmers has been verified and quantified (WHO 2004, 2010b and 2012b). Market penetration rate of women in Sub-Sahara Africa ranges from 55% in South Africa, to 10% for Kenya. For Tanzania the market penetration rate is only 5%. It should be noted that more earning could be generated when women penetrate the market.

OBJECTIVES, DATA SOURCES AND METHODS

Objectives

The main objective of this study is to quantify the amount of labor that Tanzanian women spend in tobacco farming.

This will be compared with that of men and children. In addition the amount of time women spend in maize farming (the major staple diet of Tanzanian farmers) and in a third important crop (as identified by women farmers) will be quantified and compared. We hypothesize that women who spend more time in tobacco farming are likely to earn less income as tobacco farming is time intensive but less productive when compared to maize (Kidane *et al.*, 2015). Women tobacco farmers are also more likely to suffer from tobacco related illnesses.

Data Sources and Method of Analysis

The data for this study is based on a 2015 survey conducted among tobacco (plus other crops) farmers in Tabora- a major tobacco growing region of Tanzania. A structured questionnaire that included some open ended questions was designed, pilot tested, revised and administered. The method of sampling is stratified random sampling which aims at including as many subregions as possible. The sample size is 408 farmers and the unit of observation is a household. All respondents are female spouses of male headed households as well as female headed households.

The questionnaire included basic information on demographic and socioeconomic characteristics, acreage owned, rented, planted and harvested. Labor input of women, men and children in tobacco, maize and other crop farming were also collected. The labor input is measured at different stages of tobacco, maize and other crop production. The stages included land clearing and planting, fertilizing and chemical spray, weeding and harvesting, tobacco curing, storing and marketing. Other questions included health status of household members, wealth ownership, debt incurred as well as questions pertaining to decision making process within a household.

The method of analysis include simple and cross classified descriptive statistics followed by a multiple linear regression approach on the determinants of women's labor input.

EMPIRICAL FINDINGS

Some Descriptive Statistics

Before quantifying women's labor input, an attempt is made to present a descriptive statistics on background information of the respondents. This is given in Table 1.

The result in Table 1 shows that the mean age of husbands as being 6 years more than that of spouses, that the mean number of years in tobacco farming is 5.7 years with low variability. The level of education of

Table 1. Some Descriptive Statistics of Women Tobacco Farmers - Tabora Region, Tanzania.

Variable	Mean (Percent)	Standard Deviation
Age of male household head	43.4	13.6
Age of respondent	35.0	11.3
Years in tobacco production	5.7	2.8
Education: female spouse*	70.0	
Household size	6.1	2.4
Area cultivated in hectares	2.2	1.3
Distance to nearest town in Km	11.0	6.0
Distance to nearest road in Km	1.7	2.4
Distance to nearest health facility in Km	2.4	2.1
Remittance**	30.9	
Wealth (Number of timber trees)	50.8	145.0
Percent in debt	10.0	

Survey results

*Percent who read and write, **% who get remittance

Table 2. Household Time Share* in Tobacco, Maize and other Farming - Tabora Region-Tanzania.

Crop Type	Men	Women	Children	Total
Tobacco	105.5	83.8	3.6	198.7
Maize	20.0	23.8	1.4	45.2
Other	5.2	7.5	0.6	13.3
Total	136.2	114.3	5.8	251.9

Survey results

*In days-eight hours per day

spouse is very low while the mean household size is 6.1 which is above the national average (the latter is 5.4). The mean area cultivated is 2.2 acres which is larger than the national average of 2.0, mean access to health facilities as measured in distance from home is 2.4 km. Furthermore, 52% of the respondents receive remittances from children, relatives and other sources. In this study the measure of wealth is the number of timber trees owned; the mean value of the latter is 50.8 with wide variability. Only 10% of respondents are in debt. The latter may imply that tobacco farmers are better off. It may also imply that women cannot borrow money because they have no collateral to show.

Labor Input among Household Members

Respondents were asked how many days they, their husbands, and children spend at each stage of farming activity. They were also asked how many hours per day they spend in the field. Total hours spent is the number of days multiplied by number of hours per day. The total number of hours was converted into man-days by dividing the latter by eight hours, that is, a man-day is a typical day with eight hours of work per day.

Table 2 shows the allocation of time share in farming in the study area.

The following observations are in order:

251.9 out of 365 days are spent in farming. The contribution of men, women and children is 54%, 45% and 1% respectively.

Tobacco takes 79 % of the total time allocated to farming indicating that tobacco growing is more labor intensive when compared to maize and other annual crops.

Out of the total man-days earmarked for tobacco farming, 42.% is spent by women. This is a relatively high value when one considers the role of women in household activities such as cooking, searching for wood, raising children and related inhouse activities.

