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The Impact of Contract Farming on Smallholder Tobacco Farmers' Household Incomes: A Case Study of Makoni District, Manicaland Province, Zimbabwe

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Abstract: This purpose of this paper was to assess the impact of contract farming on household income. The study used primary data collected using a structured questionnaire from a random sample of 98 smallholder tobacco farmers in Makoni district of Zimbabwe. The study found that despite contract farmers selling on average 1.6 times the number of bales sold by non-contract farmers, they only realised an average income that was 1.4 times higher than that realised by non-contract farmers. The study also found that tobacco farming is the major source of livelihood for farmers in Makoni district contributing on average 73% of the households' annual income. Using a Tobit regression model, the study found that being a contract farmer does not have a significant effect on the share of tobacco income to total household income. The factors that significantly and positively influence the share of tobacco income to total household income are gender of the farmer, access to extension on tobacco production and marketing, being a full-time farmer, total cropping area, farmer having attained at least secondary education and individual land tenure. The study recommends that government and tobacco contracting merchants must further strengthen extension support to tobacco growing farmers especially women farmers to increase household incomes and sustain rural livelihoods. Further, there is need to review and upgrade the current master farmer training programme curriculum to include specialised tobacco good farming practices for farmers located in tobacco producing regions.
Keywords: Household income, Smallholder tobacco farmers, Contract farming, Zimbabwe, Tobit analysis

INTRODUCTION

Contract farming continues to gain widespread acceptance by a majority of smallholder farmers in Zimbabwe although there are still a number of challenges that lead to side marketing of produce by farmers. In the tobacco sector, contract farming is now the major form of production and in 2015, 77% of total annual tobacco production was produced under contract [1]. Sixty percent of the 75392 active growers in 2015 sold their tobacco through contract [1]. Although contract farming has been practised for a long time for crops like tea, sugarcane and cotton, tobacco contract farming was introduced in Zimbabwe in 2004 to boost output which had tumbled in the wake of the fast-track land reform exercise that decimated agriculture production at the turn of the millennium [2]. Prior to the introduction of contract farming in the tobacco sector, tobacco selling was done through auctions where tobacco farmers would take their crop to an auction floor of their choice for its marketing. Under the auction system, the tobacco grower is solely responsible for securing all the production inputs and for delivery of the tobacco to an auction where the highest bidder secures the produce. Thus, the production and marketing risk lies with the producer. Under contract farming, tobacco buyers provide the inputs required for the production and guarantee to buy all the tobacco contracted at prices equal to or higher than those prevailing on the auction floors.

Smallholder farmers stand to enjoy a number of benefits associated with contract based farming. Chief among them are guaranteed and more stable prices, access to reliable markets, access to new markets, access to more affordable credits and inputs, access to new technologies, extension, training and information and reduction of production and marketing risks [3-8]. Prowse in 2012 [5]also notes that contract farming assists farmers to meet sanitary and phytosanitary standards demanded by export markets, increase on-farm diversification, encourage knowledge and skills transfer to nearby farmers and can also act as a form of collateral for credit. Buyers also stand to benefit by going into contract arrangements with farmers. Some of these benefits that may accrue to buyers include assured raw materials supply, improved and better quality standards through control of production processes, economies of scale in input and produce procurement and reduced transaction costs. Contract farming is also seen as a tool for improving smallholder household incomes. In theory, contract farming improves agricultural production and marketing

that may in turn result in an increase in farmers' income. Studies by Sokchea and Culas in 2015 [9], Miyata *et al*.; in 2009 [10], Birthal *et al.;* in 2008 [11], and Warning and Key in 2002 [12] have shown that contract farming significantly raises farmers' incomes.

Despite the growth of contract farming in Zimbabwe, few empirical studies have been conducted to assess the benefits that smallholder farmers enjoy. Research in this field has focused on efficiency issues in general [13] and very little on the specific effect of contract farming on tobacco communal farmers' income. The purpose of this study is therefore to assess the impact of contract farming on smallholder tobacco farmers' income.

METHODOLOGY

Study Area and Sample

This study was conducted in Makoni district, Manicaland region where tobacco is the main cash crop with more than 75% of all farmers being regular tobacco growers. A total of 6.726 households are engaged in tobacco production and the total area under tobacco production is 3.200ha. Other main economic activities of the residents in the area are livestock husbandry, maize, groundnuts and horticulture farming. Data was collected from a randomly selected sample of 98 farmers using a structured questionnaire between February and March 2016.

