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A COMPARATIVE ANALYSIS OF PROFITABILITY OF COTTON PRODUCTION UNDER CONTRACT AND NON-CONTRACT FARMING

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A Comparative Analysis of Profitability of Cotton Production Under Contract and Non-Contract Farming

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Abstract - It has been widely argued that agriculture is undergoing a process of vertical integration with allied industries to which contract farming is most acceptable. As a continually evolving process, contract farming has taken many dimensions and has become the most popular issue in cotton production. An analysis was done on 50 Zaka district cotton farmers in order to come up with the real operations on the ground concerning cotton production by the smallholder communal farmers. The rationale was to compare the two farming systems in terms of productivity and viability of cotton production concerning contracted and self funded farmers. Questionnaires and interviews were used in data collection whilst the respondents were the sampled farmers from Zaka district to obtain primary data. Agritex, Cottco and Windmill were the sources of secondary data about production trends and activities in the district. The data was analyzed using the t-test and profitability ratios. The difference in yield of the two groups of farmers was insignificant considering the two seasons. However cotton farming proved viable despite the system used by the farmer with self funding proving to be more profitable considering the current economic situation. From the study it proved better for the smallholder communal to produce cotton on their own to increase market access until proper regulations are put in place with also the economy changed its atmosphere. Also the researcher recommended that the government should put strong regulations that protect both the farmers and the cotton companies in terms of prices and problem solving of other issues.

I. INTRODUCTION

Contract farming has been recognised in Zimbabwe and as a system that has the potential to increase productivity and reduce rural poverty. Apart from provision of inputs contract farming has the following benefits: access to credit and loans, provision of extension and technical advice, appropriate knowledge and management systems. These benefits are actually relevant to Zimbabwe's small holder farmers who until recently (when the multicurrency system came into effect) were experiencing continuous economic hardship due to inflation; also input supply was still on a

critical condition since shortages are noticed, (Dawes *et al*, 2009).

Agriculture growth in 2011 remained in line with projections of 19.3%, largely attributed to better preparedness through support from Government and cooperating partners, timely availability of inputs through the open market, contract farming arrangements as well as own farmer resources. Due to some uncontrollable circumstances such as draught in 2010-2011 season agriculture produce increased but with an insignificant margin.

Over the years, huge resources were committed to agriculture without the requisite impact on production and productivity. This paper compares the returns per dollar between the contract farmers and non contracted farmers in Zakadistict.

II. PROBLEM STATEMENT

Most farmers are used to produce cotton under the contract. Contract farming has become the conventional system which farmers are implementing and are failing to neglect even with the introduction of new dealers in cotton such as those from China. There is lack of information on the extent to which contract farming of cotton has contributed to alleviation of poverty of communal farmers. The condition of communal farmers has not been significantly changed which has been attributed to the burden passed by the contractors as the prices per bale that is being offered by contract farming companies is far below the world prices which are given below, (IMF, 2011). This has led to side marketing of cotton in Zimbabwe; the Ministry of Finance (2011) noted that incidences of side marketing activities by contracted farmers are threatening the existence of financial schemes which leaves a lot as to which production is perfect considering smallholder farmers.

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World Prices Of Cotton

Actual Market Price for Agricultural Commodities Annual Average					2011 Monthly Averages					
Commodity	Units	2008	2009	2010	Jan	Feb	Mar	Apr	May	Jun
Cotton	Cts/lb	71.4	62.8	103.5	178.9	213.2	229.7	216.6	165.5	164.9

