ECONOMIC CHALLENGES OF SUGAR CANE PRODUCTION IN THE LOWVELD OF ZIMBABWE

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Abstract: The study sought to investigate the economic factors affecting the productivity of small scale sugar-cane farmers in the Lowveld of Zimbabwe with particular reference to Chipiwa farmers in Mkwasine area in Chiredzi District. The main objective of the study was to bring to light the economic challenges that contribute towards the low productivity by small scale sugar cane farmers so that the relevant stakeholders can assist to rectify the situation. The research sampled 100 farmers. The descriptive survey method was used to identify and explain the economic challenges faced by sugar cane farmers. The research showed that while sugar cane industry is a critical sector to the economy, its productivity is going down. It was discovered that the low productivity is largely due to failure to plough out old cane, lack of equipment for operations, low prices paid for the harvested cane, high transport and haulage charges, limited training and unavailability of inputs. This is largely due to limited access to cheap finance and credit. The research recommends that farmers be given cheap finance and easily access credit using their crop as collateral security.
Key words: Sugar Cane, Sugar Cane Productivity, Sugar Production, Economic Challenges

INTRODUCTION

Sugar cane is a subtropical and tropical crop which needs lots of sun provided that its roots are not water-logged (Zimbabwe Sugar Association, 1982). According to a research carried out by Sserunkuma and Kiniera(2006) 127 countries worldwide produce sugar and 30% of it is traded internationally while the rest is consumed locally.

In Zimbabwe it takes twelve months to reach maturity although the period varies widely around the world. The Lowveld has been identified as one of the best places to produce sugar at competitive costs in the world. The climate is ideal for sugar cane and the distances from the mill are quite manageable. Sugar cane is a high labour intensive crop especially for weeding and harvesting and it is an important user of agro-chemicals like fertilizers and herbicides.

Harvesting is done by chopping down the stems and leaving the roots to regrow. The crop is essential in providing the nation with sweeteners for all industries, earning the country foreign exchange, generating electricity, making molasses for cattle feed or for distillation and ethanol production. The number of by-products from sugar cane outweighs other commercial crops.

Despite the benefits that can be reaped from sugar cane, production has gone down over the years. Generally all the farming categories have had declining sugar cane yields over the six year period. Mkwasine Estate is owned by Hippo Valley and Triangle with 50% shareholdings each.

Statement of the problem: Sugar cane productivity has gone down over the years for Chipiwa farmers despite their vast experience. What are the economic challenges they are facing?

Purpose of the research: The aim of the research is to:

- Investigate economic challenges faced by Chipiwa Sugar cane producers in Mkwasine.
- Explore the ways in which the challenges faced can be overcome
- Advise the producers and enlighten policy makers on areas, which need attention for improvement and for corrective purposes.

Significance of the study: The study sought to provide empirical evidence on the decline of the industry and provide a platform through which the policy makers can assist to resuscitate the industry. It intends to provide a home-grown policy capable of resuscitating the industry and substitute imports by maximizing the potential the country has for the growth of sugar cane. The high demand for fuel and electricity can be eased if the challenges facing the sugar industry are addressed and more sugar is produced.

This is so because by-products from sugar cane can be used to generate electricity and also for ethanol which can be blended into fuel . This would mean that the country saves foreign currency as they will not import electricity and fuel during the milling season. The research benefits the farmers in the Lowveld as assistance may be forthcoming through this research. The stakeholders who may read this research may decide to fund operations of small scale farmers to improve productivity in the sugar industry. The millers also benefit from economies of scale once production increases. The nation at large will benefit from increased production which might lead to lower prices of sugar on the domestic market.

Scope of the Study: **From a population of 191 Chipiwa farmers, a sample of 100 producers was interviewed; answered questionnaires and 20 were personally interviewed. The research covered the Mkwasine area which is under the jurisdiction of Masvingo Province where sugar cane is grown. The thrust of the research was to establish the economic factors affecting low productivity of the Chipiwa sugar cane farmers.**

REVIEW OF LITERATURE

Opportunities for the growth of sugar cane

Sugar cane is a sweet grass that thrives in hot temperatures and low rainfall areas but need a lot of water to grow. Sugar cane is a highly labour intensive crop which cannot be mechanized to get the best products. Clowes and Breakwell (1998:87) state that sugar cane is a perennial plant belonging to the grass family and does well in the lowveld where altitude is around 400m, typified by very hot summers and short cold winters. The crop also requires a lot of water, to the tune of about 590 mm annually.

