

DURBAN UNIVERSITY OF TECHNOLOGY

**EFFECTS OF SUGAR TAXATION ON SMALL-SCALE CANEGROWERS IN
EMPANGENI, KWAZULU-NATAL**

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**EFFECTS OF SUGAR TAXATION ON SMALL-SCALE CANEGROWERS IN
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Abstract

In April 2018, the South African government implemented a Health Promotion Levy (HPL), commonly known as a sugar tax, on sugar-sweetened beverages (SSBs). This followed the discovery that the regular consumption of SSBs is associated with an increased risk of dental cavities, obesity and noncommunicable diseases. Since the introduction of the sugar tax, there has been a noticeable reduction in the demand for sugar. While sugar taxation is a necessary intervention towards addressing obesity and non-communicable diseases, this has a significant financial impact in the sugar industry. Equally affected are the small-scale canegrowers who rely solely on the production of sugarcane for income. The study investigated the effects of the sugar tax on small-scale canegrowers in the Empangeni area of KwaZulu-Natal. To achieve this, the study adopted a cross-sectional research design where quantitative data was collected from 262 small-scale canegrowers in the Empangeni region. Descriptive statistics and the principal component analysis technique were subsequently utilised to analyse the data. Several key findings emerged from the study which revealed significant concerns among respondents, indicating a consensus on declining sugarcane production, some growers abandoning their farms, and adverse impacts such as job losses. Additionally, a lack of confidence in government support to mitigate these effects was evident. These insights highlight the necessity for policy interventions to address the challenges faced by small-scale canegrowers.

Keywords: Canegrowers; obesity; sugar tax

Declaration by student

I, Mirriam Monica Ndlazi, hereby declare that this mini-dissertation is my original work. I represent my own opinions and not necessarily those of the Durban University of Technology. I also certify that the mini dissertation has not previously been submitted to any other higher education institution for the purposes of the awarding of a degree.

23 May 2024

Signature

Date

Dedication

This mini-dissertation is sincerely dedicated to everyone who believes in my work. More especially my supportive family, supervisor, fellow colleagues and friends who encouraged and inspired me in conducting this study. Without their support and assistance, this mini-dissertation would not have been made possible.

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Table of contents

Abstract	ii
Declaration by student.....	iii
Dedication	iv
Acknowledgements	v
Table of contents	vi
List of figures	ix
List of tables	x
List of acronyms	xi
List of appendices	xii
CHAPTER 1 : INTRODUCTION.....	1
1.1 Introduction and background of the study	1
1.2 Problem statement.....	3
1.3 Aim of the study	4
1.4 Significance of the study	4
1.5 Organisation of the study	6
CHAPTER 2 : LITERATURE REVIEW	7
2.1 Introduction	7
2.2 Theoretical literature	7
2.2.1 The economic theory of demand	7
2.2.2 The theory of taxation	9
2.3 Empirical literature	10
2.3.1 The implementation of the sugar tax in South Africa	10
2.3.2 The effects of the sugar tax	13
2.3.3 Cushioning small-scale sugarcane growers	15

2.4	Conclusion	17
CHAPTER 3 : METHODOLOGY		19
3.1	Introduction	19
3.2	Research philosophy.....	19
3.3	Research design	20
3.4	Empirical setting.....	21
3.5	Study sample and size	22
3.6	Sampling technique.....	23
3.7	Data collection instrument.....	24
3.7.1	Testing for instrument reliability	25
3.7.2	Testing for instrument validity	26
3.8	Data collection procedure	27
3.9	Data analysis.....	28
3.10	Ethical considerations, anonymity, and confidentiality.....	30
3.11	Conclusion	31
CHAPTER 4 : RESULTS		32
4.1	Introduction	32
4.2	Descriptive statistics.....	32
4.3	Knowledge of sugar taxation	35
4.3.1	Reliability test for questions on sugar taxation knowledge.....	35
4.3.2	Frequency distribution of responses on sugar tax knowledge	37
4.3.3	Factor analysis of responses on sugar taxation knowledge.....	39
4.4	Effects of sugar taxation.....	44
4.5	Conclusion	47
CHAPTER 5 : CONCLUSION		48
5.1	Introduction	48

5.2	Summary.....	48
5.3	Recommendations	51
5.4	Study limitations and areas of future research	53
5.5	Delimitations of the study	54
	References.....	55
	Appendices	71

List of figures

Figure 3.1: Map of the study site	21
Figure 4.1: Responses on sugar tax knowledge (n = 262)	37
Figure 4.2: Responses on the effect of sugar taxation (n = 262).....	45

List of tables

Table 4.1: Descriptive statistics (n = 262).....	332
Table 4.2: Cronbach's alpha test results.....	365
Table 4.3: Correlation matrices for sugar taxation knowledge variables (n = 262) .	409
Table 4.4: KMO sampling adequacy for questions on sugar taxation knowledge.....	40
Table 4.5: Principal component analysis for sugar taxation knowledge (n = 262)	43
Table 4.6: Component loadings for knowledge variables (n = 262) Error! Bookmark not defined.	

List of acronyms

KMO	Kaiser-Meyer-Olkin
NCD	Non-Communicable Disease
NEDLAC	National Economic Development and Labour Council
PCA	Principal Component Analysis
SACU	South African Customs Union
SAIT	South African Institute of Taxation
SASA	South African Sugar Association
SSB	Sugar-Sweetened Beverage
WHO	World Health Organisation

List of appendices

Appendix 1: Ethics clearance certificate.....	71
Appendix 2: Letter of information (English version).....	72
Appendix 3: Letter of information (isiZulu version)	74
Appendix 4: Consent letter (English version)	76
Appendix 5: Consent letter (isiZulu version).....	78
Appendix 6: Questionnaire (English version)	80
Appendix 7: Questionnaire (isiZulu version).....	86
Appendix 8: Gatekeeper's permission	91
Appendix 9: Editing certificate	94

CHAPTER 1: INTRODUCTION

1.1 Introduction and background of the study

The South African sugar industry is recognised as one of the world's leading low-cost producers of world class quality sugar. According to the South African Sugar Association (SASA) (2023), the industry makes a significant input to the country's economy, with an annual estimated average direct income of more than R14 billion which constitutes about R5.1 billion in value of sugarcane production. The sugar industry contributes about 0,84% of the total GDP in South Africa and 6% of the country's total agricultural output, and the sector remains crucial to local economies (Marais 2022). Furthermore, the sugarcane sector is the largest contributor to the agricultural GDP in KwaZulu-Natal with about 44% reported in 2016. An estimated 2.2 million tons of sugar is produced per season with about 60% of this sugar marketed in the Southern African Customs Union and the remainder is exported to markets in Africa, Asia and the Middle East (SASA 2024). The South African Sugarcane Value Chain Master Plan indicates that there are approximately 19 300 black growers (producing 24% of the estimated 19 million tons of sugarcane produced each year), of which approximately 18 770 growers are small-scale growers producing 11% of the total industry production (South Africa, Department of Trade, Industry and Competition 2020).

In South Africa, sugar is mainly used for direct human consumption and industrial purposes. Industries use sugar as an ingredient for confectionary products and sweetened beverages. These commodities are generally criticised as they are associated with increased body weight, obesity and other health impairments (Kurz and König 2021). South Africa is a major consumer of sugar and is ranked the third most obese country in Africa, with 40% of all deaths in the country resulting from non-communicable diseases (NCDs) (Myers *et al.* 2017). The average amount of sugar consumed per person per day in South Africa is about 23.5 teaspoons (or 99g) which is clearly more than the daily World Health Organisation (WHO) recommendation of about 25g per day (Joseph 2019; Koo and Taylor 2011). According to Myers *et al.* (2017), the sales of soft drinks were projected to increase by nearly 13% between

2012 and 2017, this being detrimental to the health of many South Africans. Evidence suggests that a total of 107.7 million children and 603.7 million adults around the world are obese, with an annual mortality of 4 million obesity-related deaths (Joseph 2019; Rafey 2021).

Fiscal measures such as hiking taxes are increasingly recognised as effective complementary tools to address the rise of NCDs (Legote 2019). These NCDs include cancer, obesity, diabetes and hypertension, and are among the top causes of death globally. South Africa has seen a significant rise in diet-related noncommunicable diseases and childhood obesity since 1994, with forecasts suggesting that it will have the 10th highest level of childhood obesity in the world by 2030 (Hofman 2021). For example, NCDs accounted for 39% of total deaths in 2010, with more than 36% of these deaths occurring before the age of 60 years (Nojilana *et al.* 2016). Furthermore, it has also been projected that by 2030, NCDs are expected to be the biggest cause of death in the African region.

To address the health concerns associated with excessive sugar consumption, sugar taxes are being used around the world. As a result, countries that have not yet implemented sugar taxes are under pressure to do so, with evidence that the sugar tax improves people's health by reducing the intake of sugar (Wilson and Hogan 2018). In South Africa, there were concerns that the sugar tax would be regressive and cause harm to those most vulnerable in society. However, the health experts counterargued that obesity was a regressive disease that negatively impacted those in lower socio-economic groups (Legote 2019). The evidence suggests that the vulnerable and socially disadvantaged people get sicker and die sooner than people of higher socio-economic groups, mainly from a greater risk of being exposed to harmful products, such as unhealthy dietary practices, and have limited access to health services (World Health Organisation [WHO] 2023).

The introduction of tax measures to promote health from reduced consumption of unhealthy products is not new. Smith (1937) through his inquiry into the nature and causes of wealth of nations, concluded that sugar, rum, and tobacco are commodities that have become subjects of almost universal consumption and are not necessities of life, and are therefore proper subjects of taxation. The sugar tax was legislated in South Africa through the amendment of the Revenue Laws Act (Act No. 14 of 2017)

with effect from 1 April 2018 (South African Revenue Service 2018). It was initially set at a rate of R0.021 per gram of sugar content exceeding a threshold 4g per 100ml. The introduction of sugar tax resulted in a decrease in the demand of sugar from the beverage sector (Food Business Africa 2023). Subsequently, it has created a lot of uncertainty pertaining to the future of the sugarcane growing sector, and the livelihoods of many people in rural communities due to job losses.

1.2 Problem statement

While sugar taxation is a necessary intervention to address obesity and unhealthy habits, the manufactures of sugar sweetened beverages (SSBs) and other sugar related products have been negatively affected (Haines 2017). Equally affected are the small-scale canegrowers who rely solely on the production of sugarcane for income. A common argument against sugar taxation was that reduced demand for SSBs would harm businesses, leading to job losses, and as well as slow economic growth (Hattersley *et al.* 2020). Upon announcement, beverage manufactures instantly embarked on a proactive approach to either prevent or reduce the impact of the sugar tax using measures such as reformulating their products and reducing packaging sizes to reduce the sugar content (Sikuka 2021). This led to the reduction in the demand for local sugar which had an immediate effect on the amount of profit paid to the sugarcane growers (Nicholson and Kadwa 2023).

The sugar industry not only provides sugar to the South African market but is a major economic force in our struggling economies with approximately 65 000 direct employments within cane production and sugar processing divisions (SASA 2024). Apart from direct employment, the indirect employment from the numerous support industries is estimated at 270 000, predominantly from KwaZulu-Natal and Mpumalanga provinces, where sugarcane is grown and processed (SASA 2024). Mckenzie (2021) stated that within the first year of the sugar tax on SSBs, the industry suffered an accumulative 16 621 job losses overall, and 9 000 job losses in the cane-growing sector specifically. It is worth noting that these job losses have been predominantly in rural communities already affected by high level of poverty. According

to SASA (2024), more than 2% of the South African population mostly in deep rural areas depend on the sugar industry for living.

There has been a noticeable decline in sugarcane farming which can be attributed to many factors such as drought and imported sugar. However, the associations between SSBs and the rise in non-communicable diseases have created a challenging environment for the small-scale canegrowers operating in South Africa (Myers 2017). Generally, a tax raises the price of a commodity. This is supported by a study conducted by Besley and Rosen (1999) which found that generally the after-tax price increases by exactly the amount of the tax applied, a result consistent with the standard competitive model. However, this is not always the case as sometimes the degree to which suppliers raise their price depends on the elasticity of demand and therefore, they would want to recover the full price.

1.3 Aim of the study

The aim of the study is to investigate the effects of sugar taxation on small-scale canegrowers in the Empangeni area of KwaZulu-Natal. This aim is achieved through the fulfilment of three objectives, namely:

- i. To examine the implementation of the sugar tax in South Africa,
- ii. To establish the effects of the sugar tax on small-scale canegrowers in Empangeni, and
- iii. To suggest possible ways through which small-scale sugarcane growers can be cushioned from the effects of sugar taxation.

1.4 Significance of the study

The South African Government introduced the sugar tax with the aim of addressing the issues of obesity and other NCDs, but the tax threatens the survival of about 18 770 small-scale canegrowers and the income of those dependent on these canegrowers (Dardagan 2022). The sugar industry in KwaZulu-Natal operates mainly in rural areas where there is sufficient agricultural land for sugarcane plantation. It is

therefore worth noting that the most people affected by the sugar tax are in rural communities where poverty rates are very high.

There is no doubt due to the strong evidence that fiscal measures, especially taxes, are recognised globally as effective control measures to help tackle the NCDs through advancement of public health. Hence, it is not an easy decision to do away with sugar taxes, however, the sugar industry transformation and as well as diversification is of paramount importance to assist the small-scale growers with sustainability and job preservation and creation. Taxes on particular products can increase producers' marketing costs which forces the producers to react in an aggressive manner for business sustainability. This has been proven to have a negative impact on consumers as the increased costs are generally recouped by passing these onto consumers through higher prices on the taxed product (WHO 2022).

The implementation of the sugar tax has had a negative effect on South African growers due to the average reduction of 19% of the local market demand over the 2018/19, 2019/20 and 2020/21 seasons (Nicholson and Kadwa 2023). The food and beverage sector was proactive in preempting the sugar tax as over years they have been preparing for this scenario and looking at possible ways to substitute sugar in their production lines. According to Nicholson and Kadwa (2023), the sugar sales data over three seasons indicate that local sales to SSB manufacturers have been reduced by approximately 50% and contributed to an initial 14.6% decline in the recoverable value price in 2018 which the sugarcane growers are paid on. This study therefore sought to understand the effect of implementation of the sugar tax in South Africa on small-scale growers operating in KwaZulu-Natal, Empangeni region. Empangeni is the area in KwaZulu-Natal where most sugarcane farming takes place with three sugar mills (Amatikulu, Felixton and Umfolozi) located around the area.

Understanding the effect of sugar tax and the extent to which the local small-scale growers are affected will assist in providing possible ways through which the small-scale growers can be transformed, cushioned and thus remain competitive in the market. The study investigated possible government initiatives to address socio-economic issues, and the control measures undertaken to support and arrest the ailing sugar industry and ensure sustainability and job retention. This follows the announcement by South Africa in 2019 that the government will develop a number of

sector master plans to help industries grow of which the role of sugar tax in job reduction was made part of (South Africa, Department of Trade, Industry and Competition 2020).

