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Growth of Small Agro-Processing Firms in Mbeya and Morogoro, Tanzania

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ABSTRACT

Small agro-processing firm is an important sub-sector since it absorbs raw-materials from agriculture as well as creating employment and income generation to individual and national level. Despite the importance growth of small agro-processing firms has been recorded low growth and sometimes stagnating, this was indicated by number of firms established and collapsed. The objective of this study therefore evaluated the growth of firms in regard to growth of value of processed products as a different way of growth evaluation. The study used both cross sectional and time series data. The evaluation has done in Mbeya and Morogoro regions for a period of 2002 – 2011. The analysis used both descriptive and regression analysis. The results showed the growth is affected by labour productivity, inadequate raw-materials and energy cost. The paper recommends the improvement of labour productivity, production of high quality of raw materials and reduction of energy cost for growth of sub-sector.

Keyword: Growth, Small agro-processing firms, Tanzania

INTRODUCTION

Growth of small agro- processing firms is a greater challenge since most of them collapses one to two years after established and those which survive does not grow as expected (Mwang'ombola, 2005). The growth and development of small agro-processing firms was encouraged by Tanzania government since 1965 (Mwang'ombola, 2005 and Shitundu, 2000). This was done by establishing small industrial development strategy under National Small-Scale Industries Corporation (NSIC) which was created in 1966 under the National Development Corporation - NDC (Mwang'ombola, 2005). Emphasis on establishment and operation of industries was added after the Arusha Declaration in 1967 to promote structural change and increase self- reliance (Shitundu, 2000). After 1967 agricultural parastatals such as Dairy Farming Company - DAFCO (dairy), National Agricultural and Food Corporation - NAFCO (grain), NMC (milling), General Agricultural Products Export Company - GAPEX (oil seeds), and various crop authorities (Sisal, Cashew, tea, tobacco and cotton) were established and strengthened for vertical integration of respective sub-sector (Shitundu, 2000). This was done to overcome inefficiency, poor planning and lack of extension services for farmers and other actors. However, the NSIC, which was established in 1966, provided little constructive support for industrial growth and performance and was subsequently replaced by the Small-Scale Industries Development Organisation (SIDO) established in 1973 (Mwang'ombola, 2005) as described earlier. This organization was designed to bring positive impacts both at the micro and macro levels of the economy by generating employment and income (Wangwe and Rweyemamu, 2002).

However, between 1980s and 1990s firms faced significant challenges of collapsing and poor production due to unwarranted overcapitalization and poor management during the 1970s. Collapsing and stagnation of firms dragged the Tanzanian economy down to the last position among the three East African countries (Kabelwa, 2002). The National Milling Corporation (NMC), also collapsed during this period due to a number of factors including; poor co-ordination, under-funding of the corporation, inefficient marketing and distribution of products (Isinika *et al*., 2005; Onsongo, 2002 and ADBG, 2001).

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The poor performance of firms was closely associated with policy-related problems, which failed to maintain the growth of firms (Shitundu, 2000). Similarly, Ashimogo (2008) pointed out that failure of agro-processing firms to grow was associated with trade policies which were not favourable to the sub-sector. Another reason that dragged down the small agro-processing firms of the 1970s and 1980s includes, low value addition growth which was associated with low levels of infrastructure and physical investment. This increased the export of unprocessed agro-products while also increasing imported processed products in order to meet domestic demand (Mukami, 2003; ADBG, 2010 and URT, 2008). With regard to this (unsustainable growth of agro-processing firms), analyses was done by Kinda and Loening (2010) who used the number of working hours as an indicator of firm's growth. This method is often used for firms with good records for labour working hours (Marthur and Gill, 2011). The Tanzania ministry of industries and trade evaluated growth with regard to number of firms established and collapsed (MPEE 2007a and MPEE 2007_b). For this study most of firms considered for evaluation could not be evaluated through number of working hours of labour due to poor records of working hours. In this study therefore, value of processed products measured by the selling price, value of raw-materials measured by commodity price, labour productivity, energy cost, and value of capital invested and other factors were used to measure and evaluate the growth of firms.

