

Agricultural export crop participation, contract farming and rural livelihood in Zimbabwe: The case of cotton farming in Rushinga district

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Abstract: *The paper relates export crop participation and contract farming to rural livelihoods. It models the determinants of export crop participation and contracting activities. Using cotton as an export crop, 107 cotton and non-cotton farmers from Rushinga district were surveyed. Results confirmed few cases of livelihood successes, with no evidence to support that cotton offers better income than non-exportable cash crop. Household-specific factors were found to influence the decision to participate in export cropping and contracting activities. The study concluded that single export crop dependency threatens rural livelihood sustainability. Diversification into cereal cash crops by improving market access conditions is needed.*

JEL Classification: *Q1, O1*

Key words: *Export crop, livelihoods, rural poverty, contract farming, smallholder farmers*

I. Introduction

Cotton is Zimbabwe's second major export crop and foreign currency earner after tobacco, with lint exports accounting for 12% to 17% of agricultural exports, (Musara, et. al 2011) among other key agricultural export drivers like coffee, tea and horticulture. Cotton occupies a very important role in rural livelihoods, at its peak approximately 250,000 to 300,000 smallholder cotton growers depended upon it (Hanyani-Mlambo et al. 2002) contributing 80% of cotton production (Imani, 2003). It is estimated that approximately 99% of production grown by smallholder farmers is now financed under contract farming schemes administered by ginning companies (GAIN, 2012). In view of the agricultural export sector dynamics that altered economic and livelihood opportunities for export-crop dependent households, Scoones (2009) emphasised the need to take a dynamic longitudinal view on livelihood strategies. He called for policy actions that give more attention to how the vulnerable are likely to cope, adapt, improve, diversify and transform their livelihood strategies. A reconsideration of the role played by export crops in rural livelihoods is therefore, called for. This study focuses on cotton given its important role to rural farmers for the past 3 decades since 1980. It is assumed that restoring the sector's export capacity is critical under the spirit of export-led growth, economic recovery (Kaminski and Ng, 2011; DBSA, 2012) and rural livelihoods enhancement.

Background to the cotton sector

Investment and recovery in the cotton sector and agriculture in general is adversely affected by challenges originating from the socio-economic crisis of 2000 to 2008 that was characterised by the general shortage in foreign currency, fuel, basic commodities and agricultural inputs (seed, fertilizers, chemicals etc.). This caused a decline in all major agricultural commodities, across the small and large scale producers (Moyo et al 2008; Scoones et al, 2011). Agriculture which at its peak, accounted for 70% of total employment, 40-45% of merchandised exports and supplied 60% of raw material to the manufacturing sector (Bautista and Thomas, 2000), with approximately 7.6 million people directly depended on it, (DBSA, 2012), declined by more than 30% during the crisis period (Sukume & Guveya 2009; DBSA 2012). Export agriculture in particular was hard hit due to macroeconomic policy distortions and exchange control measures by the central bank that caused viability challenges (Munoz, 2006; Kamoyo, 2011). This resulted in a loss in export capacity (Kaminski and Ng, 2011), leading to the collapse of the rural market economy (Esterhuizen, 2010). Consequently, it culminated in the loss of traditional peasant livelihoods in the face of wider economic and political forces (Bryceson et al. 2000; Weis 2007) that caused social conflict and economic crisis (Hawkins, 2012).

