Research article

Economic Assessment of Tea Smallholder Farmers under Contract Farming in Rungwe District, Tanzania

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Abstract In Tanzania, tea is considered as one of the most exported crops. The main stakeholders of the tea industry are smallholder farmers and estates. Smallholder tea farmers are required to engage in contract farming, as stipulated in the Tea Regulation of 2010. This study attempted to assess contract farming and its impact to production and income of tea smallholder farmers in Rungwe District, Tanzania. A total of 48 randomly selected smallholder farmers were interviewed using a semi-structured questionnaire in September 2020 and October 2021. Agribusiness company officials, government officials and extension officers were also interviewed to clarify the condition and issues of the contract farming scheme. Descriptive analysis and cost and return analysis were utilized. Results show that yield, income, and profitability increased from 2016-2019. These can be attributed to steady supply of inputs, easy access to technical assistance, and early adoption of new technology under contract farming scheme. Moreover, the price of smallholder green leaf has improved, with farmers receiving a second payment hence improve their overall revenue returns.

Keywords: contract farming, smallholder farmers, tea, profitability, Tanzania

INTRODUCTION

Tea is a globally manufactured and widely consumed beverage (Hicks, 2009; Onduru et al., 2012). Kenya, Malawi, Uganda, Tanzania, Zimbabwe, South Africa, and Rwanda are the principal tea-producing countries in Africa, with tea contributing considerably to their economy (FAO, 2014). By the year 2023, the continent's export volume is expected to reach 743,384 metric tons (FAOSTAT, 2015).

Tea is the fifth most exported crop in Tanzania, the tea sector accounts for an average of approximately USD 50 million every year, when it comes to foreign exchange earnings. Tea industry also contribute to the huge amount of employment opportunities as it employs more than 50,000 families and indirectly it affects to as many as 2 million Tanzanian citizens (Baffes, 2004). Moreover, the nature of tea production necessitates a significant amount of labor, implying that the sector can employ a large number of people. Tea can be harvested all year round, making it one of the few crops that can generate a relatively consistent income when compared to seasonal crops like maize.

Tea cultivation was only done on a large scale under the supervision of several tea estates during colonial and early post-colonial times, which meant that smallholder farmers were non-

existent. Smallholder tea production legally began only after the independence in 1960s. At that time the government had actively pushed smallholders' involvement in the tea sector (Maghimbi et al., 2011; Gibbon, 2011). This marked the starting point for the co-existence and relationship between the smallholders and estates in the tea sector. The relationship was later on cemented with the introduction of programs such as contract farming and sales agreements. Further, smallholders are required by law to have at least a one-year sales agreement in place. This is due to a number of factors: Firstly, the tea leaves' perishable nature; green leaves can only be stored for around six hours before they must be processed. Secondly, tea processing also demands complex and costly machinery, which is why the majority of tea processing firms are owned by large corporations. As a result, smallholders are reliant on tea processing plants owned by large tea companies. This mandates close collaboration between smallholder farmers and estates that possess processing plants, hence makes sales agreements and contract farming necessary in Tanzania tea sector.

OBJECTIVE

The main goal of the study was to assess contract farming and its impact to production, income, and profitability of tea smallholder farmers in Rungwe District, Tanzania.

METHODOLOGY

Study Area

This study was conducted in Rungwe district (see Fig. 1) located in the Southern tea growing zone. Two villages from the Rungwe district namely Katumba and Lugombo village were purposively selected because these villages large concentration of smallholder farmers operating under a contract system. A total of 48 randomly selected smallholder farmers were interviewed using a semi-structured questionnaire in September 2020 and October 2021. Agribusiness company officials, government officials and extension officers were also interviewed to clarify the condition and issues of the contract farming scheme.

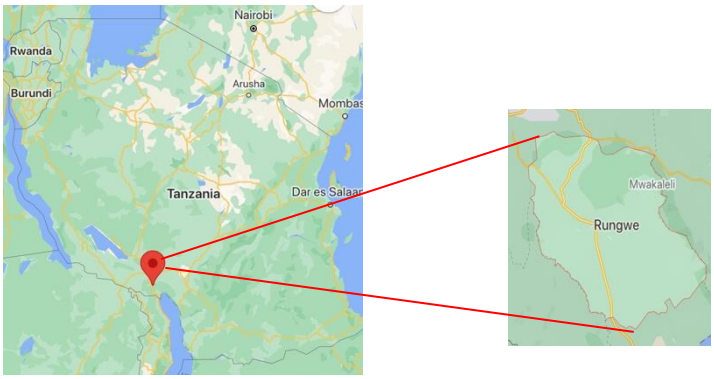

Fig. 1 Map of the study area
Source: Google map

Methods of Study

For evaluating the impact of these Contract Farming schemes on yield, income, and profitability of tea per unit area, cost and return analysis was utilized. Furthermore, the study compared the yield, income, and profitability of smallholder tea farmers from the year 2016 to 2019.