1.5 Organisation of the study

The rest of the study is organised into four chapters. Chapter 2 reviews the literature, discussing both the theoretical and empirical studies on sugar taxation. Chapter 3 discusses the methodology employed in the study. Chapter 4 presents the data and discusses the results of the study. Chapter 5 concludes the study, providing recommendations and areas for further studies.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

There is an ongoing drive to support the implementation of sugar tax on sugary beverages, aimed at promoting health lifestyle amongst the citizens. As a result, the sugar tax policies and its effect on the stakeholders including but not limited to, the sweetened sugary beverage producers and sugar industry, have been a central focus of numerous academic studies. Sugar taxation and its related cost to small-scale growers and economic development is well defined in the literature. However, it manifests differently in each country. There are numerous theories and empirical studies that can be used to explain the effects of sugar taxation on small-scale growers. This chapter discusses some of the theories and the empirical literature underpinning the study. The chapter is divided into two main sections. Firstly, the theoretical literature is provided where two theories linked to the study are discussed. Secondly, a discussion of some of the empirical literature supporting the study is provided.

2.2 Theoretical literature

Several theories are linked to consumer behaviour following the implementation of taxation on different products. This study adopts two common theories as key theories that explain the effects of sugar taxation on small-scale canegrowers. These theories are the economic theory of demand (Marshall 2009) and the theory of taxation (Scherf and Weinzierl 2020; Smith 1937).

2.2.1 The economic theory of demand

The law of demand suggests that the higher the price of a good, the less consumers will purchase it, and has been termed the most famous law in economics, and the one that economists are most sure of (Gans *et al.* 2023; Marshall and Marshall 2023). To

predict consumer behaviour, economists use well-defined techniques evaluating the sensitivity of consumers to changes in price. This technique was pioneered by the British economist Alfred Marshall in the early part of 1890 (Inoua and Smith 2023). The sugar tax on SSBs was designed based on the relationship between the changes in the price and the response of quantity demanded for such product in the market, called price elasticity of demand (Lauer et al. 2022).

Demand is defined as the functional relationship between the price of goods or services and the quantity demanded by consumers in a given period of time, provided everything else remains constant (Salvatore 2021). The law of demand has been defined differently by many economists. However, the concept remains the same, suggesting that the price is inversely proportional to the quantity demanded (Khan 2020). According to Marshall's (2009) law of demand, the amount demanded increases with a drop in price, and diminishes when the price is increased. This suggests that in order to increase sales revenue, businesses should drop the price of their product so it can reach many consumers.

According to Goswami (2020), the economic theory of demand plays a vital role in understanding the market from a consumer behaviour perspective. Business strategic planning is based on consumer demand forecasting to help businesses improve their revenues and thus remain competitive in the market (Kabeyi 2019). De Bruijn and Antonides (2022) state that an individual must possess sufficient wealth to afford goods at a specific price. Generally, lower demand of a product may force the producers to downsize and reduce the cost of production by cutting some of the critical jobs.

After the theory of demand was proposed, there was debate on whether income should be kept constant as the price of goods changed. As a result, the Hicks-Marshall laws of derived demand were developed. The first law of derived demand stated that own-wage elasticity of labour demand will be relatively high when the price elasticity of demand for the final product is relatively high (Fanfani 2022). This means that an increase in the price of the final product results in a reduction in the quantity of the product demanded. At the same time, when there is a significant fall in the final output, businesses will be forced to reduce their employment of labour (and all other inputs) by a relatively larger amount (Mpakaniye 2016).

The theory of demand is applicable to this study as the SSB producers reacted by reformulating their products with a range of no sugar options launched, and 500ml bottles reduced to 440ml while the price remained the same. The sugar industry saw a reduction in the demand for local sugar in the market following the introduction of the sugar tax in South Africa (Nicholson and Kadwa 2023). This theory shapes the discussion in this study as it explains the behaviour of both the consumers and sellers. It also explains the downstream impact, in particular on small-scale canegrowers after the sugar taxation was implemented.

2.2.2 The theory of taxation

Economists and social philosophers have established several concepts about a good tax system. Many of these concepts originated from the book Wealth of Nations written by Adam Smith in 1776 which includes the canons of taxation such as equity, certainty, convenience, and economy. The theory states that the time and manner of payment; the amount to be paid shall be clarified to the taxpayer, and to every other person. In other words, the legislators should provide information and be transparent to everyone likely to be affected by a levy introduced (Ali and Nasaruddin 2020). The introduction of any tax therefore triggers a whole series of adjustments in pricing, consumption, and the quantity demanded.

According to Smith (1999), sugar, rum, and tobacco are products which are non-essential in life. However, they became objects of almost universal consumption due to their addictive nature, and were, therefore, subjected to taxation. Thus, the notion of levying taxes on unnecessary commodities was derived from Smith (Ali and Nasaruddin 2020). Sugar tax falls under health taxes which provide governments with a clear objective to save people's lives, generate revenues, while reducing the health and social costs associated with NCDs (Lauer et al. 2022). Initially, taxation was aimed at raising revenues with no impact on the consumption of taxed commodities. However, Ramsey (1927) concluded that the effect of taxation is usually to transfer income from individuals to the government which then further supports the public. These transfers will slightly adjust the demand schedules depending on the tax applied and the manner of their expenditure.

Ramsey's theory of taxation was incorporated into Pigou's theory which further strengthened the foundation of commodity taxation by associating it with negative externalities and implications not reflected in the market price (Ramsey 1927). It became clear that these products are associated with poor health and therefore they are not necessities. According to Lauer *et al.* (2023), the application of taxation on such products was already in use even before the evidence of their health implications emerged which now makes them more acceptable as a means for government to pursue health objectives through fiscal policies. The theory of taxation is important in strengthening the discussions on the effects of sugar taxes and to what extent the taxes should be applied. It encourages the reasoning behind the sugar tax and prompts suggestions on various ways that the small-scale canegrowers can be cushioned to lessen the effects of sugar taxation.

2.3 Empirical literature

There are numerous studies that seek to explain sugar taxation and its effects on health and economic development. Policies have been adopted to regulate and guide the promotion of health levies in South Africa. This section discusses some of the empirical literature on this phenomenon. More precisely, the section reviews the empirical literature on the implementation and effects of sugar tax in South Africa. The various ways through which small-scale sugarcane growers can be cushioned from the effect of the sugar taxation are also discussed.

2.3.1 The implementation of the sugar tax in South Africa

Implemented in April 2018, the tax on sugar-sweetened beverages aimed to address obesity and the prevalence of NCDs in South Africa (Legote 2019). Initially, it was set at a fixed rate of R0.021 (amended from time to time) per gram of sugar content that exceeds 4g per 100ml, meaning the first 4g per 100ml are levy free (Sikuka 2021). This is a new levy in collaboration with the Department of Health's deliverables to control diabetes, obesity, and other related diseases facing South Africa. The implementation of such a tax was backed by Smith's theory that classified sugar as an

unnecessary product which should be taxed (Smith 1937). Ramsey's (1927) theory also suggested that these taxes aim to reduce the consumption of the selected product with the view to improve people's health.

The levy was legislated through the Rates and Monetary Amounts and Amendment of Revenue Laws Act (14 of 2017) and published in the Government Gazette on 14 December 2017. The South African Government Gazette (2017) stated that the sugar content of sugary beverages liable to the levy on sugary beverages must be calculated on:

- the sugar content stated on the food labelling of the SSBs as prescribed in terms of the Foodstuffs, Cosmetics and Disinfectants Act (54 of 1972),
- the sugar content as certified on a test report obtained and retained from a testing laboratory recognised by the National Regulator for Compulsory Specifications of South Africa, or
- the deemed sugar content of the SSB that is assumed to constitute 20g per 100ml.

Diabetes SA (2020) indicated that the direct healthcare costs associated with treatment of weight-related conditions were very high with a direct impact on productivity losses and the economy of the country. According to Boachie *et al.* (2022), overweight and obesity cost South Africa's health department about R33 billion a year, representing about 15% of government's health expenditure, equivalent to about 0.70% of the country's gross domestic product. Boachie *et al.* (2022) further stated that around 12 million South Africans suffer from weight-related diseases, including diabetes, hypertension, and cardiovascular diseases for which they receive treatment in the public sector. The World Obesity Federation indicated that half of all adults living in South Africa are overweight and obese with a projected increase from 27% to 37% by 2030 (Boachie 2022). As a result, WHO encourages all countries to implement a health promotion levy as one of the control measures to reduce the rise in NCDs (WHO 2022).

Evidence suggests that tobacco and alcohol taxes have gained extensive recognition as an effective health measure to decrease the consumption of harmful products (WHO 2022). This is mainly due to the reduction in their demand from increased prices

in the market which has been proven to reduce their affordability. There is no doubt that the use of SSB taxes to reduce sugar consumption with a potential to improve health rather than raising revenues has gained momentum globally (Hagenaars *et al.* 2021). Tax policies implemented in the United Kingdom (UK) and the United States of America resulted in a significant reduction in purchases of sugar-sweetened beverages (Hofman 2021). According to Lauer *et al.* (2023), most of the fiscal measures are effective in influencing people's health as they have -a bigger impacts on consumers behaviour. However, Manyema *et al.* (2015) argued that most of those affected by NCDs are from poor communities with less access to healthcare, less income, and they consequently die prematurely.

The introduction of sugar taxation in South Africa was received with mixed feelings with many firms and lobby groups resisting the implementation (WHO 2019). Both the beverage and sugar industries argued that the sugar taxation would result in massive job losses and as a result, a suggestion for voluntary measures was proposed (Hofman 2021). In many countries where a sugar tax has been proposed, legislators have seen lots of challenges, with industries campaigning against the policy (Allen and Allen 2020). For example, when it was proposed in Mexico, media campaigns were launched against the proposal citing revenue losses and concerns with foreign interference in the market. The Coca-Cola company lobbied against sugar tax implementation in Latin America. Furthermore, the company is believed to have distorted China's obesity policy by influencing legislation to focus purely on physical activity rather than diet to reduce obesity (Cape Business News 2019).

While Mexico and South Africa successfully passed sugar tax laws, evidence suggests that campaigns against the introduction of sugar tax have been successful in other countries. Despite overwhelming evidence of improved health and support from WHO, countries like Columbia, Denmark and Finland are reportedly to have failed dismally to pass proposed sugar taxation because of political pressure and industry lobbying (Jacobs and Richtel 2017; Hofverberg 2015; O'Sullivan 2020; Pomeranz, Cash and Mozaffarian 2023). The American Beverages Association reportedly spent about \$11 million campaigning against the tax in Philadelphia, and the soft drink industry reportedly spent over \$20 million in San Francisco prior to their legislation being finalised (Maa 2016; Sasko 2016).

In South Africa, the sugar tax policy was highly criticised in mass media campaigns, with some in support and others against it due to misuse of public resources by government officials (Bosire *et al.* 2020). Although the sugar tax was aimed at addressing health issues facing the country, many people believed this tax was meant to raise revenue rather than reduce SSB consumption (Bosire *et al.* 2020). Ultimately, the deliberation process saw the initial rate of 20% recommended by the WHO reduced to approximately 10% in efforts to alleviate concerns arising from industry interests (WHO 2016; Stacey *et al.* 2021). The policy was adopted, but Bosire *et al.* (2020) assert that there was a limited understanding of policy by the public.

2.3.2 The effects of the sugar tax

The introduction of the sugar tax has had a negative effect on sugar demand with lost revenue amounting to approximately R1.2 billion per season since 2018 (Marais 2023). The tax reduced the demand for local sugar in the market by approximately 20% with a subsequent noticeable reduction in industry-related jobs, with some small-scale growers abandoning the industry due to significant loss in revenue (Mthiyane 2022). Subsequently, within the first year of introducing the sugar tax, the South African sugar industry suffered an accumulative 16 621 jobs losses overall, and 9 000 job losses in the cane-growing sector (South Africa 2020; McKenzie 2021).

Further research conducted by the Bureau for Food and Agricultural Policy also suggest that keeping the sugar tax at the current rate will further cost the industry about 15 984 jobs and contribute towards a decline of 46 600 hectares under cane over the next 10 years (Dardagan 2022). According to the South African Canegrowers Association (2021), the effect of an increase in sugar tax as proposed by the government in 2021 will further threaten the existence of the industry's 21 000 small-scale growers as well as the jobs created by commercial growers. Nicholson and Kadwa (2023) stated that the sugar tax resulted in the cost of sugar for SSB producers rising above the threshold level and almost tripled instantly upon implementing the levy on 01 April 2018. Furthermore, the SSBs producer decided to reformulate their products by substituting sugar with artificial sweeteners and no sugar diets.

Coca-Cola South Africa was proactive in relation to the sugar tax as they reduced 500ml bottles to 440ml and 330ml cans to 300ml while deliberations to introduce tax were taking place (Child 2017). However, this was a blow to the consumers because there was a reduction in volume but the price was not reduced which meant that consumers were paying 13% more (Child 2017). A range of no sugar and low-kilojoules options were also launched with a shift in their marketing strategy to lead with no or low-sugar options at a lower price (Cape Business News 2019). The health authorities in South Africa emphasised that the intake of added sugar should not exceed 10% of an individual's total calorie consumption (Hofman 2021; WHO 2022).

A study by Ross *et al.* (2022) on pricing and acquisition of beverages in South Africa showed that there was a greater reduction in purchasing of sugar sweetened products in small shops compared to supermarkets. According to Fiteni (2017) fewer sales of SSBs were observed in accordance with the sugar price increase. Coca-Cola SA indicated that the tax had a negative impact as more consumers were choosing no and low-calorie options and limiting the intake of sugary drinks. As a result, the average sugar across their portfolio was reduced by 26%, ahead of industry commitments of 15% in a period of two years (Cape Business News 2019). A study conducted in Mexico revealed that on average there was a 6% reduction in purchases of taxed beverages whereas the untaxed beverages saw a 4% increase in sales over the first year of the tax (Colchero *et al.* 2017; Hofman 2021). According to Colchero *et al.* (2017), Mexico introduced an excise tax of one peso (R0.34) per litre on SSBs in 2014 which differs from the South African tax of R0.021 per gram of sugar content exceeding 4g of 100ml.

A NEDLAC study initiated by the South African Department of Trade and Industry in 2020 highlighted that the sugar farming sector's output had declined by a cumulative R414 million by 2019, and the sugar manufacturing sector's production had dropped by a cumulative R772 million by 2019, with a drop of R653m in investment into the economy (Russel 2021a). Currently, there has been no convincing evidence produced by the government that suggests that the tax has had the desired effect of reducing the level of obesity in the South Africa (Russel 2021a). According to Nour and Altintas (2023), studies have revealed that there are many factors contributing to obesity, such

as socio-demographic factors, lack of exercise and sleep, unhealthy food, and psychological problems.

2.3.3 Cushioning small-scale sugarcane growers

South Africa is a developing country with extremely high unemployment rates. Currently, the unemployment rate is 32.9% (Statistics South Africa 2023). According to the South African News Agency (2022), in the first quarter of 2022, the agricultural sector alone had a total of 844 000 people employed. According to the South African Sugar Association (SASA 2023), the sugar industry generates an annual estimated direct income of R14 billion, constituting about R5 billion from sugarcane production. Furthermore, the direct and indirect jobs generated by the industry are estimated at 65 000 and 270 000, respectively. Generally, most of the small-scale farmers are located in the deepest corners of the country where infrastructure accessibility remains a challenge.

