
Evaluating the Challenges Facing Small-Scale Sugarcane Farmers (Sugarcane Outgrowers) In Zimbabwe: A Case Study of Chiredzi District in Masvingo Province, Zimbabwe

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ABSTRACT: The study was based on the evaluation of the challenges facing small-scale sugarcane farmers (sugarcane outgrowers) in Zimbabwe and focusing on Chiredzi District. Consequently, the research used phenomenological philosophy to study this phenomenon and the sample was made of 50 persons comprising of 20 sugarcane outgrowers, 5 Ministry of Lands, Agriculture, Fisheries, Water and Rural Development officials, 5 Ministry of Women Affairs, Community, Small and Medium Enterprises, 5 Agritex, 5 Village heads and 10 spouses. Accordingly, the findings from the study show that small-scale sugarcane farmers in Chiredzi District are facing a myriad of challenges and that the government should intervene in order to save the industry. Likewise, microfinance institutions should help sugarcane outgrowers with the much-needed funds for their day-to-day operations. Thus, it was suggested that Ministry of Lands, Agriculture, Fisheries, Water and Rural Development officials and the Ministry of Women Affairs, Community, Small and Medium Enterprises should help sugarcane outgrowers with establishing a workable relationship with Tongaat as the current one is unhinged in favour of Tongaat Hullels. Similarly, sugarcane outgrowers are playing a vital role in developing Zimbabwe economically. Therefore, should be equipped with the much need entrepreneurship prerequisite skills sets though up-to-date trainings in order to equip sugarcane outgrowers with extant and suave entrepreneurial skills in order for them to increase production and meet the expectations of their miller through capacity building.

KEYWORDS: entrepreneurship, skills sets, outgrowers, economic development, sugarcane outgrowers, capacity building.

BACKGROUND TO THE STUDY

Sugarcane has been grown for thousands of years since about 1000 BC and originated from New Guinea (Laws, 2010). Accordingly, after the initiation then the growing of sugarcane increasingly spread across Southeast Asia and East Pacific (McNeill, 1984; Laws, 2010; Munyoro & Tyorera, 2023). In fact, it is thought that sugarcane was mongrelised with wild sugarcane relatives of India and China to produce what is known today as commercial sugarcane (Laws, 2010; Paungfoo-Lonhienne et al, 2010). Thus, in the case of Zimbabwe, sugarcane came through Natal province into the Lowveld in 1931 by Thomas Murray McDougall and was processed into crystals in same year (Mlambo and Pangeti, 1996; Munyoro & Tyorera, 2023) and interestingly, sugar is a very important commodity that contributes towards feeding of the mankind (Zahniser, 2016; USDA ERS, 2018; Zulu, 2019). Furthermore, sugarcane is significant because it provides livestock feed, fibre and energy as well, particularly biofuels (sugar-based ethanol) and co-generation of electricity (cane bagasse) and is also by and large considered as one of the most important and effective source of biomass for biofuel production (isosugar.org; USDA ERS, 2018 isosugar.org; Zulu, 2019). Thus, in 2016, Cuba was regarded as highest average consumption per capita of 51kgs with Zimbabwe at an average of 21kg (www.weforum.org; Munyoro & Tyorera, 2023). Yet, the sugarcane sector contributes 1.4% to the Zimbabwean GDP with more than 25 000 people directly employed while 125 000 people are indirectly employed in sugarcane sector in Zimbabwe, with more than 80% of sugar produced in Zimbabwe being exported to neighbouring countries and European Union making Zimbabwe a net exporter of Sugar (Chandiposha, 2013; Munyoro & Tyorera, 2023). In this case, the main export destinations for Zimbabwe sugar are the United States, Eastern Africa (Kenya), Botswana, South Africa and the EU and Zimbabwe is a beneficiary of the United States Tariff Rate Quota (TRQ) annual raw sugar allocation of 12,636 MT, which allows it to export raw sugar duty free to the United States (fas.usda.gov; ustr.gov; Munyoro & Tyorera, 2023).

