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A Value Chain Approach Turning Ga-Lekgothoane Village into a Home of Sweet Potato Yoghurt

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Abstract

Most studies and organisations recommend the value chain approach as a tool for alleviating poverty within rural villages. The study argues that the lack of employment and infrastructure is caused by the unwillingness of firms, farmers and tertiary sectors to integrate. The study assesses the processes for integrating firms, agricultural cooperatives and retail cooperatives into a global supply chain using the value chain approach. Multiple case study strategies are conducted at Kgarose Kgaros Pty Ltd, agricultural cooperatives and the primary retail cooperatives. The study reveals that Kgarose Kgaros Pty Ltd, a manufacturer of sweet potato yoghurt in Limpopo Province, is currently limited to supplying only two small retail stores in Polokwane due to capacity constraints. The company missed significant opportunities to supply larger retailers like Shoprite and Woolworths, as it could not meet Shoprite's high-volume demand and lacked detailed nutrient information for Woolworths. For optimal operation, the study highlights that Kgarose Kgaros Pty Ltd requires a substantial investment of R115 million. The qualitative data was collected through interviews, company reports and online magazines. The study used in-depth case study analysis to analyse the three cases which have been included in the study due to the complexity of the study, as the three organisations are made up of an agro-processing sole trader, agro-processor smallholders and the primary cooperative.

Keywords

Value Chain, Smallholder Farmers, Agro-Processing, Capacity Constraints and Retail Distribution.

1. Introduction

The micro-enterprise Kgarose Kgaros Pty Ltd is a manufacturer of sweet potato yoghurt. It was founded by a young man who grew up in the rural village called Ga-Lekgothoane within the Capricorn District in Limpopo Province of South Africa. In Ga-Lekgothoane in 2011, the population size was 1 156 black South Africans of which 641 were females and 515 were males (StatsSA, 2011). Of these residents, 98.70% had Sepedi as their first language. The village then consisted of 278 households.

The founder and brainchild of sweet potato yoghurt was Edward Molatelo Kgarose who grew up experiencing all the disadvantages that most young people came across as a result of growing up in a rural village. The challenges that

most children faced, such as growing up without daily parental love due to their parents' working far from home and where grandparents were the caretakers of grandchildren (Barbarin & Richter 2013). Fluctuations are the result of South Africa's previous unjust laws which have kept black people far from development, infrastructure and better education (Grant 2013; Rena 2017). Kgarose saw young adults leaving the village for greener pastures in the city after graduating from Grade 12, as universities and other higher education institutions were too far from where people lived. Kgarose concluded that such challenges were setbacks because the majority of black South Africans lived in rural areas with few economic opportunities. According to Kgarose, the situation needed to change for the sake of the populations living in rural villages.

As emphasised by Du Toit (2010), who argued that even though the poverty in rural areas was caused by the past unjust laws and other ill-treatment experienced by black South Africans, the solution could not stem from the numerous policies which stated that rural areas had to move closer to global markets. Instead, the global markets needed to operate in rural areas. The rural areas were and are still experiencing a lack of support (Hickey & Du Toit 2013), as development was only done in industrialised areas and not in rural areas.

According to Tjebana and Rachidi (2018), a city without infrastructure tends to experience higher poverty levels. For a community to develop, it needs to depend on the nature and usage of the existing infrastructure. The value chain is a scientific method of showing how industries and agricultural farmers in emerging markets may progress through an integrated market (Bolwig, Ponte, du Toit, Riisgaard & Halberg 2010). The value chain is a rightful tool to approach Kgarose's ideology. The value chain in the global market is created within rural areas between the farmers (agricultural primary cooperatives, the agro-processing industry and the primary retail cooperatives) and industries. Cooperative enterprises are strong, practical and vibrant alternative economic solutions (Rena 2017). Three-quarters of the population living in rural areas live in extreme poverty with inadequate resources, fewer economic opportunities and poor economic prospects. People with few or no resources are unable to protect themselves from unforeseen and cruel socioeconomic factors (Rena 2017).

1.1 Objectives

The purpose of the study was to integrate the three sectors in any rural area to come up with an integrated global value chain market. The study implemented a practical case study on a poverty alleviation policy, namely value chain. The policy was introduced as an intervention to alleviate poverty by integrating global markets in rural areas (Bolwig et al. 2010). Numerous policy studies emphasised that the global market be closer to rural areas to alleviate poverty but Bolwig et al. (2010) argued that industries and farms needed to work together in developing a value chain which integrated markets within rural areas. Kgarose Kgarose Pty Ltd, as an agro-processing firm, worked with sweet potato farmers, a primary retail cooperative and other wholesalers on integrating the global market in rural areas.

2. Theoretical background and literature overview

2.1. Value chain conceptual framework

The value chain is a systematic model which describes value-adding activities by connecting the supply network of the focal company (Rayport & Sviokla 1995). In this case, Kgarose Kgaros Pty Ltd is the focal company. The value chain may be any activity from the production of a product to the practical step-by-step processes of getting a product to an end customer (Rayport & Sviokla 1995; Syahrudin 2012). The value chain of this study precisely links the agro-processing entrepreneurs with the farmers and primary retail cooperatives. Market-based initiatives like agriculture value chains (AVC) are becoming progressively pervasive to support smallholder rural farmers by aiding them in entering larger market interventions and supplying a pathway to enhance their socioeconomic well-being (Wang, Wang, Sarkar & Qian 2021).

