Productivity of Small-Scale Cotton Farmers in Bunda District: Does Contract Farming Matters?

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Abstract

This study examines the impact of contract farming on the productivity and welfare of small-scale cotton farmers in Bunda District. A sample of farmers were purposively selected, and data were collected using structured questionnaires, interviews, and literature reviews. Both qualitative and quantitative methods were used for analysis.The findings indicate that socio-economic factors such as marital status, income level, and family support significantly influence *the adoption of contract farming. Additionally, contract farmers achieved higher yields and incomes compared to non-contract farmers, benefiting from lower long-term investment costs, improved access to inputs, and better pest control measures. Statistically, significant differences were observed between contract and non-contract farmers in terms of productivity and income.Despite its advantages, contract farming faces challenges, including delays in input provision by ginners, contract breaches by farmers, and inadequate farm management among non-contract farmers. To enhance the effectiveness of contract farming, the study recommends revising contract terms, improving pest control strategies, ensuring timely input supply, and providing farmer training programs.*

Keywords: Contract farming, Productivity, Welfare, Income generation

Introduction

Farming hires about 80% of the people in a country, accounts for approximately 25% of GDP, 27% of export earnings, and roughly 65% of raw materials furnished to industries (URT, 2013). Despite its prominence in the economy, the sector still encounters numerous challenges such as imperfect market, unpredictable weather, lowly technology, low productivity, and insufficient capital (Will, 2013). As a result, the agricultural sector's growth has been moderate in recent years. According to the Tanzania Economic Survey 2021, the sector grew by 3.1% in 2020, up from 3.0% in 2019 (Ministry of Finance and Planning, 2021). Over a longer period, the sector's average annual growth rate was 4.7% between 2016 and 2020 (World Bank, 2022). Furthermore, it is known that agricultural production in developing countries is generally low in productivity compared to agricultural production in developed countries. There are often many reasons for poor agricultural productivity, for example, inadequate knowledge of methods of production that improve productivity and highly productive technologies, inadequate accessibility of high productive varieties and inputs that increase productivity, inadequate accessibility of liquidity and narrow access to credit, and/or unwillingness to invest in measures to improve productivity due to production risk, output price variability and unreliable market access in combination with poor farmers' risk aversion (Key & Runsten, 1999).

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To tackle some of these challenges, contract farming, which began in the country in the 1990s for most of the traditional cash crops, was considered as one of the plans for rising farming production, and ensuring a secure market for farming produce, thus leading to improved farmers' incomes (Roth, 2002). Contract farming is seen as an instrument that improves access to knowledge, technologies, agriculture inputs, credit, and providing more foreseeable production prices and secure access to markets (Key & Runsten 1999). Some studies including Simmons (2002), Warning and Key (2002), Simmons, Winters, and Patrick (2005) propose that contracted farming provisions allow small farmers to obtain better crops, expand into new crops, and raise income. Though, writers also notice a number of drawbacks and threats, such as the limits for the inclusion of contract agriculture schemes (often limited to the highest level of small producers), unfair contractual relations between buyers and farmers, high farmers' risk, and the conditions of the contract for farmers that decay over time in the process of normalization of agribusiness (Simmons 2002; warning and key 2002)

In Africa, contract farming is extensively practiced as it is for numerous developing countries (Wainaina, et al, 2012). Though, there are contrasting views concerning its positive effects on the welfare of small-scale farmers. For example, Birthal et al. (2005); Key and Runsten (1999); Minot and Roy (2007); Warning and Key (2002) argue that contract farming is useful for small farmers, as it allows them access to local and global markets; opposing views are that contract farming is a way for large agro-industrial companies to exploit farmers because of their inherent bargaining power for small farmers (Little & Watts 1994; Singh 2002). Guo et al. (2005) support this argument by saying that only large farmers benefit from contract farming.

The main concerns are that the agreements have not helped farmers enough to increase their income, access to new technologies and credit (Guo et al., 2005). There is a school of thought that argues that CF agreements are fundamentally exploitative agreements by big agribusiness, primarily due to the imbalance of negotiating power between small farmers and sufficiently resourced farms (Baumann, 2000). It is said that farmers have a high disproportionately production risk that can boost their debt if the plants do not produce sufficient revenue to cover the supplied inputs (Miyata et al., 2009). Miyata et al. (2009) also noted that contract farming in societies can boost equalities as it favors people with better resources. Although there are number of arguments on advantages and disadvantages of CF, studies examining the contract farming's contribution to productivity are still rare (Key & Runsten 1999; Little and Watts 1994; Miyata *et al.* 2009; Singh 2002; Warning & Key 2002). The aim of this paper, therefore, is to examine the contribution of contract farming on productivity small cotton farmers in Bunda district using OLAM as a case study. Specifically, the paper focuses on the following:

i. To evaluate the socio-economic characteristics of the farmers for the adaptation of contract farming;
ii. To examine the effect of contract farming on farmers' yields;
iii. To assess the effect of contract farming on farmers' income; and
iv. To examine the difference in yields and income between cotton contracts and non-contract farmers in the district of Bunda.

Conceptualization of Key Terms

Contract Farming

A contract is a binding contract between two or more parties (business, individual etc). It creates a duty to do something for each party or not to do anything. The contract includes clauses stipulating the parties' rights and obligations. The contract must be valid and enforceable, must have legal objectives, must include the ability and freedom to do so to enter into a contract (Bellemare and Bloem, 2018). With regards to contract farming, different authors defined it as an arrangement between farmers and firms to produce and supply agricultural products on predetermined terms and often at predetermined rates (Otsuka et al., 2016). Furthermore, contract agriculture is argued as a form of vertical integration into the agricultural supply chain, so that the company has superior control over the production process, quantity, quality, characteristics and production times (Prowse, 2012). Often, as the agreement works, the purchaser commits to provide a degree of production support, e.g. by providing timely agricultural inputs, pesticides, technical advice, preparing the soil and organizing the transport of products to the purchaser's facilities. The farmer, in turn, undertakes to supply a specific product in the quantities and quality standards determined by the buyer (Prowse, 2012; Wainaina *et al.,* 2012).

The rise and growth of contract agriculture is due to the fact that the market has not allocated productive resources for each sector of the economy because of the incomplete information received (Freguin *et al.,* 2012). Contract farming with small farmers is considered risky, as they lack resources, safety and skills and training for the production of income crops. The government, contractors and regulators must work together to alleviate these problems. For the purpose of this paper contract farming is considered an agreement that can reduce the problem of the imperfect market by increasing the flow of information on markets, technology and other production resources. Apart from contract farming, Weldon (2019) defined non-contract farming as system of farming in agriculture whereby the farmers produce different food products for both animal and human consumption without any legal agreement. However, the farmers can be categorized into various types varying from those who produce crops to those who raise different animals such as fish and livestock.