Thus, despite its significance, the sugarcane sector has been facing numerous challenges in recent years that have inhibited growth as the TRQ amount has remained constant over the last several years and the industry average production has been on 430 000tons sugar for the past 10 years (fas.usda.gov). In this case, the stagnant world market price coupled with dumping of sugar commodity

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by major producers has put pressure on the world sugar arena (www.fao.org; Zulu, 2019; Munyoro & Tyorera, 2023). In Zimbabwe, for example, the sugarcane sector nearly collapsed as a result of cheap imports and this was only saved by the introduction in 2014 of a 10% import duty and US\$100 per MT surtax to all non SADC and COMESA origin sugar (www.worldbank.org). Furthermore, the prices did not support the growth of the sector as limited space to grow sugar cane slowed down horizontal growth of the sector (Dubb, 2013; Zulu, 2019; Munyoro & Tyorera, 2023). In addition, the high entry barrier into sugarcane farming did not ease the situation but only to new farmers that were well funded as the land preparation requirements and irrigation infrastructure in Chiredzi District, Masvingo province supported optimum growth of sugarcane which require a lot of capital (unctad.org; Munyoro & Tyorera, 2023). Accordingly, the situation is not as good as one would want as Zimbabwean out-growers (small-scale sugarcane farmers) are struggling to attract financiers due to land tenure and security around offer letters that are not bankable as the Zimbabwe land policy post land reform program is still tainted and hence, requires a lot of market confidence to attract good will from external sources (globalpressjournal.com; Chigunha et al, 2020; Munyoro & Tyorera, 2023). In a nutshell, vertical growth of sugarcane sector is pretexted on optimizing sugarcane stick growth during farming and efficient extraction of recoverable sugars during milling processes (Zulu, 2019). In short, productivity in sugarcane farms is measured by tons of sugarcane produced per hectare and for mill cum planter, the average productivity has been 89 tons of cane per hectare which is compared to outgrowers at 72 tons per hectare whilst, mill cum planter is occupying 24 000 hectares against 21 000 hectares by out-growers (gain.fas.usda.gov). For that reason, there is need to improve productivity to at least 103 tons per hectare of which some sections of fields are achieving except outgrowers (small-scale sugarcane farmers). In fact, recovery of extractable sugars during milling is averaging 96% of which best mills are at 98% (wrldbank.org; Munyoro & Tyorera, 2023). As a consequence, an improvement of extraction by 2 units to benchmark with best practices translates to 2% improvement in production is significant and hence to find out alternatives (asq.org). Although, a wide range of environmental and social issues are connected with sugar production and processing, and sugar crop growers, processors plus energy interestingly, food companies are seeking for ways to address concerns related to sugar production, biofuels and sustainability (isosugar.org; Zulu, 2019; Munyoro & Tyorera, 2023). Yet, none are engrossed in the existence of entrepreneurship essential skill sets in the growth of sugarcane sector in Zimbabwe. Accordingly, this study aims to ascertain the existence of entrepreneurship essential skill sets in the small-scale sugarcane farming sector in Zimbabwe focusing on Chiredzi District, Masvingo province in addition to ascertaining the challenges facing the growth of sugarcane industrial sector in Zimbabwe.

LITERATURE REVIEW

THE ORIGIN OF THE SUGARCANE INDUSTRIAL SECTOR IN ZIMBABWE

In Zimbabwe, sugarcane was brought from Natal province into the Lowveld in 1931 by Thomas Murray McDougall and a successful sugarcane experiment by Thomas Murray MacDougall at Triangle led to the opening of Hippo Valley in 1954 and Mkwesine in 1968 respectively as discussed in detail below (Saunders, 1980; Mlambo and Pangeti, 1996; Munyoro & Tyorera, 2023).

- **Triangle Estate (1920s)**

Tom Murray MacDougall established Triangle Sugar Estate in 1919 as a ranch but a severe downturn in the economy during the post-World War 1 recession forced him to turn into crop production and before embarking on a successfully crop production, they needed to find a way of harnessing the waters of the nearby rivers for irrigation, since rainfall levels were too low to sustain crop farming (Saunders, 1980; Mlambo and Pangeti, 1996; Munyoro & Tyorera, 2023). Thus, they diverged water from Mutirikwi River into Jatala Weir, where it was later directed into cane plantations by canals (Saunders, 1980). As a consequence, the main crop to be firstly cultivated in the estate was wheat and by 1934 eighteen hectares of sugarcane were under irrigation in the estate culminating in the opening of the first sugar processing mill in Zimbabwe on the estate in 1937 (Saunders, 1980; Mlambo and Pangeti, 1996; Munyoro & Tyorera, 2023).