METHODOLOGY

The study was conducted in Mbeya and Morogoro regions. Morogoro was represented by Morogoro municipal and Kilombero district meanwhile Mbeya region was represented by Mbeya city and Mbeya rural. Both regions play an important role in agro-processing activities in Tanzania. These qualities make the area suitable for study. The study evaluated the growth of small agro-processing firms using value of processed products as reflected in some literature including (Bervidova, 2002; Freeman, 2008; Webber and Horse well, 2009) who argued that the net value of output or the added value of processed products is preferred for evaluating the performance of processing firms because it takes into account differences and changes in data quality. Kinda and Loening (2010) also recommended the net output or value added method as the best output measure for the growth of firms if data is available. The study used both time series and cross sectional data. The time series data were available from TRA and SIDO offices. Further that, the study used graphs, percentages and regression analysis.

To evaluate the growth of small agro-processing firms expressed in terms of the annual average value of processed products from 2002 to 2011 was probably affected by inflation. To account for inflation, the value of processed products at any point in time was deflated before they were used for analysis.

Model Specification

The value of processed agro-products (y) is influenced by many factors. The relation between the dependent variable (y) and independent variables (z_i) was represented in a general form - equation 1.

$$y = f(z_1, z_2, \ldots\ldots\ldots\ldots z_n) \quad (1)$$

Using the Cobb Douglas functional form, equation (1) can be written as:

$$y_i = b_0 \prod_{j=1}^{k} z_{ij}^{b_i} e^{\varepsilon_i} \quad (2)$$

Where; b_o = Constant

b_i = a coefficient of the i^{th} firm for the j^{th} variable (z_{ij})

e = Natural log

ε_i = an error term for the i^{th} firm

Log-linear transformation leads to equation (3)

$$Y_i = b_0 + B \sum_{j=1}^{k} Z_{ij} + \varepsilon_i \quad (3)$$

Where;

y_i = Ln Y_i, Z_{ij} = Ln Z_{ij}, b_i = Ln B_i, b_{ij} = for i =1, 2, 3.....n being respondents, j=1, 2, 3.....k being variables, ε_i = Error terms

Expanding the components of equation (3), we get equation (4).

$$Y = b_o + B_1 Z_1 + B_2 Z_2 + B_3 Z_3 + B_4 Z_4 + B_5 Z_5 + B_6 Z_6 + B_7 Z_7 + \varepsilon \quad (4)$$

Where Y = Value of agro-processed products per year.

Z_1 = Labour productivity (measured as value of product per number of workers computed per firm)

Z_2 = Value of raw-materials per annum

Z_3 = Number of years in operation (considering the time since a firm started to operate up to 2011)

Z_5 = Value of capital invested per firm per annum

Z_4 = Cost of energy per year per firm.

Z_6 = Dummy variable; 1if operated infrequently 0 otherwise (a firm was assumed to be operating infrequently if at least did not operate for an average of 90 days per year).

Z_7 = Dummy variable; 1 if a firm was not managed by owner, 0 otherwise. (Firms considered were those which did not transfer the ownership)

The model was tested and established absence of multicollinearity based on the VIF values above the upper limit of 10 and Condition Index - CI being below 10. The model was also tested for autocorrelation and heteroskedasticity using the Newey-West standard errors method and the Durbin-Watson test (Hoechle, 2007).

RESULTS AND DISCUSSION

Trends of Small Agro-Processing Firms Growth

The trend of growth for small agro-processing firms measured by the real value of processed products per year has been increasing but at a decreasing rate as indicated in Figure 1. The value of processed products in Morogoro region shows an increasing growth trend being higher than those of Mbeya region and the average of both regions. This trend is contrary to similar trends reported by MPEE (2007a) and MPEE (2007_b) which indicated a declining trend of agro-processing firms for Morogoro while the trend for Mbeya was increasing. This difference in findings is probably due to the method used to evaluate growth of firms. The MPEE (2007a) and MPEE (2007b) reports evaluated growth of firms in terms of number of firms established while this study evaluated growth in terms of processed products sales. Evaluating growth based on the real value of products is recommended because it reflects the income and profit obtained by firms, a better indicator of growth than the number of firms established. A high number of firms could be established but they may be operating below capacity or they may be producing low value products.