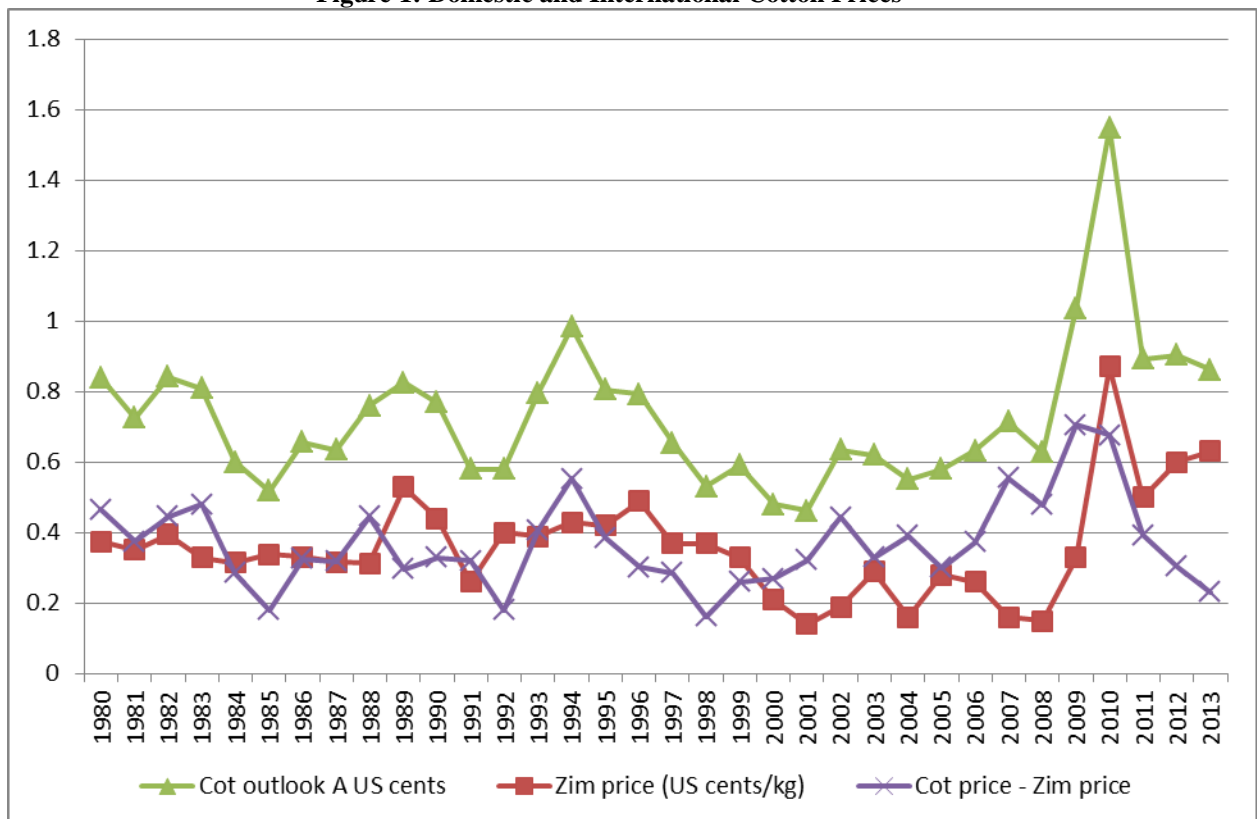
The role of cotton in rural livelihoods had shifted tremendously, as land use norms and production pattern changed. In the process food crops replaced export commodities, leaving only traditional export crops like cotton and tobacco grown on small scale, with horticulture and floriculture exports affected the most (DBSA 2012). On the other hand less experienced smallholder farmers driven by agrarian merchants and

contract farming replaced large-scale commercial farmers in export agriculture (Moyo, 2011a; 2011b). It is estimated that by year 2000 only 25% of cotton production was coming from about 350 commercial farmers and by 2003 only a mere 1% of production was coming from 12 large scale commercial farmers (Imani, 2003) and today the entire production is coming from smallholder farmers. This generated new differentiated livelihood patterns with both winners and losers (Scoones et al, 2012).

Under the new agrarian structure driven by cotton merchants many smallholder farmers continued to be constrained by historical barriers that excluded them from accessing key agricultural inputs and services like irrigation infrastructure, export incentives, market information, long term bank credits and extension services as used to be enjoyed by large scale farmers (Moyo, 2000; Moyo and Nyoni, 2013). Access to reliable agricultural credit markets continued to be a deterring factor to smallholder cotton producers. They continued to depend on an unfair contract scheme for credit inputs like seed, fertilizers, pesticides and extension services (Likulunga, 2005). Given the weak bargaining power characterising smallholder farmers, the outgrower scheme turned to be oligopsonistic in nature, with cotton merchants exerting greater market power over farmers. Cotton merchants continued to extract the surplus from farmers, by contracting them through provision of agricultural inputs, credits and technical support at inflated prices and purchase farmers' produce at lower prices (Balat et al, 2007; Porto et. al, 2011).

This caused the gains from the broader agricultural market reforms that began in 1991 to be limited and short-lived (Makamure et.al, 2001; Larsen, 2002; Poulton and Hanyani-Mlambo, 2009). The reforms that abolished the statutory monopoly of Cotton Marketing Board (CMB) in 1994 were meant to facilitate the conversion from a single agricultural marketing channel to a multi-marketing channel. These reforms were expected to reduce rural poverty by facilitating the poor to access domestic and export markets through promoting the integration of informal rural traditional market with the modern efficient market, at the same time promoting the integration of domestic agricultural commodity markets with the international agricultural commodity markets (IFAD, 2003; Moyo, 2011 and AIAS, 2009). This would ensure competitive market equilibrium, eliminate price distortions in the input and output markets, re-establish a close correspondence between local and world market prices in order to achieve the so-called border parity pricing (Barret et al, 2005; Development Bank of South Africa, 2012). Yet the gap between international prices (Cotlook A) and domestic prices was never closed (Figure 1).