Productivity

Martin (2016) stated productivity is an indicator of how effective a manufacturing process is. It is calculated as an output to input ratio. Productivity may not be the same within the same organization, in a given period of time. Productivity generally refers to a change or increase in the job or output quality. In general, growth in productivity is expressed by an increase in total production or performance. An increase in total production or revenue, however, does not necessarily mean productivity growth. Furthermore, Akram-Lodhi and Komba (2018) defined productivity as the measure of output per unit of input, which may include labor, materials, and capital. They emphasize that, productivity improvement is often linked to technological advancements and enhanced management practices. For the purpose of this study, productivity in agricultural output is defined as the positive change in yield and income. While focusing on Small-scale Farmers; this term is defined by Weldon (2019) as a person who engages in small agriculture whereby, he or she produces different food products for both animal and human consumption. However, the small-scale farmers can be categorized into various types varying from those who produce crops to those who raise different animals such as fish and livestock.

Theoretical Framework

This study was guided by Transaction cost theory, The innovation diffusion theory, C-D production frontier theory and Impact evaluation model. Rindfleisch (2020) argues that Transaction Cost Analysis (TCA) theory which is a common approach to understanding contract farming. Most agro-industrial companies deal with contract agriculture to minimize transaction costs. Therefore, if it is less costly for a company to produce an output without being involved in contract farming, then it will integrate backwards to do so. Contract farming can have high costs for transactions, although it is still the “best bet" for company growth over alternatives. Transaction cost theory seeks to identify and minimize transaction costs. Bogetoft and Olesen (2004) present and analyses four types of transaction costs. These types include Entering a Contract, Conflict Resolution, Monitoring and Influence Costs. They argued that during contracting three main transaction costs occur. (1) The difficulty to predict the coming events. (2) Joint agreement of the contract. The contract must be drawn up in such a way that all the parties involved have the same understanding of the content. (3) The cost of a contract that is legally binding. There are many ways for which transaction cost can be minimized. One way is minimizing negotiation cost through the use of a standard contract for all producers. For this reason, it is not mandatory for each producer to participate in the negotiation, but only for the producer organization committee, thus reducing these costs. It is therefore clear that by entering in contract farming the small-scale farmers can shift some of the cost to the counter party of the contract agreement.

The innovation diffusion theory was introduced by Wani and Ali, (2015). It focused on knowing how, why and at what rate innovative ideas and technologies spread in a society from other society, or in an organization from other surrounding organizations. He wanted to know the drivers and the reasons for an organization or individual to accept change which already exists in the environment. Rogers did not at all focus on persuading individuals to change but rather saw change as the reinvention of products and behaviors so as to be a better fit for individuals. This also emphasizes the importance of interaction within the adoption process and peer networking. The diffusion of creativity, however, refers to the process that take place when people embrace a new concept, consumer strategies, theory etc. Rogers set out this process, stressing that in most situations an inherent few are open to the new idea and make use of it. As these early innovators spread the word more and more people are becoming open to it, contributing to critical mass growth. Overtime, until a saturation point is reached, the new concept or item will be diffused among the population.

In using the innovation diffusion theory, Miller (2018), argued that although the adoption of new systems simplifies the day-to-day activities, the question on whether the organization is willing to adopt or not is still questionable. He tried to relate the theory of diffusion to categories stated by Rogers and he stated how, why and at what rate adoption can take place in any organization or individual. This theory is widely applicable to this study as the first objective of this study focuses on adoption of contract farming systems which is just another form of practices. The adoption of contract farming system is a process just like any other adoption process of any other activities. Although the rate of adoption can differ from one farmers/village to another due to the mentioned factors, but still there is adoption. Wani and Ali, (2015) also stresses that innovated idea/practices and philosophy adoption is necessary but firms have different paces of doing so. Likewise it can be predicted that adoption of contract

farming by small scale farmers can be influenced by different characteristics including gender, age, marital status, education, experience, income and peer groups as detailed in the analysis.

The Cobb-Douglas (C-D) production frontier theory describes the relationship between two or more inputs, usually physical capital and labor, and the level of output generated from these inputs. It is widely used in microeconomics for modeling production processes and in macroeconomics for designing forecasts (Douglas, 1928). The theory stipulates that output cannot be produced from nothing; it requires facilities, infrastructure, personnel, and know-how, all of which can influence overall productivity (Onalan & Basegmez, 2018). A production method in economics is a way to calculate what comes out of production to what has gone into it. The equation seeks to measure with as much output as possible from a number of inputs. The factors of production in macroeconomics are; physical resources or tangible assets generated for use in the manufacturing process. It includes things like building, machinery, computers and unqualified human workers' activities; land that includes natural resources, raw materials, and energy sources such as oil, gas and coil; innovation that is the value of business intelligence applied to the production method. According to this C-D production frontier theory, farmers contracted and non-contracted in order to maximize their produce, need human resources and resources for optimal production. This theory is used to predict the relationships indicated for third and fourth objectives in which they examined the relationship between contracted farming (inputs) and productivity (output which is measured by yields and income).

Impact evaluation model evaluate the improvement that can be traced to a particular action, such as a plan, program or regulation, both intended, and preferably, unintended (World Bank 2008). Contrary to the monitoring of results, which examines whether targets have been achieved, impact assessment is structured to answer the question; how would outcomes such as the productivity of participants have changed if the action had not been carried out? It includes counterfactual analysis, which is a contrast between what actual happened and what would have happened in the absence of the intervention (White, 2006). Impact evaluations are designed to answer questions about cause and effect. In other words, they are searching for result shifts that are directly attributable to a system (Vermeersch, 2011).

Impact evaluation helps people answer key questions for policy making based on evidence; what works, what doesn't, where, why and how much? In this case there are two commonly used impact assessment which include before and after approach and with and without approach. Before and after approach can be used to assess the contracted farmers before and after engaging in the contract to evaluate whether there is any changes in productivity. Alternatively, evaluation can be conducted by considering contract farmers and non-contract farmers, which is with and without approach. Based on theory of impact the evaluations are therefore designed to answer questions about cause and effect. In other words, they are searching for result shifts that are directly attributable to a system (Vermeersch, 2011). This theory is relevant to this study especially on the fourth objective in which the researchers examined the impact of contracted farmers as compared to non-contracted farmers on yields and income. The researcher looked at the results and explained the causes.

Empirical Review and Hypotheses Development

Socio-economic Characteristics of Farmers for Contract Farming Adaptation

Numerous studies have explored the socio-economic factors affecting farmers' participation in contract farming (CF), revealing a complex interplay of variables (Bezabeh et al., 2020; Azumah et al., 2016; Maske, 2013). Bezabeh et al. (2020) conducted an extensive study on malt barley CF in Ethiopia, using a probit model to identify influencing factors. They found that age, livestock ownership, credit access, proximity to the main market, and cooperative membership positively and significantly impacted farmers' decisions to engage in CF. This indicates that older, more established farmers with greater assets and better resource access are more inclined to participate in CF. Similarly, Azumah et al. (2016) examined CF participation determinants among farmers in Northern Ghana. Their study emphasized the importance of institutional factors, showing that access to extension services and credit positively influenced CF participation. Interestingly, they found that farm size and off-farm income negatively affected participation, suggesting that smaller-scale farmers and those more reliant on farming income were more likely to engage in CF. Maske (2013) provided insights into the socio-economic characteristics of cotton farmers in India. The study found that factors such as age, family size, landholding, capital investment, and livestock ownership were positively associated with CF participation. Notably, contract farmers had slightly smaller average landholdings than non-contract farmers, indicating that CF might be particularly appealing to farmers with moderate land sizes.