- **Hippo Valley Estates (1956)**

Hippo Valley was first established as a citrus estate by Raymond Stockil in 1956 and most of the citrus trees planted in the 1950s were uprooted in the 1970s when the company lost most of its market due to the international organisations' sanctions drive which was imposed on Rhodesia (now Zimbabwe) after it had unilaterally declared independence from Britain (Saunders, 1980; Mlambo and Pangeti 1996; Munyoro & Tyorera, 2023). In consequence, Raymond who was the former leader of the Dominion Party (DP) in the then Rhodesia had given up politics to concentrate on farming (Saunders, 1980) and together with six other white farmers, they then formed Hippo Valley Estates Limited (Mlambo and Pangeti 1996; Muromo, 2017). In view of that, the company soon broaden their horizons into other crops like wheat, cotton and the first sugarcane crop was planted three years later in 1959 (Saunders, 1980; Mlambo and Pangeti, 1996; Munyoro & Tyorera, 2023). Thus, in 1960, Stockil bought a sugar mill from Mauritius which arrived a year later at Hippo Valley (Saunders, 1980; Mlambo and Pangeti, 1996; Muromo, 2017). As a result, immediately after 1960, Hippo Valley launched on an expansion program premeditated to increase sugar production on the estates and the expansion saw Hippo Valley borrowing money from overseas and selling some of its shares in 1964 (Saunders, 1980; Mlambo and Pangeti 1996; Muromo, 2017). In the process, Anglo American Corporation and Tate & Lyle limited bought 40% and 10% of the shares

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respectively with the latter selling its shares to numerous Rhodesian financial institutions and pension funds (Saunders, 1980; Mlambo and Pangeti 1996; Muromo, 2017; Munyoro & Tyorera, 2023) and soon Hippo Valley was transformed into a sugar growing giant which by the early 1980s had one of the most efficient sugar processing mills in Southern Africa apart from South Africa (Tongaat Hulett Zimbabwe, 2015; Muromo, 2017; Munyoro & Tyorera, 2023).

• Mkwasine Estate (1968)

It is worth noting that Mkwasine Estate was sold to Triangle and Hippo Valley on an equal share partnership (Mlambo and Pangeti, 1996; Tongaat Hulett Zimbabwe, 2015; Muromo, 2017) and although the two sugar estates had intended to grow sugarcane at Mkwasine but had to initially shelve the thought thanks to lack of sufficient markets due to International Organizations' sanctions and the sharp fall within the world sugar price (Tongaat Hulett Zimbabwe, 2015; Muromo, 2017). As a result, for a time the two sugar companies continued to grow cotton and wheat at Mkwasine (Tongaat Hulett Zimbabwe; Muromo, 2017). In the process, the conversion from wheat and cotton to sugarcane production began in 1976 (Mlambo and Pangeti, 1996) and was in the midst of a change from overhead to flood irrigation because the extension of the railway from Nandi Siding to Mkwasine Estate to facilitate the transportation of sugarcane to the mills at Triangle and Hippo Valley was being in the process of being commissioned ((Mlambo and Pangeti, 1996; Tongaat Hulett Zimbabwe, 2015; Muromo, 2017). In view of that, the two companies started growing sugarcane at Mkwasine in 1980 using seed cane from Hippo Valley (Tongaat Hulett Zimbabwe; Munyoro & Tyorera, 2023).

• Chipiwa Settlement Scheme (1980)

In 1980, that is after Zimbabwean independence, the Chipiwa Settlement Scheme was launched and with a purpose to initiate a black sugarcane farming on 10-hectare plots who are known as sugarcane outgrowers or small-scale sugarcane farmers and is the focus of the study (Tongaat Hulett Zimbabwe; Muromo, 2017; Munyoro & Tyorera, 2023). Thus, this was premised on two considerations. Firstly, it was a prerequisite that 40 percent of the available irrigation water be channelled towards private landholders and secondly, as part of the newly independent state of Zimbabwe to involve black farmers in those economic activities that were exclusively to the minority white farmers under colonial governments (Muromo, 2017; Munyoro & Tyorera, 2023). Since, Mkwasine Estate which is 50 km and 70 km from Hippo Valley and Triangle respectively has no sugarcane processing mill, its sugarcane was transported to the processing mills by either road or rail for processing and marketing purposes (Tongaat Hulett Zimbabwe; Muromo, 2017).