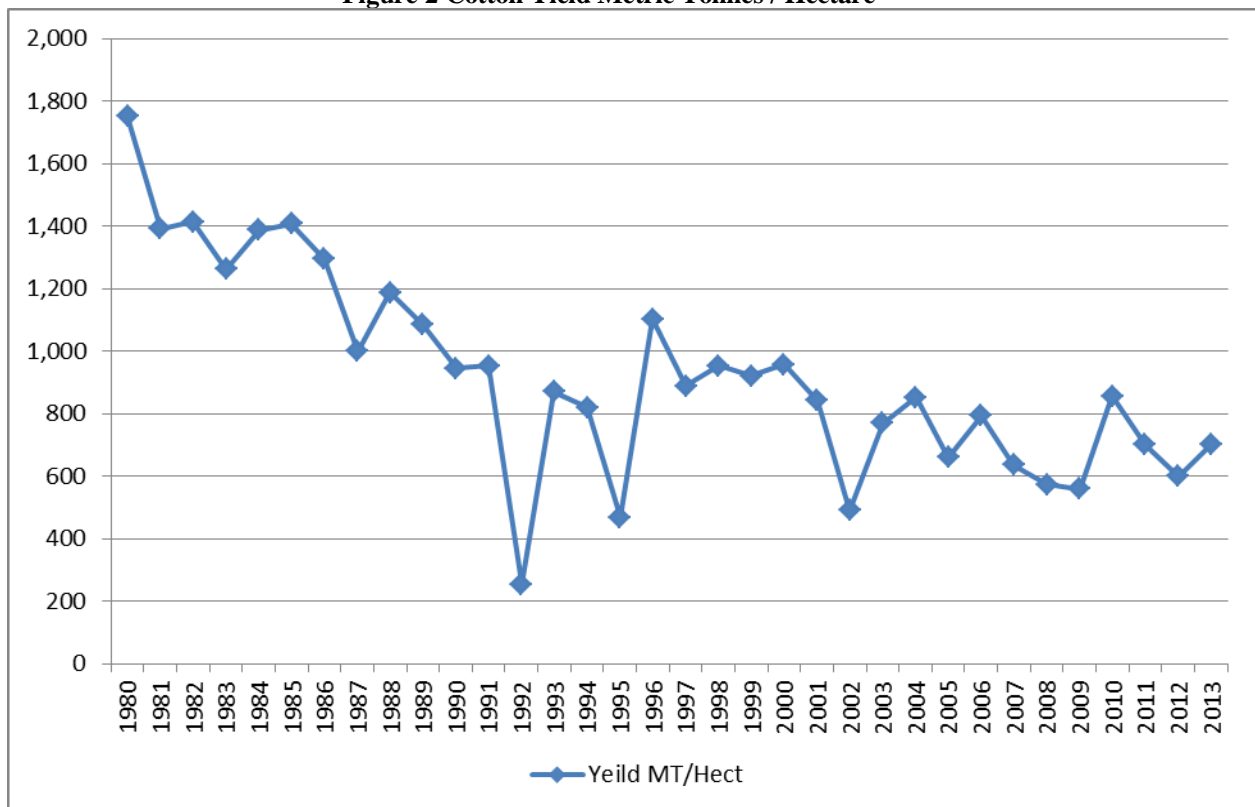
Figure 1: Domestic and International Cotton Prices



Source: Data obtained from FAO

In the long-run the results were contrary to expectations. The reforms failed to stimulate the production of internationally tradable commodities like cotton, tobacco and horticulture through promoting private sector participation that was expected to replace government in supplying inputs, purchasing output, storing, processing and exporting at competitive prices (Makamure et.al, 2001). In fact the entry of new merchants after cotton sector liberalization contributed to the disintegration of the contract farming model, since most of the new players were opportunistic. Their uncooperative behaviour resulted in disregarding of quality in buying cotton and fuelled side-marketing of seed cotton, making it difficult to enforce contractual agreements (Poulton and Hanyani-Mlambo, 2009; Baffes, 2001). As a result contracting firms reduced their lending activities, making it difficult for many smallholder farmers to produce beyond the mere subsistence level and surpass the large-scale commercial farmers, replacing them in supplying local, national and international markets (Cousins 2010). Consequently, productivity level declined by more than half from a peak of 1.75 tonnes per hectare in 1980 to 0.7 tonnes per hectare in 2013 (Figure 2).

Figure 2 Cotton Yield Metric Tonnes / Hectare



Source: Data obtained from FAO

II. Literature Review

The debate on the link between poverty and export crop participation is inconclusive. There is no consensus on whether, capacitating the rural farmers to participate in export cropping would benefit them or hurt them. However, more evidence gathered so far, tends to favour the proposition that there are more gains than cost from export crop participation. Increasing agricultural exports is viewed to be associated with rural poverty reduction in developing countries through generation of employment in rural areas (Berry, 2001). The same evidence is also confirming a shift in rural livelihood strategies with export crops occupying an important role. Balat and Porto (2006) determined the relationship between export crop participation, income gains and poverty in rural agriculture, using cotton and tobacco as export crops and hybrid maize as locally tradable cash crop in Malawi. Their observation was that participating in export crops has much higher impact on poverty than participating in locally traded cash crops.

According to Caletto, et al, (2011) rural farmers tend to exhibit comparative advantage in labour intensive exports due to their smallness in size. As a result of small size smallholder farmers are characterised by low cost, effective production processes, as they rely on family labour at below market wages. If they participate in export agricultural their gains are not only limited to high prices associated with high-value export crops, but includes more employment opportunities created as a result of strong forward and backward linkages generated by the labour intensive demands of the sector.