These studies collectively highlight the crucial role of resource access and support services in CF adoption. Factors like credit access (Bezabeh et al., 2020; Azumah et al., 2016), extension services (Azumah et al., 2016), and cooperative membership (Bezabeh et al., 2020) consistently emerge as significant determinants of CF participation. This aligns with broader literature suggesting that CF can provide farmers with access to inputs, technical support, and markets that might otherwise be unavailable (Wainaina et al., 2012). However, the relationship between farm size and CF participation appears context-dependent. While Azumah et al. (2016) found a negative relationship between farm size and CF participation in Ghana, Maske (2013) observed only slight differences in landholdings between contract and non-contract farmers in India. This variability underscores the importance of considering local contexts when designing and implementing CF programs. Age and experience also emerge as significant factors, with older farmers more likely to participate in CF (Bezabeh et al., 2020; Maske, 2013). This may reflect the accumulation of knowledge and resources over time, facilitating engagement with more complex farming arrangements. The above literature indicates that there is a link between socio-economic characteristics and contract farming adoption which leads us to hypothesize that;

H_1. There is a positive relationship between socio-economic characteristics and adoption of contract farming.

Effect of Contract Farming on Farmers' Yields

Research on the effects of contract farming (CF) on agricultural yields has produced varied results depending on the crop and context (Mafuse et al., 2012; Mishra et al., 2018; Kumar et al., 2016; Paltasingh & Jena, 2023). For example, Mafuse et al. (2012) compared cotton yields under contract and non-contract farming in Zimbabwe's Zaka district. Using t-tests and profitability ratios, they found no significant yield

differences between contracted and self-funded farmers over two seasons, indicating that CF might not always enhance cotton yields. Conversely, studies on lentil farming in Nepal have shown more favourable outcomes. Mishra et al. (2018) used propensity score matching to assess CF's impact on smallholder lentil farms, finding that CF significantly increased per-hectare yields, especially for very small farms (0.01-0.05 ha). Similarly, Kumar et al. (2016) reported that CF in lentil farming resulted in notably higher yields compared to independent farming, leading to an 81% increase in net income for contract farmers.

Further supporting CF's positive impact on yields, Paltasingh and Jena (2023) analysed wheat farming in Haryana, North India, using data envelopment analysis and an endogenous switching regression model. They found that CF adopters were significantly more efficient than non-adopters, with potential efficiency gains of 12% for non-adopters if they adopted CF. The authors attributed these gains to the provision of higher quality inputs and better production technology through CF. However, the impact of CF on yields can vary based on the crop, region, and specific contract terms. While some studies show clear yield improvements (Mishra et al., 2018; Kumar et al., 2016; Paltasingh & Jena, 2023), others do not find significant differences (Mafuse et al., 2012). This suggests that the relationship between CF and agricultural yields is complex and context-dependent, requiring further investigation in specific agricultural settings. This is why we hypothesize that;

H_2; Contract farming has a positive impact on farmers' yields.

Effect of Contract Farming on Farmers' Income

Extensive research has explored the effects of contract farming (CF) on farmers' income across various crops and regions, generally showing positive outcomes (Bezabeh et al., 2020; Azumah et al., 2016; Wainaina et al., 2012; Maske, 2013). However, some studies report mixed or negligible impacts, indicating a complex relationship (Abdulai & Al-hassan, 2016). Bezabeh et al. (2020) examined CF's impact on smallholder malt barley farmers' income in Ethiopia using propensity score matching. They found that contract farmers had a significant increase in annual gross farm income, earning 27.80% more than non-contract farmers, highlighting CF's potential to improve rural livelihoods in similar settings. Similarly, Azumah et al. (2016) used a treatment effect model to assess CF's impact on farm income in Northern Ghana. Their study showed that CF participants generally had higher incomes than non-participants. They also identified other factors positively influencing farm income, such as land, labor, and fertilizer use, providing a broader understanding of income determinants in CF contexts.

Also, Wainaina et al. (2012) used propensity score matching to study CF's impact on smallholder poultry farmers' income in Kenya. They found that contracted farmers earned, on average, 27% more net revenue per bird than independent farmers, suggesting that CF can significantly improve smallholder poultry farmers' welfare. Maske (2013) conducted an economic analysis of cotton farming in India, comparing contract and non-contract situations. The study found that CF in cotton was profitable, with contract farmers achieving a higher output-input ratio (1.36) compared to non-contract farmers (1.10). This research also provided insights into the specific inputs and factors contributing to increased production and income under CF. However, not all studies report positive effects. Abdulai and Al-hassan (2016) assessed CF's impact

on smallholder soybean farmers' incomes in Ghana and found that CF participation did not necessarily improve income. This is why we hypothesize that;

H_3: Contract farming has a positive impact on farmers' income.

Difference in Income, and yields Between Contracts and Non-contract Farmers

Previous studies have thoroughly explored the effects of contract farming on farmers' income and yields, generally showing significant benefits for contract farmers across different crops and regions (Senthilnathan et al., 2010; Gondalia et al., 2017; Akubo et al., 2024; Chang et al., 2006; Maske, 2013). These studies consistently indicate that contract farming often results in higher yields, increased income, and greater efficiency compared to non-contract farming. Senthilnathan et al. (2010) examined cotton farming in Tamil Nadu, India, and found notable advantages for contract farmers. Their research showed that contract farmers had 32.23% higher cotton productivity and 51% higher net revenue compared to non-contract farmers, highlighting the potential benefits of contract farming in the cotton sector. Similarly, Gondalia et al. (2017) studied potato farming in Gujarat, India, and reported significant benefits for contract farmers. They found that contract farms had higher average potato production (399.92 q/ha) compared to non-contract farms (303.83 q/ha). This yield difference was attributed to better varieties, proper input use, and improved production technology provided by the contracting firm. Additionally, contract farmers received higher prices (830.29 per quintal) than non-contract farmers (808.17 per quintal), leading to significantly higher net returns for contract farms (146,615 per ha) compared to non-contract farms (90,620 per ha).

Further, Akubo et al. (2024) investigated tomato farming in Kogi State, Nigeria, and found clear income advantages for contract farmers. Their study showed that the gross margin of contract farmers (N375,174) was higher than that of non-contract farmers (N303,950). The mean income of contract farmers (N5,120) was significantly higher than that of non-contract farmers (N3,350), with statistical analysis confirming this difference. These findings suggest that contract farming can lead to substantial income improvements for tomato farmers in this region. Chang et al. (2006) analyzed rice farms in Taiwan and reported that the average revenue of a contract farm was about 11% higher than that of a non-contract farm. They also found that the per hectare cost of production in a contract farm was about 13% lower, resulting in average profit margins under contract being more than 50% higher than those without contracts. Their efficiency analysis indicated that an average contract farm was 20% more efficient than an average non-contract farm in a comparable operating environment. Maske (2013) conducted an economic analysis of cotton farming in India and found that contract farming was more profitable. The output-input ratio was 1.36 for contract farming compared to 1.10 for non-contract farming. This study also revealed that there was substantial scope to increase cotton production under contract farming through judicious use of critical inputs, particularly labor and machinery. The above literature indicates that contract farming often leads to higher yields, increased income, and improved efficiency compared to non-contract farming. This is why we hypothesize that;

H_4: Contract and non-contract farmers have significant differences with cotton production in terms of yields and income.