Source : *International Actual Average Commodity Prices, IMF Data & Statistics*

III. METHODOLOGY

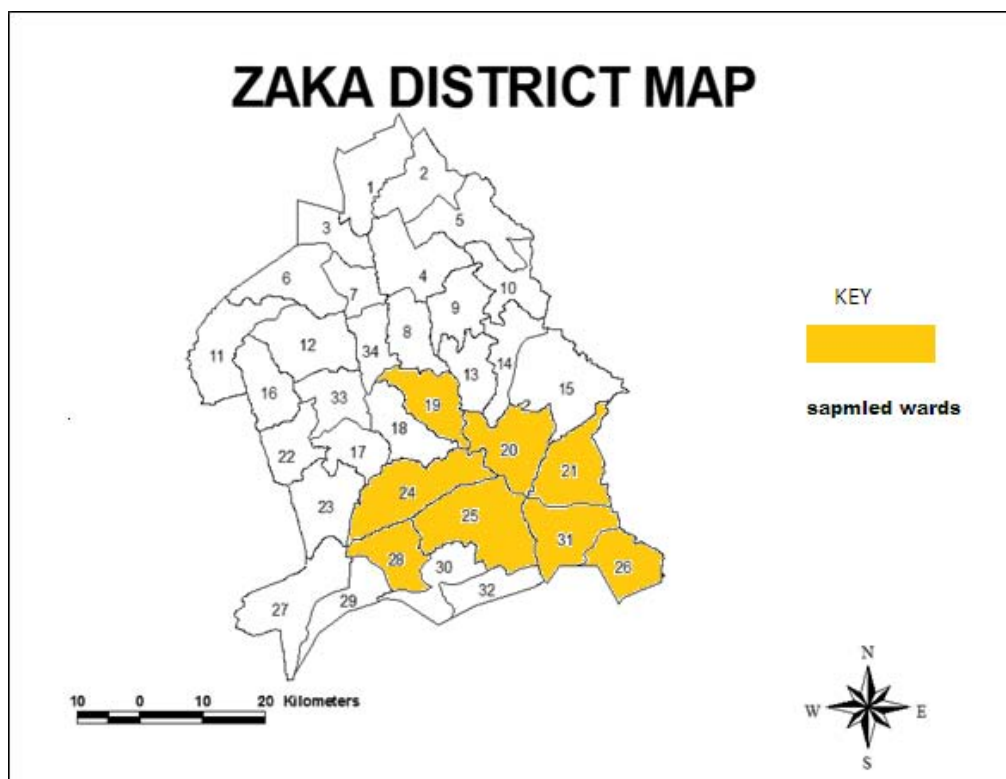
a) Description of the Study Area

Zaka district is located in Masvingo province, southern Zimbabwe, about 130 kilometers from the city of Masvingo and 70km from Chiredzi town. It lies in natural region V characterized by an annual average temperatures of about 26°C and an average annual rainfall of about 500 mm (Agritex Annual Report, 2009). The district is mostly characterized by sandy loamy soils and black clay loamy soils suitable for cotton production. In addition to cotton production, Zaka farmers are also into production of maize, sorghum, bambara nuts and ground nuts. Crop production

including cotton is mostly dry land with irrigation practiced in few areas mainly for subsistence. Beef production is mostly done in the the eastern parts of Zaka district in addition to small ruminant production.

Cotton production is grown as a cash crop with no other use or processing in the area. The communal farmers sell to the contract farming company deport, the only deport in the district located at Jerera growth point. Therefore the study was carried out in Zaka district as cotton is vastly grown in the area; however cotton contract farming contribution to poverty alleviation has not been evidenced with improvement in the standards of living of the communal farmers.

b) Zaka District Map



Source: Ocha Zimbabwe

III. RESEARCH DESIGN

a) Sampling Procedure.

The target population were cotton farmers in the wards where cotton is mostly grown as indicated in the map of Zaka district above. In the 8 wards targeted in the study the population of cotton producers amounted to 2800 farmers.

The sample size was obtained using the formular below:

$$\text{Sample Size} = \frac{X^2 NP (1-P)}{d^2 (N-1) + X^2 P (1-P)}$$

X^2 = Table value of Chi-Square at d.f (0.5 confidence level)

N = population size

P = population proportion (assumed to be .50)

d = degree of accuracy (expressed as a proportion-0.05)

Therefore sample size

$$X^2 = 3.84, N = 2800, P = 0.50, d = 0.50$$

$$n = \frac{3.84^2 * 2800 * 0.50 (1 - 0.50)}{0.05^2 (2800 - 1) + 3.84^2 * 0.5 (1 - 0.5)} = 247$$

The respondents were clustered depending on whether they had produced cotton under contract farming or self funding which formed the stratus. In line with selecting the actual farmers on the ground stratified random sampling was used and it was facilitated by the use of lists of cotton farmers obtained from the Agricultural, Technical and Extension services department (AGRITEX). Separate random samples were taken from each stratum of which if put together they form the population. Names of farmers were selected randomly from the lists using random number tables. To avoid bias for the farmers two thirds was selected from the contracted farmers and one third from the non contracted farmers.

b) Data Collection and Tools

The data collected included both qualitative and quantitative including socio demographic factors such as gender, age and marital status; yield, prices of cotton and prices of inputs. Primary data was collected using a structured questionnaire which included the yield and sales of cotton in the 2009/2010 and 2010/2012 seasons. The cost of inputs: seed, pesticides, fertilizers, transport and packaging material which form the marketing bills for the farmers as factors to consider to work out productivity and returns per dollar. Questionnaires and interviews were preferred as they allow active participation of the farmers in providing information.