However, concerns are being raised that barriers to entry into export crop production are still too high for smallholder farmers. Using the Ecuadorian experience, Korovhin (2005) noted that in the presence of barriers, export cropping may limit economic opportunities and magnified the levels of insecurity and powerlessness for rural poor, if entry and export marketing costs are not well managed. Smallholder farmers are exposed to poor export infrastructure, high transport costs, excessive paperwork and cumbersome customs clearing procedures that increases real trade costs and inhibit them from entering and participating in export crop production (Porto et al, 2011). In a highly distorted market, with missing markets or high transaction costs that precludes participation by poor households, the success of poverty reduction strategy is limited (Hertel and Reimer, 2008; De Janvry et al, 1991).

Smallholder farmers face very high entry barriers into export crop participation. Rural agricultural households by nature are characterised by complex behavioural patterns, and in most cases they are semi-commercialised (Singh et. al, 1986), with differential access to productive assets, export infrastructure and markets for agricultural inputs and credits (Zezza et. al, 2011, Moyo, 2011). Sometimes they are characterised by partial engagement with markets which are often imperfect or incomplete, sporadic and somewhat disconnected. As a result their crop income levels are low and many are in a poverty trap, which forces them to engage in diverse markets and non-market activities to complement agricultural food and income. As such they are also involved in pastoralism, fishing, crafts, bricklaying and gathering fruits or firewood for cash among other non-farm activities (Mendola, 2007). The complex nature of rural livelihood patterns entails greater variability in their capacity to respond to export crop price incentives. Even if prices for export crops are comparably higher than for locally traded commodities, some rural households cannot respond because they are deep-rooted in poverty, without sufficient productive asset or sufficient credit to cover any start-up costs in fertilizer, seeds, tillage and labour costs (Balat and Porto, 2006). In Rwanda, Diop et. al (2005) noted that smallholder entry into export value chains is still inhibited by high entry barriers that includes, high demand for specialised knowledge when producing for export market, high start-up cost, infrastructural, labour supply constraints, high trade costs, lack of access to credit, lack of access to export information, skills shortage and technical deficiencies.

Beside high entry and marketing costs in export crop participation, rural farmers are small in size and they have a very low level of price risk tolerance in addition to poor access to information, capital and technology (Korovhin, 2005; Balat & Porto, 2006). As a result their behavior conforms to the “safety first models” of choice which state that poor rural farmers are risk averse. As such they prioritise low return, low risk food crops for own consumption to avoid starving the family at the expense of high risk, high return cash or export crops (Mendola, 2007). Thus their time, labour and productive resources may be trapped in low return subsistence agriculture. Policy interventions that promote access to agricultural inputs, services and improve the market access conditions facing smallholder farmers will therefore, promote smallholder farmers’ participation and diversification into export crop production. If interventions that promote smallholder export crop participation and open up more avenues for diversification into high-value non-traditional exports (Afari-Sefa, 2010) are done developing economies cannot only enhance rural livelihoods but can achieve high agricultural sector growth, address unemployment and realise immense poverty reduction gains (Caletto, Kilic and Kirk, 2011).

III. Methodology

In this study we used cotton as an export crop to determine the livelihood effects of participating in export value chains. Household level data was collected from a survey of 107 cotton and non-cotton farmers in Rushinga district. The non-cotton farming households were included in the study as a control group. The study then addresses two main research issues. Firstly, the study assessed whether smallholder cotton farmers in Rushinga District of Zimbabwe realize better income than non-cotton farmers. Secondly, we determined the household level characteristics that influence the decision to participate in export crop production using cotton as an exportable.

Questionnaires were administered to solicit for data on household level characteristics like gender of household head, employment status of household head, family size, access to finance, educational status of household head, cotton farming status and production status on food and cash crops. The questionnaire also extended to capture data on other non-farming livelihood options like, non-farming activities and remittances.

To check on income differentials, the research tested the hypothesis by Balat, Brambilla and Porto (2007) that households engaged in export cropping are less likely to be poor than subsistence-based households. An independent t-test for income levels between the cotton farmers and non-cotton farmers was first carried out to determine whether export crops offers better income than non-export crop. In the second stage an independent t-test for income levels between contracted and non-contracted cotton farmers was carried out, to establish whether contracting activities have any impact on rural incomes and livelihoods. However, the study did not focus on income level only since “livelihood strategy is a very complex concept” (Wikan, 2004) which goes

beyond just addressing income-poverty. The study reaffirm that livelihood analysis is quite consistent with Jodha’s paradox that one can be ‘income-poor but better off’ (see Chambers 1995). Therefore, the methodology adopted also considered other livelihood dimensions like asset holding, life skills endowment and infrastructure acquired.