Conceptual Framework

This part details the relationship between variables involved in this study in figure which include; independents variables and dependent variable from specific objectives which only were included in quantitative analysis. This figure shows the relationship between characteristics of the farmers, contract farming, and non-contract farming as independent variables and productivity and income as dependent variable as shown below;

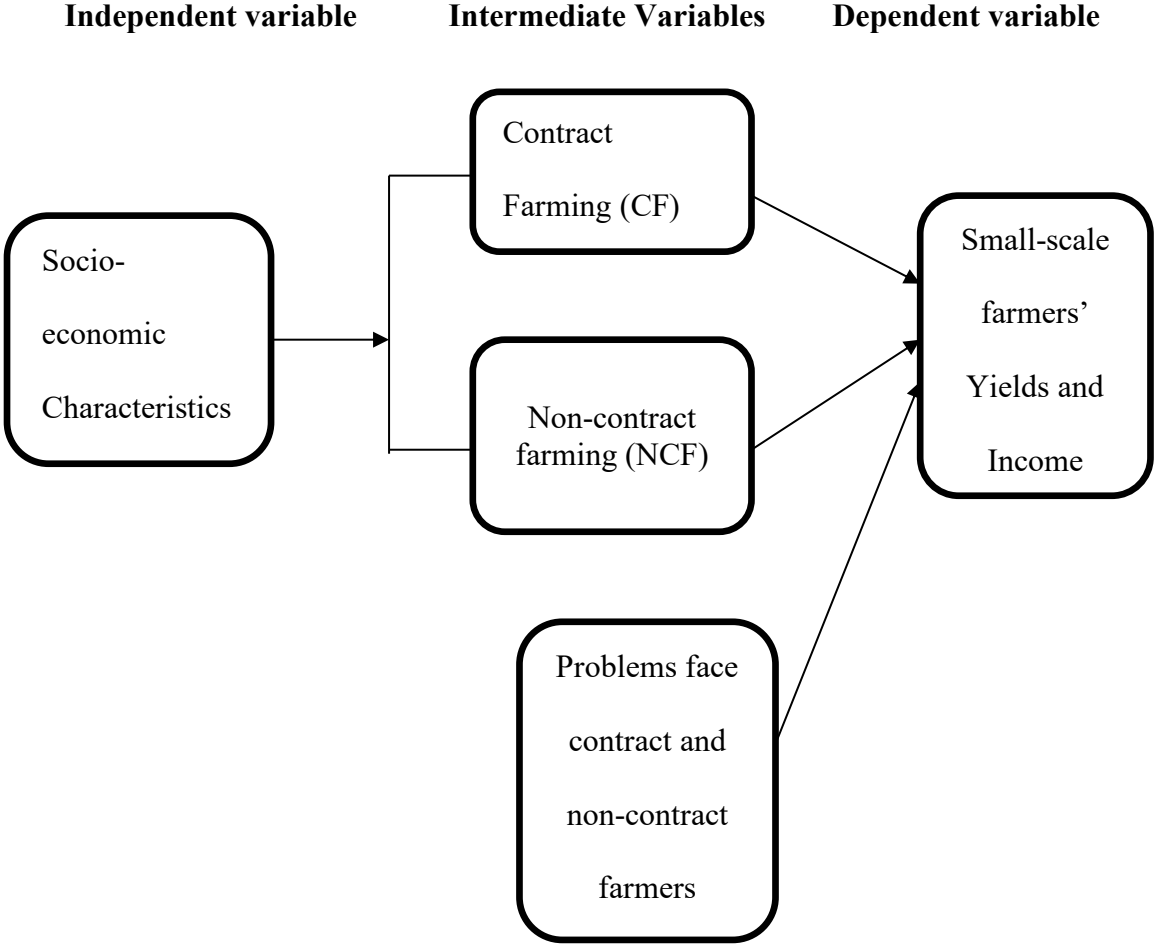

Figure 1: Conceptual Framework for the Study

Source: Synthesized from Literature Review

Methodology of the Study

An explanatory research design was adopted for this study as it allows for analyzing the associations between dependent and independent variables (Creswell and Zhang, 2009). A cross-sectional approach was used to collect both qualitative and quantitative data from selected cotton farmers in Bunda District, Mara Region. Bunda District was selected due to its significance in cotton production in Tanzania and its accessibility for data collection. According to the Tanzania Cotton Board (TCB), Bunda District is one of the key cotton-producing areas in Tanzania, hosting both contract and non-contract farmers. The study population included 131 respondents, comprising contract and non-contract cotton farmers, key players, and facilitators such as TCB representatives, local buying agents (LBA), clerks, and OLAM staff, including the Zonal Purchasing Officer (ZPO), Quality Control Inspector (QCI), Head of Unit of

Clusters, and Logistics Officer. These participants were selected due to their direct involvement in cotton production and supply chain activities in Bunda District.
Given the study population of 131 respondents, the sample size was calculated using Smith's (2003) formula, resulting in a total of 131 participants. Specifically, 100 farmers (50 contract and 50 non-contract farmers) were surveyed using structured questionnaires, while 31 key informants were interviewed. Table 1 summarizes the sample distribution.

Table 1: Sample Distribution

S/N	Respondent Group	Sample size
1	Contract and Non-Contract Farmers	100
2	FBGs Secretaries	20
3	LBA	1
4	Clerks	5
5	TCB Zone Division	1
6	Key Informants From OLAM	4
	Total	**131**

A non-probability sampling technique was employed, specifically using purposive and convenience sampling methods. Purposive sampling was used to select key informants from OLAM and TCB due to their expertise and authority in cotton production and supply chain management (Rahman, 2023). Convenience sampling was used to select farmers, allowing easy access to respondents available at the time of data collection (Golzar, Noor, and Tajik, 2022). This method ensured timely and efficient data collection while considering the accessibility of the target respondents. Structured questionnaires were used to collect data from farmers, covering key aspects such as demographic information, cotton production, market access, challenges faced, and contract farming experiences. The questionnaires consisted of both open-ended and closed-ended questions. Interviews were conducted with key informants to gather in-depth insights on policy implications, supply chain efficiency, and cotton market dynamics. Data collection took place at farmers' meeting points, local markets, and OLAM offices.

To ensure the validity and reliability of the data collection instruments, a pilot study was conducted with 10 selected cotton farmers. Participants provided feedback on question clarity and relevance. Based on their input, the questionnaire was refined before actual data collection. Reliability was tested using Cronbach's alpha to assess the internal consistency of the measurement items.According to Taber (2018), a coefficient above 0.70 is considered acceptable for most studies, confirming the reliability of the research instrument. The validated questionnaire and interview guide were then used for data collection in Bunda District.