The Zimbabwe Sugar Association(1982:62) states that optimum crop growth is largely dependant on sound fertilization practices, which includes the right selection of fertilizers, application of correct amounts and the timing of applications and the correct placement to ensure that the nutrients remain in a moist zone.

This shows that the lowveld is endowed with the requisite conditions for the growth of sugar cane. This is because the lowveld has the recommended altitude and temperatures. The amount of rainfall is complimented by water from Manjirenji and Siya dams to irrigate Chipiwa fields.

Impact of limited access to inputs on sugar cane farming

Inputs play a great role in the growth of sugar cane. According to Sundara (1998) the cost structure in sugar cane farming is such that human labour takes 45%, pesticides consume 4%, manure and fertilizers take 14%, seed take 14%, machine labour takes 17% and interests consume 4%. Sundara (1998) however insisted that the 'costs incurred depend upon the level of crop management by the framer, their economic condition and credit availability'. The above statement implies that sugar cane is a labour intensive

type of crop as almost half of the costs are spent on labour. Machine labour is ranked second while fertilizers, manure and seed have significant demands on the farmer's coffers.

Sundara (1998) further states that the inputs are required within 3-4 months of planting to get the best crop.

This shows that the rate of return of sugar return is determined by the timeliness of input application on the crop. If fertilizers are not available on time it affect the growth rate and thus the return per piece of land. It is therefore critical to avail the required quantities of inputs as and when they are needed.

Lower input use will certainly save costs but reduce productivity. It is further argued that the age of ratoon has an inverse relationship with crop yield. If no new cane is planted that implies declining trend in productivity. Clowes (1998) agreed that inputs are very important in achieving good yields. He identified seed, fertilization, irrigation, transport costs and ratoon management as the key elements to be managed for efficient production. The right varieties for the climate and soils need to be grown. Land has to be prepared taking into consideration the method of irrigation to be used and it should facilitate water movements.

The major elements of fertilization identified by Clowes et al &rare nitrogen, phosphate and potash. These should be applied in adequate quantities for high productivity and at the correct time. Plant cane has a lower nitrogen requirement than ratoon cane. Sugar yields are depressed if nitrogen is applied in excess or if applied on cane that is water stressed. Nitrogen is applied at the 4th and 8th week after harvesting cane. Phosphate should be applied soon after cutting to develop the roots. Potash is applied to improve plant uptake of the soil. Clowes et al (1998: 115) said irrigation is the farmer's management tool. In winter a conserve strategy should be used while in summer a sped strategy should be used in irrigating the cane. Sugar cane needs approximately 1 500mm of water per year for a 10 hectare field.

Bardhan K. Prana in the Journal of Political Economy Volume 81 argued that there is an inverse relationship between farm size and output, returns to scale and imperfections in the labour market. He further argued that the negative relationship between output per acre and farm size is a result of an inverse relation between size and other inputs rather than of scale diseconomies. This implies that even on a small piece of land with adequate inputs one can still be highly productive, but what are critical are inputs.

In a research carried out on the Fiji Sugar Industry by Reddy (1998) it was concluded that lower input use will certainly save costs but reduce productivity. The inputs that were identified by Reddy are land quality, labour, fertilizer weedicides and machinery. The land quality refers to fertility, productivity and tenure. In Fiji 73% of the land under cane was leased from land owners. Ownership insecurity will impact negatively on farm investments and productivity. In Fiji the uncertainty halted all major investments. Reddy argues that if land is turned into mortgageable, transferable commodity, farmers can use it as collateral to access credit needed for productivity enhancing investments.

