

## **DETERMINANTS OF SMALLHOLDER COTTON CONTRACT FARMING PARTICIPATION IN A RECOVERING ECONOMY: EMPIRICAL RESULTS FROM PATCHWAY DISTRICT, ZIMBABWE**

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### **ABSTRACT**

Due to the recent economic recession and a decade of economic stagnation, anomalies have been observed in the cotton sector. An examination of the determinants of farmer participation in cotton contract farming was carried out on 100 smallholder farmers. The case was Patchway in Kadoma. Purposive sampling was used to select the study villages. Snowballing was then used to identify respondents. Questionnaires and Focus Group Discussions were used to collect data. Observations augmented data collection. Data were analyzed using logit regression model and Friedman rank test. Most parameters were observed to significantly influence participation. Non flexibility of the contractual arrangements was the major problem faced as well as price inconsistency. Though opportunities such as policies to counter side marketing exist, stringent implementation and monitoring regimes need to be put in place. This baseline analysis will aid in the development of sustainable strategies in restoring viability of the enterprise.

**Key words:** Determinants; Cotton; Contract farming; Recovering; Empirical.

### **INTRODUCTION**

Agriculture is strongly supported in Zimbabwe by the government, the private sector and many local and international non governmental organizations (NGOs). These have for a considerable time rendered diverse forms of financial and institutional support systems. The main thrust is primarily to act as a strategy to increase income and reduce poverty to enhance the food and nutritional security especially of rural households. Despite the reported significant economic advantages and the concerted support of the various stakeholders, the current performance of the agriculture subsector in Zimbabwe remains an insignificant part of its potential.

Traditionally agriculture has been the cornerstone of Zimbabwe's economy accounting significantly towards Gross Domestic Product (GDP) and total export earnings as well as supplying the manufacturing sector's raw materials. Approximately 60 % of the economically active population depends on the subsector for food and employment (Rukuni, Tawonezvi. Eicher, Munyuki-Hungwe and Matondi, 2006).

The decline in economic activity in the country over the last decade greatly compromised performance in the subsector. This was mainly so because of significant declines in government expenditure (mainly in the form of subsidies), which is the conventional way of supporting especially resource constrained farmers. Various initiatives were crafted to cope with the developments in the economy, among them contract farming, which actively brought in other stakeholders to partner and augment government efforts. Rukuni *et al.*, (2006) asserted that contract farming could revive the agriculture sector in Zimbabwe especially in high value crops such as cotton, barley, paprika and tobacco where returns to investment were high. With the communal farmers contributing about 70 % of the national cotton yield, contractors have mainly targeted them and provide inputs such as chemicals, seed, fertilizers and in some cases money to pay for labor (Esterhuizen, 2004). Even though some observers (Mugwagwa, 2005) proposed that there is no viability in entering cotton contract farming, (Esterhuizen, 2004) had pointed out that cotton contract farming ensures guaranteed markets to their farmers which is instrumental in the success of agricultural production. This variation is mainly so in the wake of a spectrum of problems encountered in cotton contract farming such as breaching of contracts especially side marketing, inadequate finance from contractors, poor quality produce and unfavourable producer prices that makes this contract unsustainable.

Despite these drawbacks, most cotton companies including COTTCO, Cargill and Grafax have embraced the initiative. Chizarura (2007) argued that these hindrances are attributable to worsened macroeconomic instability. The objective of this study is firstly, to investigate the constraints and opportunities faced by smallholder cotton contracted farmers in Patchway, secondly to examine the most critical factors that influence the smallholder farmers' participation in cotton contract farming and finally draw out implications for cotton contract farming that are inclusive at all geographical and political scales. This is done in the post economic recession era so as to develop appropriate support systems that are sustainable.