Analytical Framework

The study used the Tobit regression analysis to assess the impact of contract farming on share of tobacco income to total household income. The Tobit regression model was chosen because it allows for the estimation of linear relationships between variables when there is either left- or right-censoring in the dependent variable (also known as censoring from below and above, respectively). The variables used in the Tobit model, their explanation and the a priori expectations are provided in Table 1.

The share of tobacco income was defined as follows:

$$HCI_i = \frac{\text{Tobacco income of the } ith \text{ household in year } j}{\text{Total income of the } ith \text{ household in year } j} \times 100$$

Table 1: Definition of Tobit regression variables

Variable	Description	Hypothesis
Dependent		
Share_Tobacco_In	Share of tobacco income to total household income	
Independent		
GENDER	= 1 if farmer is male, 0 otherwise	+
FARMERTYPE	= 1 if Non-contract farmer, 0= Contract farmer	+
Tobacco_EXP	Farmer's tobacco farming experience in years	+
OTHERLOAN	= 1 if farmer has access to other loans other than contract farming credit, 0 otherwise	-
EXTENSION	= 1 if farmer has access to extension on tobacco production and marketing, 0 otherwise	+
OCCUPATION	= 1 if primary occupation of farmer is full-time farming, 0 otherwise	+
Master_Farmer	= 1 if farmer is master farmer trained, 0 otherwise	+
CROPAREA	Total tobacco cropping area in hectares	+
FEDUC	= 1 if farmer education is at least secondary level, 0 otherwise	+
TENURE	= 1 if farmer has individual land title, 0 otherwise	+

RESULTS AND DISCUSSION

Socioeconomic Characteristics of the Sample Households

Seventy-nine percent of the sample farmers were male (Table 2). The average tobacco farming experience was 8.36 years and 83% of the farmers were into full-time farming. Seventy-eight percent of the sample farmers were not growing tobacco on contract. Only 7% of the sample farmers had access to other sources of loans apart from the credit provided under contract farming.

Table 2: Socio-economic characteristics

Variable	Mean	Std. Deviation
GENDER	0.79	0.412
FARMERTYPE	0.78	0.419
Tobacco_EXP	8.36	5.211
OTHERLOAN	0.07	0.259
EXTENSION	0.94	0.241
Farmer_Occupation	0.83	0.407
Master_Farmer	0.20	0.405
CROPAREA	4.05	2.939
FEDUC	0.70	0.459
TENURE	0.42	0.496

Nine-four percent of the farmers had access to extension on tobacco production and marketing. Only 20% of the farmers had received master farmer training and 70% had at least attained secondary education. The average cropping area for tobacco was 4.05 hectares and 42% of the farmers had individual title to their farming land.

Tobacco Sales and Income

On average contract farmers sold 26 bales during the 2015/2016 season while non-contract tobacco farmers 16 bales (Table 3). The mean number of bales sold for all the sampled farmers was 19 bales.

Table 3: Mean annual tobacco bales sold

Farmer Category	**Mean bales sold**
Contract farmer	26.32
Non-contract farmer	16.36
Total	18.65

In terms of distribution, only 2.7% of the non-contract farmers sold above 30 bales compared to 27.3% for contract farmers (Fig-1). The proportion of non-contract farmers who sold 10 bales and less is five times that of contract farmers.