Tshuma (2014) indicated that any form of agriculture, including crop production is dependent on water which calls for government to provide these farmers with water and electricity. This will improve their production yields and lessen the financial impact of sugar tax. A study conducted by Cockburn *et al.* (2014) in Noodsberg area, KwaZulu-Natal revealed that weed management and high raw material costs are viewed as the biggest limitations to sugarcane production by the small-scale growers. Therefore, government should assist growers with weed management to improve production yields which in addition to improved household income will promote sustainability of sugar millers.

To remain sustainable, the South African Sugarcane Value Master Plan to 2030 (South Africa, Department of Trade, Industry and Competition 2020). has provided a helpful pathway that the small-scale canegrowers could follow. The study was initiated in support of the implementation of the sugar taxation to come up with a plan to lessen the impact of reduced sugar consumption on jobs (Legote 2019). As stated during the approval of the Sugar Master Plan in 2020 (South Africa, Department of Trade, Industry and Competition 2020), the master plan is mainly focused on diversifying the value chain based on sugarcane away from the current sugar manufacturing model.

The master plan promotes a shift from the manufacturing of raw and refined sugar to one that produces a wide range of globally competitive sugarcane-based products and which provides new job opportunities.

Apart from sugar production which is currently under threat and on the downward trend from reduced consumption due to sugar tax, the opportunities identified include: bioethanol for fuel blending, biojet fuel; potable, industrial and pharmaceutical-grade bioethanol, biomass co-generated electricity, biogas, no- and low-calorie sweeteners, various platform and specialty chemicals and bio-based polymers for application in different sectors i.e., plastics, packaging, automotive, industrial, textiles, among others (South Africa 2020). Biomass has gained popularity as one of the most important renewable energy sources. For example, in Brazil, a programme called ProAlcohol focused on producing ethanol from sugarcane as a gasoline substitute (Matsuoka, Ferro and Arruda 2009).

According to Matsuoka, Ferro and Arruda (2009), new technologies for electricity production from sugarcane were supplying about 15% of the electricity requirements in Brazil with projections implying that the figure could double to over 30% by 2020. As per the sugar industry 2030 vision, similar interventions could save the small-scale sugarcane growers with a potential to minimise electricity loadshedding currently facing South Africa. Globally, sugar cane-based industries are progressively moving towards energy production for sustainability, therefore, the South African sugar industry needs similar access to the electricity and fuel markets (Phillips 2011). To date, most future analyses are supporting the cogeneration of electricity in the process of sugar manufacturing and the production of ethanol from sugarcane as a fuel (Dubb, Scoones and Woodhouse 2017).

There is compelling evidence suggesting that health taxes are the most cost-effective tools in controlling unhealthy consumption and non-communicable diseases (Lauer *et al.* 2022). According to Stacey *et al.* (2019), the sugar tax law was intended to reduce risks associated with excessive sugar consumption and so to encourage the SSB manufactures to reduce the sugar content on taxable beverages. However, this translates to a higher cost of production for small-scale canegrowers in South Africa and the one million livelihoods that the industry supports (Marais 2023). According to Sifundza (2019) access to production credit aids small-scale growers to capitalise in

agricultural technology and enables them to easily purchase farming inputs, such as chemicals, fertiliser, and high-yielding seeds, and facilitates hiring of labour.

Kgobisa (2022) argued that despite being in place for more than four years, there remains no noticeable evidence to suggest that the levy has reduced obesity levels in the country. Hence, the South African Cane Growers Association are appealing to the government to reduce the levy and focus on other control measures such as promoting physical activities (Kgobisa 2022). According to Bosire *et al.* (2020), beside sugar tax measures, government and health experts should promote educational strategies to increase the practice of healthy diets by employing captivating and appealing messages to the public. The South African Canegrowers Association is continuously appealing to the government and health experts to further review the sugar tax and assess the impact it had on local industry (Polity 2021).

The increase in sugar imports in 2017 appears to have played a major role in depressing the South African industry's direct sales in 2016/17 and industrial sales in 2017/18 (South Africa 2020). Under the conditions of an effective contraction in demand for South African sugar sales, government, wholesalers, and retailers should promote the use of local sugar so that 95% of sugar procured is locally produced (South Africa 2020). Kgobisa (2022) indicated that the South African Canegrowers Association remains committed in its fight against obesity and exploring other methods which does not unfairly target one industry and the livelihoods that depend on it.

2.4 Conclusion

This chapter reviewed the literature relevant to the effect of sugar tax on small-scale canegrowers in South Africa. It began by providing theoretical literature whereby theories related to taxation and economic demand were reviewed. This was followed by a discussion of some empirical literature on the implementation and the effect of sugar taxation in South Africa. The chapter also reviewed the various ways through which the small -scale canegrowers can be protected from the impact of sugar tax. It emerged from the review of literature that sugar is one of the contributing factors to obesity and other NCDs and should therefore be taxed to reduce consumption with a view to improve health of individuals. Key issues that emerged from the literature

include the decline in the demand for local sugar in the market, the job and income losses experienced in the sugar industry after the tax was implemented. The reviewed literature also indicated the need for the sugar industry to diversify in order to cushion the small-scale canegrowers from the effect of sugar taxation.

CHAPTER 3: METHODOLOGY

3.1 Introduction

Methodology refers to the technique used for collecting data; it provides details on how the research is to be conducted with the aim of answering the research questions (Nayak and Singh 2021). Research methodology encompasses the techniques used for data collection, the types of data collected, and the data analysis tools (Sileyew 2019). According to Jansen and Warren (2020), methodology rationalises the research design by indicating that the selected methods are the best fit for the research aims and objectives. This chapter outlines the methodology of the study which is arranged into various sections. The chapter discusses methodological components such as the research design, the study population, target sample, sampling method, data collection instruments, data collection process, validity and reliability of data and data analysis. It further discusses the relevant ethical considerations in the study.

3.2 Research philosophy

Research philosophy refers to a system that incorporates beliefs and assumptions of how the knowledge in relation to the research is developed (Saunders, Lewis and Thornhill 2009). According to Saunders *et al.* (2009), there are five philosophies, namely, positivism, critical realism, interpretivism, postmodernism and pragmatism. Positivism paradigm was deemed appropriate to this study as the study is adopting a quantitative research approach. Positivism recognises that only factual knowledge gained through observation, including measurements, is trustworthy (John 2018). This suggests that the role of the researcher is limited to data collection and interpretation in an objective manner. In order to achieve the objectives of the study a questionnaire was administered to the respondents and the collected objective data was carefully analysed. Positivism involves the use of the existing literature (both theoretical and empirical) to develop the hypothesis to be tested during the research process (Saunders *et al.* 2009). The outcome of the study is based on the responses from the survey and the researcher is an external and independent individual with no influence

of what is happening or the outcome. Therefore, positivism research philosophy was deemed appropriate in the context of this study.

3.3 Research design

Research design refers to the framework for the collection and analysis of empirical data to answer the research question and meet the objectives of the study (Saunders *et al.* 2009). According to McCombes and Bhandari (2023), well-designed research helps ensure that the methods in use are aligned with the research objectives and that the correct data collection instrument and analytical tool are used. Research designs are categorised into qualitative, quantitative and mixed-methods design approaches. A qualitative approach emphasises non-numerical data or data that have not been quantified such as data derived from spoken words, written words, videos, and collected using interviews (Saunders *et al.* 2009). A quantitative study emphasises quantification in the collection and analysis of numeric data through administration of questionnaires (Bryman *et al.* 2014). A mixed method involves a combination of both the above methods.

Quantitative cross sectional research design was deemed appropriate to this study. Cross-sectional involves collection of relevant data from many different individuals at a specific point in time and where variables are observed without influencing them (Kesmodel 2018). In this study, data was collected from different small-scale canegrowers randomly and the variables were analysed and observed without the influence of the researcher. Due to time constraints, it was a once-off study and the data gathered explains the effects of sugar taxation on small scale canegrowers during the time of the study. According to Bryman *et al.* (2014), a quantitative approach allows the collection of information from a large sample size and involves testing, measurements, objectivity and replicability. This study drew a sample from a large population of about 3 000 small-scale canegrowers in the Empangeni area, with a large sample size (262) being used to ascertain the effects of sugar taxation.

In Figure 3.1, Panel A depicts the South African map, indicating the position of Empangeni in KwaZulu-Natal. Panel B shows the selected areas in the Empangeni region. The areas shown in Panel B include the rural areas of Amadaka, Ngwelezane, Ngoye, Nseleni, eNiwe, Gobandlovu, Port Dunford, Mtunzini and Ongoye where the study was conducted. In terms of racial dynamics, according to the 2022 national census statistics, about 91% of the population is black African, while whites constitute 6% of the population with Indians and coloureds representing 2% of the total population (Statistics South Africa 2022). The most commonly spoken language is isiZulu.

The Sugar Master Plan as per the Department of Trade, Industry, and Competition (DTIC) (2020) indicated that the South African sugarcane growing sector consists of about 20 200 canegrowers, producing about 19 million tons of cane per annum. In terms of racial dynamics, the sector comprises about 19 300 black African growers who are responsible for 24% of the total sugarcane production. White farmers produce 69%, while miller-owned estates produce the remaining 7% of sugarcane. A total of about 18 770 represents small-scale growers produce about 11% of the total industry production in South Africa with about 3 000 growers operating in Empangeni and the surrounding areas.

3.5 Study sample and size

A sample is a subset of the population that is selected to be a representative of the entire population during the study (Acharya *et al.* 2013). This is very important in the study because the main aim of the researcher is to generalise and draw conclusions from the selected sample. Therefore, the more representative the sample, the more confident the researcher that the results can be generalised to the target population (Mcleod 2023). While there are many canegrowers in KwaZulu-Natal, the study focused on the Empangeni area where the survey was conducted. The Raosoft sample size calculator was used to determine a sufficient sample size of 249 respondents. Given a total population of about 3 000 small-scale canegrowers in Empangeni and a confidence level of 90%, the Raosoft sample size calculator suggests that data should be collected from at least 249 respondents. The inclusion

criteria were that the potential respondent should be a small-scale cane grower in the Empangeni area, supply sugarcane to the sugar mills in KwaZulu-Natal, be 18 years or older at the time of the survey, and agree to voluntarily participate in the survey. Anyone who did not fit these criteria were excluded from participation in the study.

3.6 Sampling technique

Sampling is a process of collecting a subset of participants that is representative of the entire population (Taherdoost 2016). According to Bryman *et al.* (2014), proper sampling ensures that findings from the study of a specific sample can be generalised to the entire population in relation to the existing theory. However, this clearly depends on the choice of the sampling technique to be used during the study. Two types of sampling techniques are identified in the literature, namely, probability sampling and non-probability sampling. Probability sampling techniques employ random selection from a large population whereby every item in the population has an equal chance of being part of the sample (Acharya *et al.* 2013). This technique allows the researcher to make strong statistical inferences in relation to the study which therefore produces results that are representative of the entire population (McCombes 2019). The literature suggests that probability sampling methods are the most appropriate when conducting experiments and survey research strategies. There are five main types of probability sampling, namely, simple random sampling, stratified random sampling, cluster random sampling, multi-stage random sampling and systematic random sampling (Taherdoost 2016). A sampling frame is key when choosing the probability technique and must be based on the research question and objectives (Saunders *et al.* 2019).

Non-probability sampling techniques employ non-random selection and are applied when it is impossible to determine who the entire population is or when there are difficulties in accessing the entire population (Hassan 2024). In this technique, the researcher selects the samples based on their judgement, hence not every individual has an equal chance of being selected. This method is most appropriate in exploratory and qualitative studies, but has a higher risk of sampling bias when compared to the probability sampling technique. Non-probability sampling is classified into five main

types, namely, quota sampling, snowball sampling, judgemental sampling, convenience sampling and consecutive sampling (Taherdoost 2021).

This study adopted a simple random probability sampling technique. This technique ensured that each canegrower in the population had an equal chance of being selected. This addressed the issue of sample selection bias which may arise if sampling is not done properly. Respondents in this study were randomly selected from the entire population of small-scale growers in the Empangeni area, KwaZulu-Natal. The respondents were selected based on their involvement with the phenomenon under investigation and their relevant work experience in the cane growing sector.

3.7 Data collection instrument

According to Moyo (2017), survey instruments constitute a fundamental element of the research process, as they provide the analytical basis for pursuit of answers to a given research problem. Many studies use instruments such as questionnaires, interviews and observation to collect data. Since the study adopts a quantitative research approach, a questionnaire was used as an instrument to collect data from the small-scale canegrowers. Questionnaires are a series of questions asked to individuals to achieve statistically valuable information about the given research (Ikart 2019; Roopa and Rani 2012). According to Aithal and Aithal (2020), questionnaires become a fundamental instrument from which conclusions can be deduced about the entire population when they are properly constructed and structured. Therefore, adequate questionnaire construction is important to the success of a research. Generally, correctly constructed questionnaires make the survey worthwhile.

A valid method for testing a questionnaire and thus ensuring it is accurately constructed and captures the required information is to pilot it among a small subset of the target population (Aithal and Aithal 2020). Accordingly, the draft questionnaire was piloted on 10 small-scale cane growers who were randomly selected prior to data collection. The feedback from the pilot study was used to improve the quality of the questionnaire. The questionnaire was developed based on the extensive literature review. Key empirical studies that have been instrumental in the development of the questionnaire in this study include the South African Sugarcane Value Chain Master

Plan (South Africa, Department of Trade, Industry and Competition 2020), Haines (2017), Hofman (2021), Nicholson and Kadwa (2023), and Sikuka (2021).

The questionnaire was divided into two sections. The first section collected the biographical information of respondents. The second section collected data on the challenges and critical issues experienced by the small-scale cane growers in Empangeni relating to sugar taxation. Questions contained in the second section were closed-ended with some of them based on a 4-point Likert scale with options ranging from “strongly agree” to “strongly disagree”. Lastly, open-ended questions were included to allow respondents to share their views and experiences on the phenomenon. The other questions in the second section were dichotomous (yes or no). Since most of the growers speak only isiZulu, there was a need to translate the questionnaire into isiZulu; the questionnaire was developed in the English language and directly translated into isiZulu. The questionnaire used to collect data in the study is provided in Appendices 6 and 7.

Prior to data collection using self-designed instruments, it is important to test the effectiveness of the research methodology while ensuring that the questions are clear to the participants (Roopa and Rani 2012). A pretest for a questionnaire aims to validate the content of the data collection instrument and measure the understanding of the respondents. The pretest survey was conducted on 10 respondents selected randomly from the sugarcane growing sector and industry experts. Following the survey, it was established that the questions were properly framed, understood by all respondents and achieve the intended outcomes. Lastly, the instrument reliability and validity were addressed and are further discussed in this subsection.

3.7.1 Testing for instrument reliability

Reliability measurements indicate the extent to which the methodology is able to repeatedly produce stable and consistent results under similar conditions (Ahmed and Ishtiaq 2021). It shows the accuracy and precision of the data collection tool across time and of the various items in the instrument (Sileyew 2019). The literature suggests three types of reliability, namely, test-retest reliability, across different researchers (or inter-rater reliability), and across items (or internal consistency). Test-retest reliability

refers to the consistency of a measure across time whereas inter-rater reliability is the consistency of a measure across observers or raters. Lastly, internal consistency is the consistency of the measurement itself (Ahmed and Ishtiaq 2021). This study employs the internal consistency approach to test the reliability of the survey instrument used.