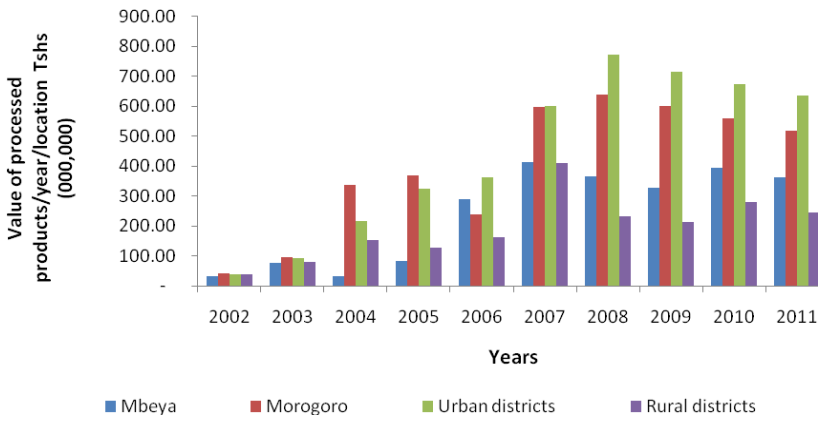

Figure1. *Average value of processed product per year per location*

For Morogoro region, the value of processed products increased from 2002 to 2005 followed by a decrease in 2006 and a subsequent increase in 2007 continuing up to 2009 after which it declined. In the case of Mbeya region, the value of processed products increased from 2002 up to 2003 followed

by slight decrease in 2004, then increased from 2005 up to 2007. There was a slight decline in 2008, which recovered during 2009, thereafter remaining almost stagnant until 2011. The increase in the value of processed products in 2003 was associated with the introduction of prudent monetary policy and restrained fiscal policy during 2002 that lead to the decline of food inflation to 4.4% which contributed to improvements in supply of basic foodstuffs following increased food production and improved distribution (ICC, 2005 and IMF, 2006). This probably contributed to the growth of value for processed products in both Mbeya and Morogoro regions from 2003 to 2005. As can be seen in Figure 1, the value of processed products per annum was higher in Morogoro than that of Mbeya region, probably because Morogoro being near Dar es Salaam, a major market for agricultural produce that has more price effects than Mbeya. This also is associated with transport and other cost being lower in Morogoro than in Mbeya region. Decline in the value of processed agro-products, which was experienced in both region during 2006 may be attributed to poor harvest which occurred throughout the country during 2005 due to drought (Minot, 2010); Consequently, agricultural output fell by 33% compared to the previous year hence reducing the average value of agro-processed products (Minot, 2010).

As noted earlier, the growth of value of processed products for Mbeya regions was almost stagnant from 2007 to 2011 growing at 4.8% (about 1.2% annually) compared to Morogoro region, which experience 10% during the same interval, representing 2.5% annual growth rate. The difference in growth could be attributed to relaxed export restriction within the East African market. This include East African Community customs union protocol which went into effect in 2007, which allowed more relaxed movement of agro-processed products hence expanding the market, meanwhile Southern African development Community - SADC harmonized customs union for Tanzania was expected to start in 2010 after the East African Community customs union protocol (Khorana *et al.*, 2009). The harmonization of custom union has not yet started for SADC countries, hence presenting a temporal disadvantage to Mbeya region which is near to boarders of SADC countries. In contrast to Morogoro region which is near to the market accessed easily by East African countries, probably brought the temporal advantage to fetch more value of processed products than Mbeya region.