Labour shortages can result in very high costs especially at harvesting. Reddy (1998) said that most farmers rush to harvest before the deadline for milling set by millers. This results in high demand for labour and high cost of labour. Labour used to be the most abundant factor but Reddy noted that most people were aiming for white and blue collar jobs and thus moving out of the cane industry.

In a research by Govere, Jayne and Nyoro on Smallholder Commercialization

(1999) in Kenya it was found that land preparations, input supply, cane harvesting and transport was done by the millers on credit and farmers were only responsible for planting and weeding the sugar cane. These findings clearly show that the millers realized the importance of quality cane through supporting its growth. The millers assisted the farmers to overcome their economic challenges.

Impact of management skills and training on sugar cane production

According to Sundara 1998,the level of crop management by farmers determines the costs incurred by the farmer. This means that if the crop is not well managed more costs are likely to be incurred Good crop management can only be done by a farmer who has learnt good management techniques.

The success of sugar cane farming depends on good crop management practices. If the farmer has poor management skills or is not trained he will not schedule irrigation on time, he will not apply fertilizers on time, may over burn the cane at harvest time and even with all the machinery needed he will fail to produce a crop. Clowes et al (1998;243) even argue that the more sophisticated the mechanized systems to be implemented, the higher the standards of field preparations required. If this is not observed there will be problems of water logging and even crop loss during harvesting. Farmers therefore need adequate extension services and training to be able to be efficient and productive. Sound agronomic practices such as timely land preparations, selection of adapted varieties, proper fertilization and weed control are critical for quality sugar cane production.

Inefficiency at farm level will increase the costs of production. This means that trained farmers will allocate resources efficiently and optimum use will be achieved. If farmers do not receive extension services they are likely to incur very high costs of production and lower output per unit of land area.

In the research carried out in Kenya by Govere, Jayne and Nyoro (1999), sugar companies which are concerned with cane development, milling and marketing were found to be providing extension services to farmers. This implies that they realized the importance educating the farmer on the right production methods in order to get the best product.

Later on farmer formed out growers companies to take over from sugar companies and left them to mill and market their sugar. The out Growers Company supplies its members with credit whose guarantee is the cane crop. The main source for on lending to farmers was the Agricultural Finance Corporation.

In a study carried out by the US government agency of the African Development Foundation (2005) in Tanzania it was concluded that poor cane husbandry methods significantly reduce average cane yields per hectare.

This means for increased productivity there has to be good cane husbandry practices. It needs skills and training to be able to care for the cane as is prescribed.

Impact of lack of capital equipment on sugar cane production

Sundara (1998) argues that there is need for fertilizer application technologies to be used so that the right quantities of fertilizers are applied. He said 'use of slow releasing nitrogen fertilizers technologies save around 70kg/ha. The author suggests that when fertilizer is applied manually we may end up over applying the precious input or under applying it altogether.

Clowes et al (1998; 238) argued that cane loading and transport account for a high proportion of the capital and running costs. He also argued that if cane harvesting is mechanized then the quality of the cane will be low and the higher the field losses. This means that there is need for farmers to own their own Perry loaders to ferry the cane to the loading zones and if possible transport to carry the cane to the mills.

In a research carried out by Langton (2004) on the South African sugar industry, he concluded that the industry was becoming less viable because of labour shifting. According to him farmers needed to be mechanized to depend less on labour as labour had become scarce.

MATERIALS AND METHODS

Research design plan: The descriptive survey method was used in the research. The research explicitly exposed problem areas of the study to investigate and describe the economic challenges faced by the Chipiwa sugar cane farmers, determination of current legislation and to describe the current situation obtaining.

According to McMillan and Schumacher (1958) the descriptive survey design describes the existing achievements, attitudes, behaviors and other characteristics of the group of subjects. It helps to describe, clarify and interpret factors and variables that generally affect or influence the productivity of the sugar cane industry. It is more practical as it gives the conditions prevailing at the time of the research. It also allowed respondents the opportunity to comment in a qualitative open-ended manner and therefore the personal interviews emanating from a descriptive design was necessary.