## **LITERATURE REVIEW**

### **Cotton contract farming in perspective**

In Zimbabwe cotton contract farming can be defined as an extension of contracting firm's activities in which the firm has considerable control over the smallholder production and provides a comprehensive input or extension package and in turn, the farmers provide labor and land as highlighted by Kwenda (2009). The contractor specifies the conditions of the contract pertaining to hectares, quantity, price schedule, payment modalities and the delivery schedule. The basis of this arrangement is the commitment of the farmer to provide a specified quality of produce as determined by the contractor and a commitment on the part of the company to support the farmer's production and purchase the produce in effect making the contract non transferable (Eaton and Shepherd, 2001). Contract farming has expanded particularly in countries that have liberalized their markets through closing down of marketing boards. (Rukuni *et al.*, (2006) acknowledged that contract farming has considerable potentials in Zimbabwe where smallholder agriculture is widespread. According to the risk theory, contract farming is usable by both the contractor and the farmer to mitigate risk (Makhura, Coertze, and Good, 1996). As a result, contract farming has received increased attention as an institutional approach to commercialization of smallholder agriculture; improvement of the incomes and livelihoods of smallholder farmers and private sector led agriculture in Zimbabwe as postulated by Wooded (2003). Its pre-eminence in Zimbabwe is attributable to coordinating of agriculture production and processing by agribusiness. The liberalization of the agriculture markets and removal of subsidies has made a number of farmers indulge in contract farming

Cotton is generally a capital and labour intensive crop and its production is based on the ability of a company to finance farmers throughout the production season since few farmers can afford much field work and alternative systems have developed slowly (Ton, 2002; Toulmin and Gueye, 2003). Several factors have been linked to the emergence of contract farming. The factors vary between developed and developing countries. In developed countries, agribusinesses were economically motivated and entered into contracts with farmers in order to obtain assured supply of produce for processing (Key and Runsten, 1996). Baumann (2000) classify contract farming into out-grower schemes, nucleus estate – out-grower schemes, and multipartite arrangements. Contracting agribusinesses incorporates monopsonies or oligopsonies hence smallholder farmers need to be organized to boost their bargaining power (Coulter, Goodland, Tallontire, and String fellow, 1999).

The conventional cotton production has contributed to most economies in Sub-Saharan Africa (Minot and Daniels, 2002; Ton, 2001). Notably, cotton production in developing economies has been greatly affected by subsidies paid by the USA, European Union and China that undermine world market prices through overproduction (Goreux, 2003; Linard, 2002; Watkins, 2002). Moreso, in developing economies, prices of cotton are set below world prices to subsidise the state sector and allow it to compete against artificially low international market prices caused by subsidies elsewhere (Watkins, 2002).

With cotton being vulnerable to pests, especially when grown as a monoculture, there has been significant rises in production costs notably in developing economies. This has been compounded by the impacts of agrochemicals on human and environmental health thus significantly contributing to lower cotton farming (PAN UK, 2003; Ton, 2002; Williamson, 2003). To counter these developments, organic cotton projects in sub-Saharan Africa have evolved over time and are focusing more on farmers' welfare as well as the demand of the more lucrative markets. Projects in Zimbabwe have promoted an extension system relying on the training of literate farmers as Farmer Field Workers who would in turn share their knowledge with about 10 fellow producers (Wilson, 2002). The effectiveness of this approach has been questionable in the wake of the numbers involved in cotton farmers against those trained. In recent years, however, significant investments have been made in adapted extension and training systems (Ton, 2002) and these are financed by donors but transferable to markets.

### **Costs and Benefits of Contract Farming**

Wooded (2003) highlighted that the institutional arrangement of contract farming has reduced the transactional cost and improved market efficiency to benefit the smallholder farmer. In Zimbabwe, the cotton out growers' schemes has commercialized the cotton smallholder agriculture through provision of assured markets, "favourable" producer prices, critical input provision and knowledge on agriculture technologies to farmers and as a driver to rural development. The schemes are creditable for playing a key role in increasing profitability of crop farming reducing market risk and above all opening new markets (Larpar, Holloway and Ehui, 2008). Contract farming has proved effective in integration of smallholder farmers in that provisions of seasonal finance is made to farmers that they cannot access through normal commercial channels as acknowledged by Wooded (2003). This has lightened the burden of sourcing scarce and expensive inputs to rural farmers.

Furthermore, the system has also promoted infrastructural development in the rural areas for cotton industries such as agrochemicals, fertilizer and cotton marketing companies. As a result, the adoption of contract farming has created employment especially for the rural poor. Wooded (2003) also appraises contract farming for giving the smallholder farmer the opportunity to earn income as evident by a large participation of smallholder farmers in cotton production as a means of acquiring cash.