Secondary data collection was also collected as part of the research. Data collected included the

production trends, input usage, sales and the cotton prices in the seasons 2009/2010 and 2010/2011.

c) Data Analytical Tools

T- Test

To compare the performance of contract farming and self funded production of cotton for the two seasons was done using the **t-test**. This was used in order to clarify whether there was significant difference between the two systems in terms of production capacities or that production capacities are the same or by chance.

d) Gross Margin and Profitability Ratios

Gross margin analysis was used to asses which production system is more viable than the other. Gross margin (also called gross profit margin or gross profit rate) is the difference between revenue and cost before accounting for certain other costs. Generally, it is calculated as the selling price of an item, less the cost of goods sold (production or acquisition costs, essentially). Considering the research, the sales included average sales obtained by the farmers of each production system which included all the grades that is grade A, B, C and D in the two seasons. Costs also included the average cost incurred by farmers of each farming system. The average costs were derived from the cost of fertilizers, seed, pesticides (fernkil and cabryle), transport, labour and packaging costs. The reason why the researcher opted to use the gross margins was to determine the value of incremental sales between the two production systems which were subjected to profitability ratio analysis.

Gross margin ratio was obtained to which it reflects what the farmer has left with from each dollar of net sales to pay operational and other expenses plus make a profit.

Formular: gross profit / revenue

Earnings on sales also known as return on sales for each farming system was also obtained which shows the return per dollar realized from each dollar of sales per each farming system.

Formular: net income/ sales

- Return on capital was also calculated which reflects the percentage by which each farmer is earning per dollar invested that the money dedicated by the farmers in each season.
- Formular: net operating profit / invested capital
- Real prices were used to compute the ratios and they were calculated using 2009 as the base year since this was the time when the \$US dollar was officially approved to be used as the country's official currency.

IV. RESULTS

a) *T-test Results*

These were the t-test results that were obtained after the data was subjected to SPSS version 16.5 to compare means.

Table 4.2 : t-test summary.

Season		Laverne's test for Equality variances		t-test for equality of means		
		F	Sig	t	df	t-sig
2009-2010	<i>Equal variance assumed</i>	.708	.404	-.086	48	.932
	<i>Equal variance not assumed</i>			-.092	43.469	.927
2010-2011	<i>Equal variance assumed</i>	5.297	.026	.693	48	.492
	<i>Equal variance not assumed</i>			.803	47.981	.426

Source : survey data 2012

The Lerne's test for variance showed an insignificant F value (.404) to which it suggests the use of equal variance assumed for t test in the season 2009-2010. Also for 2010-2011 the F test value on the Lerne's test for variance was significant under 0.05 significant level as it is less than 0.05 which means that the t values under equal variance not assumed are important for analysis.

b) *Profitability Ratios for Two Seasons*

Profitability ratios indicate the extent to which the farmers benefited from the sales that they have in each season. This gives the idea of how the farmers by production system earned from each dollar of sales and return from each dollar invested.

c) *Profitability Ratios Output*

Profitability Measure	2009 – 2010 Season		2010 – 2011 Season	
	<i>Contract Farming</i>	<i>Self Funding</i>	<i>Contract Farming</i>	<i>Self Funding</i>
Operation (\$)	(1,777.99)	339.40	3,257.95	1,587.75
Earnings On Sales(\$)	(0.14)	0.07	0.17	0.17
Return On Capital(%)	(12.50)	6.98	20.15	20.87

Source : survey data 2012

The table presents results from the gross margin to which the ratios were calculated using Microsoft excel. It shows ratios that are lucrative when it comes to production in the season 2010/2011 season. However, as for 2009/2010 season ratios for the contracted farmers were to a negative which is disappointing.

V. DISCUSSION

The t-test table shows that F value for the 2009-2010 seasons was insignificant. The t-significant value for equal variance for the seasons that was considered. The t-significant value was 0.932 which is greater than 0.05. This means that it is insignificant meaning that there was an insignificant difference between the yield means for the two groups of farmers (contracted and

self-funded) for the period under review. This means that both groups of farmers (contracted and non-contracted) have similar production potentials. This similarity in production for the farmers could be due to climatic and socioeconomic factors prevailing in the district as the rains are very erratic. All farmers are affected by the climatic conditions even though their resources may differ. They are also affected by macro environment factors of the country such the political will, and the shortages of money in the economy. In terms production capabilities for the two groups is therefore not significant.