Through questionnaires and interviews, the respondents provided the present state of affairs for the Chipiwa sugar cane farmers.

Subjects: All the 191 Chipiwa sugar cane farmers in Mkwasine and the two millers, Hippo Valley and Triangle were identified as the target population. A sample of 100 people was interviewed; 80 answered questionnaires and 20 were personally interviewed. The researchers chose this strategy for convenience since the subjects stay miles away from the researchers' place of work.

Sampling procedure: A sample is a subset of the population that displays all the characteristics of the population in order to be truly representative. The sample consisted of 100 people out of 191 Chipiwa farmers of Mkwasine. This constitutes 52% of the population. This sample is justifiable in accordance with Babbie (1989) and Borg and Gall (1979:84). These scholars indicated that a good representation is an acceptable sample size in descriptive survey.

According to Wegner (1997) sampling is a process of selecting a representative sub-set of observations from a population to determine the characteristics of the random variable under study. He concluded that there were two basic methods of sampling namely;

- Non-probabilistic methods where observations were not selected randomly and
- Probability sampling where observations to be included in a sample had been selected on a purely random basis from the population.

Wegner (1997) further contended that the major disadvantages of non-probabilistic sampling methods were unrepresentative nature of the sample with respect to the population from which it is drawn. This was likely to produce biased results because entire sections of the population were likely to be omitted from the selective process. A further disadvantage of non-probabilistic sampling was that sampling error could not be quantified. Consequently results from any

statistical inferential based on non-probability sample data could be invalid.

The research also used the concept of a representative sample of the population and therefore used the probability sampling method. Wegner (1997) identified the following methods of selecting respondents randomly; simple random sampling, systematic random sampling, stratified random sampling and cluster random sampling, where the population is divided into clusters that are similar in profile. Clusters are then randomly selected.

The sampling units within the randomly selected clusters can then be randomly selected to provide a representative sample from the population. The cluster sampling method was used to identify the Chipiwa group of farmers. The sampling units were then selected using the convenience sampling method.

Judgmental and convenience sampling procedure was employed based on personal experience and judgment. According to Cohen and Marion (1994: 89) purposive sampling is when the researcher handpicks the cases to be included in the sample on the basis of their judgement.

No particular scientific or mathematical methods were used in arriving at the particular target respondent. Convenience sampling involves using the available subjects. Chipiwa farmers who would have come for services at the Mkwasine administration were given the questionnaires. The researcher also made use of the chairman of the Chipiwa group of farmers to distribute and collect the questionnaires to his members.

Research instruments: **The researchers used questionnaires and interviews to collect data. Both instruments sought to enquire from farmers the economic challenges that they had faced during the year.**

Data Collection Procedures: **The researchers took the following steps in administering data instruments including data collection from the target group which is both cost effective and time serving:**

• The researchers personally interviewed, distributed questionnaires and collected them from farmers in Mkwasine Estates, which constitute the highest number of target respondents and at Triangle and Hippo Valley Estates. The Mkwasine administration was also asked to distribute some of the questionnaires and to collect them.

• In some cases the researcher telephoned the subjects randomly selected considering that the numbers of target respondents was few.

DATA ANALYSIS AND DISCUSION

Background Information: The research captured the age, level of education, experience in farming and whether the farmers belonged to a farming group. It could be deduced that the majority of the farmers are male. Where females are taking charge of the farms it is because their husbands passed away. Ninety- five percent of the farmers are in the 50-60 age groups. Most of the original Chipiwa farmers were settled on the farms in Mkwasine in 1980 and so they have over 10 years experience with sugar cane. In some cases where the original farmer died and the son took over that is where less than 10years experience with sugar cane is found. Most of the farmers who settled in Mkwasine had been working in the sugar plantations and so they had not been highly educated except for a few that had been carrying out extension work on the sugar plantations. As a result only 5% have a certificate in farming and the rest have levels of education below 'O'level. All Chipiwa farmers belong to the Chipiwa Milling Group, which is a group

they formed to represent their interests especially to millers.