SUGAR CANE GROWING PROCESS IN ZIMBABWE

Sugar cane can be classified into various categories namely sugarcane varieties, depending on sucrose content and various properties such as percolation rates through a bed of the sugarcane fibre and a few examples of these varieties are NCO376, N14, ZN8 and ZN10 (Shezi, 2017). Thus, it is worth noting that sugarcane is planted in the fields in furrows using sugarcane stalks as seed and the furrows facilitate irrigation of the sugarcane by means of siphons from a water supply canal (Griggs, 2004; Munyoro & Tyorera, 2023). Therefore, other means of irrigation employed are: overhead sprays and centre pivot and the sugarcane is planted in sets to allow constant supply of the raw material throughout the production season, which stretches from mid-March to late December (Ndeketea et al, 2014; Munyoro & Tyorera, 2023). Accordingly, the sugarcane takes about 3 weeks to germinate and growth of sugarcane is enhanced by use of fertilizers (Vuyuru, 2019; Munyoro & Tyorera, 2023). In short, the sugarcane is irrigated until it is mature, and this takes about 12 months (Hagos, 2014; Ndeketea et al, 2014). Consequently, once the sugarcane is mature, it is then burnt to get rid of the leaves which are hazardous to the skin thereby, facilitating the cutting of cane and delivery to the mill (Publica, 2018; Munyoro & Tyorera, 2023). Thus, burning of cane is significant because it gives the juice less suspended solids, increases the mill capacity by about 13 – 15%, reduces length of season, increases extraction by about 0.47% and ensures lower consumption of energy per tonne of sugarcane during milling and all this is also being done by outgrowers who were first incorporated into sugar farming in 1980 s outgrowers even though the number has increased significantly but there are some reservations in the way these outgrowers are running their business and which is the focus of this study (Valente and Laurini, 2021; Munyoro & Tyorera, 2023).

SUGAR CANE DELIVERY IN ZIMBABWE

Sugarcane is transported to the mill after harvesting in bulk using hilos (approximately 20 tonnes of sugarcane), or in bundles (approximately 5 tonnes of sugarcane) by tractors, trailers and locomotives (Neikirk, 1981; Munyoro & Tyorera, 2023). As a consequence, as the sugarcane arrives at the mill weighbridge, there is a laboratory staff member present who must visually inspect the sugarcane load to check for any signs of excess soil, excess trash, rocks, and loose chains that may be included in the bundles (Neikirk, 1981; Iryani, 2012; Munyoro & Tyorera, 2023). As a result, if a bundle is judged to be unacceptable, the laboratory worker has the necessary authority to reject either the whole bundle, or whole load (Munyoro & Tyorera, 2023). In this case, the laboratory is also responsible for taking samples of the sugarcane and analyzing sucrose quality and content (Iryani, 2012). Thus, at the

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weighbridge, the mass of the laden vehicle as well as the mass of the empty vehicle are recorded and the mass of the sugarcane is obtained by subtracting the mass of the empty vehicle from the mass of the laden vehicle (Neikirk, 1981; Iryani, 2012; Munyoro & Tyorera, 2023). In addition, there is also a rail weighbridge for determining the mass of sugarcane brought by train wagons and the mass of the cane is very important as it gives the knowledge of the hourly throughput and is used to pay farmers (Neikirk, 1981; Iryani, 2012).

THE SIGNIFICANCE OF SUGAR INDUSTRY IN ZIMBABWE

It is worth noting that sugarcane Industry is significant to Zimbabwe and its set up in remote areas brings with it many benefits such as provision of Infrastructure and Service in which Tongaat Hulets supports a total of 18 primary schools and 4 secondary school that service its employees and people who service it (www.tonga.com). Furthermore, employment provision of 18,000 direct people, plus several casual workers across its two mills and estates and 870 sugar cane outgrowers employ a further 7,000 people and the industry creates the much-needed employment as it is labour intensive (www.tonga.com; Munyoro & Tyorera, 2023). More so, many service companies, government institutions, civil institutions benefit by offering support services thereby adding to the number of employment creation, income tax, corporate tax and sales tax revenue base is improved (www.tonga.com; Munyoro & Tyorera, 2023). Furthermore, promotion of commercial farming models, have an impact on the sugarcane sector as well the national economy and thus, the industry partakes in commercial sugarcane farming and efficient use of dry land through effective farming methods (www.tonga.com). Consequently, an extension office and Zimbabwe Sugar Experiment Station among others have been established by government to support the industry and agronomy is in control of plant diseases and variety development (www.tonga.com; Munyoro & Tyorera, 2023). Thus, a win-win self-sustaining farming model is fostered by miller and farmer which can be a model to use for other crops in other parts of country against the command farming model (Nyathi, 1999; Chingarande et al, 2020). Equally, bulky buyer of key consumables and equipment means that the industry is a bulky user of fuel, diesel and fertilizers and the industry uses an average of 350kgs per hectare of AN (ammonium nitrate) and 180 kgs per hectare of SSP (single super phosphates) making it the biggest consumer of such (www.tonga.com; Munyoro & Tyorera, 2023).