Results and Discussion

Socio-economic Characteristics of The Farmers For The Adaption of Contract Farming

The first objective aimed at examining the socio-economic characteristics of the farmers for the adaptation of contract farming. Under this objective, the researcher determined three factors based on the socio-characteristics which included; Marital status, level of income and peer groups. The researcher addressed several questions under this factor to what he expected in this study and used questionnaire and interview to get responses from sample of respondents on this study. Through the descriptive statistics analysis the results from respondents are found as follows below:

Table 2 Socio-economic characteristics

	Mean	Std. Deviation	N
Level of income	1.40	.492	100
peer groups members	1.30	.461	100
Marital status	1.20	.402	100
Valid N (listwise)			100

Through the questions addressed in questionnaire and the analysis as shown in a Table 2 the researcher found that level of income is one of the socio-characteristics factors that influence farmers to adapt contract farming according to respondent's views. The analysis showed that most of respondents at Bunda district accepted that the level of income is influencing farmers to adapt contracting farming at mean scores of 1.40 and standard deviation of 0.492. Due to analysis, the researcher noted that this socio-economic characteristic factor of level income has greater influence than all other factors were determined by the researcher to oblige farmers to adapt contracting farming. The researcher revealed that peer group's member is another factor that influences farmers at Bunda to adapt contracting farming. The analysis showed that most of respondents at Bunda district accepted that the peer group's member has moderate influencing farmers to adapt contracting farming at mean scores of 1.30 and standard deviation of 0.461. Due to analysis, the researcher found that this socio-economic characteristic factor of marital status factor influence that obliges farmers to adapt contracting farming. Also, the study revealed that marital status is another factor that influences farmers at Bunda to adapt contracting farming. The analysis showed that most of respondents at Bunda district accepted that the marital status is influencing farmers to adapt contracting farming at mean scores of 1.20 and standard deviation of 0.402. Due to analysis, the researcher found that this socio-economic characteristic factor of marital status factor has low influence that obliges farmers to adapt contracting farming.

Moreover, the researcher spent time by discussing with some respondents and he revealed that various factors including age, farming experience, education, monthly income, status of land ownership as well as risk adverse habits of household head are important variables affecting the adoption of contract farming. In this study, the respondents argued that age has a positive effect on contract farming adoption. "Older people may choose less risky investments by participating in the contract farming to avoid the negative impacts of unfavorable climate". One of the respondents spoke from Bunda. Also, the study revealed that the effect of education is positively related to the adoption of contract farming. The researcher quoted that one of the respondents said that "this education has positive effect on contract farming because educated people can access more information and can identify the benefits of risks management tools".However, the researcher noted that some farmers were not ready to adapt contract farming because of their farming experience. The study revealed that experienced farmers usually tend to avoid engaging in contract farming. The farmers who are more experienced might have greater information on how to deal with natural disasters, hence this experience on the effects of climate changes may have impacts on their willingness to engage in contract farming. On the other hand, the impact may be due to the fact that farmers with more experience usually prefer the use of traditional way of farming, hence are found to be reluctant in adoption of modern way of farming.

However, the results indicated that farmers with higher incomes are most likely to engage in contract farming. A higher-income tempts farmers to participate in contract farming so as to produce more income and reduce investment risk. In this study, land ownership has a positive effect on the adoption of contract farming. This may be due to the fact that landlords believe that it simple to make decisions independently, hence they have a tendency of implementing contract farming in the sense of minimizing the effects of unfavorable climate circumstances associated to a farmer's choice of a tenant that is related with willpower of the owner. Furthermore, risk-averse attitude stimulates the adoption of contracting farming for reducing risks. However, we note that farmers' risk perceptions are subjective indicator, and we may have also captured other constraints that affect their decision to participate in contract farming when measuring these risks perceptions. Thus, through the questionnaire and an interview, the researcher revealed that the socio-economic characteristics of the farmers to adapt contracting farming, in addition the study shows that how can influence them to engage in contracting farming and in advance he gets to know the contract farming can be used as risks management tools.

Basing on the literature review and adoption theoretical review, the researcher revealed that there were several factors that influence the adoption of contract farming: agro-ecological constrain, credit constrain, labor market constrains, safety-first constrain, seed supply constraints, risk preference or tradition value. However, also on the adoption theory review, it seems knowledge is one of the factors that influence the adoption of the contract farming and the other factors were included: enterprises type, market place, attribute public policy and farm production characteristics. The last factor that influencing adoption of the contract farming basing on the adoption theoretical review is demographic factors which included: Gender, age, farming experience, risk averse and private and public institution.

Moreover, basing on theoretical and empirical literature review made above, the researcher found out that participation in contract farming is influenced by a number of factors. Among these factors include: farmer and farm characteristics such as age, education, health, experience and gender; Famer wealth/home equipment such as TV, bicycle, motorcycle, radio; farm biophysical characteristics such as farm size, area planted, parcel size and farm fragmentation; farm financial/management characteristics such as tenure, family labor, hired labor, income, labor requirement, importance of livestock, availability of machinery, tillage equipment/animals, off-farm activities/income, access to credit, and exogenous factors such as input prices, output prices, other crops‘ prices, source of information, membership in organizations, extension/technical assistance and program participation. In this regard, as farmers adopt contract farming, it is expected that their respective total productivity will increase too provided that other factors of production such as land, capital, labor and inputs are held constant. But, specifically this study based on the socio-economic characteristics factors that influencing the adoption of contract farming as stipulated above on the table 2 which included: level of income, peer group member and marital status. However, the researcher was interested to test these factors under this model through the regression model to see in what extent influence the farmers to adopt contracting farming.

Table 3: Regression analysis – Socio economic characteristics

Socio-economic characteristics	Coef.	Std. Err.	T	P>t
Gender	-.2429549	.2284181	-1.06	0.290
Age	-.2082331	.2274209	-0.92	0.362
Marital status	.75975	.2965341	2.56	0.012
Education	.55689	.1773373	3.14	0.002
Experience	.1529766	.2447954	0.62	0.534
Income	3.438421	.7136985	4.82	0.000
Peer groups	.1968512	.4620556	0.43	0.671
_cons	-4.054939	2.342857	-1.73	0.087

Gender

From the table 3 of regression analysis above, the results showed that the adoption of contract farming scores was negatively related to gender because coefficient were negative, i.e. -0.2429549. This implies that adoption of contracting farming was reduced by -0.2429549 for every change in gender; however, the analysis showed that the relationship was not statistically significant since the T is -1.06 and p-value is 0.290. The hypothesis was rejected because of the P-value is greater than 0.05. H0: Gender is not significant and has negative relationship with adaption of contract farming.

Age

From the table 3 of regression analysis above, the results showed that the adoption of contract farming scores were negatively related to age because coefficient was negative, i.e. -0.2082331. This implies that adoption of contracting farming was reduced by -0.2082331 for every change in age; however, the analysis showed that the relationship was not statistically significant since the T is -0.92 and p-value is 0.362. The hypothesis was rejected because the P-value is greater than 0.05.
H0: Age is not significant and has negative relationship with adaption of contract farming.