For the 2010-2011 season, F-sig value was significant hence the t-test value under the equal variance not assumed was considered. Again the t sig value (0.426) was insignificant as it was greater than

0.05. Thus there was no significant yield difference related to growing cotton under contract farming by smallholder farmers when compared to production by self-funding communal farmers. This could be attributed to edaphic factors in the district. The soil in the area is exhausted such that yield levels are almost similar for everyone despite the differences in resource endowment. However, the small differences noticed were due to management practices by the contracted farmers. This is because they are monitored by the cotton extension officers on sound agronomic practices. The yield levels in each farming system were very low than expected by the contract farming company of 7 tonnes per hectare. This shows that yield levels are marked towards production systems but to climatic factors like droughts. This actually contradicts with the mainstream perception that if the utility associated with new technological innovations is the same with the status quo, then decision makers are less likely to adopt these innovations (Roggers 1995).

The economic returns that are realized by the farmers from the different farming systems are crucial, as this affects the farmer's livelihood quality since the disposable income will be affected. There was a significant difference between revenue obtained by the farmers in the season 2009/2010. This entails that the margin between the profit earned by the self-funding farmers was far much higher than that of the contracted farmers. A negative return on capital and return on sales obtained by the contracted farmers indicated serious losses, as this implies that, for every dollar that was invested by the farmer a shortfall was realized, that of 12.5% which discourages participation in cotton production. Considering that the average yield obtained by farmers of the two farming systems were statistically insignificant, it shows that somehow the contract farming system deprived farmers in their operations, marketing and hence returns. Again the costs of production were almost the same for both contracted and self-funding farmers, with also the marketing bill for contracted farmers being very much lower than that of the self-funding farmers. This brought a fair advantage of contract farming over self-funding production. However as for the disposable income for the farmers, self-funding farmers were better off in terms of returns than the contracted farmers. This was attributed to better prices that were offered to the cotton seed by other companies that were coming to purchase the produce in the district were paying exceptionally higher prices than the contract farming company hence self-funding farmers benefited more than contract farmers.

The results however, show that the shortfall by the contracted farmers was not permanent. This was indicated by the lucrative returns on capital that were above 20% hence reflecting that both the farming systems in the season were paying back a good margin for each dollar that was invested for the production by

the farmers whether contracted or non-contracted. A rate of 20% explains that 20% of all the money the farmer spends in production and the marketing bill was recovered as profit. Also as for the profit generated from each dollar of sales, contracted farmers stirred up from a dismal negative margin in 2009/2010 season to a positive margin which happens to be equal to that of self-funding farmers that is 17% of the dollar of sale which is a better level in terms of operations. This implies that for every dollar of sales that the farmer realized 17% was realized as profit. Cotton production is therefore a lucrative endeavor provided marketing strategies are in favor.

VI. CONCLUSION

Cotton production under contract farming was found to be the norm of the farmers in Zaka district. Basing on the two farming seasons that is 2009/2010 and 2010/2011 season, farming systems were found adding no value to the output of the farmer. This bears the picture that contract farming system as a recommended system in cotton production adds not much value other than encouragement of land size increment due to input provision for production in a season hence the hypothesis that farmers in contract farming produce more cotton than self-funded farmers is rejected.

The production capacities of the farmers despite the system are equal. As the yields for the two farming systems were the same.

Despite the fact that contracted farmers realized serious losses in the first season, both farming systems showed signs of viability hence cotton production in Zaka district by the smallholder farmers is viable. This led to the acceptance of the hypothesis that cotton production by smallholder farmers is viable.

Self-funding proves to be a better system as the farmer is left with a vast wide market option to consider and realizes a better margin in terms of income as compared to contract farming.

VII. RECOMMENDATIONS

Considering the outcomes of the survey, the researcher recommends that farmers should negotiate better cotton prices if they are to remain in the contract. The farmers can lobby for better cotton prices through the government or through the Agricultural Marketing Authority in Zimbabwe.

The cotton companies are taking advantage of the underrepresented or unrepresented contracted farmers. They are being paid less for their produce than self-funded farmers due to the obedience of the contracts that they have with the contractors even if the contractor is offering uncompetitive prices. The researcher recommends that the farmers should form



strong cotton producers association that would represent their interest rather than to be individualistic.

Producing cotton as a self-funding farmer is more profitable than contract farming since there is flexibility in the market options that maximizes their revenues. The researcher recommends that farmers should concentrate on more paying self-funding production systems instead of being exploited by contract farming companies.

The Cotton companies should offer prices that can leaves the farmer appreciating producing the white gold. This would reduce the incidences of side marketing which affects the profit margins of the organization.

The cotton company of Zimbabwe, should lobby for f setting favourable regulations for the farmers such as pre-season setting of cotton buying prices and again put measures that can eliminate side marketing by discouraging firms to buy cotton in areas which they do not have contracted farmers.

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