Internal consistency refers to the extent to which items within a survey correlate with each other and measure the same thing (Sürücü and Maslakçi 2020). For example, when 10 items are designed to measure the same concept, each respondent should therefore respond to these items in the same way, which would then suggest the perfect internal consistency of the survey. To test whether the study would produce the same results using internal consistency reliability, the survey instrument was administered to the respondents once and the reliability was determined based on scores from a single survey (Tang, Cui and Babenko 2014). This study used Cronbach's alpha coefficient to assess consistency of the survey. In addition, the adequacy of the sample size was tested using the Kaiser-Meyer-Olkin (KMO) which is further used to measure the suitability of data for factor analysis (Shrestha 2021).

In the context of this study, the questionnaire developed to obtain data from the small-scale canegrowers was administered to 10 respondents from the target sample. Each question item was then measured against the other to check for alignment when compared to the rest of the questions in the survey. The data obtained from the individual respondents was then computed and analysed using the Cronbach's alpha test method. Cronbach's alpha coefficient normally ranges between 0 and 1; when the coefficient is closer to 1.0, the greater is the internal consistency of the items in the survey. However, a value of between 0.6 and 0.8 is acceptable (Hajjar 2018). The internal consistency reliability suggests which of the items based on the score should remain or be omitted from the survey.

3.7.2 Testing for instrument validity

Validity refers to how the measuring instrument accurately measures the behaviour it is designed to measure, and is also an indication of how well the survey instrument performs its function (Sürücü and Maslakçi 2020). The literature suggests four types

of validity in a questionnaire, namely, content validity, face validity, criterion validity and concurrent validity. According to Roopa and Rani (2012), content validity refers to the degree to which the instrument represents all aspects of the survey and where expert judgement is vital on the adequacy of the questionnaire. On the other hand, face validity refers to an evaluation of whether an item on a questionnaire is relevant to the sample in the study in such a way that at face value the researcher achieves the objectives.

Criterion validity indicates the effectiveness of the tool in predicting the outcomes of what it is intended to measure. Construct validity refers to the extent to which a newly designed questionnaire conforms to the hypothesis being measured or the existing ideas. This study employs the principles of content validity. In the literature, several methods have been proposed for determining content validity. Amongst them, consulting subject matter expert and statistical methods are the two most highly recommended methods (Hajjar 2018). It is therefore to make a concerted effort to describe the population interest, followed by a request to experts to judge how well the selected sample describes the study population.

To achieve validity in this study an extensive literature review and the consultation of field experts was followed by the development of the questionnaire. The questionnaire was piloted on 10 small-scale growers to confirm the accuracy of the data and also remove any form of ambiguity and biases prior to data collection and analysis. Furthermore, sufficient time must be allocated for both data collection and analysis to improve on the robustness of the data and results.

3.8 Data collection procedure

Choosing inappropriate data collection methods may produce invalid research findings and lead to inconclusive results. Therefore, it is important that the methods are carefully chosen in order to achieve the objective of the study. In this study the respondents self-administered the survey, with questionnaires completed in the presence of the researcher. Self-administered questionnaires improve the quality of a survey and there are no delays as questions are clarified to the respondents resulting in a higher response rate. The questionnaire was designed in the English language

and translated into isiZulu; hence respondents could choose their preferred language. Prior to data collection, a letter of information explaining the nature and purpose of the study was provided to each respondent (Appendices 2 and 3). The letter introduced the study to the potential respondents, providing all necessary information regarding their rights, procedures, and recourse. In the letter of information, respondents were informed that the survey was voluntary and they could withdraw from the study at any time should they feel uncomfortable to continue participating. The letter of information was provided in both English and isiZulu, and as a result each potential respondent was given an opportunity to choose a questionnaire prepared in a language of their preference.

Upon understanding the letter of information, respondents were presented with the consent letter. The consent letter provided details and was a statement of agreement between the researcher and respondents participating in the study. Therefore, the respondents were asked to sign the letter, indicating that they agree to participate in the survey at their own free will, and without any form of undue coercion. The informed consent letter was provided in both the English and isiZulu languages, and each respondent signed one in the language of their choice. Both versions of the consent letter are respectively presented as Appendices 4 and 5. Only after the respondents signed the consent letter were they able to participate in the survey. Respondents chose a version of the questionnaire based on their preferred language and it took approximately 10 minutes for each respondent to complete the survey.

3.9 Data analysis

Data analysis refers to a process through which raw data obtained from a survey is analysed and constructed in a manner that conclusions can be drawn from it and it can be used in decision making (Malik, Fatema and Iqbal 2021). According to Saunders *et al.* (2009), data analysis is the process of breaking down data and clarifying the natural component parts and as well as the relationships between them. After data collection the characteristics of the responses are described using statistical analysis. In this study, the quantitative data collected from the sample was analysed through descriptive statistics and frequency distributions. According to Ali (2020),

descriptive statistics are used to arrange data into an easily accessible and readable format, helping researchers to establish the rationale associated with the study. The literature suggests three types of descriptive statistics, namely, frequency distribution, measure of central tendency, and measure of variability (Mishra *et al.* 2019).

The frequency distribution depicts a summary of the frequency or percentages of individual values for that particular variable. In other words, it measures how frequent does a certain response occurs from a particular group of respondents in the population. According to Mishra *et al.* (2019), this is a critical area of statistics that deals with the number of occurrences and percentages. In this case, the different responses obtained during the survey in the Empangeni region were segmented demographically and thereafter the total responses for each category were obtained. The study then is able to describe the characteristics of small-scale canegrowers in Empangeni region. The data was organised and presented in the form of tables and graphs. A correlation coefficient test between the independent variables is conducted to identify the strength and extent of their relationship; this is a number between 0 and 1, where 1 represents a perfect correlation, while 0 suggests that there is no relationship between the variables (Bhandari 2021).

There are several mathematical methods that can be utilised to reduce a large number of variables into a smaller number of factors. This study adopts a principal component analysis (PCA) approach which involves a statistical method that converts a large number of correlated variables into fewer uncorrelated variables. PCA is a widely used variable reduction method that results in a small number of components that account for most of the variance in a set of collected data (Paul, Suman and Sultan 2013). In doing so, the critical key components are identified and further analysed. According to Sürücü and Maslakçi (2020), factor analysis utilises statical methods to simplify interrelated data and explore key components arising from a set of variables. This helps the researcher to summarise and make judgements from the collected data. It becomes easier to comprehend the relationships and patterns of observed variables from the measuring instrument.

The variables that are important in assessing the effects of sugar tax on small-scale growers were determined by means of the PCA model. The technique used in PCA is called eigen analysis, where the results are ordered in descending order to set the

variable in order of significance. The eigen value represents the total of variances that can be described by each principal component where components that have eigenvalues greater than 1 are chosen. PCA is expressed as:

$$y_{ij} = \mathbf{a}'_i \mathbf{b}_j + e_{ij} \quad i = 1, \dots, n. j = 1, \dots$$

where y_{ij} are the elements of \mathbf{Y} , \mathbf{a}_i (scores) and \mathbf{b}_j (loadings) are f -vectors of parameters, and e_{ij} are independent homoscedastic residuals. In the case of factor analysis, the scores \mathbf{a}_i are random rather than fixed, and the residuals are allowed to be heteroskedastic in j . It then follows that $E(\mathbf{Y})$ is a matrix rank of f , with f typically substantially less than n or p (Jackson 2005).

3.10 Ethical considerations, anonymity, and confidentiality

Ethical considerations are guidelines for conducting professional studies. These guide and regulate researchers to ensure that strict code of ethics when conducting research are adhered to (Hasan *et al.* 2021). Researchers must maintain ethics from the beginning to the end of a research. This study maintained the ethical principle of self-determination because respondents were treated as autonomous agents. All respondents were informed of this principle before they could participate in the survey. Respondents were also informed that their participation was voluntary, and that they could choose to withdraw from the survey at any time. Details of the researcher, those of the supervisor and contact details for the administrator of the ethics committee at the Durban University of Technology were provided to each participant who could use those details in case of any complaint against the researcher. All ethical standards outlined by the ethics committee at the Durban University of Technology were strictly adhered to. An ethics clearance number was issued by the ethics clearance committee and is provided in Appendix 1.

Understanding and applying anonymity and confidentiality in research is key for the credibility of a study. The practices of anonymity and confidentiality are mainly used to protect the privacy of people participating in a study while obtaining, analysing, and concluding data associated with the participants (Hoft 2021). To ensure that anonymity and confidentiality of respondents were respected in the study, the study was first

approved by the faculty research committee and the ethics committee at the Durban University of Technology. Poor anonymity and confidential approaches applied in the study can lead to unprecedented and precedented harm to participants with a major impact on the overall critical appraisal of the study outcomes (Eungoo and Hwang, 2023). For this study, the identities of all respondents will not be published, that is, the names, photographs, or any identifying information will be treated as highly confidential. The data collected in the study will not be controversial, and confidentiality will always be ensured. Completed questionnaires will be stored for five years in a locked cupboard at the supervisor's office and thereafter shredded.

3.11 Conclusion

This chapter discussed the research methodology used in the study. The study adopted quantitative research with numerical data being collected from 262 small-scale canegrowers in Empangeni, KwaZulu-Natal. Secondary data was obtained from literature surveyed for this study, and the primary data was obtained using a structured questionnaire. The researcher administered the questionnaire using data collection procedures outlined in this chapter. Descriptive statistics and the PCA model were used to analyse the quantitative data obtained during the survey. Lastly, ethical considerations, anonymity and confidentiality were presented to guide the researcher throughout the study. In the next chapter, the empirical results of the study were presented and discussed.

CHAPTER 4: RESULTS

4.1 Introduction

This study set out to achieve three main objectives. The first objective was to examine the implementation of the sugar tax in South Africa, while the second objective was to establish the effects of the sugar tax on small-scale canegrowers in Empangeni, KwaZulu-Natal. The third objective was to suggest possible ways through which small-scale sugarcane growers can be cushioned from the effects of the sugar taxation. To achieve these objectives, quantitative data was collected from small-scale canegrowers sampled across the Empangeni area. This chapter discusses the results of the study and is organised into four sections. Section 2 of the chapter presents the descriptive statistics. Section 3 discusses the results obtained from the respondents' general knowledge of sugar taxation. Section 4 presents the effects of sugar taxation on small-scale canegrowers and section 5 concludes the chapter.

4.2 Descriptive statistics

Descriptive statistics are concerned with organising, summarising, interpreting and transforming data into information and knowledge that is readable and understandable (Hassan 2024). Alabi and Bukola (2023) highlight three main benefits of descriptive statistics. Firstly, descriptive statistics are commonly used to gain more understanding into the characteristics and distribution of data during a survey. Secondly, they assist the researcher to easily comprehend data, and those statistics then become a fundamental basic tool for further statistical techniques. Lastly, they produce understandable and reliable data which allow decision makers to make informed decisions. In the context of this study, quantitative data was collected from 262 small-scale canegrowers in the Empangeni area during December 2023. The descriptive statistics incorporate gender, race, education, farming categories, years in farming, total number of employees and the total amount of sugarcane produced by each grower per year. Table 4.1 presents the descriptive statistics of respondents.

Table 4.1: Descriptive statistics (n = 262)

Variable	Category	Frequency	%	Mean	SD	Min.	Max
Gender	Male	171	65	-	-	-	-
	Female	91	35	-	-	-	-
Race	African	262	100	-	-	-	-
	White	-	-	-	-	-	-
	Indian	-	-	-	-	-	-
	Coloured	-	-	-	-	-	-
Education	No formal school	68	26	-	-	-	-
	Primary school	20	8	-	-	-	-
	High school	69	26	-	-	-	-
	Diploma	102	39	-	-	-	-
	Degree	2	0.8	-	-	-	-
	Postgraduate	1	0.4	-	-	-	-
Farming scale	Small-scale	262	100	-	-	-	-
	Large-scale	-	-	-	-	-	-
Years in farming		262		11	8	0	50
Employees (Number)		262		2	6	0	35
Annual production (tons)		262		178	239	10	1 600

Note: % is the percentage of respondents; SD is the standard deviation; Min is minimum; Max is maximum.

More males participated in the survey (65%). In contrast, the South African population statistics figures by gender in the City of uMhlatuze indicate that half of the population (51.5%) are females (Statistics South Africa 2022). However, Smith (2021) argues that there is still gender imbalance in the South African labour market with only about 34% of small, medium, and micro enterprises (SMMEs) being led by women. Furthermore, Radebe and Smith (2023) argue that women in rural areas are mostly housewives with limited access to development programmes that could provide them with the means to start their businesses. Therefore, the composition of the respondents in this study agrees with the current state of the South African labour market.

All the respondents were black African (100%). This is a true reflection of the population of the area, with the majority of the residents (88%) being black African (Statistics South Africa 2022). The Sugar Industry Master Plan (South Africa, Department of Trade, Industry and Competition 2020) indicated that there are approximately 19 300 black growers of which 97% are small-scale growers producing about 11% of the total industry production. There are approximately 850 white growers of which 170 are small scale growers. On average, the canegrowers who participated

in this study had been farming for 11 years, which suggests that the majority of the respondents were well-informed and have experienced the effects of the sugar tax since its inception seven years ago. Therefore, the results of the survey are reliable with the majority of the respondents having experienced the pros and cons of no sugar taxation and of sugar taxation.

The summary statistics indicated a large variation within the sample in terms of the number of employees, averaging 2, with a minimum and maximum number of employees at 0 and 35, respectively. This is a true reflection of the population as some of the growers were farming on their own or operating as family businesses with no employees. These figures indicate that all the sugarcane growing businesses in this study can be classified as micro enterprises because all of them employed less than 50 employees (South Africa, Department of Small Business Development 2019). With the high unemployment rate (about 32%) in South Africa, SMMEs cannot be overlooked because they play a crucial role in economic development, innovation and job creation (Statistics South Africa 2024).

The sugar cane production per annum per grower indicated a large variation, averaging 178 tons per annum with the maximum tonnage of 1 600 tons per annum. This number of tons is indicative of small-scale cane growers, with growers delivering more than 1 800 tons of cane per annum being categorised as large-scale (Nicholson and Kadwa 2023). The survey results indicated that about 66% of the growers obtained higher education (matric or a degree) which suggests that they were able to comprehend the study and had a clear understanding of the questions posed to them. However, it is important to note that about 26% of the respondents had never attended school, the population statistics for the area indicated that about 8% had never attended school (Statistics South Africa 2022). In general, the majority (60%) of the SMME owners have secondary education, while only 4% have never attended school (South African Enterprise Agency 2016). This suggests that sugarcane farming can be a source of income for those without any formal education.

4.3 Knowledge of sugar taxation

The South African government legislated the sugar taxation law through the Rates and Monetary Amounts and Amendment of Revenue Laws Act (14 of 2017), effective from 1 April 2018 (South African Revenue Service 2021). Respondents were asked ten general questions to express their views to demonstrate their understanding of the sugar taxation under the study. These questions were asked using a Likert scale with four options (strongly agree, agree, disagree, and strongly disagree). The respondents were only allowed to choose one option in each question which would then demonstrate their understanding of the reasoning behind the government's implementation of the sugar tax. This was in line with the objectives of the study which were to examine the implementation of the sugar tax in South Africa.