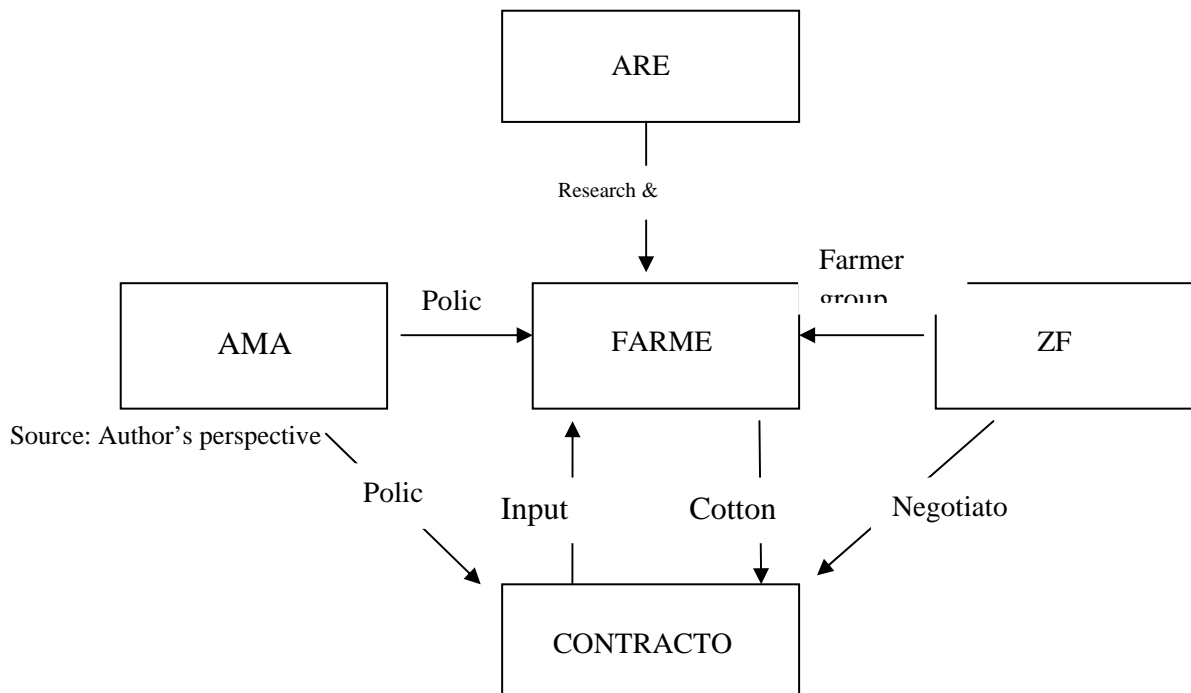
Contract farming is less subjective if smallholder farmers are involved and sponsors have or attainment of political acceptability. As long as the farmer is not a tenant to the sponsor contract farming is less likely to be subject to criticism. With the land reform program in Zimbabwe contractors have managed to overcome land constraints through assessing crop production to land that is unavailable to the company with the additional advantage that it does not have to purchase it. Working with contracted farmers enables sponsors to share the risk of production failure weather, diseases etc. The farmer takes the risk of loss of production while the company absorbs losses associated with reduced or non-existent throughput for processing facilities.

**METHODOLOGICAL FRAMEWORK**

According to (Kumar, 2005; Patton, 1990), a research methodology is the guide to the research process.

**Conceptual Framework**

The researcher conceptualized cotton contract farming as in Figure1.



**Figure 1: Conceptual diagram of cotton contract farming**

## **Study Area**

Pathway district is located in Mashonaland West province with a population of about 40 000. The area is in Natural region III with moderate mean annual rainfall ranging between 600-700 mm. However, some parts are characterized by severe dry spells during the growing season or relatively short growing season. Temperatures range from 28 to 32 ° C. Main crops grown in the area are cotton, soyabeans, groundnuts, sunflower and maize. The production of small grains such as sorghum and mhunga is under promotion in the lower valley areas through contract farming due to the low rainfall pattern in those regions. There are four contractors namely COTTCO, Cargill, OLAM and Alliance with each having at least one extension agent responsible for crop management. Depots are scattered around the area.