Similarly, Export Creation and Forex Earning means that the industry has a guaranteed export quarter to EU markets over and above sales to Botswana, Namibia, and DRC and the much-needed foreign currency is received by sales of above 200 000 tons of sugar in regional and overseas markets which is in support of government Vision 2030 and STSP (www.tonga.com; Munyoro & Tyorera, 2023). Additionally, import substitution, which means the sugar industry produces green electricity for its own use by burning bagasse and excess power is channelled into the ZESA grid (Chingarande et al, 2020). Currently, the country has an overall power deficit and importing to complement local production and the savings of foreign currency is realized by supporting the cogeneration initiatives of sugar industry (www.tonga.com; Munyoro & Tyorera, 2023). Furthermore, the industry is also producing fuel grade ethanol that is blend with petrol to make E15. E15 is flex fuel with 15% of ethanol and 85% petrol. Consequently, the generation of locally made fuel is reducing petrol fuel import bill by 15% (Zuurbier and Vooren, 2008; Johnson et al, 2020; Munyoro & Tyorera, 2023). Accordingly, it is also worth mentioning that molasses as by product is a primary raw material for manufacture of animal feeds and baking yeast and the current use of it is presently improving the country's herd as it is used as a provision of much needed nutritious animal feeds though at a minimum level something that could be improved with the use newfangled innovation (Niekerk, 1981; Johnson et al, 2020; Munyoro & Tyorera, 2023). Likewise, the sugarcane industry also produces sugar and ethanol which are raw materials for bakery, beverage industry and solvent in chemical industry (Zuurbier and Vooren, 2008; Johnson et al, 2020; Munyoro & Tyorera, 2023). For example, refined sugar is required for manufacture of beverage drinks, bread and confectionaries (Munyoro & Tyorera, 2023). Whilst, ethanol is either absorbed by fuel industry as energy or further processed to make alcoholic beverages (spirits) and industrial raw materials (paints and medical) (Niekerk, 1981; Zuurbier and Vooren, 2008; Johnson et al, 2020; Munyoro & Tyorera, 2023). Lastly, sugarcane industry produces table sugar which is consumed Zimbabwe at an average of 30kgs per capita and this table sugar is consumed in teas among as well as other beverages and confectionery (www.isosugar.org; www.tonga.com; Munyoro & Tyorera, 2023).

RESEARCH METHODOLOGY

This study was premised on phenomenological philosophy due to its flexibility that allows explanations for different context (Oppenheim, 1992; Kraemer et al, 2000). Thus, the research strategy was also used to attempt to fulfil the research objectives as well as answering the research questions that had been posed (Kraemer et al, 2000; Munyoro, 2014). Furthermore, the adoption of research phenomenological philosophy was also done because it deals with the source, nature and development of knowledge (Vasilachis de Giaidino, 2009). Additionally, the in-depth contextual nature of qualitative findings from the interpretive approach was also used in order to complement each other (Goodyear, 2005; Creswell et al, 2008). Furthermore, this study used a research approach referred to as qualitative (subjective) method (Creswell, 2003) due to the fact that it allowed the researcher to evaluate the challenges facing sugarcane outgrowers in Zimbabwe (Dawson, 2002). Besides, this also allowed the researcher to investigate the conceptualization and significance of those involved with these facts in this case mainly the small-scale sugarcane farmers in

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Chiredzi district (Dawson, 2002; Munyoro, 2014). In fact, this is indispensable for the reason that it allows the researcher to have admission to the best information from qualitative research realm (Saunders et al, 2019).

It is well known in research that qualitative research is problematic to decide the total population in which the researcher can work with since it is hard to pick respondents with required characteristics and as such the population is unknown most of the time as is the case with this study (Burns and Grove, 1993; Munyoro, 2014). Therefore, for the purpose of this study the target population was made up of approximately 40000 rural entrepreneurs that is sugarcane outgrowers all from Chiredzi district because a population is defined as all elements (individuals, objects and events) that meet the sample criteria for inclusion in a study (Burns and Grove, 1993; Munyoro, 2014). It is also significant to note that the research uses a lot of resources and as such there is need to reduce the population into a sample when carrying out a study but of course the sample size is dependent on your research questions and objectives (Munyoro, 2014; Saunders et al, 2016). Accordingly, a sample of this study was made up of 50 respondents and mainly sugarcane outgrowers.