Marital Status

The regression analysis in table 3 above indicated that the direct path from marital status to influencing the adoption of contracting farming had a standardized regression score of (coef = 0.75975, P < 0.012), implying that adoption of contracting farming was positive influenced by the marital status. It implies that when marital status change, adoption of contracting farming goes up by 0.75975 coefficient, however the analysis showed that the relationship was statistically significant since the T = 2.56 and P = 0.012 because of P<0.05. The hypothesis was accepted because of the P-value is less than 0.05.
H1: Marital status has significant and positive relationship with adaption of contract farming.

Education

The regression analysis found that there was significant influence of education in adoption of contract farming since the analysis indicated that (coef = 0.55689, P = 0.002). This implies that there was a positive relationship between education and adoption of contract farming, i.e. adoption of contract farming was increased by 0.55689 when there was every increase in education to farmers. However, the

relationship was statistically significant as the p-value was < 0.05. The hypothesis was accepted because of the P-value is less than 0.05.
H2; Education has significant and positive relationship with adaption of contract farming.

Experience
The analysis results between experience and adoption of contract farming revealed that experience was not significantly influence the adoption of contract (β = 0.1529766, P = 0.534). This implies that experience had positive influence of adoption of contract farming, but it was not statistically significant as a generalization of the population values cannot be made when the p-value exceeds 0.05 cut off point. The hypothesis was rejected because of the P-value is greater than 0.05.
H0: Experience is not significant and has positive relationship with adaption of contract farming.

Income
The regression analysis found that there was significant influenced of income in adoption of contract farming because the analysis showed that (coef = 3.438421, P = 0.000) which indicates that there was a positive relationship between income and adoption of contract farming as well as the relationship was statistically significant as the p-value < 0.05. The hypothesis was accepted because of the P-value is less than 0.05.
H3: Income has significant and positive relationship with adaption of contract farming.

Peer Group
The regression analysis between peer group and adoption of contract farming indicated that peer group was not significantly influencing the adoption of contract farming (coef = 0.1968512, P = 0.671) which imply that peer group had positive influence in adoption of contract farming but it was not statistically significant as a generalization of the population values cannot be made when the p-value exceeds 0.05 or 5% cut off point. The hypothesis was rejected because of the P-value is great than 0.05.
H0: Peer group is not significant and has positive relationship with adaption of contract farming.

Differences in Terms of Income and Yields Between Contract And Non-Contract Farmers
Under this objective, the researcher wanted to determine the differences in terms of income and yields between contract and non-contract farmers. Before the study looks for the differences, the researcher started to determine the relationship between the characteristics of the farmers and the two groups of farmers included with contract and non-contract farmers. The analysis has done through the chi-square test statistics to test relationship for the characteristics of the farmers. However, the researcher determined the agricultural inputs and effort used between these two groups contract farmers and non-contract farmers prior looks for the differences and the linear multi regression analysis was done to test the relationship between these inputs and contract farmers and without contract farmer. Moreover, the researcher determined the differences between contract farmers and non-contract farmers in term of income and yields. The one-way ANOVA analysis was done to test the difference between these two groups as presented below:

Farmer Characteristics: Testing for Relationships

In this study, the researcher used a chi-square test to determine the differences between cotton growers' characteristics with and without a contract. All the variables were tested exceeded the significant level of 0.05, showing they are not significant difference between contracting and non-contracting farmers. Sample homogeneity represents trends in community decision-making where data on investment choices are affected by relative, family or peer group gatherings, donor capacity construction efforts, and thus the similarities between assets and other means of manufacturing. Table 4 below summarizes multiple statistics on farmers' features for chi-square testing.

Table 4 Summary of various Chi-square test statistics for farmer characteristic

Cross tabulating variable	Chi-square test statistics		Conclusion
Sex of farmer	1.909	(p-value=0.167)	Farmers' sex is not a significant distinction between contract farmers and non-contract farmers
Age	7.343	(p-value=0.062)	Age distribution between contract and non-contract farmers is not a significant distinction
Highest level of education	8.277	(p-value=0.218)	Highest level of education between contract and non-contract farmers is not a significant distinction

From the above discussed descriptive statistics in table 4 shows that most contract farmers have achieved primary education, few have secondary education and some did not attend school. A percentage of 59% of contract farmers have a primary level education, 14% of the farmers have secondary education and 27% did not go to school. The chi-square test, however, demonstrates that there are no significant differences in both groups between the highest levels of education attained. The chi-square test, therefore, demonstrates that this distinction is not significant, meaning it does not relate to adaption of contract farming.

Factors that Cause Changes in Productivity and Income-Testing For Relationship

The researcher tested the relationship between factors and productivity and income with and without contract farming. The multi linear regression analysis was used to test the relationship among two variables which includes independent variables and dependent variable. The independent variables were used in this study include; Costs, investment requirements, plant protection measures and incidence of disease and dependent variable was used includes: production performance. From the multiple linear regression analysis, the results showed that cottons production performance scores with contract and without contract farming was positively related to protection measures to the highest extent compared to other variables, followed by incidence of disease, and investments requirements due to the fact that beta values under standardized coefficients were positive includes; beta = 0.544, 0.261 and 0.136 respectively. But, negatively related to costs because of beta value was negative under standardized coefficients of 0.031.

However, this implies that cottons productions performance in term of yields and income with contract and without contracts was increasing by 0.544 for every improvement of plant protection measure, by 0.261 for every change in incidence of disease and by 0.136 for every improvement in investment requirements and was reduced for any change in cost. Furthermore, the analysis shows that the effect of

protection measure and incidence of disease, weeds and insects were significant; t = 6.369, p-value = 0.000, and t = 2.955, p-value = 0.004 respectively.

Table 5: Regression analysis – factor that causes change in Production

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Variables	B	Std. Error	Beta		
1 (Constant)	1.051	.551		1.908	.059
Costs	-.070	.178	-.031	-.392	.696
Investment requirements	.264	.157	.136	1.684	.096
Protection	1.172	.184	.544	6.369	.000
Incidence of disease	.496	.168	.261	2.955	.004

a. Dependent Variable: Cottons production performance

Moreover, basing on the Cobb-Douglas theoretical review, the researcher revealed that there were other factors that cause changes in production under this theory which included: farmer behavior, capital, land, and labor. According to this theory, the researcher revealed that farmer behavior i.e. gender, age, education, experience, marital status and income status cause changes in productivity and income in both contract farmers and non-contract famers. Also, the researcher revealed capital is one of the factors that cause changes in productivity and income in contract farmers and non-contract famers. Farmers who have enough capital, they capable to access more and better tools, equipment, seeds and pesticides for their farm to gain high productivity and income. However, the researcher revealed that land is another factor that causes changes in productivity and income in contract farming and non-contract farming. The famers who have enough land are capable to cultivate large quantity of crops lead to gain better income, this enhances efficiency in production. In addition, Cobb Douglas theory stated that the labor is vital factor in production that enhances efficiency in production. This is considerable factor for production because it can cause the change in productivity and income, more labor involved, more wages paid which will lead cost to become higher rather than using machine in production hence it reduces income to farmer. Furthermore, the researcher was applied stochastic production frontier model to measure these factors that cause changes in productivity and income as shown in Table 6.