## **Data collection**

A case study approach was used to attain data on contracted cotton production. Purposive sampling was used to select a high cotton producing area with a number of contractors. Snowball sampling was later employed in the process of selecting a sample using networks. A blend of qualitative and quantitative data were collected. To understand behavior, attitudes, opinions and perceptions, the researcher used questionnaire, interviews and focus group discussion (conducted with two Agritex extension officers, and the representatives of COTTCO, Cargill, Alliance and OLAM). Observations were also done to triangulate data collection. This design was flexible and allowed respondents to freely express their views and opinions.

## **Analytical Techniques**

### **Friedman Test**

The Friedman test was used to rank the problems and opportunities faced by the farmers in cotton contract farming based on some preset scale. A set of constraints had been developed prior to the study during an earlier reconnaissance visit to the study area. This analytical tool was chosen because of its easiness to interpret. According to the scale of 1- extremely severe to 4-not severe, the constraint with the highest mean value was considered as the most problematic to the contracted cotton farmers.

### **Logit Regression**

The ability to choose an appropriate econometric model was mainly based on a concise definition of participation. In this context, participation implies being contracted to one contractor during the period under review. The model was used to analyze the relationship between participation and various variables including demographic characteristics and other factors external to the household. A logit regression model was chosen because of its ability to determine the effects of variables on the probability of farmer participation. It also yields the

### Description of the Hypothesised Contract Farming Participation Variables

It is vital to discuss the variables included in the model before analysing their effects. These include human-capital variables such as level of education and age, resource endowments, social psychological factors as well as tenure systems in the study area. The variables hypothesised to influence the participation decision are summarised as in Table 2. The basis of the selection of these variables was literature on related studies, the perception of the researchers on the socio-economic as well as institutional dynamics of the study area.

**Table 1: Description of variables included in the logit regression model**

Variable	Unit	Participants		Non Participants	
		Mean	SD	Mean	SD
Age of household head	Year	42.3	13.2	26.5	10.6
Household Size	Number	5.2	0.9	4.2	1.3
Dependency Ratio	Percentage	18.5	13.6	13.8	12.9
Education level household head	Year	10.3	4.4	6.5	2.7
Access to other income	Percentage	5.6	13.1	8.8	12.5
Land size	Hectares	4.1	6.5	2.3	5.7
Duration of household growing cotton	Seasons	36.5	11.9	19.40	10.7

Source: Author's Analysis 2010

## RESULTS AND DISCUSSION

### Constraints and opportunities faced by cotton contracted farmers

**Table 2: Perceived disadvantages of cotton contract farming**

Constraints faced by farmers	Farmers (%)	Mean	Rank
An inappropriate pricing system	78	2.18	2
Inadequate input supply	97	2.69	4
Not flexible	92	1.89	1
No representative in decision making	74	2.43	3
Late supply of inputs	89	3.89	6
Unavailability of seed on the market	96	3.25	5
Weak enforcement of contractual laws	79	2.43	3
N	100		

Source: Author's Analysis 2010

Table 2 shows the ranks of constraints experienced by the contracted farmers.

Cotton farmers face a number of problems, such as inadequate and untimely input supply from the contractor. The main disadvantage as observed in the study area is the rigidity of the contracts. In this time of economic recovery in Zimbabwe,

new players are coming on board the cotton industry. Once the farmer is contracted, there is no room for maneuvering to other players (even if the shift is justified for example by unsustainable prices or vagaries of nature)

In this regard, farmers viewed the pricing system as unfair in that contractors varied their prices from one farmer to another without necessarily using grading of the produce as the basis. This disincentivized most farmers especially when this scenario continued into the multicurrency era. Contractor argued that, the inconsistency in prices was a strategy to safeguard themselves from other rivals who lured their customers through offering attractive prices. Instead of cash recovery of inputs, the contractor used the kilogram system to recover their inputs from the farmers. However, the system was not clear to the farmer at the time of signing the contract therefore some farmers resorted to side marketing.

Farmers feel that the representation they are getting in the process is not consultative and should be area specific and not universal. The feeling among farmers is that they have to be consulted and informed (in a language they understand) about the whole process so that they make informed decisions. Currently farmers are producing the crop, not because it is profitable, but because it has always been their way of life in the area. Contractors have been observed to be breaching the contractual agreement by not adhering to the terms of the contract in terms of announcing the producer price. This has greatly compromised farmers' decision on whether to continue with the production of the crop or not. Therefore, farmer suggested that the contractors announce the prices at the beginning of the planting season as is the case in Zambia and Mozambique (Chizarura, 2005; Kabwe and Tschirley, 2008).