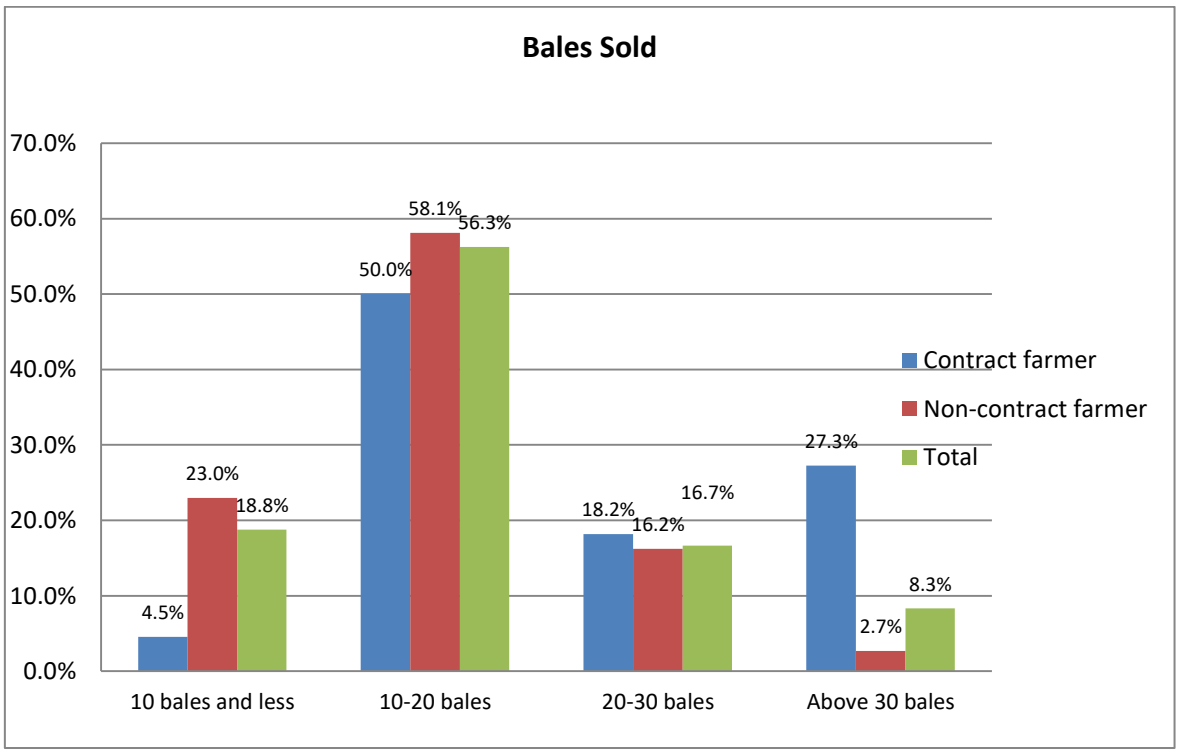

Fig 1: Bases Sold

The mean income realised from tobacco farming during the 2015/2016 season was $11,413 for contract farmers and $8,000 for non-contract farmers (Table 4). These results show that despite contract

farmers selling on average 1.6 times the number of bales sold by non-contract farmers, they only realised an average income that was 1.4 times higher than that realised by non-contract farmers. One possible explanation for this may be that non-contract farmers are realising higher prices for their produce on the auction floors compared to those offered by contract buyers.

Table 4: Mean annual income from tobacco farming

Farmer Category	Mean Tobacco Income (US$)
Contracting farmer	11,413.64
Independent farmer	8,000.54
Average	8,782.71

Figure 2 shows that only 22% of the non-contract earned incomes above $10,000 from tobacco compared to 41% for contract farmers. On the other hand only 14% of the contract farmers earned incomes of $5,000 and less compared to 32% for non-contract farmers.

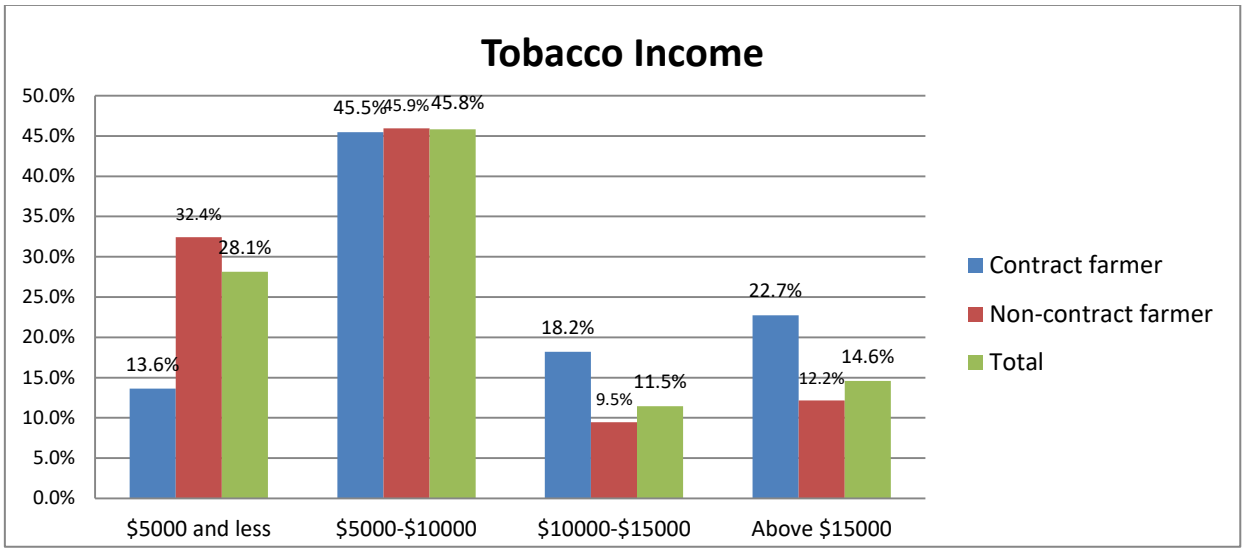

Fig 2: Annual income from tobacco farming

On average tobacco income contributes more than 76% to the total household income for contract farmers compared to the share contribution of 72% for the non-contract farmers (Table 5). The mean share contribution of tobacco income to total household income for the whole sample reveals that almost three quarters of the income earned by the households comes from tobacco farming.