Inputs Availability: The Zimbabwe Sugar Association(1992) argued that optimum crop production is largely dependent on sound fertilizer application practices. This calls for application of correct amounts of fertilizers and water and timing of the applications.Also the ratoon age affects productivity. The ratoon age for most farmers in the Lowveld is over 15 years. The American Journal of Agricultural Economics, Vol. 7 No.2 of 1992 identified ratoon age as one of the key factors that affect productivity in sugar cane production. The farmers inherited the cane from the white farmers and never ploughed out the cane. Eighty percent of the interviewed farmers have ratoon over 15 years and 81 % have not ploughed their cane. The 19% who claim that they ploughed out their cane have ploughed out only a portion and not the whole field. The major reason cited for not ploughing out the cane is lack of resources for carrying out the exercise. Most farmers are aware that the older their cane the less productive it becomes but do not afford to plough out their fields. It was also found out that most of the farmers, 78%, have their productivity in the 50-60t/ha range which is far below the average expected yield of 100-120t/ha.

Fertilizer was not to be readily available to all the farmers. Sandara (1998) argued that inputs are required on time to get the best crop. The farmers all agreed that it is important to apply fertilizers soon after cutting, at 4 weeks and at 8 weeks but they concurred that this timetable is not usually adhered to because of the unavailability of the precious ingredient. If the applications are not made at the correct time low yields will be experienced. The farmers said that the Estate sometimes sources the fertilizers for them but it is not always available.

The results showed that inputs are hard to come by for farmers in the Lowveld but all farmers concurred with Clowes (1998) that inputs help farmers to achieve good yields. Clowes identified the inputs as seed, fertilizers, water, transport and ratoon management. The Chipiwa farmers strongly concurred that their yield had fallen over the years because of unavailability of fertilizers. Most of the times farmers got the fertilizers well after the recommended periods which were identified by the Zimbabwe Sugar Association(1992).

The Chipiwa farmers sometimes got assistance from Mkwasine Estate but the assistance would come only after the Estate had done its own fields. It was found out that the queue for estate labour and machines were sometimes long resulting in late execution of tasks which resulted in reduced productivity.

While fertilization and weed control were factors identified for reduced yields, ratoon management was identified as the chief culprit. The findings at Chipiwa concurred with

the findings of Stoler (2002) in Fiji where ratoon of more than twenty years caused low productivity. Asked whether they had ever ploughed out their cane 81 % of the respondents had not done so. This was largely because most farmers could not afford the expenses involved in the exercise. The productivity of old cane fell as the years increased and such cane was affected by a disease referred to as the Ratoon Standing disease (Zimbabwe Sugar Association,1992). This disease could be seen in some fields where the stalks became smaller and smaller because water and nutrients were no longer being passed throughout the cane. In Fiji the old ratoon was a result of insecurity of land tenure(Stoler 2002) but in the lowveld it could be partly so because farmers have not

been given title deeds as promised when they occupied the farms and partly because the, cannot afford the exercise.

Management skills: 100% of the farmers have received some kind of training which makes it very good since sugar is a specialized crop. 5%, of the farmers have a certificate in farming and above but the bulk of the farmers, 95%, have had meetings with the local extension workers that are sponsored by the Estate. The training was mainly on crop husbandry and most of the farmers last had the visits long ago, with some having been visited more than a year ago.

According to Clowes and Breakwell (1998) there is need for high levels of management during weeding, harvesting and transporting of cane. This implies that extension services are required right through the year. If at weeding no proper management is done the crop will be chocked by the weeds and the quality of cane will be compromised. There is need to even train the workers as they spend more time on the fields. Sugar cane farming is highly labour intensive and if no serious training is given to the workforce then the quality of the cane will be poor.

Seventy-eight farmers, 97%, strongly agreed that there was need for more training workshops to learn about new varieties and better methods of growing cane and management workshops. It was interesting to note that most farmers do not keep any records of the farm's earnings and expenditure but only get to know about them when the Miller deducts them. It was unanimously agreed therefore that management skills need to be acquired by all the farmers. Extension work is a necessary activity by both the Government and the Estate in order to increase productivity.