It was also necessary to establish whether the growers were familiar with the reason behind the sugar tax as well as the financial implications associated with the sugar tax. In this context, the South African canegrowers stated clearly that they were committed to working together with government to come up with a plan that defines the causes of obesity in the country and provides solutions that will address this problem without destroying the sugar industry sector and the community it supports (Dardagan 2022). This section presents the results obtained during the survey and is structured into three subsections. The first subsection explains the reliability of the results, while the second subsection presents the frequency distribution results on the views and opinions of the respondents pertaining to the sugar taxation. The last subsection presents the factor analysis of responses on sugar taxation knowledge.

4.3.1 Reliability test for questions on sugar taxation knowledge

Reliability testing of the measuring instruments helps the researcher interpret and build confidence in the results obtained during the study. It indicates the stability of the values obtained repeatedly under similar conditions while using the same measuring instrument (Sürücü and Maslakçi 2020). The questions on sugar tax knowledge adopted a Likert-scale method of measurement. Generally, Likert-scales are susceptible to response bias whereby the respondents can either agree or disagree with questions posed due to fatigue or social desirability (Bhandari and Nikolopoulou

2023). Therefore, to accomplish reliability and eliminate bias, this study used Cronbach's alpha test. The coefficient ranges between 0 to 1, where a common interpretation of the Cronbach's alpha coefficient (α) is that an $\alpha > 0.8$ indicates high reliability, while test results of $0.5 < \alpha < 0.8$ suggest moderate (acceptable) reliability. When test results produce $\alpha < 0.5$, this indicates low reliability (Ekolu and Quainoo 2019). Therefore, a coefficient value of greater than 0.5 is considered acceptable in this study to confirm the reliability of the instrument. Table 4.2 shows the Cronbach's alpha test results obtained for the questions on sugar taxation knowledge.

Table 4.2: Cronbach's alpha test results

Item	Obs	Sign	Item-test correlation	Item-rest correlation	Interitem Correlation	Alpha
Awareness	262	+	0.696	0.576	0.167	0.643
Reduction	262	+	0.756	0.653	0.158	0.628
Price	262	-	0.368	0.187	0.214	0.711
Demand	262	-	0.279	0.091	0.227	0.726
Appropriate	262	+	0.752	0.649	0.159	0.629
Cost	262	-	0.744	0.618	0.162	0.654
Voluntary	262	-	0.650	0.217	0.174	0.654
SSBs	262	+	0.246	0.057	0.232	0.731
Supportive	262	-	0.385	0.205	0.212	0.708
Effect	262	+	0.360	0.178	0.215	0.712
Test scale					0.192	0.704

Respondents were asked ten questions scaled using a 4-point Likert scale (i.e., strongly agree, agree, disagree and strongly disagree). Standard definitions were provided and respondents were then asked to select the best response in each statement pertaining to the knowledge of sugar taxation. In this context, Table 4.2 shows that the scores were between 0.628 and 0.731, with an overall score of 0.704, which is moderate (acceptable). Therefore, all these ten questions asked were found to be reliable and trustworthy in contributing to the outcome of the study.

4.3.2 Frequency distribution of responses on sugar tax knowledge

This subsection presents the frequency distribution of the responses of the small-scale canegrowers to the 10 questions pertaining to knowledge of the sugar tax. These questions explored the views and perceptions of small-scale canegrowers on the implementation of sugar tax and ascertained their understanding. This was in line with the study's first objective, which sought to examine the implementation of the sugar tax in South Africa. Figure 4.1 presents a stacked bar graph that demonstrates the frequency of responses.

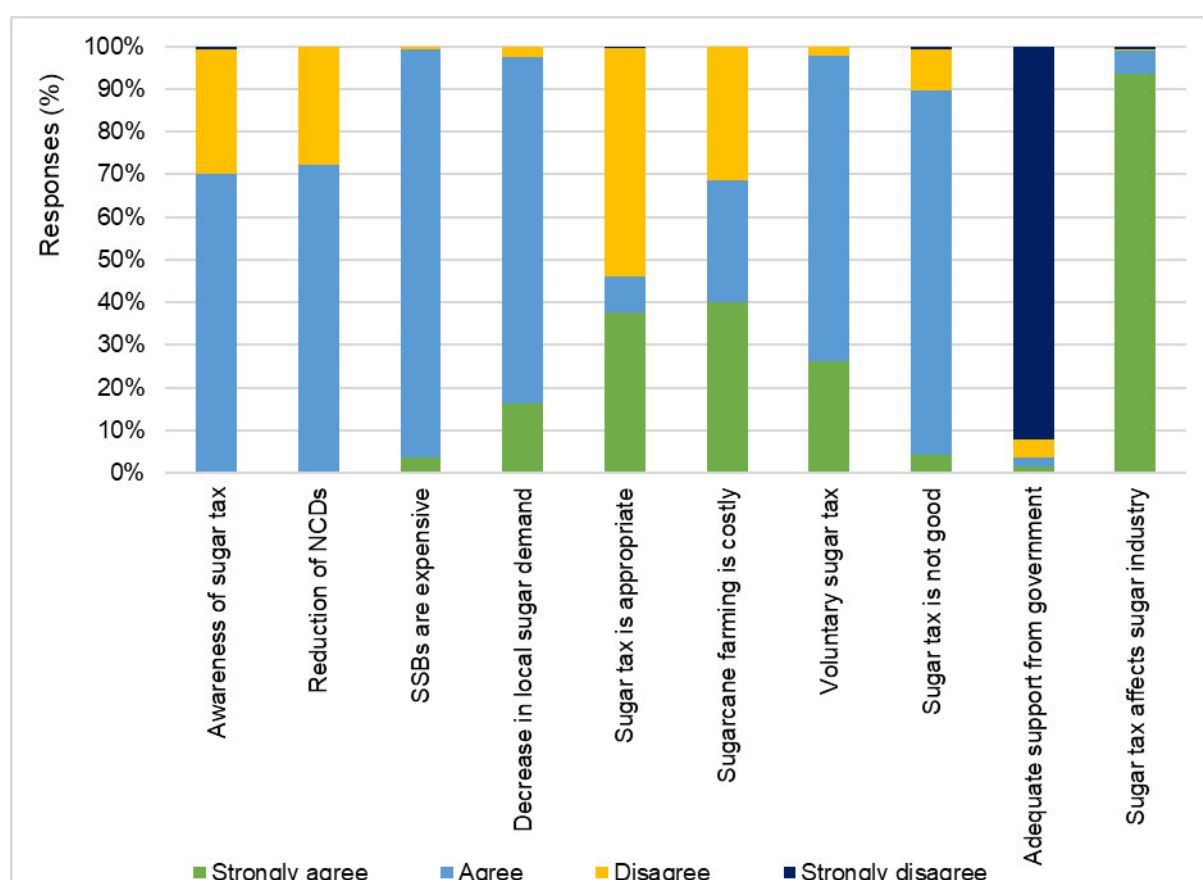


Figure 4.1: Responses on sugar tax knowledge (n = 262)

Figure 4.1 shows that 70% of the respondents confirmed that they had knowledge of the sugar tax whereas 30% indicated that they lacked knowledge of the sugar tax. Significantly, consistent with the descriptive data presented on Table 4.1, the lack of knowledge was in line with those who lacked education and had never attended school (26%). Likewise, 72% of the respondent were convinced that a reduction in sugar consumption may help reduce the rise of NCDs. However, it is believed that besides

sugar tax, there are other control measures that can be taken such as exercising and adopting a healthy lifestyle that can help reduce NCDs.

The majority of respondents (54%) felt that it was inappropriate for government to introduce the sugar tax due to the negative effects on their financial income. This highlights a need for a balanced consensus when introducing such levies. According to Abdool Karim *et al.* (2020), extensive consultative processes were followed with all stakeholders which included the beverage manufacturers, sugar industry, civil society groups, public health academics, and advocates during the development of the South African SSB legislation. According to McKenzie (2021), this process should have included an extensive economic impact evaluation on the proposed levy and its effect on South African industries. In the context of the sugar tax, the SA Canegrowers Association argues that there is a need to educate the society about the importance of a balanced diet instead of imposing the sugar tax (Russel 2021b).

While 99% of the respondents indicated that the sugary beverages became expensive after the levy was introduced, 97% of the respondents also highlighted a significant drop in sugar purchasing in their households stemming from the price increase. According to Stacey *et al.* (2021), a study in SSB prices following the implementation of the sugar tax revealed pre-value added tax price increases averaging R1.006 per litre for carbonates (an approximate 6% increase). Further studies revealed an approximately 50% decline in local sugar sales by the SSBs manufacturers from seasons 2018/2019 to 2020/21 (Nicholson and Kadwa 2023). The survey also pointed out that the government was not doing enough to support the small-scale canegrowers to lessen the effects of sugar tax, with 94% of the respondents indicating that there was lack of support. Regarding their views on government, 90% of the respondents think that the sugar tax is not good and felt that government was wrong to introduce it because of its negative impact on businesses. There was a strong view that in general sugarcane farming was negatively affected in South Africa, with 99% of the respondents indicating that they have felt the effect of the sugar tax.

4.3.3 Factor analysis of responses on sugar taxation knowledge

A principal components analysis (PCA) model which is a type of factor analysis modelling was used to identify the critical key components from the collected data. Ten items from the measured constructs on sugar taxation knowledge were subjected to exploratory factor analysis procedures using the principal component analysis extraction method and varimax rotation as the parameter of measurement. According to Sürücü and Maslakçi (2020), factor analysis utilises statistical methods to simplify interrelated data and explore key components arising from a set of variables. This helps the researcher to summarise and make judgement from the collected data. In doing so, it becomes easier to comprehend the relationships and patterns of observed variables from the measuring instrument. This subsection presents the key components extracted from the data. Firstly, the correlation of variables is presented followed by the principal components analysis on sugar taxation knowledge.

4.3.3.1 Correlation of variables on sugar taxation knowledge

A correlation analysis examines the relationship between two continuous variables in relation to how strong or weak the relationship is, and in what direction the relationship goes (Almqvist, Kwart and Brännström 2020). The direction of the relationship is either negative or positive, where a negative value means the variables are inversely proportional; as the first variable increases, the value of the second variable decreases, and a positive value means that the variables are directly proportional; as the value of the first variable increases, the second variable also increases. According to Almqvist, Kwart and Brännström (2020), correlation between the variables is very important before performing a factor analysis. Their strength is given as a coefficient which ranges from 0 to 1, where 0 means no correlation and 1 indicates a strong correlation between the two variables. Table 4.3 presents the correlation matrices of variables on sugar taxation knowledge.

Table 4.3: Correlation matrices for sugar taxation knowledge variables (n = 262)

Item	Awareness	Reduction	Price	Demand	Appropriate	Cost	Voluntary	Not good	Supportive	Effect
Awareness	1.000									
Reduction	0.839	1.000								
Price	-0.134	-0.151	1.000							
Demand	0.169	-0.002	0.256	1.000						
Appropriate	0.441	0.506	-0.127	-0.350	1.000					
Cost	-0.429	-0.478	0.161	0.305	-0.781	1.000				
Voluntary	-0.562	-0.644	0.191	-0.013	-0.452	0.543	1.000			
Not good	0.207	0.147	0.025	0.239	0.030	-0.046	0.026	1.000		
Supportive	-0.101	-0.090	0.038	-0.015	-0.090	0.030	0.025	-0.161	1.000	
Effect	0.096	0.092	0.034	0.026	0.149	-0.037	-0.057	-0.013	-0.569	1.000

The findings indicate that seven variables displayed correlation coefficients of 0.5 or above, indicating potential relationships between them (Hadd and Rodgers 2020). For example, 'Awareness' highly positively correlated with 'Reduction' (0.839) and 'Voluntary' (-0.562) while some showed very little correlation, below 0.5. Therefore, given the notable correlations observed among specific variables concerning sugarcane tax knowledge, it was appropriate to carry out a principal component analysis (PCA). The next subsection examines the results obtained from this analysis in detail.

4.3.3.2 Testing for sampling adequacy

Whether a principal component analysis is an ideal model requires testing for sampling adequacy. The Kaiser-Meyer-Olkin (KMO) test is commonly used in literature to assess whether the data are suitable for a principal component analysis. This statistical measure evaluates sampling adequacy for each variable and provides an overall model adequacy score. A higher KMO value indicates better suitability for principal component analysis hence the results are reliable. Typically, a KMO value greater than 0.5 is deemed acceptable, suggesting that the sample is adequate for principal component analysis hence results are reliable (Jackson 2005; Kaiser 1974). Table 4.4 presents the KMO results for sugar tax knowledge questions.

Table 4.4: KMO sampling adequacy for questions on sugar taxation knowledge

Variable	KMO
Awareness of sugar tax	0.686
Reduction of NCDs	0.694
SSBs are expensive	0.589
Decrease in local sugar demand	0.439
Sugar tax is appropriate	0.733
Sugarcane farming is costly	0.721
Sugar tax should be voluntary	0.780
Sugar tax an unliteral move	0.432
Government not supportive	0.496
Negative effects of sugar tax	0.476
Overall	0.663

Table 4.4 indicates an overall KMO value of 0.663, suggesting a strong adequacy of both the questions and the sample for principal component analysis. Additionally, individual KMO values were provided for each question, most of which exceeded the threshold of 0.5. Specifically, the question with the lowest KMO value was 0.432 while the highest was 0.780. These findings indicate that the sample was adequate for all questions, underscoring the robustness and reliability of the principal component analysis results in this study.

4.3.3.3 Principal component analysis results

PCA is a method used to reduce the number of variables in a dataset while retaining most of the original variance (Ghojogh *et al.* 2023; Labrín and Urdinez 2020). PCA generates eigenvalues, and the criterion for selecting components is to retain those with eigenvalues greater than 1. Additionally, PCA indicates the proportion of variance explained by each component and the cumulative variance explained by successive components. Table 4.5 presents the results of an unrotated PCA conducted on data concerning sugar tax knowledge.

Table 4.5: Principal component analysis for sugar taxation knowledge (n = 262)

Component	Eigenvalue	Difference	Proportion	Cumulative
Component 1	3.386	1.712	0.339	0.339
Component 2	1.674	0.206	0.167	0.506
Component 3	1.468	0.528	0.147	0.653
Component 4	0.940	0.287	0.094	0.747
Component 5	0.912	0.409	0.091	0.838
Component 6	0.503	0.048	0.050	0.888
Component 7	0.455	0.118	0.046	0.934
Component 8	0.337	0.142	0.034	0.967
Component 9	0.195	0.064	0.019	0.987
Component 10	0.131	0.00	0.013	1.000

Results in Table 4.5 show that three components have eigenvalues that are greater than 1, namely component 1, component 2 and component 3. The first component contributes about 33.9% of the variance in the data, while the second and third components, respectively, contribute 16.7% and 14.7% of the variance in the data. Thus, the three

components contribute a cumulative variance of about 65.3%, which is reasonably high. The second part of the principal component results presents the component loadings. This identifies the variables where each of the significant components load from. Table 4.6 presents the component loading for each variable on the knowledge of sugar taxation.