The study also established factors that influence the decision to participate in export crop production and contract farming activities. An understanding of such factors will assist in formulating proper livelihood strategies for cotton farmers and policies on how best to promote rural household participation in export value chains for high value agricultural products. To determine such factors, binary logistic regression models were run. Cotton farming status and contract status were treated as binary choice dependent variables in two separate regressions to predict the odds likelihood that a farmer engages in export crop production and contract farming. The formulated logistic regression model is

$$y_i = \alpha_i + \beta_1 age_i + \beta_2 gender_i + \beta_3 education_i + \beta_4 farmarea_i + \beta_5 familysize_i + \beta_6 familylabour_i + \beta_7 dependencyratio_i + \beta_8 otherincomes_i + \beta_9 remittances_i + \beta_{10} formalemployment_i + \beta_{11} financq_i + \epsilon_i$$

Where y_i is export crop farming status or contracting status which is a binary choice variable for the i^{th} farmer and it assumes the value of 1 if the farmer participate in export crop production or participate in contract farming activities and 0 otherwise. The intention is to predict the log odds that the i^{th} farming household will participate in export crop production or join contract farming. The prediction is modelled given the age of the household head, educational level of household head, the household land holding (farm area), the household size, the family labour supply, other sources of income which are separate from remittances and wage income from household head, the household dependency ratio and finally on whether the household qualifies for a contract farming loan or not (*financq_i*). Household dependents, was determined based on the World Bank and UN definition of family dependents, as the proportion of the age groups between 0 to 14 years and those above 65 years to the total household membership.

IV. Results

The survey revealed that they were at least 5 cotton merchants operating in Rushinga district between 2010 and 2013 seasons. These companies largely exhibited an uncooperative model, thereby, complicating the coordination of cotton contracting activities. The companies include Cottco P/L, Grafax, China Africa Cotton Zimbabwe P/L, Cargill and Fachig. The results in Table I, indicate that cotton as an export crop provide livelihood means to both male and female headed families. In most cases female counterparts were left in charge of crop management when their husbands leave for formal employment in urban area. Based on the sample data the mode category of those that participate in cotton farming are aged between 36 and 50 years, mostly with average household dependents of between 6 and 10.

Table I: Demographic characteristics sample size n=107

| | Gender | | Family members | | | Number of Dependents | | | Age of household head | | | |
|-------|--------|----|----------------|------|-----|----------------------|------|-----|-----------------------|-------|-------|-----|
| | M | F | 2 - 5 | 6-10 | >10 | <5 | 6-10 | >10 | <35 | 36-50 | 51-65 | >65 |
| CF | 57 | 11 | 23 | 40 | 5 | 8 | 58 | 2 | 18 | 39 | 11 | 0 |
| NCFs | 31 | 8 | 15 | 23 | 1 | 11 | 28 | 0 | 11 | 23 | 4 | 1 |
| Total | 88 | 19 | 38 | 63 | 6 | 19 | 86 | 2 | 29 | 62 | 15 | 1 |

Source: Survey Data

Where CF- cotton Farmers, NCF-non-cotton farmers

It is also clear from the sample data that most of the cotton farming household ranges between 6 to10 members, giving the crop a broader role in supporting livelihoods for large families. Based on these characteristics the study interrogated whether these household level traits influence the decision to venture into cotton farming.

Table II: Household head educational, professional and employment status

| | N | Educational Qualification | | | | | | FE | LS |
|-------------------|-----|---------------------------|-----|-----|-----|-----|-------|----|----|
| | | NFE | PRE | SEE | CIA | DIA | Other | | |
| Cotton farmers | 58 | 12 | 18 | 30 | 6 | 0 | 2 | 17 | 18 |
| Non-Cotton farmer | 39 | 4 | 4 | 17 | 9 | 1 | 4 | 11 | 14 |
| Total | 107 | 16 | 22 | 47 | 15 | 1 | 6 | 28 | 32 |

Source: Survey Data

Where N is the total number of household heads under cotton farming and those not in cotton farming, NFE is the number of household heads with no formal education, PRE heads with primary education, SEE heads with secondary education, CIA heads with certificate in agriculture, DIA heads with diploma in agriculture, other qualifications includes those with standard 1 and standard 2 education, FE is number of households with formal employment, LS number of households with other life skills

Table II indicates that cotton farming is still a very important source of livelihood for marginalised people. Those who are into cotton farming include vulnerable groups of the society mainly without formal education and those with primary education. Such group of people are highly vulnerable, since there is a very limited chance that they can secure decent formal employment. It is also clear that very few have formal employment and a few have psychomotor skills like bricklaying, carpentry, basketry and weaving that complement their income sources.

Table III: Other off-farm income sources

| | N | Formal employment | Remittances | off-farm income |
|--------------------|-----|-------------------|-------------|-----------------|
| Cotton Farmers | 68 | 11 | 11 | 14 |
| Non-Cotton Farmers | 39 | 17 | 11 | 18 |
| Total | 107 | 28 | 22 | 32 |

Source: Survey data

Besides farming evidence from Table III suggests that rural farmers have other sources of livelihood like salary income earned by household heads, remittances from other family members and other non-farming activities. From the sample, the number of people who have alternative sources of income is still very limited.