Table 5: Mean share of tobacco income to total household income

Farmer Category	Mean Share of Tobacco Income
Contracting farmer	0.76
Non-contracting farmer	0.72
Average	0.73

The results show that the income of from tobacco sales is the main source of livelihood for the farmers in Makoni District. Tobacco income contributes more than 60% of total household income for 86% of contract farmers compared 75% for non-contract farmers (Figure 3).

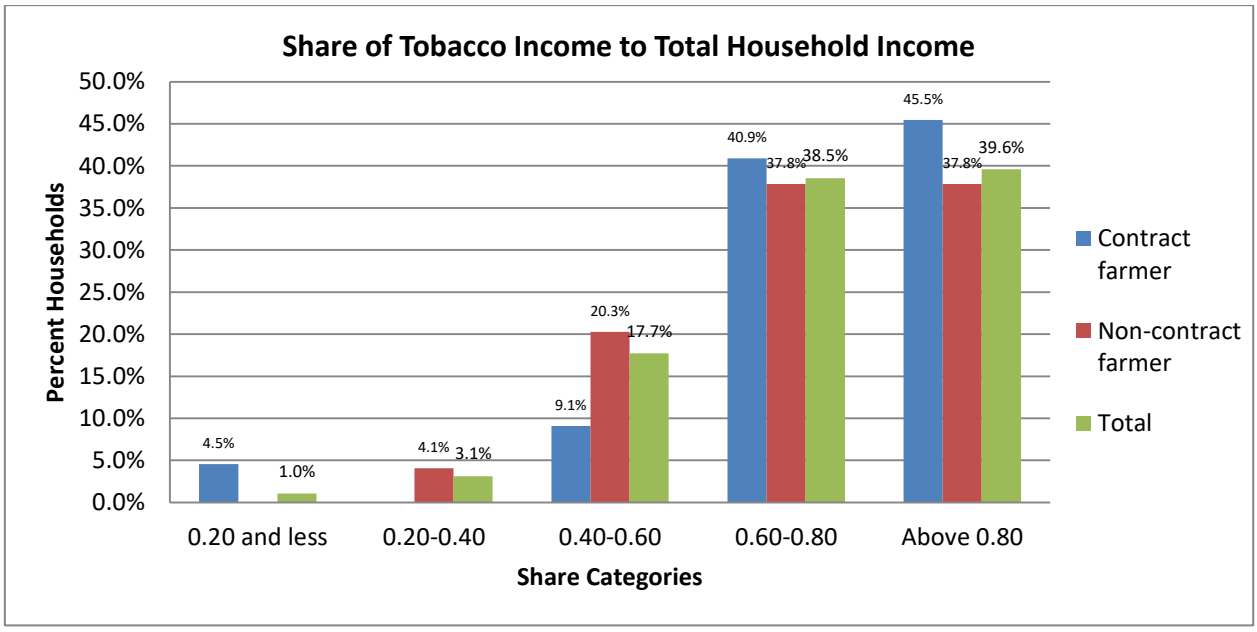

Fig 3: Share of tobacco income

Impact of Contract Farming on Household Income

Table 6 below presents the results of the Tobit regression model which was used to assess the impact of contract farming on household income in Makoni district. The F-value of 167.46 is significant at 1% level indicating that the overall model is significant and the explanatory variables used in the model are collectively able to explain the variations in tobacco income share to total household income.

The results show that being a contract farmer (FARMERTYPE) does not significantly influence the share of tobacco income to total household income. Mwambi *et al.;* in 2016 [14] in a study on smallholder avocado farmers in Kandara district in Kenya also found that contract farming had no significant effect on total household income although it had a positive and significant effect on avocado income. Other factors that do not significantly influence the share of tobacco income to total household income are, tobacco farming experience (Tobacco_EXP), having access to other loan sources apart from the credit provided under the contract (OTHERLOAN) and having received master farmer training (Master_Farmer) (Table 6).