Table 4.6: Component loadings for knowledge variables (n = 262)

Variable	Component 1	Component 2	Component 3	Unexplained
Awareness	0.434			0.187
Reduction	0.463			0.196
Price				0.796
Demand		0.473	0.485	0.252
Appropriate	0.430			0.267
Cost of farming	-0.432			0.278
Voluntary sugar tax	-0.419			0.367
Unliteral move		0.357		0.677
Supportive		-0.508	0.468	0.222
Negative effect		0.452	-0.522	0.232

Table 4.6 suggests that Component 1 loads from awareness of sugar tax, reduction of NCDs, sugar tax is appropriate, cost of sugarcane farming, and voluntary sugar tax, which are linked to "perceptions of sugar taxation and health impacts". Component 1 reflects respondents' views on sugar taxation and its implications for health outcomes. The positive loadings of "awareness on sugar taxation" (0.434), "reduction of NCDs" (0.463), and "sugar tax is appropriate" (0.430) indicate that higher scores on this component are associated with greater awareness of sugar taxation, belief in its effectiveness in reducing NCDs, and agreement with the appropriateness of the sugar tax. Conversely, the negative loadings of "cost of sugarcane farming" (-0.432) and "voluntary sugar tax" (-0.419) suggest that higher scores on this component are associated with perceptions of the costliness of sugarcane farming and opposition to voluntary implementation of the sugar tax. Overall, Component 1 captures respondents' attitudes towards sugar taxation and its potential health benefits, juxtaposed with concerns about its economic implications for sugarcane farming.

Components 2 and 3 are linked to "perceptions of government policy and impact on sugar demand". This represents respondents' views on government policies related to sugar taxation and their effects on sugar demand and sugarcane farming. The positive loading

of "Decrease in local sugar demand" (0.473) suggests that higher scores on this component are associated with perceptions of a decrease in sugar demand following the implementation of the sugar tax. Additionally, the positive loading of "Sugarcane farming was negatively affected" (0.452) indicates that higher scores on this component are linked to perceptions of adverse effects on sugarcane farming due to government policies. Conversely, the negative loading of "lack of support from the government" (-0.508) suggests that higher scores on this component are associated with perceptions of insufficient support from the government regarding sugar taxation and its impact on the agricultural sector. Overall, Component 2 and 3 captures respondents' perceptions of government policies, their effects on sugar demand, and the perceived lack of government support for the sugarcane farming sector.

4.4 Effects of sugar taxation

The effects of sugar taxation in the South Africa have garnered attention due to rising concerns about obesity and related health issues. Implementation of sugar taxes aims to reduce consumption of sugary beverages, thereby curbing obesity rates and improving public health outcomes. Literature suggests that sugar taxes can lead to reduced consumption of sugary drinks and potentially lower obesity rates, as seen in various countries worldwide (Teng *et al.* 2019). However, the impact of such policies may vary depending on factors such as tax rate, enforcement mechanisms, and public awareness campaigns (Manyema *et al.* 2014). Respondents were asked to express their views on the effect of the sugar tax. This was in line with the objective of the study which sought to establish the effects of the sugar tax on small-scale canegrowers in Empangeni. This subsection presents the frequency distribution results on the views and opinions of the respondents pertaining to the effect of sugar taxation on sugarcane farming. Respondents were asked 12 general questions related to the effect of the sugar tax. These questions were asked using a dichotomous option (yes or no). The respondents were instructed to choose one option in each question where they demonstrated their perceptions of the effect of the sugar tax on sugarcane farming. Figure 4.2 presents a stacked bar graph that demonstrates the frequency of responses.

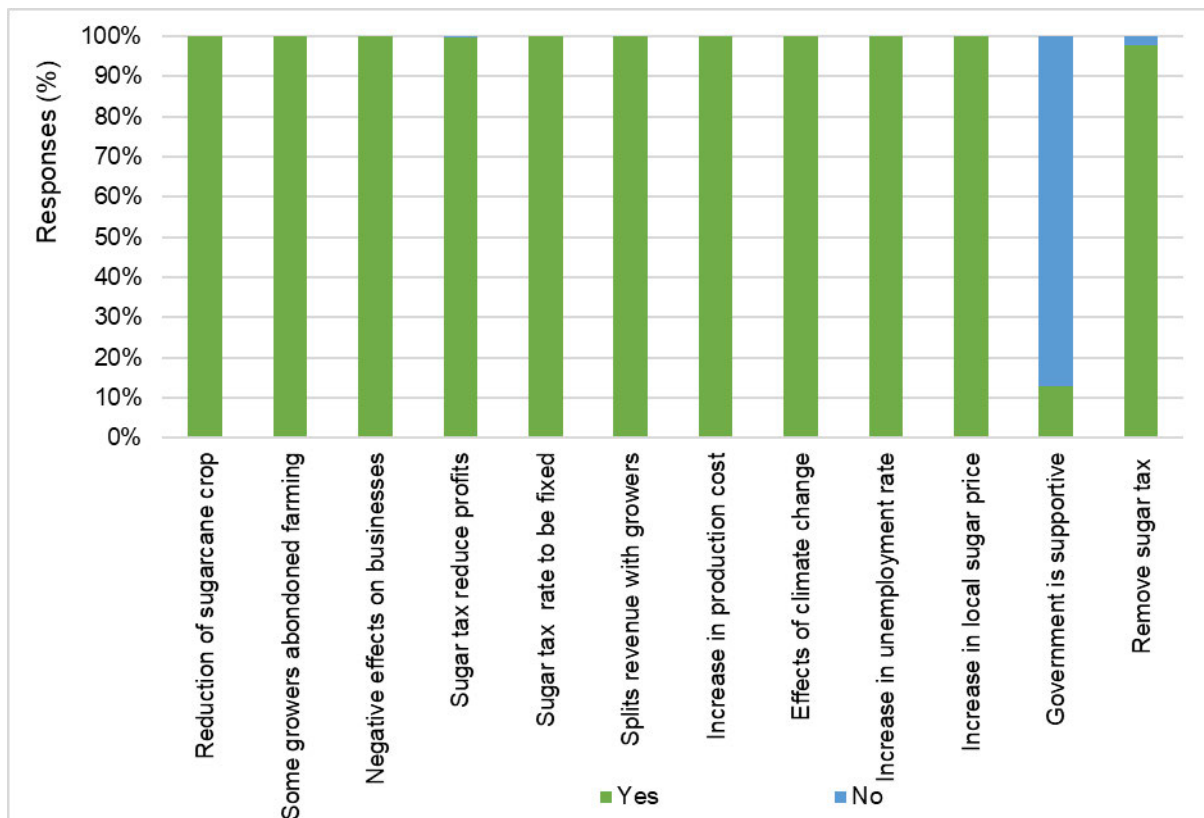


Figure 4.2: Responses on the effect of sugar taxation (n = 262)

Figure 4.2 highlights several key findings regarding the perceived effects of a sugar tax on sugarcane growers and socio-economic conditions. Firstly, it indicates unanimous agreement among respondents that sugarcane crop production has declined, leading to some growers exiting the sugarcane farming industry. Additionally, there is consensus that sugar taxation has had adverse effects on sugarcane farming. This aligns with existing literature suggesting that sugar taxes have supply-side effects as such as SSBs manufactures reformulating their products and reducing the sugar content to below the sugar policy threshold, which might drastically reduce sugar consumption (Hagenaars *et al.* 2021).

The data indicates widespread agreement that the sugar tax has led to an increase in unemployment rates and a significant rise in sugar prices in the market, exacerbating socio-economic challenges. These findings are consistent with research highlighting the potential economic consequences of sugar taxation (Manyema *et al.* 2014). Moreover, the data reveals a concerning lack of confidence in government support, with only a small

percentage of respondents believing that the government provides essential resources like fertilisers to alleviate the impact of the sugar tax on sugarcane farming. This suggests there is only limited governmental intervention to mitigate the negative effects of sugar taxation on the agricultural sector, echoing concerns raised in previous studies (Kaltenbrun 2020).

The data indicates a common agreement amongst the respondents that revenues collected from the sugar taxes should be shared with the growers. For example, in 2011, the majority of the members of parliament in France were only in support of the sugar tax provided that the revenues were split between agriculture and health care (Hagenaars *et al.* 2021). The agricultural sector will remain competitive from reducing the production (wage) costs and cover the deficit with the revenues generated from the SSBs tax. The evidence suggests that small-scale canegrowers are the first to feel the burden of sugar tax as production costs spiral out of control. However, these financial implications also extend to the one million South Africans who depend solely on the sugar industry as millers, large-scale growers and other industry stakeholders are facing a similar struggle (Dardagan 2024).

The survey indicated that the tax rate should either be fixed or removed completely. Consistently, since its inception, there has been no credible evidence suggesting that the sugar tax has reduced NCDs and obesity in the country, although the increase in unemployment rate (about 16 621 job losses) and decline in investment is evident (The Witness 2022). This is in line with the submission that was made by the SA Canegrowers to the National Treasury pleading with the finance minister to scrap the tax entirely because of the challenges faced by the South African sugar industry. Furthermore, the negative financial impact of the sugar tax was being felt by the growers, employees and the local communities that depend on sugarcane farming for their livelihoods (Dardagan 2022). Overall, the findings underscore the detrimental impact of sugar taxation on both sugarcane farming and broader socio-economic conditions, emphasising the need for policy interventions to address these challenges.

4.5 Conclusion

In this chapter, the study investigated the effects of sugar taxation on small-scale canegrowers in South Africa's Empangeni region, aiming to examine its implementation, evaluate its effects on sugarcane farming, and explore potential mitigation strategies. Utilising a quantitative approach, data was gathered via surveys from 262 small-scale canegrowers. Descriptive statistics unveiled demographic insights, including gender distribution, education levels, farming experience, and workforce size. A reliability test using Cronbach's alpha coefficient affirmed the measuring instrument's trustworthiness, while factor analysis identified key components shaping respondents' understanding of sugar taxation.

Findings revealed significant concerns among respondents, indicating a consensus on declining sugarcane production, some growers abandoning their farms, and adverse impacts such as increased unemployment and higher sugar prices attributed to sugar taxation. Additionally, a lack of confidence in government support to mitigate these effects was evident. These insights highlight the necessity for policy interventions to address the challenges faced by small-scale canegrowers, paving the way for further analysis. The next chapter concludes the study and suggests possible ways through which the growers could be cushioned from the effects of sugar taxation.

CHAPTER 5: CONCLUSION

5.1 Introduction

The previous chapter presented the study findings, and this chapter concludes the study. Subsequent to the introduction, the chapter is organised into four sections. The first section provides a summary of the study. Second, recommendations are provided based on the study findings. Third, the study's limitations and possible areas of future research are discussed. Finally, the chapter provides the delimitations of the study.

5.2 Summary

This study set out to achieve three main objectives. First, it sought to examine the implementation of the sugar tax in South Africa. Second, the study sought to establish the effects of the sugar tax on small-scale canegrowers using a case study of farmers sampled from the Empangeni area of the KwaZulu-Natal province. Finally, the study sought to establish possible ways through which small-scale sugarcane growers may be cushioned from the effects of the sugar taxation in the context of South Africa. To achieve these objectives, the study adopted a quantitative methodological approach where quantitative data were collected through a self-administered survey from 262 small-scale canegrowers randomly selected across the Empangeni area. Descriptive statistics and the principal component analysis technique were then subsequently utilised to analyse the data. Seven key findings emerged from the study, and these are further summarised in this chapter.

Firstly, the study found that about 70% of the respondents were aware of the sugar tax, and 72% of respondents agreed that a reduction in sugar consumption may help reduce obesity and non-communicable diseases. However, they emphasised the importance of adopting other control measures such as educating people about living a healthy lifestyle, exercise and healthy diets rather than enforcing a sugar tax on sugary beverages. It is worth noting that the 30% of respondents who lacked knowledge of the tax was almost in line with the percentage (26%) of respondents who lacked education or had never

attended school. In this context, it became clear that the information regarding the sugar tax and its effect was not effectively filtered down to all canegrowers, although the literature confirmed that consultation processes were conducted with all stakeholders prior to implementing the sugar tax, including the sugar industry. This finding highlights the importance of educating and creating awareness in the affected parties when implementing new policies.

The second finding was that the majority of respondents (85%) indicated that sugar tax was not good for small-scale canegrowers, and 54% felt that it was inappropriate for government to introduce a sugar tax when the sugar industry was still recovering from the impact of 2015/16 drought. As a result, the majority of the respondents (98%) were of the view that the tax rate should be removed completely as it has had a major negative financial impact on the sugar industry, with many job losses. Consistently, the majority of the respondents indicated that the tax rate should be kept at a fixed rate while control measures are being put in place to avoid further damages. This stems from the fact that since its inception there has been no convincing evidence (data) suggesting a reduction in obesity and NCDs in South Africa. This suggests that the policy change management process failed to mobilise and convince the majority of the small-scale canegrowers about the benefits of the sugar tax.

The third finding was a strong perception among respondents of a decrease in local sugar consumption as 97% of the respondents highlighted a significant drop in sugar demand in the market, stemming from the price increase. This is supported by the fact that the SSB manufacturers decided to reformulate their products to reduce the sugar content to below the tax threshold of less than 4g/100ml. In addition, this aligns with the economic law of demand which suggests that the level of demand increases with a drop in price, and diminishes when the price is increased. Following the sugar tax there was a massive decline in demand for sugar in local market and the sugar industry experienced financial losses amounting to approximately R1.2 billion year on year since its first year of inception.

Fourthly, the study highlighted several key findings regarding the perceived effects of a sugar tax on sugarcane growers and socio-economic conditions. There was unanimous

agreement among respondents (100%) that the sugarcane crop production has declined. Additionally, the study indicates a strong consensus among the respondents (100%) that the sugar tax has had an adverse effect on sugarcane farmers with a reduction in their income from reduced sugar consumption in the country. All respondents confirmed that the sugar tax has led to an increase in unemployment rates and exacerbated the socio-economic challenges in their communities. Generally, sugarcane farming is concentrated in rural areas with many people relying on farming as their source of income. Hence, the rural communities including the small-scale canegrowers were the first to feel the impact of the sugar tax.

The fifth finding captured respondents' perceptions of government policies, their effects on sugar demand, and the perceived lack of government support for the sugarcane farming sector. Most of the respondents (87%) demonstrated lack of confidence in government support when it comes to providing essential resources like fertilisers to alleviate the impact of the sugar tax on sugarcane farming. Respondents believed that it was a unilateral move by the government with no benefits to the local canegrowers. While all respondents indicated that besides the negative effects resulting from the sugar tax, the sixth finding highlighted other contributing factors such as climate change (drought and excessive floods) recently experienced in the country. Lastly, there was a strong consensus among the respondents that a portion of revenues generated from the sugar tax should be shared with the sugarcane growers.

In summary, these findings underscore the detrimental impact of sugar tax on both sugarcane farming and broader socio-economic conditions, emphasising the need for policy interventions to address these challenges. The respondents perceived that the government needed to do more to financially support small-scale canegrowers which will in turn contribute to economic growth and the agricultural sector would therefore remain competitive in the market.