Table IV: Crop patterns

| | N | Maize | Groundnuts | Sorghum | Millet | Other crops |
|--------------------|-------|-------|------------|---------|--------|-------------|
| Cotton Farmers | 68 | 68 | 36 | 12 | 10 | 27 |
| Non-Cotton Farmers | 39 | 39 | 30 | 2 | 10 | 17 |
| Total | 107 | 107 | 66 | 14 | 20 | 44 |
| Mean Hectares | 3.94 | 1.15 | 0.59 | 0.15 | 0.14 | 0.12 |
| Std Dev. | 1.939 | 0.694 | 0.500 | 0.581 | 0.262 | 0.234 |

Source: Survey Data

Sample results on Table IV shows evidence for livelihood diversification for both cotton and no-cotton farmers. The data is showing that rural farmers are not relying on one crop for food and also very few farmers are able to produce surplus cereal crops for the market. It was noted that the 68 cotton farmers sampled also produced maize, groundnuts, sorghum and millet. These cereal crops are also grown by non-cotton farmers. Maize is grown by everyone across the sampled farmers with average hectares of 1.15, while the average hectares for other grains and crops are below one.

Livelihood gains from cotton farming

Findings summarized on Table V indicate that the livelihood gains from cotton as an export crop are very limited. Only 37% of the sampled cotton producers claimed to have an improvement in well-being from cotton farming. Those who benefited include 34% who managed to acquire assets and 10% who build infrastructure using proceeds from cotton. Assets bought include tillage equipment, scotch carts, farm animals (cattle included) as shown on Table VI.

Despite these limited benefits and high concerns raised on the viability challenges associated with cotton farming (see Table X), 63% of the sampled cotton producers are insisting on increasing production area if more resources are made available. The fact that such intentions were made amid high concern for poor returns on cotton farming investment is a reflection of lack of alternative cash crops for livelihood sustainability within the area, caused partly by lack of adequate information on other potential export or cash crops. Although results on Table IV show that farming in the area is relatively diversified into cereal crop farming, market access for these crops is severely constrained. Only a limited number of farmers are able to secure viable markets for such cereal crops. Unlike cotton, there is no readily available cash market for other crops. The market constraints are exacerbated by the failure of Grain Marketing Board (GMB) to pay farmers for their deliveries owing to liquidity challenges. Secondly, high transport costs owing to long distances to the markets and poor road infrastructure constitutes serious market access barriers in the area. Thus cotton unlike other cash crops is easy to market with merchants providing on-farm purchasing services.

Table V: Cotton farming benefits for the past three years

| | N | Life improved | Acquired assets | Build infrastructure | to increase production |
|--------------------|----|---------------|-----------------|----------------------|------------------------|
| All Cotton farmers | 68 | 37% | 34% | 10% | 63% |
| Contracted | 47 | 32% | 32% | 11% | 68% |
| Non-Contracted | 21 | 48% | 38% | 10% | 52% |

Source: Survey Data

Therefore, the research noted that cotton remained the only available cash crop with readily available market in Rushinga, despite some isolated tendencies for cash crop diversification. Thus farmers have limited options on cash crops hence they continue cotton even if it means poor returns. Some of the qualitative responses by disgruntled farmers, who vowed not to shift from cotton production, are a clear testimony to the fact that smallholder farmer still bank their livelihood hopes on cotton, despite challenges affecting its viability. These includes “Hatingarisiye nekuti vamwe vakatoyambuka naro” (We cannot abandon cotton farming because others accumulated assets from participating). “Donje ndiro rega rinopa mari kuno” (Cotton is the only cash crop in Rushinga). “Rimwe gore unogona kusimudzikawo” (By chance you might get well paid in future). These responses indicate serious market access impediments, confronting cotton farmers in Rushinga, who are desperately underpinning their livelihood hopes on a poor performing crop. There is also lack of information on possible cash crops available to cotton farmers for diversification.

Table VI: Asset accumulation by cotton farmers for the past three years

| | N | Tillage equipment | Scotch cart | Constructed Housing | Cattle | Other animals |
|----------------|----|-------------------|-------------|---------------------|--------|---------------|
| Cotton farmers | 68 | 12% | 3% | 10% | 1% | 6% |
| Contracted | 47 | 13% | 4% | 11% | 2% | 4% |
| Non-Contracted | 21 | 10% | 0 | 10% | 0 | 10% |

Source: Survey Data

Income distribution and variability by crop and cotton farming status

Table VII indicates the percentages of farmers who sold cotton, maize and groundnuts according to income ranges, from a sample of 107 smallholder farmers. While there are 68 cotton producers considered in this study the 36.1% of farmers who never sold represents the non-cotton farmers sampled. While there 107 maize producers sample only 49.1% produced surplus for sale, whereas from the 66 groundnuts producer sampled only 36.4% generated surplus for the market.

Table VII: Income distribution by major cash crops n=107

| Income levels | Cotton | Maize | Groundnuts | Total |
|---------------------|----------|----------|------------|----------|
| Never sold | 36.1% | 50.9% | 76.9% | 13.9% |
| \$1 to \$150 | 14.8% | 22.2% | 9.3% | 18.5% |
| \$150.1 to \$300 | 26.9% | 13.0% | 8.3% | 22.2% |
| \$300.1 to \$450 | 15.7% | 8.3% | 1.9% | 16.7% |
| Above \$450 | 5.6% | 4.6% | 2.8% | 27.8% |
| Mean Income | \$357.00 | \$326.68 | \$195.05 | \$328.97 |
| Std. Deviation | \$178.96 | \$197.25 | \$170.95 | \$204.01 |
| Number of producers | 68 | 107 | 66 | 107 |
| Number of sellers | 68 | 52 | 24 | 92 |