While availability of inputs can go a long way in assuring productivity, it was noted that the know-how of sugar cane farming was also essential. If the high cost inputs were not administered properly the expected productivity might not be realized. While all the respondents had received some form of training, 97% said they needed more training as sugar technology was improving and new varieties being developed.

Reddy (1998) concluded that inefficiency at farm level will increase costs. If farmers and their workers do not receive adequate training the scarce resources will not be allocated efficiently and optimum use will not be achieved.

Labour turnover is quite high given the Lowveld's close proximity to South Africa. This calls for constant training on the new labour to ensure that they acquire the requisite skills to produce quality sugar cane. Skills are needed in fertilizer application, watering of the cane and at harvesting. There were cases of losses that were caused by over burning of sugar cane. Clowes and Breakwell (1998) argued that a high level of management is needed during weeding, harvesting and transporting as this affects the cane quality. The research findings concurred with Clowes et a1 (1998) as most farmers lost through inefficiency or poor scheduling of one of the operations.

Equipment availability: Seventy-five percent, 75%, of the farmers do not own tractors. They hire the services of Estate tractors or tractors owned by their colleagues. The tractor is important in land preparation, carrying inputs and workers to the fields and hauling cane to the loading zones or to the mills when the distance is short. The Perry loader is also important in loading the cane but only 13 % of those interviewed have the equipment. The Massey cane is a heavy duty trailer that carries bundles of sugar cane to the loading zone.

Without the Massey cane the tractor cannot carry the cane to the mill or loading zone. Only 6% of the farmers own the Massey cane. Twenty-five percent of the farmers have ploughs and only 5 % have disc harrows. To plough out one's field there is need to plough the field, disc it and prepare the slope taking into consideration the method of irrigation in use to facilitate water movements (Clowes, 1998). Only 13 % of the farmers own truck or lorries. The bulk of them are trucks that farmers bought long ago when their yield was high and their cane productive. Currently most of the trucks have not been in use for a long period because of breakdowns and fuel problems. Farmers claimed that their cane is no longer productive enough to allow them to move around in cars. A few lorries were also used by the other farmers to ferry cane to the mills.

About 81 % of the interviewed farmers spent most of their income on hiring equipment and transport. The equipment that is essential to a sugar cane farmer include tractors, disc harrows and ploughs for land preparation, Perry loader and Massey cane for haulage of inputs and cane to the loading zone. The Chipiwa sugar cane farmers are more than 60 kilometers away from the mills and so they rely heavily on NRZ for cane haulage. About 87% of the farmers carry their cane using NRZ. The farmers said it would be cost effective if one used his own transport to carry the cane to the loading zone and then load onto NRZ coaches. The farmers said that the major reason they were not ploughing out old cane was because the hiring charges for tractors were prohibitive but if they could be capacitated to own tractors then they would cut on costs and also increase productivity. Only 25% of the farmers in the survey own tractors. Most of these managed to buy the tractors but cannot buy the implements and so will hire the implements to carry on the tasks.

The research findings seem to show that most farmers paid heavily for hiring equipment for carrying out operations at their farms. Clowes et al (1998) had their contention confirmed by the Chipiwa farmers that cane loading and transport account for a high proportion of the capital and running costs. This was even worse for farmers who owner not even a tractor. Farmers in Chipiwa were left with very little earnings as most of their earnings were consumed by equipment hire and labour. This left inadequate finances for inputs and the upkeep of the farmer.

Seventy-five percent, 75%, of the farmers interviewed also said the major problem was the pricing of their cane. They argued that uneconomic prices were being paid for their cane During the 2006 season $160 000 was paid for a tonne of sugar. The tonne could not even pay for a bag of cement to repair the canals, for example. According to them all the other challenges could be addressed if the pricing challenge was addressed first. If farmers got better prices for their cane then they could afford to plough out their cane as and when necessary, buy inputs on time, attend training courses or hire qualified personnel, acquire their own equipment and even service that which they own.