5.3 Recommendations

The study confirms a fundamental problem in the sugarcane farming sector which suggests an urgent turnaround strategy from all stakeholders (government, health experts and the sugar industry) to support the small-scale canegrowers. The South African department of national treasury and WHO continue to support the implementation of a sugar tax based on the data which proves that the sugar tax is effective in reducing obesity and NCDs from reduced consumption (South Africa 2016). Furthermore, the government is adamant that applying a flat rate per beverage would not support the objective of encouraging producers and consumers to switch to lower sugar content beverages. It seems that the government has no intention of scrapping the sugar tax, instead an increase in levy is imminent which will further cripple the sugar industry. However, there is a need to review the policy and its indirect effects on local sugar market and upstream as well downstream related products. The policy should be reviewed jointly with all stakeholders thus ensuring that they are all aware of the changes being proposed and be part of the solution.

The purpose of introducing the sugar tax was to reduce sugar consumption, which was evident from the third finding. Clearly, the government achieved its objective, however to the detriment of small-scale canegrowers. The influx of cheap sugar imports continues to put a strain on the South African sugar market and has a direct impact on small-scale growers who are already struggling financially. Consumers opting for lower priced imported sugar produce no direct financial contribution to the local growers. Therefore, government intervention is necessary to reduce the amount of imported sugar and to encourage consumers to buy locally produced sugar. While there is a need to maintain good trade relations with foreign countries, this should not be to the detriment of local communities, threatening their income and job opportunities. It is however recommended that the import tariff should be increased in order to reduce the threat that comes with cheap imported sugar entering the South African market.

There is definitely a significant rise of unemployment in the country at the same time that there is an increase in the sugar tax. It would be helpful to conduct a study which will engage all stakeholders before any further increase takes place. The South African

sugarcane value chain master plan to 2030 was a commendable initiative from all stakeholders with the goal of saving the industry. A study conducted on the extent of follow through of the recommended actions and alignment thus far would be helpful, as well as further studies on alignment with the forever changing environment and technologies. The South African institute of taxation also suggested that government should enact a moratorium on the sugar tax until a thorough and complete socioeconomic impact assessment is conducted (Schneider 2019).

To lessen the effects of a sugar tax on sugarcane growers and socio-economic conditions as highlighted from the fourth finding, it is recommended that a portion of the tax revenues collected should be utilised to help the sugar industry to increase their plant capacity and generate additional electricity for the country. Literature continues to confirm that, in addition to sugar production, there are other revenue streams that should be explored for the growth of the sugar industry. There is a need to encourage innovative solutions leading to advanced technologies. Product diversification remains key to the growth and sustainability of the sugar industry, including sugarcane farming. The South African sugar industry has the potential to generate excess electricity from cane fibre (bagasse) and export it to the national grid (Dubb, Scoones and Woodhouse 2017; Mutanga and Mbohwa 2015). This would not only benefit the sugar industry but the country as a whole because loadshedding impacts all local businesses and therefore economic growth in general. However, the sugar industry cannot achieve this alone as it necessitates plant expansion with big capital investment required to increase the plant capacity and generate more electricity. Product diversification is also one of the key elements in sustaining the sugar industry. As a result, ethanol, biojet fuel, biochemicals and biogas production can be explored as other sources of income which may offset the revenue lost through the sugar tax.

The outcome of the fifth objective was that respondents lacked confidence in government support when it comes to providing essential resources like fertilisers to alleviate the impact of the sugar tax on sugarcane farming. While the use of fiscal measures to promote health, prevent diseases and raise revenue is not a new thing, the current evidence suggests that the main outcome has been the generation of revenues rather than changes in consumption behaviours (Capacci *et al.* 2019). It is recommended that

the revenues collected from the sugar tax be shared between the agricultural and health care sector (as it is in France as per Hagenars *et al.* 2021), with a portion of revenues generated from the sugar tax being put aside to support the growth of small-scale growers. Robust traceability systems should be put in place where government and canegrowers' association can track the movements of funds thus ensuring that the funding has reached the intended recipients. Furthermore, it also promotes the effective use of resources, prevents mismanagement and corruption.

The agricultural sector is most vulnerable to climate change; therefore, the government and industries need to implement measures such as developing renewable energy sources instead of coal fired power stations. For example, power generation from sugarcane fibre (bagasse) is considered one of the most cost-effective ways for the government to meet its objectives on renewable energy. Awareness programmes should be created about the benefits of this renewable energy approach as this will benefit the canegrowers in due course.

5.4 Study limitations and areas of future research

The findings of this study will help the industry and the government to understand the effect of sugar tax on small-scale canegrowers and the rural communities relying on sugarcane farming as their stream of income. Due to time constraints, the current study only investigated the effects of sugar tax on small-scale canegrowers in Empangeni, KwaZulu-Natal, which is only a small sample compared to the broader population of cane growers in South Africa. Therefore, it is recommended that for future research a similar study should be conducted in other areas of KwaZulu-Natal, and in other provinces.

Several studies on the sugar tax have been conducted in the past, but the majority were focused on the benefits of a sugar tax reducing the rise in obesity and non-communicable diseases. However, this outcome is not evident hence the respondents are not highly convinced that the sugar tax is effective in South Africa. Future research can help explore and demonstrate the effectiveness of the sugar tax by demonstrating the relative trends

since its inception in 2018. More capital investment in the area of research and development is key for the sustainability of the sugar industry.

5.5 Delimitations of the study

In the context of this study, findings should not be generalised to apply to all small-scale canegrowers in South Africa. Due to time constraints, the study's quantitative data collection was confined to the small-scale growers in Empangeni area rather than all regions in KwaZulu-Natal.

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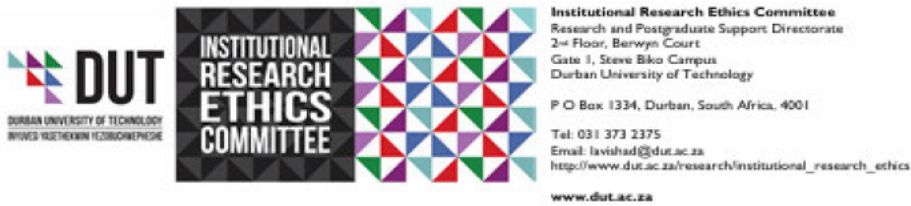
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Appendices

Appendix 1: Ethics clearance certificate



8 December 2023

Ms M M Ndlazi
P.O Box 2158
Pongola
3170

Dear Ms Ndlazi

The effects of sugar taxation on small-scale canegrowers in Empangeni, KwaZulu-Natal
Ethics Clearance Number: IREC 224/23

The DUT-Institutional Research Ethics Committee acknowledges receipt of your notification regarding the piloting of your data collection tool.

Kindly ensure that participants used for the pilot study are not part of the main study.

In addition, the DUT-IREC acknowledges receipt of your gatekeeper permission letter.

Please note that **FULL APPROVAL** is granted to your research proposal. You may proceed with data collection.

Any adverse events [serious or minor] which occur in connection with this study and/or which may alter its ethical consideration must be reported to the DUT-IREC according to the DUT-IREC SOP's.

Please note that any deviations from the approved proposal require the approval of the DUT-IREC as outlined in the DUT-IREC SOP's.

It is compulsory for a student or researcher to apply for recertification on an annual basis. The failure to do so will result in withdrawal of ethics clearance. It is the responsibility of the researcher and the supervisor to apply for recertification.

Please note that you are required to submit a Notification of Completion of Study form together with an abstract to the DUT-IREC office on completion of your study.

Yours Sincerely

Prof J K Adam
Chairperson: DUT-IREC

Appendix 2: Letter of information (English version)



LETTER OF INFORMATION

Title of the Research Study : Effects of sugar taxation: A case of small-scale canegrowers in Empangeni, KwaZulu-Natal

Researcher: Mirriam M Ndlazi, PGDip in Business Administration

Supervisor: Dr Genius Murwirapachena, PhD in Economics

Brief Introduction and Purpose of the Study:

Greetings, thank you for showing interest in this study. I am a student registered for the Master of Business Administration (MBA) at the Durban University of Technology. I would like to invite you to participate in this study. The aim of this study is to examine the effects of sugar taxation introduced by the South African government in 2018. This study is important given existing evidence on the challenges commonly faced by the small-scale canegrowers hence I would like to invite you to participate in the study by responding to the questionnaire attached.

Your participation in the study is voluntary and under no circumstances should you feel uncomfortable. I would like to emphasize that you can withdraw from the study at any time should you feel uncomfortable to continue participating. As part of the procedure, I will give you a questionnaire that you would go through and complete as honestly and freely as possible. If you need us to go through the questions together, I will gladly go through the questions with you.

Participating in this study should not result in you experiencing any discomfort or significant risk. I will not perform any painful procedure on you, your family or on employees. Therefore, there will be no discomfort or risk to you as a participant. Furthermore, there will be no negative consequences if you choose not to participate or withdraw participation in the survey. There will also be no expected injuries from participating in this study.

As mentioned earlier, you can choose to withdraw or stop participating in the study at any time without having to provide reason. There will be no negative consequence if you decide to withdraw your participation. Kindly also note that we will withdraw you from the study if you do not follow the instructions given or decided not to honour your commitment.

Kindly also note that you will not be compensated for your participation in the survey. Your participation is voluntary and will inform policy making and academic literature. Further, it is important to also indicate that you will not incur any expenses by participating in this study.

The information collected in this study will be managed and stored in a manner that ensures that your confidentiality and anonymity is always maintained. Kindly avoid recording your personal and any other identifying information.

The results of this study will be published after the data has been thoroughly analysed. If any findings emerge during the research, we will make all participants aware of such. Please note that the data collected in this study will be stored in a manner that ensures that your confidentiality and anonymity is maintained. All completed questionnaires will be stored in my supervisor's office in a locked cupboard for a period of up to 5 years. Only myself and my supervisor will have access to the completed questionnaires.

Persons to contact in the event of Any Problems or Queries:

In the event of any problem or query, please contact me on 083 4171515 or monica.ndlazi@gmail.com. You can also contact my supervisor Dr Genius Murwirapachena on 031 373 5193 or geniusm@dut.ac.za. Alternatively, you can call the DUT-Institutional Research Ethics Administrator on 031 373 2375 or report complaints to the Acting Director: Research and Postgraduate Support on researchdirector@dut.ac.za

Appendix 3: Letter of information (isiZulu version)



Incwadi Yolwazi

Isihloko Socwaningo: Umthelela wentela kashukela kubalimi bakamoba abafufusayo

Umcwangingi: Monica Ndlazi, PGDip in Business Administration

Umphathi: Dr Genius Murwirapachena, PhD in Economics

Isingeniso esibanzi nenjongo yocwaningo:

Ngokuzithoba, ngiyabingelela, ngiyabonga ukukhombisa uthando lokufisa ukuba yingxenywe yalolucwaningo. NginguMfundi ofundela iziqu eziphezulu zeMasters of Business Administration eNyuvesi yaseThekwini yezobucwepheshe (Durban University of Technology). Ngingathanda ukunimema ukuba nihlanganyele ecwaningeni engilwenzayo ezindaweni zase Empangeni. Injongo yalolucwaningo ukuthola umthelela wentela kashukela eyafakwa ngonyaka 2018 eziphuzweni ezinoshukela. Lokhu kubalulekile ngenxa yobufakazi bezinkinga nezingqinamba ezibhekene nabalimi abasafufusa. Ngakho ke, ngicela ukukumema ukuthi ubambe iqhaza kulolucwaningo ngokuthi uphendule uhlu lwemibuzo ebekiwe lana.

Ukuba yingxenywe yalolucwaningo kuya ngokuzithandela kwakho, awuphoqiwe futhi akukho ndawo lana ekumele uzizwe ungakhululekile. Ngithanda ukugcizelela ukuthi unгахoxisa ukuba yingxenywe yalolucwaningo noma inini uma uzizwa ungakhululekile ukuthi uqhubeke ube yingxenywe. Njengohlelo, ngizokunika uhlu lwemibuzo ozoyifunda bese uyayiphendula ngokweqiniso. Uma udinga ukucaciseleka ngemibuzo, ngikhona ukukusiza ukuth uacaciseleke siyifunde imibuzo ndawonye.

Ukubamba iqhaza nokubayingxenywe yalolucwaningo akumele kukwenze uzizwe ungakhululekile noma impilo yakho ibesencupheni. Ayikho inqubo engizoyenza kuwe nomndeni wakho okanye nabasebenzi bakho ezonizwisa ubuhlungu. Ngakho ke, akukho ubungozi kuwe oyingxenywe yalolucwaningo. Ngaphezu kwalokho, akukho okuwumthelela omubi uma ukhetha ukungabi yingxenywe yalolucwaningo. Futhi akukho ukulimala okulindelekile uma uyingxenywe yalolucwaningo.

Njengoba besengishilo ngaphambilini, uvumelekile ukuhoxa kulolucwaningo noma inini ngaphandle kokusho isizathu. Akukho okuwumthelela omubi uma ukhetha ukuhoxa kulolucwaningo. Ngokuzithoba, yazi ukuthi uzohoxiswa kulolucwaningo uma ungayilandeli imiyalelo noma uma ungasifezi isthembiso sokuzinikela kulolucwaningo.

Ngicela wazi ukuthi bonke abayingxenyane angeke bathole noma yiziphi izinzuzo zemali ngokuhlanganyela kulolucwaningo. Ukuba yingxenyane yalolucwaningo kungokuzikhethela wena futhi kuzosiza abaphezulu ngenqubomgomo noma ngezinqumo kanye nangokwe mfundo. Ngaphezu kwalokho, kubalulekile ukucacisa ukuthi angeke kubekhona izindleko zakho ngokuba yingxenyane yalolucwaningo.

Imininingwane ezotholwa ngalolucwaningo izogcinwa iyimfihlo nokuqikelela ingaziwa. Uyacelwa ungadaluli ulwazi lomuntu siqu. Imiphumela yalolucwaningo iyokhishwa mhla sekuqedliwe ukuhlahlela ngokwanela. Uma kukhona imiphumela ekhishwa phakath nocwaningo, bayokwaziswa bonke abayingxenyane.

Sicela wazi ukuthi imininingwane ezotholwa kulolucwaningo izogcinwa iyimfihlo futhi ingaziwa. Yonke inqubomibuzo ephenduliwe izogcinwa iphephile nguMeluleki wami eHhovisi ekhabethezi lakhe elikhiywayo iminyaka emihlanu. Yimi naye kuphela esizokwazi ukufinyelela kwinqubomibuzo egcwaliswe ngokuphelele.

Abantu ongaxhumana nabo esimeni sanoma iziphi izinkinga noma imibuzo:

Kunoma iziphi izinkinga noma imibuzo, ngicela uthinte mina ku 083 417 1515 noma monica.ndlazi@gmail.com. Ungamuthinta nomeluleki wami uDr Genius Murwirapachena ku 031 373 5193 noma geniusm@dut.ac.za. Okanye, ungafonela eDUT-Institutional Research Ethics Administrator ku 031 373 2375 noma ubike izikhalazo ku Acting Director: Research and Postgraduate Support ku researchdirector@dut.ac.za.

Appendix 4: Consent letter (English version)



CONSENT

Full Title of the Study: Effects of sugar taxation: A case of small-scale canegrowers in Empangeni, KwaZulu-Natal

Names of Researcher: Mirriam M Ndlazi

Statement of Agreement to Participate in the Research Study:

- I hereby confirm that I have been informed by the researcher, Monica Ndlazi about the nature, conduct, benefits and risks of this study – Research Ethics Clearance Number: **IREC 224/23**,
- I have also received, read and understood the above written information (Participant Letter of Information) regarding the study.
- I am aware that the results of the study, including personal details regarding my sex, age, date of birth, initials and diagnosis will be anonymously processed into a study report.
- In view of the requirements of research, I agree that the data collected during this study can be processed in a computerised system by the researcher.
- I may, at any stage, without prejudice, withdraw my consent and participation in the study.
- I have had sufficient opportunity to ask questions and (of my own free will) declare myself prepared to participate in the study.
- I understand that significant new findings developed during the course of this research which may relate to my participation will be made available to me.