Data Presentation and Analysis

The data in this study was presented using table in order to convince the readers to understand the findings and their implication on policy formulation (Kennedy, 2007). For that reason, this method was chosen because they facilitate easy comparison and understanding of the information that was being presented (Few, 2004). In addition, the data was analyzed using Qualitative Data Analysis (QDA), in which the data collected using interview guides and group interviews was transformed into some form of explanation of the respondents' views on the challenges facing small-scale sugarcane farmers in Chiredzi District and the significance of sugarcane industry to the economic development of Zimbabwe (Seidel, 1998; Davidson et al, 2011; Munyoro, 2014). As a consequence, the process of QDA involved coding and writing and in this case, the researchers looked into themes by identifying passages of text and applying labels to them that indicated some thematic idea (Seidel and Kelle, 1995. Munyoro, 2014). Thus, the labelling or coding of these themes enabled the researcher to quickly retrieve all the texts that were going to be associated with a particular thematic idea, examine and compare them (Munyoro, 2014; Plachkova and Boychev, 2012). Accordingly, the researchers divided the model into three parts, namely Noticing, Collecting and Thinking about interesting things and these parts were interlinked and cyclical (Plachkova and Boychev, 2012; Munyoro, 2014). The researcher then noticed interesting things in the data and assigned 'codes' to them, based on the topic or theme, and these codes were in turn used to break the data into fragments (Plachkova and Boychev, 2012; Munyoro, 2014). Thus, the codes were then used to act as sorting and collection devices (Seidel and Kelle, 1995; Plachkova and Boychev, 2012; Munyoro, 2014). The researcher then started writing about the findings and this involved writing a summary of the data and this entailed some analytic ideas and SPSS was used also to present diagrams, tables and so on (Gibbs, 2002; Munyoro, 2014).

ANALYSIS AND DISCUSSIONS

RESPONSE RATE

As stated elsewhere in the study, a total of 50 interview guides were distributed to various stakeholders within the boundaries of the study and interestingly all the interview guides were returned. Thus, putting the response rate at 100% as shown in the chart and table below. As a result, all the 100 % response rate obtained in the study was excellent. As noted by Wixom and Watson (2001) a response rate of above 75% is good and yet this study surpassed that expectation.

The findings also indicate that 70% of the interview guide respondents were male while 30% were female. Thus, this shows that many of the respondents were male. Whilst the table also reveals that 8% of the respondents were aged 20 years and below, 16% were aged 20-30 years, 24% were aged 30-40 years, 16% were aged 40-50 years and 20% were aged above 50 years. Consequently, most of the respondents were therefore aged 20-30 years, followed by those aged 30-40 years. Therefore, this result was motivated by the fact that these age groups are the common ages found in rural areas of Zimbabwe. Nevertheless, it is interesting to note that the youths had a fair representation showing that they are also representing local governance structures in Zimbabwe. In addition, most of the respondents in this study were educated, indicating that they could easily understand the concept of economic development and the challenges facing small-scale sugarcane farmers in Chiredzi District and other related concepts that were part of this study.

ANALYSIS OF VARIANCE

In this study the author used an interview guide which solicited for respondents' opinions on existence of entrepreneurship prerequisite skills set in women entrepreneurship in Zimbabwe. To achieve this, the researcher resorted to a likert scale which was structured as follows: 1=strongly agree, 2=agree, 3=neutral, 4=disagree and 5= strongly disagree. Therefore, any mean below 3 indicated agreements while a mean above 3 meant disagreements. Thus, Using Kaiser stopping method, the study revealed that education level was the main determinant in the way respondents answered questions this study was then used to carry out the ANOVA test and the table below shows the ANOVA test values.

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	Mean	Std Dev	Anova p.value
The sugarcane industry has high entry costs (land prep, machinery, experience)	2.3	1.01	0.29
The sugarcane industry suffers from pest and disease attacks	3.7	1.03	0.46
The impact of land reform policy on the progress of sugarcane industry	2.1	1.03	0.41
The effect of water rights on the development of sugarcane industry	2.9	0.96	0.1
The significance of technological support on the growth of sugarcane industry	2.3	0.94	0.06
The effect of weather threats (Droughts & Flash floods) on the advancement of sugarcane industry.	2.5	0.81	0.22
The effect of burn to crush deterioration on the development of sugarcane industry.	1.8	0.99	0.29
The impact of sharing of proceeds between farmer and miller on the progress of sugarcane industry.	1.6	1.01	0.07
The effect of depressed sugarcane prices on the expansion of sugarcane industry.	1.9	0.95	0.22
The effect of lobby against sugar consumption on the growth of sugarcane industry.	1.7	0.91	0.25
The impact of inadequate govt support on the expansion of sugarcane industry.	1,5	0.87	0.08
The impact of imports threats on the development of sugarcane industry	2.4	0.98	0.56
The impact of lack of entrepreneurship required skills sets in the development of sugarcane industry.	3.2	1.04	0.34