Fixed costs, such as family labor and land charges, were separated from variable costs, such as herbicides, chemical fertilizers, pesticides, and hired labor. The gross return was then obtained by multiplying the marketable produce by the year's average price per kilogram. The profit was then calculated by subtracting the total cost from the gross return.

RESULTS AND DISCUSSION

This study estimated the cost of producing green tea leaves for smallholder tea producers in the Rungwe district of Mbeya, Tanzania, as well as the revenue generated. In the study area, Pesticides, herbicides, and farm labor both family and hired labor are among the inputs used by smallholder tea farmers. On the other hand, Chemical fertilizers, such as NPK fertilizers, Glyphosate, Urea, and SA fertilizer, are also used. Additionally, other farm inputs include safety Goggles, Gloves, Gum Boots, Raincoat, Mouth Mask, Shears, and Spray Pump are often used by smallholders in the study area. This section analyzed the production costs and profitability of smallholder farmers participating in Contract Farming in greater detail. Most of these inputs are provided on credit to smallholder tea farmers in the study area by their contracting estates. The inputs are distributed according to a well-established process that is overseen by smallholder association leaders and extension officers. The loaned inputs are paid for by deducting from the overall earnings that smallholder farmers are expected to gain without any interest.

Yield of Green Tea Leaves Produced by Smallholder Tea Farmers

The yield of a crop is calculated by dividing the amount of crop harvested by the harvested area of that crop. Mathematically, the yield can be calculated by dividing production data by harvested area data.

According to the findings, the marketable yield for smallholder tea leaves in 2016, 2017, 2018, and 2019 was 1,093 kg/ha, 1,175 kg/ha, 1,247 kg/ha, and 1,347 kg/ha, respectively. This is attributable to a steady supply of inputs, easy access to technical assistance, and the adoption of new technologies in the study area's contract farming scheme. Similarly, the contracting company has stepped up its efforts to provide smallholder farmers with inputs such as fertilizers and herbicides at significantly lower prices than market prices, allowing them to have easy access to supplies at a reasonable price.

Table 1 Comparison of the average yield for smallholder tea farmers

n=(kg/ha)

Items	2016	2017	2018	2019
National	814	1,082	1,203	1,035
Study area	1,093	1,175	1,247	1,347

Source: Field survey in 2020

The Costs of the Inputs for Green Leaf Tea Production

The overall production cost was estimated, which included not only the cash payment but also the estimation of the opportunity cost for smallholder farmers. There are two types of costs in agriculture: variable and fixed. In general, variable costs fluctuate according to the degree of production. Fixed costs, on the other hand, are expenses that do not change regardless of production level. According to Mamun et al. (2018), the total cost (TC) can be obtained by adding the total variable cost (TVC) to the total fixed cost (TFC), as illustrated in the equation below.

$$TC = TVC + TFC \quad (1)$$

Where *TC is total costs, TVC is total variable cost and TFC is total fixed cost.*

In this study, the total cost was calculated by adding the costs of chemical fertilizers, herbicides, farm equipment, and labor used by smallholder farmers for producing green tea leaves in the study area.

Moreover, in an effort to improve green tea leaves production volume and quality in the study area, the amount and frequency of provision of various farm inputs such as herbicides, chemical

fertilizers and other equipment were increased which resulted into the increased cost of production as shown in the table 6.1. According to the findings, the total production cost of green tea leaves per hectare was 65.65 TZS/ha, 73.32 TZS/ha, 102.13 TZS/ha, and 112.07 TZS/ha in 2016, 2017, 2018, and 2019 respectively.

Green Tea Leaves Price in the Study Area

In the study area, for the years 2016, 2017, 2018, and 2019, the contracting company's green tea leaves price per Kg in the research region was 231 TZS/Kg, 240 TZS/Kg, 315 TZS/Kg, and 320 TZS/Kg, respectively. These prices offered to smallholders in the study area are higher than the government's recommended price (basal price), implying that farmers in the study area benefit more than green tea leaf growers in other tea producing areas, such as the Korogwe district in the northeast zone, where smallholder tea producers receive no more than the government's recommended price.