Full Name of Participant

Date

Time

Signature /

Right

Thumbprint

I, _____ herewith confirm that the above participant has been fully informed about the nature, conduct and risks of the above study.

Full Name of Researcher _____ **Date** _____ **Signature**

Full Name of Witness (If applicable) _____ **Date** _____ **Signature**

Full Name of Legal Guardian (If applicable) _____ **Date** _____ **Signature**

Appendix 5: Consent letter (isiZulu version)



VUMELA

Isihloko esiphelele socwaningo: Umthelela wentela kashukela kubalimi bakamoba abafufusayo

Ama/i/gama lomcwaningi noma abacwaningi: Mirriam Monica Ndlazi

Isitatimende sesivumelwano sokubamba iqhaza ocwaningweni:

- Ngियाqinisekisa ukuthi ngazisiwe ngumcwaningi, Monica Ndlazi, mayelana nesimo, ukuziphatha, izinzuzo kanye nobungozi balolu cwano – Inombolo yemigomo elawula ukwenziwa kocwaningo engu: **IREC 224/23**,
- Ngiphinde ngathola incwadi, ngayifunda futhi ngayiqondisisa yonke imininingwane ebhaliwe (Incwadi yalabo ababambe iqhaza) mayelana nocwaningo.
- Ngiyazi futhi ukuthi imiphumela yocwaningo ebandakanya imininingwane yami yobulili, iminyaka, usuku lokuzalwa, izinhlamvu zokuqala zamagama ami kanye nesifo esingiphethe kuzoba yimfihlo emiphumeleni yocwaningo.
- Ngokwezidingo zocwaningo, ngiyavuma ukuthi imininingwane eqoqiwe kulolucwaningo ingasetshenziswa ngokusebenzisa ubuchwepheshe bekhumpuyutha.
- Ngingahoxa noma inini ngaphandle kokuphoqwa ekubambeni iqhaza.
- Ngibe nethuba elanele lokubuza (ngokuthanda kwami) ngaze ngaziswa ukuthi sengikulungele ukubamba iqhaza ocwaningweni.
- Ngियाqonda ukuthi okusha okuzotholakala kulolucwaningo okungahlobana nokubamba iqhaza kwami kuzokwenziwa ukuthi nami ngikuthole.
-

Amagama aphelele alowo

Usuku

Isikhathi

Ukusayina

Mina, Monica Ndlazi ngियाqinisekisa ukuthi umhlanganyeli ongenhla wazisiwe ngokugcwele mayelana nesimo, ukuziphatha kanye nobungozi bocwaningo olungenhla.

Amagama omncwaningi

Usuku

Ukusayina

Amagama ofakazi uma ekhona

Usuku

Ukusayina

Amagama omnakekeli uma ekhona

Usuku

Ukusayina

Appendix 6: Questionnaire (English version)



Effects of sugar taxation: A case of small-scale canegrowers in Empangeni, KwaZulu-Natal

My name is Mirriam M Ndlazi, a Master's student in the faculty of Management Sciences at the Durban University of Technology. I am conducting research on effects of sugar taxation on small-scale canegrowers in Empangeni, KwaZulu-Natal. This survey collects data that will inform the small-scale canegrowers on the effects of sugar tax. Apart from this, the findings of this study will provide valuable information to sugar sweetened beverages producers and retailers. The survey is divided into two sections. Section A collects biographical information of the respondents, while section B contains general questions on sugar tax and its impact on small scale canegrowers. Kindly note that all information collected will be used for academic purposes only and all personal information will be treated confidentially. Please take some time to answer the following questions as truthful as possible.

Date: ____ / ____ /2023 Place: _____

SECTION A: PERSONAL INFORMATION

1. Gender

Male	
Female	
Other	

2. What is your year of birth (Optional)

3. Which population group do you belong to? (Optional)

African	
White	
Indian/Asian	
Coloured	

4. What is your highest level of education?

Never attended school	
Primary school	
High school	
Diploma	
Degree	
Postgraduate	

5. Which best describe your current farming category?

Small-scale farmer	
Large-scale commercial farmer	

6. What is your farm's average tonnage produced per year?

7. How long have you been farming cane? (State the period in years)

8. How many employees in your farm?

SECTION B: GENERAL QUESTIONS

9. The following questions relate to your knowledge of sugar taxation. Please choose the most appropriate response to each question)

		Strongly agree	Agree	Disagree	Strongly disagree
1	The sugar tax was clearly explained.				
2	Sugar tax has helped reduce sugar related diseases.				
3	The sugar sweetened drinks are expensive.				
4	The sugar demand has dropped since the introduction of sugar tax.				
5	Government did the right thing by introducing sugar tax.				
6	It is expensive to maintain the farm.				
7	Sugar tax application should have been voluntarily.				
8	Government was wrong in introducing the tax on beverages.				
9	Government is doing enough to support the small- scale canegrowers.				
10	The sugar tax is negatively impacting sugarcane farming business.				

10. The following questions relate to the effects of sugar taxation. Please choose the most appropriate response to each question)

		Yes	No
1	The sugarcane crop has reduced		
2	Some growers have left sugarcane farming		
3	Sugar taxation has negatively affected the sugarcane farming		
4	The income from sugarcane farming has reduced		
5	The sugar taxation should be applied at a fixed rate		
6	Revenue generated from sugar tax should be shared with growers		
7	The cost of sugarcane farming has increased		
8	Beside sugar taxation, climate change has affected sugarcane farming		
9	The unemployment rate has increased due to sugar tax		
10	The price of sugar has drastically increased in the market		
11	Government is supplying fertilizers and other resources		
12	The sugar taxation should not be applied		

11. In your opinion, what should be done to cushion the small-scale growers from the effects of sugar taxation. Write your response in the box below?

Thank you for taking your time to participate in this survey.

Appendix 7: Questionnaire (isiZulu version)



Umthelela wentela kashukela kubalimi bakamoba abafufusayo

Igama lami ngingu Monica Ndlazi, umfundi wesigungu esiphezulu kwaDepartment of Management Science enyuvesi yase Thekwini yezobuchwepheshe. Ngenza ucwaningo ngomthelela wentela kashukela kubalimi abasafufusayo endaweni yaseMpangeni. Lenhlolovo ihlukaniswe Kabili. Ingxenye yokuqala iqoqa imininingwane echaza ngomuntu ophendulayo, kanti ingxenye yesibili inemibuzo ejwayelekile ngolwazi lwentela kaShukela. Ngokukhulu ukuzithoba yazi ukuth lonke ulwazi oluzoqoqwa lungolwazi lwemfundo kuphela, futhi yonke imininingwane yomuntu izophathwa ngemfihlo. Ngicela uthathe iskhathi uphendule lemibuzo engezansi ngokweqiniso.

Usuku: ____/____/2023 Indawo: _____

INGXENYE YOKUQALA: OKOMUNTU SIQU

1. Ubulili

Owesilisa	
Owesifazane	
Okunye	

2. Imuphi unyaka wakho wokuzalwa (ngokuzikhethela)

3. Ungowaluphi uhlanga? (ngokuzikhethela)

Nguni	
Mlungu	
Indiya	
Khalathi	

4. Izinga lemfundo yakho?

Aukaze ufunde	
Isikole sebanga eliphansi	

Isikole sebanga eliphezulu	
Idiploma	
Iziqu	
Iziqu zeziq	

5. Ikuphi okuchaza kahle izinga lakho lobulimi?

Umlimi osafufusa	
Umlimi omkhulu	

6. Ungakanani umoba owenzayo ngonyaka?

7. Usulime isikhathi esingakanani? (Chaza isikhathi ngeminyaka)

8. Bangaki abantu abakusebenzelayo?

INGXENYE YESIBILI: IMIBUZO EJWAYELEKILE

9. Lemibuzo elandelayo imayelana nolwazi onalo ngentela kashukela. (Ngicela ukhethe okufanelekileyo kumubuzo ngamunye)

		Ngivuma kakhulu	Ngiyavuma	Angivumi	Angivumi neze
1	Intela kashukela yachazwa kabazi iyaziwa.				
2	Intela kashukela iyasiza okwehleseni izifo ezisondelene noshukela.				
3	Iziphuzo ezithakwe ngoshukela ziyabiza				
4	Izinga lokuthengwa kukashukela lehla emveni kokufakwa kwentela				
5	Uhulumeni wenza into enhle kakhulu ngokufaka intela eziphuzweni ezinoshukela.				
6	Kuyabiza ukunakekela insimu kaMoba				
7	Ukuthengwa kweziphuzo ezakhiwe ngoshukela omningi kufanele bazikhele abantu.				
8	uHulumeni wenza into embi ngokufaka intela oshukeleni				
9	Uhulumeni usisiza ngokwanele ngoxhaso singabalimi abasafufusa.				
10	Intela kashukela inomthelela omubi kubalimi bakamoba.				

10. Lemibuzo elandelayo imayelana nomthelela owafika nentela kashukela. Ngicela ukhethe okufanelekileyo kumubuzo ngamunye.

		Yebo	Chabo
1	Inani lomoba elikhiqizwayo lehlile.		
2	Abanye abalimi bashiya phansi ukulima kamoba.		
3	Intela kashukela ibe nomthelela omubi kubalimi abasafufusa.		
4	Inzuzo engenayo yehlile ngenxa yentela kashuke.		
5	Intela kashukela akufanele ishintshe njalo ngonyaka		
6	Ingxenywe etholwa uhulumeni entelaeni kashukela ifanele bayithole nabalimi.		
7	Ukutshala kukamoba sekuyabiza.		
8	Ngaphandle kwentela kashukela nesimo sezulu sinawo umthelela omubi kubalimi bakamoba.		
9	Sinyukile isibalo sabantu abangasebenzi ngenxa yentela kashukela.		
10	Intengo yenani likashuke yenyukele ezitolo		
11	Uhulumeni uyabaxhasa abelungu ngomanyolo nangezinye izinsiza kusebenza.		
12	Ayikhishwe intela kashukela		

11. Ngokubona kwakho, yikuphi okumele kwenziwe ukusiza abalimi bangawuzwa kwinzuzo yabo umthelela wentela kashukela. Bhala impendulo yakho ngezansi

Ngiyabonga kakhulu

Appendix 8: Gatekeeper's permission

SOUTH AFRICAN CANEGROWERS ASSOCIATION

DATA SHARING AGREEMENT BETWEEN

The South African Canegrowers Association

and

Institution: Durban University of Technology

Address: Faculty of Management Sciences
Durban University of Technology
P O Box 1334
Durban
4000

Collaborating scientist/authority: Dr Genius Murwirapachena

In consideration of the South African Canegrowers Association (hereafter CANEGROWERS) supplying data (as herein defined), the parties agree as follows:

1. Data include: (Describe the nature of the data)
The study is focused on the effects of sugar taxation on small-scale growers in Empangeni, KwaZulu-Natal. Therefore, the required data include: The list of small-scale growers in Empangeni, total sugarcane produced yearly, sugar price, total sugar produced and sold to the local market / SSBs manufactures; and number of farm workers employed by the small-scale growers.

supplied to:
(Identify the name of the scientist/researcher/economist)

Miriam Monica Ndlazi

2. No material will be distributed or disclosed to third parties except the co-workers working directly under the scientist's/economists supervision who have agreed to abide by the terms of this agreement. The material will only be used by the researcher/institution/company at the following address:

Faculty of Management Sciences
Durban University of Technology
P O Box 1334
Durban
4000

and no one will be allowed to distribute this material to any other person or location unless written permission is first obtained from CANEGROWERS.

3. It is understood that the material will exclusively be used for research work carried out under the supervision of the scientist upon the following subject:

Master of Business Administration: Research Report (RERE 902)

4. The material supplied will not be used either directly or indirectly for commercial purposes unless specifically agreed by both parties to this agreement.
5. Upon request the scientist/researcher will keep CANEGROWERS informed of research results obtained using the material.
6. Research findings will be permitted to be presented at symposia or professional meetings or published in reports, dissertations or journals **provided that** CANEGROWERS shall have been furnished with copies of any such proposed presentations or publications at least sixty (60) days in advance of the submission date of such material to a journal, editor or third party. CANEGROWERS shall have thirty (30) days to object in writing, on receipt of such notice to proposed presentations or publications either because there is patentable subject matter or confidential information regarding CANEGROWERS contained in the proposed material.
7. The scientist/researcher undertakes that for the duration of this agreement and for a period of 24 (twenty four) months after the termination of the discussions and negotiations between the scientist/researcher and CANEGROWERS, they shall not, directly or indirectly, approach or engage with members or employees of the SOUTH AFRICAN FARMERS DEVELOPMENT ASSOCIATION (SAFDA), which shall include any parties, entities or organizations forming part of or being members or associated with SAFDA, with a view to undertaking similar research work.
8. CANEGROWERS has no liability in connection with material supplied under this agreement.
9. This agreement shall be effective from the date of last signature and shall remain in force until notice of termination is given.
10. Each party to this agreement is entitled to give thirty days' notice of termination of this agreement to the other party.
11. Termination of this agreement, for whatever reason, shall not prejudice or affect the accrued rights, claims and liabilities of either party to this agreement.
12. Both parties undertake to perform their obligations under this agreement in the utmost good faith.

Signed in the presence of the subscribing witnesses at Durban on the ...24.. day of

...October... 20 24

Signatures

For and on behalf of the South African Canegrowers Association

Muhammad Kadwa
Manager: Industrial Affairs
SA CANEGROWERS

Witnesses: 1. _____

2. _____

Student Researcher

For and on behalf of Durban University of Technology (Name of Agreement Partner)

Signature: _____

Representative Name: **Monica Ndlazi** _____

Designation: **Researcher** _____

Witnesses: 1. _____

2. _____

Supervisor

Dr Genius Murwirapachena

For and on behalf of (Name of Agreement Partner)

Signature: _____

Representative Name: _____

Designation: **Supervisor** _____

Witnesses: 1. _____

2. _____

Appendix 9: Editing certificate

DR RICHARD STEELE

BA HDE MTech(Hom)

HOMEOPATH

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Practice No. 0807524

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EDITING CERTIFICATE

Re: **Miriam Monica Ndlazi**

DUT MBA: Effects of sugar taxation on small-scale canegrowers in Empangeni, KwaZulu-Natal

I confirm that I edited this dissertation and the references for clarity, language and layout. I returned the document to the author with track changes so correct implementation of the changes and clarifications requested in the text and references is the responsibility of the author. The intellectual content of the document is the responsibility of the author. I am a freelance editor specialising in proofreading and editing academic documents. My original tertiary degree which I obtained at the University of Cape Town was a B.A. with English as a major and I went on to complete an H.D.E. (P.G.) Sec. with English as my teaching subject. I was a part-time lecturer in the Department of Homoeopathy at the Durban University of Technology for 13 years and supervised many master's degree dissertations during that period.

Dr Richard Steele

14 May 2024

per email