FINDINGS AND RECOMMENDATIONS

FINDINGS

- **High Entry Costs (land prep, machinery, experience)**

Notwithstanding all the benefits that are derived from the sugarcane industry that were mentioned elsewhere in the study, the industry by tradition experiences so many challenges especially in developing countries such Zimbabwe. For example, the industry has high capital which is used for repairing farming and processing equipment (de Vries, 1969). Moreso, when the farmers are at the land preparation stage which requires heavy use of machinery to allow levelling, ridging, water drainage, fertilizer application, weeding and pest control there is need for one to spend a lot of capital in order to finance these activities (www.agmrc.org). Hence, few players who invest in this industry find it difficult to fund operations due to lack of funding which always delays replanting and capitalization of equipment leading to reduced efficiencies as is the case with sugarcane outgrowers (Vries, 1969; www.agmrc.org).

- **Pest and Disease Attacks**

Smut, ratoon stunt disease, leaf scald, brown rust, orange rust, yellow leaf are the main diseases affecting Zimbabwe sugar cane crop and eldana, sugar cane yellow aphid and back maize beetle are the main pests of concern (<https://vikaspedia.in>; www.oecd-ilibrary.org). Even though, ZSAES (Zimbabwe Sugar Association Experiment Station) routinely scouts for pests and disease in sugarcane farms (<https://apps.fas.usda.gov>).

- **Impact of Land Reform Policy**

There is still transfer of sugar cane farming techniques required for some farmers to operate at commercial basis as yields of some allocated farmers are depressed to as low as 30tons per hectare against an average of 100tons per hectare (www.fao.org). As a result, some land has been converted to other crops that are not supported by the region condition hence poses as a biosecurity risk (www.fao.org; www.apn-gcr.org). Thus, to make matters worse funding is difficult to access especially for sugarcane outgrowers as the government offer letter are not bankable and resulting in the sugarcane outgrowers ending up relying on contract farming which is being offered by the miller and is not favourable (www.herald.co.zw).

- **Water Rights**

Zimbabwe sugarcane relies on irrigation and the main water sources are 85km (Lake Tugwi Mkosi), 198km (Lake Kyle) and 76km (Siya) away and water flow is by gravity in a network of canals from the sources to holding dams on Estates (www.herald.co.zw). In this case, the water channel infrastructure is maintained by ZINWA and unfortunately, the infrastructure is suffering from continuous vandalism along the route where residence is tapping water for drinking, irrigation and animal husbandry (www.zinwa.co.zw).

- **Technological Support**

Zimbabwe sugar cane industry relies on Tongaat Hulett's (SA) for technological support, which is a full member of SMRI (supported by KwaZulu Natal University). In fact, Zimbabwe mills are also affiliated to SMRI and pays fees to share benefits like benchmarking, sugar conferences, sugar technology training which all Southern Africa mills makes up the pool (www.universityworldnews.com). Whilst, local universities and technological institutes do not offer sugar technology courses (<http://www.rcz.ac.zw>; www.universityworldnews.com). In fact, Zimbabwe Sugar Research & Experiment Station(ZSRES) offers sugar cane extension services and research for free (<http://www.rcz.ac.zw>) and training and certification of key operation

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competencies are framed from SMRI (www.ilo.org). In consequence, sugar technology expertise in Zimbabwe is scarce as the industry is unique and not comparable to any other industry and replacement of key competencies requires expatriation services.

- **Weather Threats (Droughts & Flash floods)**

It is unfortunate that sugarcane crop suffers moisture stress during droughts or when there is low water level in main water sources dams such as Mutirikwi Dam as water is then prioritized for drinking and animal husbandry (www.adaptation-undp.org). Thus, the unfortunate thing is that flash floods are also a potential threat as Lowveld is on low lying land (www.weather.gov) and in the past many cyclones have affected the region with incremental weather conditions inducing forced harvesting stoppages, whirl winds that destroys crops and torrential river floods that wash away cane crop (<https://reliefweb.int>).

- **Burn to Crush deterioration**

Burn to Crush deterioration is a measure of time (in hours) taken between burning and crushing cane and therefore, the number should be a single digit but delays caused by cane cutting and hauling methods leads to cane deterioration and loss of sucrose as is the case with outgrowers in Chiredzi district (Misra et al, 2022).