In recent years, the value chain approach has been used by numerous organisations in an attempt to alleviate poverty (Bolwig 2010). The initiative of the value chain approach tends to focus on integrating small and micro-enterprises (SMEs) (Morgan, Hawkes, Dangour & Lock 2019). Kgarose Kgaros Pty Ltd is an SME, buying and selling to other SMEs, both vertically and horizontally. The value chain always forms part of the business, be it a well-established business or a micro-enterprise. It should be about more than just taking part in the global economy; it should also be about generating a sustainable and equitable income (Kaplinsky 2000). The main aim of the value chain is to force industrial companies to pay attention to suppliers, especially in emerging markets. In this case, the value chain is used to integrate the suppliers who are operating in one local market, thus building a strong socioeconomic supply chain management.

The value chain, a model that describes value-adding activities, is crucial for agribusiness performance (Rayport & Sviokla 1995). It is particularly beneficial for small rural producers, helping them integrate into global markets (Arato 2017; Hena 2019). In Africa, it can enhance competitiveness and reduce rural poverty (Webber 2009). In the United States, values-based supply chains can support small and mid-scale producers (Feenstra 2016). In Rwanda, value chains can be used to organize technology and innovation trajectories in the agricultural sector (Yongabo 2021). For small enterprises, the value chain approach can enhance their competitiveness (Reji 2013). A framework for analyzing agricultural value chains in developing countries has been proposed, focusing on constraints, value addition, and upgrading options (Trienekens 2011). Lastly, the value chain framework can enhance export supply policies in developing economies (Kaplinsky 2008).

2.2. The Overview of Limpopo Province

According to Statistics South Africa (StatsSA) (2016), 11.5% of the people living in Limpopo province live in poverty. The Limpopo Province is made up of five districts, namely Mopane, Sekhukhune, Vhembe, Waterberg and Capricorn. According to StatsSA (2016), Limpopo Province is home to 5,8 million people which makes it the fifth highest population size in the country. The Capricorn district is the home of 378 272 residents and the Greater Sekhukhune district houses 290 489 people (StatsSA 2016). The Capricorn district is the second largest district and the Greater Sekhukhune is in fourth place out of the five districts. The study concentrated on these two districts, as they were the two central districts from which Kgarose would like to operate and work closely with the farmers. The two districts are also the districts that experience droughts and unpredictable rainfall the most. The Capricorn district, specifically the Ga-Lekgoathoane village, will be the home of sweet potato yoghurt, while the Greater Sekhukhune and Capricorn districts' smallholder farmers will be the leading suppliers of sweet potatoes, according to Kgarose. Kgarose Kgaros Pty Ltd is currently manufacturing its yoghurt in Polokwane, the capital city of Limpopo Province. The city is also the business hub of the Limpopo Province. Besides supplying the small two retailers, the Kgarose enterprise also targets events such as exhibitions to sell its products and where they call upon casual workers to come and assist with sales.

Most of the South African country, according to De Cock, D'Haese, Vink, van Rooyen, Staelens, Schönfeldt and D'Haese (2013), is covered by level one food security which does not cover all households, especially those in the rural areas of South Africa. De Cock et al. (2013) mention that 1.3% of households in Limpopo Province experience hunger or are always hungry, while further mentioning that the population in Limpopo Province is 5,5 million people. They make up 10% of the South African population and 90% of people living in rural areas. People in Limpopo Province, specifically in the Capricorn and Sekhukhune districts, survive on the water which is normally taken from the running dams in the province. The water is only sufficient enough to cater to the villagers who use the water for household purposes rather than for industrialisation.

3. Methods

The study is based on three cases and due to its complexity, it requires a multiple case study strategy. A case study is an in-depth examination of a person, group of individuals or unit that aims to generalise over multiple units (Gustafsson 2017). The three organisations are made of an agro-processing sole trader, an agro-processing smallholder and a primary cooperative. Multiple case study strategies are conducted to provide an in-depth understanding of the phenomena. Baxter and Jack (2008) allude to the fact that multiple case study strategies allow for analysis within and across cases. It enables intensive analysis of more than one instrumental case study (Chmiliar 2012). The study follows a qualitative analysis, using inductive in-depth analysis. Multiple case study strategies are employed in three SMEs, namely Kgarose Kgaros Pty Ltd, primary agricultural cooperative and primary retail cooperative. A qualitative research design is employed in which a descriptive research methodology is conducted. In the study, Kgarose Kgaros Pty Ltd is an independent variable, while the primary retail cooperative and agricultural smallholders are the independent variables.

4. Data Collection

The three-step process of Yin (2009) has been adopted for conducting a multiple case study.

4.1. Define and Design

The theory was defined through the selection of three cases, namely Kgarose Kgaros Pty Ltd, smallholder farmers and the primary retail cooperative. The data collection instruments were developed, namely interview questions, analysing company reports and online report magazines.