Ratoon age was also identified as the major cause for low productivity. 90% of the interviewed farmers said their average yields were below 60 tonnes per hectare. One farmer actually said the break even yield is 60 tonnes per hectare, so this meant that of the farmers were operating at a loss. The reason cited for the low yield was mainly the old rata on which even if fertilized would

not yield much. 80% of the interviewed farmers
said the old ratoon was the reason for their failure. If they got funding to plough out the old cane then productivity was likely to go up.

Farmers interviewed said it was important to own equipment for most operations on tll1e farms required the use of a tractor and its implements. It was interesting to note that ferrying cane from the field to the loading zone chewed the greater part of the framer' earnings as this was quite expensive. The expense was greater than the expense incurred
to haul cane from the loading zone to the miller who is about 60 kilometers away. This results in the farmer failing to make improvements on the crop.

All the millers and estates strongly agreed that the quality of cane delivered was being affected by lack of sufficient inputs and that there was need to assist the farmers with inputs to increase productivity. All the three Estates agreed that they always assisted farmers with inputs. The major constraint was that the inputs were not always available.

The farmers were expected to borrow inputs and pay for them when they delivered the sugar cane to the mills. When the inputs were in short supply estates would only cater their for fields and small scale farmers become stranded and do not apply the inputs on time. Mkwasine Estate said it provided Chipiwa farmers with inputs when they were available but did not provide working capital to the farmers. Triangle and Hippo Valley said they had applied for working capital from the Reserve Bank's ASPEF funding. The miller revealed that of the 447 000 tonnes of sugar cane produced in 2006 season, 174 819 tonnes were exported. It was critical that the Government and financers considered funding this foreign currency earner.

The millers and estates concurred with the fanners that the low producer prices of sugar were also hitting hard on the sugar cane farmers. The low prices affected most of the farmers' operations as they could not pay competitive wages, repair equipment and buy fuel.

The estates and millers agreed that the extension service being given to farmers was not adequate. They said they sometimes helped the small scale farmers with management training. This therefore meant that there is need for skills training. The estates and millers agreed that there was need for more involvement of extension workers in the farming operations to ensure high productivity. Estate extension workers sometimes move around the fields providing advice to farmers on good sugar cane farming practices.

The results also showed that the estates and millers strongly agreed that equipment is critical in sugar cane farming. Only one of the three estates argued that equipment is critical but for small scale farmers it is not viable to own the entire equipment but farmers can aim for group ownership of equipment. They felt that Government should capitalize farmers with tractors and trailers. All the estates agreed that small scale farmers were less productive partly because of the poor agronomic practices on the farms, inputs problems, old ratoon and lack of equipment to carry out activities on time.

Mkwasine Estates said that it has a maximum milling quota of 800 000 tonnes from the two millers, Hippo Valley and Triangle. In the 2006 milling season all the

farmers in Mkwasine delivered a total of 467 719.713 tonnes to the two millers. Millers attributed the falling output to financial constraints and difficulties with cane haulage and cane The discussion and analysis of the data indicated that sugar cane farmers' productivity is heavily influenced by inputs management skills, prices and equipment and transport costs. The unavailability of cheap credit might be leading to the economic challenges that the farmers are facing.

CONCLUSION

Productivity in the sugar industry affects the whole nation in terms of foreign currency earnings, production of ethanol, generation of electricity, molasses and other by-products from sugar cane. If more sugar cane is produced then more of each of the benefits that can be obtained from sugar cane will be derived. The results showed that the Lowveld is a suitable altitude for the growth of sugar cane. According to Clowes and

Breakwell (1998) sugar cane grows well in low altitudes, which are typified by hot summers and short cold winters and the Lowveld in Zimbabwe has the prescribed conditions. The Lowveld is one of the hottest parts of Zimbabwe and there are also very short cold winters.

The large amounts of water identified by Sundara (1998) are complimented by the irrigation systems that have been put in place in the Lowveld. The research revealed that generally fanners have vast experience in sugar cane farming but they lack the resources with which to compliment their experience.