It appears that the contribution of children is relatively low.

Labor Input within Tobacco Farming

Table 3 shows labor input within tobacco farming as classified by different stages of activities. The sequence of activities include land clearing and planting, fertilizing and chemical spray, weeding and harvesting, curing, storing and selling the final product in the market.

The following observations are in order:

- More amount of time (53%) is devoted to land clearing and planting.

Table 3. Household Time Share* in Tobacco Farming, by Type of Activity -Tabora Region.

Type of Activity	Men	Women	Children	Total
Clearing and Planting	52.4	49.4	1.7	103.5
Fertilizing	2.1	2.2	0.2	4.5
Weeding and Harvesting	16.0	17.3	1.2	34.5
Curing**	36.2	11.0	0.6	47.8
Storing	4.2	4.1	0.2	8.8
Selling	0.9	0.2	0.0003	1.1
Total	111.8	84.2	3.9	198.7

Survey results

*In days-eight hours per day **includes searching for firewood

Table 4. Women's Labor Input* in Tobacco by Age and Acreage - Tabora Region.

Acreage	Man-days	Age	Man-days
<2	76.2	<20	67.2
2-	86.1	20-	70.3
4-	77.3	30-	83.1
6-	81.4	40-	77.1
8-	85.8	50-	84.2
		60-	91.9
Mean acreage	4.7	Mean age	35.0
SD screase	2.4	SD age	11.3

Survey results

- 47% of man-days devoted to planting tobacco is undertaken by women.
- 49% of man-days spent in fertilizing and chemical spray is undertaken by women.
- The most arduous task in tobacco farming is weeding and harvesting. In this activity women's contribution constitutes 50% of the total.
- 23% of the time devoted to curing is done by women. Curing includes searching firewood for the same.
- Storing and selling take relatively very little time.

The table also shows that 82% of man-days devoted to selling is done by men. Women's share in selling constitutes only 18% of the time. Children's share is negligible. The individual who sells the product receives the revenue from the buyer. Most likely he has control over the distribution of the money into various activities. It appears that women have less control over the revenues generated from tobacco and other crops.

Women's Labor Input in Tobacco Farming by Age and Acreage

An attempt is made to see whether women's time in tobacco varies by their age and by the size of land the family possesses. The results are given in Table 4. The results indicate a direct relationship between a woman's

age and time spent in tobacco farming-elderly women tend to spend more time when compared to those aged 20 years or less. This may have a negative effect on women's health and wellbeing of older women. There appears to be positive relation between planted acreage and women's labor input. This is to be expected as families who farm large areas may require more labor input.

Women's Labor Input in Tobacco Farming and Ratio of Acreage Devoted to Tobacco

Table 5 shows the association between women's labor input in tobacco farming and the proportion of land earmarked for tobacco farming. We hypothesize that the higher acreage devoted to tobacco the higher the labor input of women tobacco farmers.

The above result suggests that there is very little association between the ratio of land devoted to tobacco plantation and women's labor input. A simple correlation coefficient between these two variables is estimated to be a low 0.021.

Determinants of Women's Labor Input in Tobacco Farming

This section considers the socioeconomic variables that affect the amount of time women spend on tobacco

Table 5. Association between Women Labor Input and Ratio of Total Acreage Devoted to Tobacco.

		Women labor input				Total
		Low	Medium	High	Very high	
Ratio of land devoted to tobacco	Low	4(16.7)	8(33.3)	10(41.7)	2(8.3)	24(100.0)
	Medium	41(18.7)	94(36.0)	86(33.0)	40(16.0)	261(100.0)
	High	22(22.0)	28(28.0)	30(30.0)	20(20.0)	100(100.0)
	Very high	3(17.7)	7(41.2)	5(29.4)	2(11.8)	17(100.00)
	Total	70(17.4)	137(34.1)	131(32.6)	64(15.9)	402(100.0)

$$\chi^2(9) = 6.31, \text{Prob} > \chi^2 = 0.709$$

Survey results

Table 6. Determinants of Womens Time Share a priori Expectation and Explanation.

Variables	A priori sign	Explanation
Age*	+	As age increases, women's time input increase
Education	-	Educated women may opt for non farm employment
Mandays spent by men	+, -	Positive if complementary, negative if substitute
Distance from farm to the nearest road	-	If women have easy access to transport they may opt to seek employment elsewhere
Employing non family labor	-	Women may reduce time input by hiring non family labor
Remittance	-	Non farm earning may reduce women's time input
Number of timber trees owned (proxy for wealth)	-	Wealthy households may opt for less involvement in tobacco farming
Household size	-	Large household size suggests more labor and less time spent by women
Area cultivated	+	Larger cultivated area requires more time input

*the relation may also be non linear

farming. Table 6 lists the explanatory variables, a priori expectation of the direction of relation along with explanation:

A multiple linear regression was estimated and the results are given in Table 7. The dependent variable is the number of man-days that women devote to tobacco farming (NMWTF).