The inputs provided to the farmer were inadequate. This resulted in 60 % of respondents failing to repay the "loan" and assets declared impounded. This explains why cotton farmers still live in vicious cycle of poverty. From the view point of the contractors, failure to supply adequate inputs was because the inputs like fertilizer were scarce locally and had to be imported. The extra cost was then passed on to the farmer (which was not part of the initial agreement). In most cases, farmers had to supplement the inadequate inputs from personal savings or additional borrowing.

**Table 3: Perceived advantages of cotton contract farming**

<b>Opportunities faced by farmers</b>	<b>Farmers (%)</b>	<b>Mean</b>	<b>Rank</b>
Ready market	84	1.21	1
Convenient planting time	77	3.69	4
Improved farming practices	85	2.97	3
Reliable and affordable input supply	63	2.36	2
N	100		

Source: Author's Analysis 2010

Larpar *et al.*, (2008) observed that contract farming improves market access. However in Zimbabwe, after the introduction of the statutory instrument, even though farmers have a ready market for their produce transporting the produce to the market

(unlike in previous seasons when contractor bought the produce from the farm gate) introduces a new variable cost that further cuts the profit margin. By virtue of being contracted, a farmer has access to unlimited technical advice from extension workers provided by the contractor in terms of farming practices. This does not only benefit cotton production but other related crop enterprises. The positive externalities generated have been beneficial to the farmers. The nature of the cotton seed market is monopolistic. COTTCO has been observed to have monopolized cottonseed production and this has become the only source for farmer, and other contactors who venture into cotton contract farming. The scenario has actually forced some farmers to indulge in contract farming so as to have ready access to the seed. There is need to rationalise the seed supply system to promote competition that will be to the advantage of the farmers in terms of rationale pricing practices.

The institutional arrangement of contract farming has reduced the transactional cost and improved market efficiency to benefit the smallholder farmer as highlighted by Wooded (2003). In Zimbabwe, the cotton out growers' schemes has commercialized the cotton smallholder agriculture through provision of assured markets, high prices, critical input provision and knowledge on agriculture technologies to farmers and as a driver to rural development. The schemes are creditable for playing a key role in increasing profitability of crop farming reducing market risk and above all opening new markets. As in the case of Zimbabwe, most smallholder growing cotton have improved their housing, mechanized some of their operations and have invested in the local business centers as stated by Rukuni *et al.*, (2006). Farmers have improved their skills in management through training offered by the Cotton Training Centre in Kadoma and extension agents in all cotton-growing areas of the country.

### Factors influencing farmer participation in cotton contract farming

**Table 3: Factors influencing farmer participation in cotton contract farming**

Variable	Coefficient	t-ratio	Marginal effect
Constant	-4.567	-1.565 <sup>a</sup>	-0.856
Land size	0.923	4.682 <sup>c</sup>	0.0629
Dependency Ratio	0.082	1.113 <sup>b</sup>	0.0110
Years of schooling	-1.002	0.785 <sup>a</sup>	0.0657
Age	-2.214	4.457 <sup>b</sup>	0.0759
Years of schooling-by-age interaction	-0.0129	-1.007	-0.0012
Access to other income	-0.0720	-1.501 <sup>b</sup>	-0.0074
Duration growing cotton	0.0673	1.957 <sup>b</sup>	0.0062
Loglikelihood Function		-59.21674	
X (d.f.)		128.3764(6) <sup>c</sup>	
Percentage of correct predictions		95.4	

<sup>a</sup>Significant at 10%, <sup>b</sup>Significant at 5% <sup>c</sup>Significant at 1%



Source: Author's Analysis 2010

Most of the variables that were captured in the model (Table 3) had the expected signs. As per aprior expectations, duration growing cotton significantly influences the farmers' decision to participate in contract farming. In the context of the study, most farmers had on average five seasons under contract. This is constructed in the social dynamics of the communities under review where there are observable trends of conservatism irregardless of benefits derived from the practices. Land tenure system in place views inheritance as the norm and as such the enterprises that have been practices over time are still the ones practiced today.