Table 6: Tobit regression estimates of factors influencing share of household income

Variable	Coeff.	Std error	T	P> |t|
GENDER	0.116	0.045	2.56	0.012
FARMERTYPE	0.087	0.064	1.36	0.178
Tobacco_EXP	-0.006	0.004	-1.49	0.140
OTHERLOAN	0.083	0.065	1.28	0.203
EXTENSION	0.247	0.094	2.63	0.010
OCCUPATION	0.160	0.059	2.71	0.008
Master_Farmer	0.082	0.055	1.50	0.136
CROPAREA	0.018	0.005	3.65	0.000
FEDUC	0.139	0.046	3.03	0.003
TENURE	0.108	0.043	2.54	0.013
Sigma	0.199	0.014	13.97	0.000
Number of obs	94			
Population size	94			
Design df	93			
F(10, 84)	167.46			
Prob > F	0.0000			

One possible explanation as to why being a master farmer does not significantly influence share of tobacco income to total household income is that the master farmer training course does not cover agronomic aspects of tobacco farming as it is geared more towards grain crops and horticultural crops. Variables that

significantly influence the share of tobacco income to total household income are gender of the farmer (GENDER), access to extension on tobacco production and marketing (EXTENSION), being a full-time farmer (OCCUPATION), total tobacco cropping area (CROPAREA), farmer having attained at least secondary education (FEDUC) and individual land tenure (TENURE).

Male farmers are 0.12% more likely to have higher tobacco income shares total household income and the result is significant at 5% level. Tobacco in Zimbabwe is produced primarily for the market and is the most popular commercial crop for smallholder farmers located in tobacco producing zones. This result is consistent with the findings of Kirui and Njiraini in 2013 [15] who found that female farmers are less likely to be commercialised as they are constrained from market participation and collective action initiatives.

Farmer who receive extension support on tobacco production and marketing are 0.25% more likely to have a higher tobacco income shares to total household income when compared to farmers who do not have access and this result is significant at 5% level. Extension support plays a critical role in farm decision making as extension workers provide farmers with information on good production and tobacco curing practices as well as market specific requirements. This result is supported by the findings of Haq [16] who also find that farmers with access to extension attain higher crop incomes.

Full-time farmers also have a higher tobacco income share total household income and the result is significant at 1% level. The likelihood of a full-time farmer having a higher share is 0.16 when compared to farmers who have other occupations. Full-time farming can be used as a proxy of how committed the farmer is to tobacco farming. In this case farmers who are practice full-time farming put their undivided attention to the farming activities allowing them to put better management practices as farming is their main source of livelihood.

Total tobacco cropping area also positively and significantly increases the share of tobacco income to total household income. A hectare increase in total cropped area increases the share of tobacco income to total household income by 2% and this result is significant at 1% level. Farmers with large cropping areas are likely to benefit from economies of scale and preferential access to output and input markets [17-20].

Farmers who have attained at least secondary school education are 14% more likely to have a higher tobacco income share when compared to farmers with less education and this is significant at 1% level. This finding is consistent with the findings of Dube and Guveya in 2014 [21], Latruffe *et al.;* in 2008a [22] and Rao *et al.;* in 2004 [23] as better educated farm managers can be expected to have more skills to run their farm efficiently. Land tenure security plays an important role in influencing farm production and investment decisions. Farmers with more secure title are more likely to invest in improved technologies and fixed production infrastructure like tobacco curing bans and this in turn enhances productivity and farm income [24, 25].

CONCLUSION AND RECOMMENDATIONS

This purpose of this paper was to assess the impact of contract farming on household income. The study found that despite contract farmers selling on average 1.6 times the number of bales sold by non-contract farmers, they only realised an average income that was 1.4 times higher than that realised by non-contract farmers. One possible explanation for this may be that non-contract farmers are realising higher prices for their produce on the contract floors compared to those offer by contract buyers. The study also found that tobacco farming is the major source of livelihood for farmers in Makoni district contributing on average 73% of the households' annual income. The study further established that found that being a contract farmer does not have a significant effect on the share of tobacco income to total household income. The factors that significantly and positively influence the share of tobacco income to total household income are gender of the farmer, access to extension on tobacco production and information, being a full-time farmer, total cropping area, farmer having attained at least secondary education and individual land tenure. The study recommends that government and tobacco contracting merchants must further strengthen extension support to tobacco growing farmers especially women farmers to increase household incomes and sustain rural livelihoods. Further, there is need to review and upgrade the current master farmer training programme curriculum to include specialised tobacco good farming practices for farmers located in tobacco producing regions.

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