- **Sharing of proceeds between farmer and miller**

There is always a contentious rival between farmer and miller as far as sharing of proceeds is concerned as farmer feels prejudiced by miller and that notion works against business efficiency and improvement and Chiredzi is no exception (Donaldson and Walsh, 2015).

- **Depressed sugarcane prices**

World sugar price is low attributed by a combination of overproduction and change in consumers taste and EU export quarter has been reducing over the years (Trejo-Pech et al, 2020). In addition, East Africa countries like Kenya and Congo are also increasing its land under sugar cane leading to potential markets being net exporters (Zeze, 1988; Sandrey and Vink, 2007).

- **Lobby against sugar consumption**

It is worth noting that millennial customer taste are ever changing and the lobbying to reduce consumptions of sugar per capita is putting pressure on the industry (www.theguardian.com) and therefore, people are now widely read and promotion of health eating is increasing and such pressure groups have managed to lobby for sugar levy to reduce consumption (www.thesait.org.za).

- **Inadequate Govt Support**

There is no government policy in support of biofuels and electricity cogeneration in Zimbabwe as biofuels and electricity cogeneration are taken as by products, yet they are a gamechanger in the sugar industry (www.zera.co.zw; www4.unfccc.int). For example, cogeneration is not paid in cash but exchanged using a banking arrangement (To et al, 2018) and the pricing of biofuel is controlled by government and is not lucrative to support expansion (www.fao.org). In consequence, if the two products were well supported, then they have a potential of being the main products and sugar relegated to a byproduct.

- **Imports Threats**

Zimbabwe has not been spared by sugar dumping threat from influx of imports (Sikuka, 2017; <https://apps.fas.usda.gov>). Though an import customs duty of 10% and US\$100/MT surtax was introduced by government on all imports from countries other than SADC and COMESA, notable incidents of imports are still being reported (Tshuma, 2022). The imports are coming in as bottler specification sugar, which is not restricted, but finds its way competing with local table sugar.

- **Lack of entrepreneurship required skills sets**

Since, the establishment of the Chipiwa Settlement Scheme with the purpose of initiating a black sugarcane farming on 10-hectare plots who are known as outgrowers nothing much has come out of these growers as was expected by all the stake holders and this is attributed to lack of entrepreneurship prerequisite skills sets in the outgrowers in Chiredzi district yet it is a keystone of every efficacious outgrower (Tongaat Hulett Zimbabwe; Muromo, 2017).

RECOMMENDATIONS

- **Training of small-scale sugarcane farmers**

It was noted in this study that training of sugarcane outgrowers was an important component of business success since small-scale sugarcane farmers need to be professionally trained or at least acquire basic business management skills sets in order to move away from being peasant farmers to professional farmers as noted by Chigunhah et al (2020). Therefore, the ministry of women affairs, Community, Small and Medium Enterprises should embark on establishing more training centres across the country focusing on basic business techniques such as bookkeeping, market information, communication, organizational, leadership, customer service, financial skills, and marketing skills.

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• Capital injection.

The study recommended that there is great need for capital injection into the sugarcane sector as this will facilitate the provision of the much-needed working capital. This in turn will enable small-scale sugarcane farmers to shift away from relying on their own savings to finance business operations as they may not be enough and takes long to raise.

• Capacity building

The study outcomes indicate that capacity building is a critical area that requires urgent attention from all the stakeholders such as government and private sector. Thus, this may include training of small-scale sugarcane farmers in the areas of new product development and refinement of policies and procedures. Consequently, this will enable small-scale sugarcane farmers also known as sugarcane outgrowers to become more aware of their rights and where they can get funds and at the same time enabling banks to be more receptive of small-scale sugarcane entrepreneurs when they need money. In the process getting rid of all bottlenecks that make it difficult for sugarcane entrepreneurs to access funds for growth of their projects. Furthermore, Ministry of Women Affairs, Community, Small and Medium Enterprises service should be able to attract and provide development funds from other non-profit making institutions so as to be able to offer more training programmes for sugarcane entrepreneurs to enable them to acquire more entrepreneurship skills sets.

• Creation of an enabling environment

The character and kind of policies chosen within any economic sector have a substantial impact on how that sector will evolve in the future. Thus, examining the situation in Zimbabwe, it can be seen that efforts have been made to promote rural sugarcane entrepreneurs (small-scale sugarcane farmers) through legislation but that the development of rural agricultural entrepreneurship is hampered by the fact that these regulations are frequently not effectively articulated through stakeholder participation. Hence, the government must therefore consult and include the proper groups before enacting these policies as noted by Munyoro et al (2016).

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