Source: Survey data

The average incomes generated from marketing these crops are distributed as follows cotton \$357, maize \$329.68 and groundnuts \$195.05. Thus the average income received from cotton is slightly higher than from other crops. However, results from an independent t-test on Table VIII, confirm that there is no significant variation in total crop income between cotton growers and non-cotton farmers. The research noted that cotton farmers also have a tendency to diversify their crop income by engaging in non-cotton cash crop. The study therefore, proceeded to compared non-cotton income between cotton farmers and non-cotton farmers. The results confirmed a significant non-cotton income difference between cotton and non-cotton farmers. The differences are explained by variations that are clear from the contributions of both maize and groundnuts to total household incomes between cotton and non-cotton farmers. Non-cotton farmers earn an average contribution of 48.93% of total crop income from maize, compared to 17.87% for cotton farmer. Similarly they earn an average contribution of 12.61% of total crop income from groundnuts, compared to 6.68% from cotton farmers.

Table VIII: Income variability across cotton farming status

| | Cotton farming status | N | Mean | Std. Dev | F.stat | Sig. |
|---------------------------|-----------------------|----|---------|----------|---------|-------|
| Total income | No | 39 | 869.31 | 1098.18 | 1.856 | 0.176 |
| | Yes | 68 | 1498.21 | 939.63 | | |
| Non-Cotton income | No | 39 | 869.31 | 1098.18 | 14.641 | 0.000 |
| | Yes | 68 | 470.18 | 687.94 | | |
| Maize contribution % | No | 39 | 48.93 | 47.46 | 124.611 | 0.000 |
| | Yes | 68 | 17.87 | 23.31 | | |
| Groundnuts contribution % | No | 39 | 12.61 | 28.61 | 7.753 | 0.006 |
| | Yes | 68 | 6.68 | 15.98 | | |

Source: Survey Data

Income variability by contract farming status

Since contract farming is the predominant model adopted in export crop farming and cotton farming in particular, the study was also interested in finding out income variations across contract farming status. While the motive was to test whether contract farming had brought income gains to the smallholder contracted farmers, the study found no evidence to support this hypothesis. Contrary to general expectations there is no evidence in favour of high income gains by contracted farmers as compared to non-contracted farmers.

Table IX: Income variability by contract farming status

| | contract status | N | Mean | Std. Dev | F. Stat | Sig |
|------------------------|-----------------|----|---------|----------|---------|-------|
| Cotton income (\$) | No | 21 | 1041.10 | 741.18 | 1.981 | 0.164 |
| | Yes | 47 | 1022.19 | 712.31 | | |
| Non-Cotton income (\$) | No | 21 | 452.90 | 790.84 | 0.003 | 0.953 |
| | Yes | 47 | 477.89 | 645.91 | | |
| Total income (\$) | No | 21 | 1494.00 | 990.02 | 0.260 | 0.612 |
| | Yes | 47 | 1500.09 | 927.25 | | |

Source: Survey data

These findings prompted further action to determine factors that are influencing the performance of contract farming. A factor analysis was then carried out based on data obtained using a 5 point Likert scale and findings are summarised on Table X and Table XII below.

Factors affecting contract farming performance

According to the mean scores obtained from factors below, the biggest concern bedevilling farmers is the absence of a proper arbitration system between smallholder farmers and contractors that will help to resolve the impasse on any contentious contractual issue. This is followed by high input costs coupled with poor price that are threatening the viability of cotton farming. Lack of a proper regulatory system was ranked on fourth position as one of the factors negatively impacting contract farming management.

Table X: Factors affecting cotton contract farming n=47

| | Mean | Std. Deviation | Communalities | |
|---|--------|----------------|---------------|------------|
| | | | Initial | Extraction |
| high input costs | 4.1522 | 1.22868 | 1.000 | .845 |
| Poor prices | 4.0652 | 1.38888 | 1.000 | .712 |
| weak bargaining power by farmers | 3.8696 | 1.54357 | 1.000 | .767 |
| Loss of flexibility marketing | 3.6522 | 1.46390 | 1.000 | .637 |
| No arbitrators for smallholder farmers | 4.1957 | 1.10794 | 1.000 | .515 |
| Lack of regulatory framework | 4.0000 | 1.36626 | 1.000 | .569 |
| Risk of perpetual indebtedness | 3.6739 | 1.39928 | 1.000 | .392 |
| Unsuitable contractual terms | 2.9565 | 1.78831 | 1.000 | .815 |
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy | | | | 0.579 |

Source: Survey Data

Sentiments from the sampled farmers are that prices offered under contract arrangements are not in commensurate with the inflated input costs. The conditions are accentuated by the absence of a proper arbitration process and a regulatory framework that protect small farmers from unfair trading practices by cotton merchants. According to Table XI:, about 65.64% of the variations in contract farming is explained by the first three component factors, with component one explaining 30.7%.