Table 6 Stochastic production frontier-Factors of production

	Coef.	Std.err	Z	P>z
Protections	-0.2198191	0.0834389	-2.63	0.008
Disease	-0.370327	0.0816551	-4.54	0.000
Capital	0.1072951	0.1980028	0.54	0.588
Land	-0.5474626	0.2040652	-.2.68	0.007
Labor	0.410724	0.1240032	3.31	0.001
Gender	-0.932955	0.0875143	-1.07	0.286
Age	-0.1297818	0.0857414	-1.51	0.130
Marital status	-0.0364886	0.1092348	-0.33	0.738
Education	0.281118	0.0693842	4.05	0.000
Experience	0.7148385	0.090637	7.89	0.000
Income	1.023308	0.2807696	3.64	0.000
cons	-1.298176	0.9310973	-1.39	0.163

NB: Stochastic frontier normal/half-normal model, Number of Obs = 100, Wald chi2 (11) = 198.96, Log likelihood = -44.834101, Prob > chi2 = 0.0000 for both contract and non-contract farmers.

Protection Measure

From the table 6 of Stochastic frontier model above, the results showed that the efficiency of productivity and income scores were negatively related to protection measure because coefficient was negative, i.e. -0.2198191. This implies that efficiency of productivity and income was reduced by -0.2198191 for every decrease in protection measure; however, the analysis showed that the relationship was statistically significant since the z is -2.63 and p-value is 0.008 because of P-value is less than 0.05.

Incidence of Diseases

From the table 6 of Stochastic frontier model above, the results showed that the efficiency of productivity and income scores were negatively related to incidence of diseases coefficient was negative, i.e. -0.370327. This implies that inefficiency of productivity and income was reduced by -0.370327 for every decrease in incidence of diseases; however, the analysis showed that the relationship was statistically significant since the z is -4.54 and p-value is 0.000 because of P-value is less than 0.05.

Capital

The stochastic frontier in table 6 above indicated that the direct path from capital to influencing the efficiency of productivity and income had a coefficient score of (coef. = 0.1072951, P < 0.588), implying that efficiency of productivity and income was positive changed by the capital. It implies that when capital increase, efficiency of productivity and income increase by 0.1072951coefficient, however the analysis showed that the relationship was statistically significant since the z = 0.54 and P = 0.588 because of P>0.05.

Land

From the table 6 of Stochastic frontier model above, the results showed that the efficiency of productivity and income scores were negatively related to protection measure because coefficient was negative, i.e. -0.5474626. This implies that efficiency of productivity and income was reduced by -0.5474626 for every decrease in land; however, the analysis showed that the relationship was statistically significant since the z is -2.68 and p-value is 0.007 because of P-value is less than 0.05.

Labour

The stochastic frontier in table 6 above indicated that the direct path from labor to influencing efficiency of productivity and income had a coefficient score of (coef. = 0.1072951, P < 0.588), implying that efficiency of productivity and income was positive changed by the labor. It implies that when labor increase, efficiency of productivity and income increase by 0.1072951coefficient, however the analysis showed that the relationship was statistically significant since the z = 0.54 and P = 0.001 because of P> 0.05.

Gender

From the table 6 of Stochastic frontier model above, the results showed that the efficiency of productivity and income scores were negatively related to gender because coefficient was negative, i.e. -0.932955. This implies that efficiency of productivity

and income was reduced by -0.932955 for every change in gender; however, the analysis showed that the relationship was not statistically significant since the z is -1.07 and p-value is 0.286 because of P-value is greater than 0.05.

Age

From the table 6 of Stochastic frontier model above, the results showed that the efficiency of productivity and income scores were negatively related to age because coefficient was negative, i.e. -0.1297818. This implies that efficiency of productivity and income was changed by -0.1297818 for every change in age; however, the analysis showed that the relationship was not statistically significant since the z is -1.51 and p-value is 0.130 because of P-value is greater than 0.05.

Marital status

From the table 6 of Stochastic frontier model above, the results showed that the efficiency of productivity and income scores were negatively related to marital status because coefficient was negative, i.e. -0.0364886. This implies that efficiency of productivity and income was changed by -0.0364886 for every change in marital status; however, the analysis showed that the relationship was not statistically significant since the z is -0.33 and p-value is 0.738 because of P-value is greater than 0.05.

Education

The stochastic frontier in table 6 above indicated that the direct path from education to change efficiency of productivity and income had a coefficient score of (coef. = 0.281118, P < 0.000), implying that efficiency of productivity and income was positive changed by the education. It implies that when education increase, efficiency of productivity and income increase by 0.281118 coefficient, however the analysis showed that the relationship was statistically significant since the z = 4.05 and P = 0.000 because of P> 0.05.

Experience

The stochastic frontier in table 6 above indicated that the direct path from experience to change efficiency of productivity and income had a coefficient score of (coef. = 0.7148385, P < 0.000), implying that efficiency of productivity and income was positive changed by the experience. It implies that when experience increase, efficiency of productivity and income increase by 0.7148385 coefficient, however the analysis showed that the relationship was statistically significant since the z = 7.89 and P = 0.000 because of P> 0.05.

Income

The stochastic frontier in table 6 above indicated that the direct path from income to change efficiency of productivity and income had a coefficient score of (coef. = 1.023308, P < 0.000), implying that efficiency of productivity and income was positive changed by the income. It implies that when income increase, efficiency of productivity and income increase by 1.023308 coefficient, however the analysis showed that the relationship was statistically significant since the z = 3.64 and P = 0.000 because of P> 0.05.

Differences Between Contract Farming and Non-Contract in Term of Yields and Incomes

Comparison Between Contract and Non-Contract- Test For Relationship

The researcher tested the relationship between these two groups include contract farming and non-contract farming on cottons production performance in Bunda district. ANOVA analysis test was conducted to test the difference between two groups of variables. The results in analysis show that there was a significant difference between contract farming and non-contract farming in term of yields and incomes because of F-value = 12.255 and P-value = 0.000 which is less than 0.05.

Table 7 ANOVA analysis test for contract and non-contract farming

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	7.008	4	1.752	12.255	.000
Within Groups	13.582	95	.143		
Total	20.590	99			

However, the researcher indicated that the difference existing between contract and non-contracting farming on cottons production of cottons performance with respect to yields and income occurs as a result of factors that cause change in the production of cottons. The researcher discovered that this difference was a result plant protection measures and extent of insects, disease and weeds. On the other hand, the investments and its associated costs where the factors though were not significant for the cause. Furthermore, the researcher indicated that non-contract farming needs more plant protection and weedicides compared to on contracting farming and also the extent of insects, disease and weedicides were higher on non-contracting farming than to contracting farming which reduced yields and income on production of cottons. Therefore, from this fact, the contract farming systems are more favorable in Bunda district as compared to non-contract farming systems.