On average, well-to-do farmers are less likely to participate in cotton contract. In the context of the study the access to off-farm and non-farm income had the expected sign. As the farmers' access to income from off farm and non-farm sources increases, the likelihood of being contracted increases to some point. This shows the importance of cash (for leverage) in the initial participation decision of farmers. However, at higher levels of off-farm and non-farm income, the farmers are less likely to participate in contract farming because they have enough to finance their farming activities and still remain with enough for contingencies. As postulated by Spio (2002) agricultural finance is a major constraint limiting market access, participation and commercialization of the smallholder farmers.

Farmer's age had the expected negative and significant influence on the chances of farmers participating in contract farming. The negative sign for the age variable could be understood from the commonly observed negative correlation between the age and adoption decision for most technologies in dynamic economic environments. In other words, younger farmers tend to be more willing to adopt than their older counterparts. With increase in age farmers tend to abandon cotton contract for less demanding cropping systems with low transactional cost associated with them. Furthermore, older farmers tend to be risk adverse and may avoid contract farming in an attempt to avoid risk associated with the initiative. This idea is supported by Makhura *et al.*, (1996) who argued, that being older assists farmers to overcome fixed transaction cost since some experience about market would have occurred overtime. In his study Norsidia, (2007), however observed that chances in participation in contracted farming increases with age because youths have little appreciation on the importance of agricultural activities in most rural set ups and will take marginal effort to expand these activities.

Education level (as measured by the number of years of schooling by household head) significantly influence farmers' participation in contract farming but with more achievements in academics participation tends to decrease. A possible explanation to this is that educated people tend to shun agriculture for white color jobs in Patchway and these are more concerned with time value of money and will prefer projects with quick return and profitable like broiler production. However, these results differ from Larpar *et al.*, (2008) who asserted that education influences household to process information and causes farmers to have better access to understanding and interpretation of information.

The education-age interaction had the expected sign, but was statistically insignificant in the study area. The reason for the insignificance of these variables may be that contract farming has a long history and is no longer considered as a risky initiative by farmers in Patchway. This has resulted in most farmers being contracted to various contractors. The negative

partial coefficient for the interaction effect could be understood from the universally observed negative correlation between the age and level of education. In most set ups, younger farmers tend to be more educated than their older counterparts.

From Table 1 land size significantly, influenced farmer participation in contract farming. A possible explanation to this could be that farmers with large arable land size have the opportunity to grow large tracts of cotton with adequate financing from contractors as it is the case in Patchway. Jackson and Cheater (1994) supported this by stating that the size of the land is important because the transactional costs are largely fixed cost that are spread across more potential output on large farms. There are also observable indications that increased participation in contract farming is a function of land productivity. Large land size also implies that farmers can diversify into other crops and reduce the inherent risk that is in agricultural production (and compounded by contract farming) (Hardaker, Huirne, Anderson and Lien, 2004).

Dependency ratio (i.e., the proportion of family members whose ages are less than 14 or more than 65), was introduced into the model as a surrogate for household size to indicate the status of labor availability in the household. The variable had a positive and significant effect on the participation decision. This greatly reflects on the high labor requirements of cotton production as compared to other crop enterprises. The higher the effective labour available the more likely the household is to be contracted since chances of labour shortages during peak times are low. This enhances the chances of favourable yields and ability to repay the contractor.

## **CONCLUSIONS AND RECOMMENDATIONS**

### **Conclusions**

The study reveals that contract farming is integral in integrating smallholder farmers into the overall economy in that provisions of seasonal finance is made to farmers that they cannot access through normal commercial channels. This has lightened the burden of sourcing scarce and expensive inputs to rural farmers. However the relationship between the farmer and the contracting firm thrive well where there are incentives and ways to monitor and enforce agreement.

### **Recommendations**

The researcher therefore calls for collaborative efforts (both in terms of facilities and conditions) by all economic agents in the establishment of more contracting firms in all of the rural communities in Zimbabwe. The government (through the invisible hand phenomenon) should also closely monitor the performance of the parties involved in cotton contract farming. Such arrangements should seek to prevent deceptive practices, inefficient management and regulatory inefficiencies by the various agents.

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