The Lowveld was found to have the best climate for the growth of sugar cane with water being complimented through irrigation. Zimbabwe thus has a comparative advantage over the production of sugar cane. The breakeven point for sugar cane is on average 60 tonnes per hectare although the yield can go as far as 115 tonnes per hectare. The Chipiwa farmers have not been reaching the expected yield because their ratoon is old and needs ploughing out but they do not have the funds to carry out the expensive exercise. If the ratoon goes beyond its productive life, its sugar content is greatly reduced and water and nutrients cannot be supplied to all the parts of the cane. A disease called the ratoon standing disease will develop.

Fertilizers is an important input in sugar cane farming but farmers do not always get it when they need it. Sometimes they apply the fertilizers long after it was due or in short quantities because of its unavailability or its high price. Estates sometimes procure fertilizer for fanners and they repay at harvest time. Without adequate fertilization and timely applications at cutting, at 4 weeks and at 8 weeks productivity cannot improve. While all the fanners have received some kind of training, they still need further training on weed control, fertilization, water management, ratoon management and book-keeping The extension services provided by the Estates and government have not been thorough and focused. This is so because some fanners have not been visited by extension worker in the past year. Sugar cane is a specialized crop which needs a lot of expertise. There is need to provide such skills to increase productivity and earn the much needed foreign currency.

Equipment and transport play a major part in sugar cane farming in ploughing, discing, carrying inputs, carrying cane and carrying workers. Farmers fail to carry out tasks on time because of lack of equipment or transport thereby affecting productivity. If a farmer has to wait for a hired truck to deliver his fertilizer then he may not apply the input on

time compromising on productivity. More than 60% of most farmers' earnings go towards hiring equipment and transport. The high cost of fuel leads to exorbitant hiring charges leaving the farmer with very little income for sustenance.

The research found out that farmers were disgruntled on the price offered for sugar. Some even compared it to sand which was just fetched in rivers but was better paying than sugar. They thus attributed all the other challenges to low prices offered for sugar. It can therefore be concluded that the small scale sugar cane farmers are facing economic challenges ranging from low prices paid for sugar, unavailability of fertilizers, high cost of inputs, lack of access to cheap finances, lack of equipment and limited extension services.

In the light of the above findings and conclusions, the researchers recommend that the Government should, through the existing structures treat sugar cane in the same way tobacco is treated so that farmers are encouraged to produce. A support price for sugar cane could also be put to incentivize farmers. Farmers could also earn part of their proceeds in foreign currency to be able to import equipment. Since sugar cane produce ethanol that can be blended into fuel the government could finance farmers to ensure that mills are utilized to capacity, ethanol and electricity are generated to save foreign currency and substitute imports. This would also reduce the burden on the fiscus as there would be import substitution when electricity is generated locally and fuel is manufactured locally. Mauritius embarked on sugar sector transformation to save its sugar cane industry which benefited the economy in electricity generation, production of ethanol and employment creation (Herald 13 November 2006). Zimbabwe could also supply cheap finance to small scale sugar cane farmers and reform the industry.

Millers can form binding contracts with farmers to provide quality cane by providing them with inputs, equipment and transport timeously. The millers need the cane from farmers so that they can realize efficiency at their mills. They thus should assist the small-holder farmers to be more productive by financing them in all aspects and later deduct their money when the farmers deliver their cane.

There is need to properly organize the small holder farmers so that they can purchase in bulk and realize discounts, and buy equipment as groups. The Chiredzi Sugar Cane Association could come up with their constitution and use it to borrow funds from commercial banks for purchasing group assets which could then be rotated on group members' farms at relatively low costs. The farmers could also emulate what small holder farmers in countries like Kenya and Tanzania have done. These have established revolving funds where farmers can borrow.

The Estate and millers can also guarantee the small scale farmers so that they can access loans from banks to purchase their own equipment and to be able to plough out their cane. The millers know that farmers will definitely sell their cane to the mill and they use this premise to guarantee the farmer's loan.

The sugar cane on the field should be recognized as enough collateral to advance loans to farmers by banks. Banks can assess the crop on the field to vet the client's credit worthiness. The current complex procedures for obtaining a loan are commercialized and cannot be accessed by small scale farmers.

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