H1: Contract farming and non-contract farming has significant different between the two group in terms of yields and income

The Impact of Contract Farming on Farmers in Bunda District

The researcher interested to determine the impact of contract farmers on farmers in Bunda districts. The study determined the impact of only contract farming on yields and incomes of the farmers in Bunda and not in non-contract farming. Descriptive statistics and correlation analysis were performed to determine the frequency of responses and relationship between contracting farming and yields and income respectively on this objective. The results were as follows:

The Impact of Contract Farming on Farmers Yields

The researcher addressed the question in questionnaire to know the estimated average yields per hectare were produced by the farmers in Bunda district. The researcher revealed that the estimated average yields per hectare on farmers who are in contract farming were more than 350 kg. The responses were as follows; 8 percent of the respondents said the average yield per hectare was less than 200 kg, 16 percent of the respondents said the average yield was between 200 to 250 kg, 20 percent of the respondents said the average yield was between 250 to 300 kg, 26 percent said the average yield was between 300 to 350 kg and 30 percent of the respondents said it was

more than 350 kg. (Table 8). The researcher noted that farmers get different average yields that are in contract farming, but to the majority of the farmers the estimated yield per hectare was more than 350 kg.

Table 8 Estimated average yield per hectare

	Frequency	Percent
Less than 200 kg	4	8.0
200 - 250 kg	8	16.0
250 - 300 kg	10	20.0
300 - 350 kg	13	26.0
More than 350 kg	15	30.0
Total	50	100.0

Moreover, the respondents argued that contract farming significantly increase the yield potential but lowers the group technical efficiency. Also, they said that the positive effects on the yields potential and the (average) productivity can be caused by the contractor's provision of (addition) extension services and seeds of high-yielding varieties to the contract farmers.

The Impact of Contract Farming on Yields – Testing for Relationship

The researcher tested the relationship between contract farming against farmers' yields. The correlation analysis was used to test the relationship among two variables which includes independent variables and dependent variable. The independent variables were used in this study included; contract farming and dependent variable was used includes: farmers' yields. The results showed that in sample of 50 respondents, there was significant relationship between contract farming and farmers yields, r = 0.276 and p-value = 0.050. However, this means that, there was a positive relationship between contract farming and farmers' yields and the sample reflect the population value to the facts that p-value is less than 0.05. Hence, the contract farming was significantly positive effect on farmers in Bunda district in term of yields statistically. The hypothesis was accepted because of the P-value is less than 0.05.

H1: Contract farming has significant and positive impact on farmers' yields.

Table 9 Correlations analysis for contract farming

		Contract farming	Famers yields
Contract faming	Pearson Correlation	1	.276
	Sig. (2-tailed)		.050
	N	50	50
Farmers yields	Pearson Correlation	.276	1
	Sig. (2-tailed)	.050	
	N	50	50

*. Correlation is significant at the 0.05 level (2-tailed).

The Impact of Contract Farming on Income

The researcher addressed the question in questionnaire to know the rates of profitability that farmers make in contract farming in Bunda district. The investigator wished to understand the farmer rate of cotton contract farming's profitability.

Responses were as follows; (32)64 percent of the respondents' said profitability was high, (9)18 percent of the respondents' said profitability was moderate, (5)10 percent of the respondents said profitability was low and (4)8 percent of the respondents said there was no profit at all (see Table 10). The analysis showed that farmers get a different rate of profit in contract farming, but to the majority responded that the contract farming has high profit.

Table 10 the rate of profitability of cotton contract farming

	Frequency	Percent
High	32	64.0
Moderate	9	18.0
Low	5	10.0
Unprofitable	4	8.0
Total	50	100.0

However, the respondents argued that the contract farming stimulate cotton farmers to boost their income as a result of because of its ability to address the challenges of agricultural, marketing and production. The benefit of contract farming can be realized by farmers through the facilitation of access to inputs, credit, advanced technology and remunerative markets, hence boosting the farmers' income. Furthermore, the respondents showed that the contract farming leads to appropriate coordination and resource allocation hence, result in poverty reduction and improvement of livelihoods of farmers. However, it was argued that contract farming enables risk sharing between agricultural business firms and producers hence it can allow reduction of price and volatility of income.

The Impact of Contract Farming on Income- Testing for Relationship

The researcher tested the relationship between contract farming against farmers' income. The correlation analysis was used to test the relationship among two variables which includes independent variables and dependent variable. The independent variables were used in this study included; contract farming and dependent variable was used includes: farmers' income. The results showed that in sample of 50 respondents, there was significant relationship between contract farming and farmers yields, r = 0.341 and p-value = 0.015. However, this means that, there was a positive relationship between contract farming and farmers' income and the sample reflect the population value to the facts that p-value is less than 0.05. Hence, the contract farming was significantly positive effect on farmers in Bunda district in term of income statistically. The hypothesis was accepted because of the P-value is less than 0.05.
H2: Contract farming has significant and positive impact on farmers' income.

Table 11 Correlations analysis for contract farming on income

		Contract farming	Farmers income
Contract farming	Pearson Correlation	1	.341*
	Sig. (2-tailed)		.015
	N	50	50
Farmers income	Pearson Correlation	.341*	1
	Sig. (2-tailed)	.015	
	N	50	50

*. Correlation is significant at the 0.05 level (2-tailed).

Conclusion

The findings of this study reveal that contract farming has a significant impact on the productivity and welfare of small-scale cotton farmers in Bunda District, Tanzania. The study demonstrates that contract farming contributes to increased yields and income for farmers, with participating farmers achieving higher productivity due to improved access to inputs and extension services. Additionally, socio-economic factors such as income levels and peer influence play a role in farmers' decisions to adopt contract farming. However, despite its benefits, contract farming is not without challenges, including delayed input provision, side-selling, and weak enforcement of contractual agreements.

Recommendation

The Role of Government in Promoting Cotton Contract Farming Viability

The government can provide a support price or subsidy on the cost of cotton inputs to tackle the challenge of low profitability of the agricultural cotton industry owing to low producer prices. Cotton manufacturers and merchants could put pressure on the government, arguing that in terms of foreign currency income, cotton remains an economically significant crop. Another pressure point could be job creation from the domestic economy's cotton industry. The government and all stakeholders must now plan a strategy on how to deal with this worm.

Communication of the Contract Agreements

Contractors are required to print vernacular agricultural agreement papers to enable farmers to comprehend their contents and consequences better. Anyone interested in cotton contract farming should understand the language used irrespective of their academic level. It is therefore essential to translate the contract farming agreement into all vernacular languages. It is also suggested that contract terms and conditions to benefit both farmers and contractors should be reviewed.

Availability of Adequate Inputs

Cotton businesses must provide appropriate packages of inputs per contract hectare if they wish to encourage higher efficiency, profitability, and restoration of loans. Farmers opting for contract farming are poor in resources and are unable to finish insufficient packages. Giving seeds, chemicals and fertilizers half or less of the cotton ISO would certainly leave the farmer in a worse situation. Insufficient inputs yield sub-optimal returns, low yields, and low recovery rates.

Employment of Competent Field Staff to Train Tarmers

The training of farmers should be improved by using skilled staff in the sector. The fact, that the merchants have been practicing contract farming for many years and yet most farmers are still need training is proof of inefficient field staff in terms of farmers training. The proportion of field agents per farmer should be minimal to allow the employee enough time to solve each farmer's shortcomings.

To conclude on the recommendations, rates of loans should be lowered to enable farmers to repay their loans and farmers should be honesty whenever receiving those loans and should use them for the intended purpose.

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