Table XI: Total Variance Explained

| Component | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | | Rotation Sums of Squared Loadings | | |
|-----------|---------------------|---------------|--------------|-------------------------------------|---------------|--------------|-----------------------------------|---------------|--------------|
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 2.456 | 30.706 | 30.706 | 2.456 | 30.706 | 30.706 | 2.139 | 26.732 | 26.732 |
| 2 | 1.599 | 19.993 | 50.699 | 1.599 | 19.993 | 50.699 | 1.596 | 19.947 | 46.679 |
| 3 | 1.195 | 14.941 | 65.640 | 1.195 | 14.941 | 65.640 | 1.517 | 18.962 | 65.640 |
| 4 | .856 | 10.706 | 76.346 | | | | | | |
| 5 | .835 | 10.443 | 86.789 | | | | | | |
| 6 | .492 | 6.156 | 92.945 | | | | | | |
| 7 | .344 | 4.303 | 97.248 | | | | | | |
| 8 | .220 | 2.752 | 100.000 | | | | | | |

Source: Survey Data

Decision to participate in cotton farming and contracting activities

This last part of the study show results on factors influencing the farmers’ decision to participate in cotton production and contract farming activities. Using a logistic regression function we found evidence confirming that cotton is mainly grown by male headed families, as the gender variable was found to be positive and significant. We also noted that the likelihood that a household participate in cotton farming is decreasing with educational level, implying that cotton is a livelihood source for a special group of the community with limited opportunities to secure formal employment. The results also show a significant positive sign for the hired labour variable and finance variable. This implies that the decision to participate in cotton farming is also influenced by the capacity of the household to hire extra labour and secure finance. Factors like age, family size, farm area, dependency ratio, availability of other sources of income, availability of remittances and formal employment status of household head were found to have no effect on the decision to participate in cotton farming

However, contract farming status was found to be negatively influenced by formal employment status of household head, negatively by availability of other sources of income and also negatively by availability of remittance income. The implication is that, those households whose heads are formally employed or have other sources of income or receive remittance income are less likely to engage in contract farming. Thus contract farming is increasing becoming a means of agricultural financing for households with limited avenues to secure funding.

Table XII: Logistic results for cotton farming status and contract status

| | Cotton Farming status | Contract status |
|-----------------|-----------------------|-------------------|
| Constant | -2.276 (2.438) | 2.712 (4.760) |
| Age | 0.103 (0.620) | 15.056 (0.979) |
| Gender (Male=1) | 0.826 (1.275) | -0.774 (1.865) |
| Education | 2.284 (1.275) | 0.461 (1.865) |
| Farmarea | 3.155** (0.430) | 0.821 (2.272) |
| Familysize | -0.522** (0.229) | -0.406 (0.476) |
| Hiredlabour | 0.593 (0.215) | 0.666 (0.282) |
| | 0.939 (1.040) | 1.396 (1.090) |
| | 0.789 (1.183) | -0.938 (1.627) |
| | 2.201 (1.183) | 0.391 (1.627) |

| | | |
|----------------------------|--------------------|---------------------|
| | 11.730 | 0.072 |
| Familylabour | -0.690 (1.017) | 0.998 (1.102) |
| | 0.501 | 2.712 |
| dependencyratio | -0.261 (1.039) | 0.920 (1.023) |
| | 0.770 | 2.510 |
| Otherincomes | 0.162 (0.833) | -4.749** (1.883) |
| | 1.176 | 0.09 |
| Remittances | -1.294 (0.904) | -3.688** (1.784) |
| | 0.274 | 0.025 |
| Formalemployment | 0.412 (0.853) | -3.142** (1.536) |
| | 1.511 | 0.043 |
| Financequalification | 1.345** (0.311) | 0.740* (0.389) |
| | 3.840 | 2.096 |
| Cox & Snell R ² | 0.504 | 0.484 |
| Nagelkerke R ² | 0.692 | 0.683 |
| Predicted | 87.7 | 85.3 |

The values shown in brackets are the standard error and those in italics are the Exp(B) values. Coefficient labels with *** are significant at 1%, ** are significant at 5% and those with * are significant at 10% level.

The study also noted that contract farming status is positively related to household credit loan qualification status.

V. Conclusion

Rural cotton farmers remain determined to participate in cotton farming regardless of the price challenges that have been experienced in the past few seasons. Observation shows they have limited alternative sources of income although there is a tendency toward crop diversification. Given more resources, current cotton farmers express willingness to increase cotton production although the study shows no significant income variability between growers and non-growers. Access to credit has been noted to influence increased participation in cotton as an export crop. The study therefore recommends critical sector reforms that ensure expanded credit facilities for the farmers.

Need to address the incentive structure in both export crops and cereal cash crops. This will promote the commercialisation spirit among the smallholder farmers as a prerequisite for poverty alleviation. A transition from subsistence based cereal crop farming to commercial based cereal crop farming is needed to promote crop income diversification. This can be achieved partly by promoting more formal markets channels for cereal crops. The current poor performance of cotton as an export crop is sufficient evidence to show that entire dependency on a single export crop may expose rural livelihood to external shocks and worsen rural farmer's income poverty as international commodity price adversely fluctuates.

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