The growth of value of processed products in rural areas also indicates progressive growth between 2002 and 2004, followed by a slight decline in 2005. Between 2006 and 2007 the value increased, followed by declining growth up to 2010. In comparison, the value of products produced in urban areas of both regions was higher by 56% than that of rural, which should be expected since most processing firms are located in urban areas where there is water and electricity.

Factors Affecting Growth of Small Agro-Processing Firms

The analysis of factors affecting growth of small agro-processing firms was done by the model presented in equation (4). The model had an adjusted R^2 value of 0.68, implying that about 68% of the variation in the growth of value of products from small agro-processing firms in the sample was accounted by the variation in the independent variables. The intercept was 5.915 significantly different from zero ($\alpha < 0.01$). All seven variables had the expected signs and four variables had a significant effect on variation of growth of value of products as indicated in Table -1.

Table1. *Factors Affecting Growth of Small Agro-Processing Firms (2002-2011)*

Explanatory variables	Expected Sign	Coefficient	t	P>|t|
Constant	(+/-)	5.915***	5.307	0.000
Labour productivity	(+)	0.522***	8.811	0.000
Value of raw-materials	(+)	0.308***	5.221	0.000
Number of years firm in operation	(+)	0.313***	5.264	0.000
Capital invested per firm	(+)	0.011	0.190	0.850
Cost of energy	(-)	-0.167***	-2.751	0.007
If a firm operated infrequently	(-)	-0.006	-0.100	0.921
If a firm was not managed by owner	(+)	0.0062	1.098	0.275
Number of observation = 106 Adjusted R^2 = 0.68 Prob > F = 0.000 VIF = 1.13 Condition Index = 2.3 Durbin-Watson statistic = 2.589 ;				

** Significant at the 0.1, ** at the 0.05 and *** at the 0.01 levels*

The coefficient for labour productivity (0.522), value of raw materials (0.308) and number of years of a firm had been in operation (0.303) had positive coefficients that were significantly different from zero at $\alpha < 0.01$. Meanwhile the coefficient for the cost of energy (-0.167) was negative and significantly different from zero at $\alpha < 0.01$. The coefficients for capital invested per firm (0.011), and that for a firms operated infrequently (- 0.006) and if a firm manager was not the owner (0.0062) had positive coefficients but they did not have a significant effect on the growth of firms' values.

Results in Table -1 shows the increase of labour productivity by one percent would increase the value of processed products by about 0.52%, since labour productivity determines a firm's efficiency, therefore accelerating growth of firms (Kohli, 2004). Meanwhile, a 1% increase in value of raw-materials would increase the value of processed products by about 0.3%. Likewise a firm that has been in operation for a longer period was more likely to increase value of processed products by about 31%. Such a firm would have more investments, accumulated knowledge and experience, secured more business contacts such as buying inputs at a discount and maintaining lucrative markets; all these provide competitive advantage to the firm, leading to higher value of processed products.

However, one percent increase of cost of energy per year would reduce the value of products by 0.167%. In addition to tariff rates, such cost could be higher due to inconsistent supply of energy, as established by findings by Mbelle (2005) as well as Kinda and Loening (2010) who argued that an inconsistent power supply increases the cost of processing products.

CONCLUSION AND RECOMMENDATION

The growth of small agro-processing firms has continued to increase at a decreasing rate throughout the study period. This has been attributed by low labour productivity, experience expressed in terms of number of years in operation, limited availability and high cost of raw-materials. The pricing cost of energy had also a negative impact on firms' growth. All these factors, contributed to low growth of small agro-processing firms.

To improve the situation requires coordinated efforts from both government and private sector is needed. First, labour productivity should be improved by training workers and using appropriate technology in processing agro-products. Second, quality regulatory bodies should ensure that they monitor quality of inputs for agricultural production and outputs and take measures when standards for inputs are violated for increasing value of raw materials. Third, service providers such as government extension services, NGOs and private sector should improve service delivery so that farmers increase the quantity of agricultural products to meet the requirements of processors and consumers in the market. The government should provide cheap and affordable electricity.

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