The results in Table 7 lead us to make the following conclusions:

As the age of women increases their labor input in tobacco farming increases at an exponential or faster rate. One may conclude that older women are likely to be less productive or energetic and may be forced to work more. Besides, children of older women may have left the household due to marriage or other reasons, leaving older women to take care by themselves.

The effect of men's labor input on females labor input appears to be positive and significant, suggesting males labor input as complementary and not a substitute.

Distance from home to the nearest road seems to be positively related to women's labor input in tobacco farming. This may imply that women who reside far from

the nearest road tend to spend more time in tobacco farming. Access (as measured by distance) to alternate employment elsewhere may be low.

Alternate source of income such as remittance and transfer income from children appear to negatively effect women's labor input.

Number of timber trees owned is taken as a proxy for wealth. The results show a negative relation between women labor input and wealth. In other words, households with more wealth may opt for less time in tobacco farming.

The effect of education on women labor input, though negative is not significant. The level of education among those classified as educated does not show much variability.

The effect of household size as well as the effect of total area cultivated on women's labor input are not significant. The signs are also counterintuitive.

The beta coefficient would enable us to compare the importance of the explanatory variables on labor input of wn. Among the significant explanatory variables remittance and male time input appear to be the two most important explanatory variables.

Table 7. Multiple Linear Regression Estimate on the Determinants of Women's Time in Tobacco Farming: Tabora Region.

Explanatory variables	Coefficient	Standard error	T	Beta coefficient
Womans' age	0.0051**	0.0023	2.13	0.165
Education: 0=no ed, 1=some education	5.3512	4.6961	1.14	0.061
NMMTTF*	0.1311**	0.0450	2.91	0.152
Household size	1.3779	0.8501	1.62	0.085
Dist to nearest road in KM	1.9320**	0.8402	2.50	0.120
non hh labor::; 0=no, 1=yes	-11.7941**	4.2457	-2.78	-0.146
Remit: 0=no, 1=yes	-12.8864**	4.4481	-2.90	-0.151
Timber	-0.0392**	0.0142	-2.76	-0.146
Areacultivated(acres)	-0.2434	0.9631	-0.26	-0.015
Contant	48.9113**	8.8635	5.52	
Adj. R ²	0.09113			
F(8, 236)	5.34			
Prob>F	0.0000			
Sample size	235			
B-P Chi squared	0.225			
Mean VIF	1.06			

Survey results.

*Number of man-days :of men's time in tobacco farming ** Significant at 5%level of significance.

From the above findings one may conclude that women who spend more time in tobacco farming are poor. They are relatively old, they get less or no remittance, they reside far from major towns, they do not have much wealth and have little access to alternative employment.

CONCLUSION

Several studies have shown the negative impact of tobacco farming on the health and wellbeing of the farmers in general, and women farmers in particular. The results presented above clearly show that women spend 83.8 man-days per year in tobacco farms. On the other hand, the same women spend 23.8. man-days in maize farming. They also spend 7.5 man-days in cultivating another crop. This is nothing but a glaring misallocation of resources. The more time they spend on tobacco farming, the more they are likely to be exposed to diseases related to tobacco farming. Tobacco cultivation requires more fertilizer input as well as chemical spray. Such activity is likely to reduce soil fertility and the land may not be able to produce other crops efficiently.

Other negative effects of tobacco farming include handling wet and uncured tobacco leaves, and diseases that emanate from tobacco curing. It is also noted that women time input in tobacco production is above and beyond other activities such as fetching firewood and drinking water as well as household activities such as breastfeeding, raising children, food preparation (where the source of energy is firewood with the consequence of smoke inhalation).

Tobacco farmers in Tanzania are on a virtual cycle of indebtedness to tobacco companies. There are only two buyers of tobacco leaves in Tanzania – farmers cooperatives and cigarette manufacturers. This renders tobacco growers as price takers. The selling price of tobacco is also dependent on how the leaves are graded by the monopolistic tobacco buyers. In other words, the welfare of tobacco farmers is not protected .

The study showed that the selling of tobacco leaves is mostly done by male household heads and not their spouses. In other words, husbands receive the earnings; they also have control over how the earnings are dispersed. It is not unusual to observe that husbands spend the hard earned money on local and imported brews and other wasteful and undesirable activities. Women who spend 44% of man-days in tobacco farming, appear to have little say on how the proceeds are dispersed.

Tobacco growing is not the most profitable undertaking. When one makes a comparative analysis between the cost and revenue of tobacco, and compares it with alternate crops, the net benefit from non tobacco annual crop is likely to be higher (Sidney, 2013).

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