Table 2 Total production cost and profitability of smallholder tea production

(Unit: 000' TZS/ha)

Items	2016	2017	2018	2019
Observed smallholders	(n=48)	(n=48)	(n=48)	(n=48)
Average cultivated area (ha)	0.3	0.3	0.3	0.3
Yield (Kg/ha) (AA)	1,093	1,175	1,247	1,347
Chemical fertilizer costs (C1)	8.14	9.09	12.66	13.90
Herbicide's cost (C2)	10.80	12.34	18.10	20.09
Farm Instruments (C3)	2.04	2.28	3.18	3.49
Hired labor cost (C4)	15.62	17.45	24.31	26.67
Total variable cost (TVC)=(C1+C2+C3+C4)	36.61	40.89	56.96	62.50
Family labor cost (C5)	27.77	31.02	43.21	47.42
Total labor cost (C6) = C4+C5	43.39	48.46	67.51	74.08
Total production cost (C7)=TVC+C5	65.65	73.32	102.13	112.07
Gross revenue (GR) = (AA*Farm gate price)	252.48	282.00	392.81	431.04
Gross income (GI) = (GR-TVC)	215.87	241.11	335.85	368.54
Gross profit (GP) = (GI-C5)	188.10	210.09	292.64	321.12

Smallholder Tea Farmers' Revenue, Income and Profitability in the Study Area

The gross income (GI), gross revenue (GR) and Gross profit (GP) were estimated using data from the field survey 2020 and 2021 to better understand the impact of tea leaves production on the smallholders' livelihood. The study then simulated the comparative profitability of growing green tea leaves in various years from 2016 to 2019. This will help to determine the trend of gross income, gross revenue, and profitability received by smallholder tea farmers each year, as well as ranking the profitability received over this period of time.

Gross revenue (GR) means the amount received by farmers presumably that their entire volume of marketable yield is sold at the farm gate price. Dammert and Mohan (2015) support that the concept of Gross Revenue is calculated as yield multiplied by farm gate price. Further, Gross income (GI) is computed by subtracting total production costs from Gross Revenue, excluding family labor costs. Finally, gross profit is derived by subtracting family labor costs from gross income.

The results showed that in 2016, 2017, 2018, and 2019, the gross revenue for smallholder tea leaves production was 252.48 TZS/ha, 282 TZS/ha, 392 TZS/ha, and 431.04 TZS/ha, respectively. Likewise, the results showed that in 2016, 2017, 2018, and 2019, the gross Income for smallholder tea leaves production was 215.87 TZS/ha, 241.11 TZS/ha, 335.85 TZS/ha, and 368.54 TZS/ha, respectively.

Table 3 Price of green tea leaves in TZS

Items	2016	2017	2018	2019
Tea leaves price/kg	231	240	315	320

Source: Field survey in 2020.

CONCLUSION

Firstly, land ownership of smallholder tea farmers was overwhelmingly male dominated, suggesting that land ownership for women is a major issue in African traditions and culture as a result of gender biased traditions. As a result, women's ability to participate in Contract Farming (CF) in Africa is compromised. Also, low level of education among the smallholder tea farmers was also observed. in terms of farm size, smallholder tea farms were relatively small (averaging 0.30 hectares). Inadequate farm size, on the other hand, may limit households' ability to expand their cultivation and fully exploit the benefits provided by Contract Farming programs in order to maximize productivity while utilizing the far more advanced technologies. Finally, the findings revealed that farming is the principal economic activity of the entire sample of respondents in the study area.

In the study area, smallholder tea farmers received prices higher than the government's recommended price, implying that farmers in the study area benefit more than green tea leaf growers in other tea-producing areas, such as the northeast zone's Korogwe district, where smallholder tea producers receive no more than the government's recommended price. Furthermore, smallholder farmers in the study area benefited not only from the higher price than the government recommended, but also from the introduction of a first and second payment system after the company's sales of the made tea, based on cost sharing and final market price, which improved their overall revenue returns.

Over the four years for which data were gathered, the trend of Marketable Yield has risen. As a result, in 2019 the highest marketable yield was obtained, whereas in 2016 the lowest yield was obtained. Furthermore, data obtained shows that smallholder farmers in the study area produced higher yields than the country's average yield for each of the four years examined. This is owing to a steady supply of inputs, easy access to technical assistance, and the adoption of innovative technology in the study area's contract farming scheme. Similarly, the contracting company has stepped up its efforts to provide smallholder farmers with inputs such as fertilizers and herbicides at much cheaper prices than market prices, allowing them to have easy access to supplies at an affordable price. And because of the higher price and yield, smallholders in the Contract scheme were able to generate more gross revenue, gross income, and profit compared to national average for smallholder tea farmers. In general, contract farming in the tea sector appears to be profitable for respondent smallholder tea farmers in the study area.

However, the need for a higher price for their tea leaves, difficulty adapting to new technologies, insufficient input supplies, insufficient funds to hire extra farm labor, and insufficient farm equipment were shown to be the challenges that smallholders experience.

Generally, the contract farming system in the study area has a positive impact on production, income, and profitability of tea smallholder farmers, despite the existence of some constraints. In light of the findings and conclusions, the study recommends that the government, agribusiness companies, smallholder famers association and other stakeholders develop a common strategy and ways for smallholder tea farmers to have better access to capital in order to boost their adaptability

to new technologies, buy sufficient farm input and farm equipment, and have sufficient funds to hire extra farm labor to further improve their profitability.

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