4.2. Prepare, Collect and Analyse

The data was collected in the form of in-depth interviews, focus groups and workshops. The interviews took place with the owners of the businesses. The sole trade, in these cases, being the owner of sweet potato yoghurt, was part of the workshop which took place with the primary retail cooperative. It also formed part of the focus group interview with the 11 smallholder farmers who operated as cooperatives, sole traders or non-profit organisations.

4.3. Analyse and conclude

A value chain framework is used to integrate the three cases, showing the possibilities of an integrated value chain network of industrial-based businesses in the case where Kgarose Kgaros Pty Ltd was the focal enterprise, with the smallholder farmers and primary retail cooperative. The focal enterprise became the heart of the business and strengthened the value chain. The yoghurt firm would be in a position to contract the farmers for sweet potatoes and then get in contact with the retail cooperatives to supply a certain number of products to the supermarkets and spaza shops of the retail cooperatives.

5. Case studies

5.1. Case 1 Yoghurt firm

The study is based on an agro-processing entrepreneur, a primary agricultural cooperative and two retail cooperatives. The discussion outlines the broad background, current challenges and opportunities ahead for the three sectors. Kgarose imagines a manufacturing business operating in his rural village, Ga-Lekgothoane, with all the raw materials for the business being supplied by the smallholder farmers in his village and other nearby villages. After he had finished college, Edward Kgarose set off on a journey to make his dream come true. Kgarose Kgaros Pty Ltd is a company specialising in sweet potato yoghurt. The company was established in 2016 by Kgarose who saw a need for sweet potato yoghurt worldwide.

The potential of Kgarose Kgaros Pty Ltd

Kgarose has been doing his level best to get his product on the market and also obtain seed grants for his business. The hustling was done through applying for different entrepreneurship programmes which are in the form of competitions. The company won Season 8 of the show called "Making Moves" on SABC on February 1, 2019. The company was selected to be the best business of the month in October 2019 by Shoprite under the programme called "Shoprite hustler of the month". Again, the company was nominated as one of the top five youth agriculturists in South Africa by the National Agricultural Marketing Agency. Kgarose has won the Youth in Agriculture, Fish and Forestry Award which was granted by the Department of Agriculture, Forestry and Fisheries on June 27, 2019. The event was held in Port Elizabeth, South Africa.

5.2. Case 2 Smallholder farmers

The farmers of the Sekhukhune and Capricorn districts are encouraged to farm with sweet potatoes due to their persistence in resisting drought. It means the farmers, besides targeting the local agro-processing, market the sweet potatoes locally and globally as raw products or semi-finished products such as cut-frozen products. The supply network is added to the value chain for another SME that will be doing the peeling, cutting and freezing of the sweet potatoes. When a company refines raw materials into useful end products, it creates a value chain (Rayport & Sviokla 1995).

The sweet potato happens to be the least used of the important root vegetables that can persist through drought. The reason Kgarose saw a need for the product was because of the rural areas where he grew up. The young man was born and raised in the Ga-Lekgothoane village in the Capricorn district. Smallholder farmers, who used to work the land farming maize crops, are now discouraged to farm in the regions where. Due to climate change, unpredictable rain was the result. During Kgarose's upbringing, he grew up seeing farmers ploughing the seed of maize during September or summer when there was rainfall. In addition, Maponya and Mpandeli (2012) state that Africa will be hit hardest by climate change, as larger areas could be struck by yield decreases of over 50% by the year 2020 as a result of an increasingly hotter and drier climate.

It is currently September in the areas where it gets cold but it is no longer raining as it could be easily estimated before. Smallholder farmers have been affected by drought impacts for several years now. Sekhukhune district is characterised by weak and unreliable rainfall, frequent droughts and periodic flooding. Due to low and unpredictable rainfall, smallholder farmers in the Sekhukhune district find it challenging to obtain high crop yields (Mpandeli, Nesamvuni & Maponya 2015). In the current state, no one works the fields.

Kgarose regards the sweet potato as one type of vegetable through which farmers in rural areas may regain their farming abilities. The Sekhukhune and Capricorn districts in Limpopo Province are the areas that experience the most droughts, even though they are located within Limpopo Province where there are tropical regions such as the Vhembe and Mopane districts. The sweet potato is a root vegetable that does very well in areas where there are droughts and unpredictable rain. The farmers who used to grow sweet potatoes, as well as the farmers who now work for an agricultural cooperative, may all benefit from this.

5.3. Case 3 Creation of retail cooperatives in Sekhukhune and Capricorn districts

In Polokwane, the supermarkets and spaza shop owners came together to form a retail cooperative. A retailer-owned cooperative is formed when a collection of independent retailers form a wholesale unit to the group's mutual benefit (Stoel 2002). Numerous prosperous retail cooperatives were established in expanding communities where additional retail provision was required to meet growing consumer demand that was not being met by existing private shopkeepers (Purvis 1990).

The Polokwane retail cooperative aims to enjoy economies of scale and also service the members of cooperatives with continuous learning and training to better their businesses. While working in silos, the supermarkets are unable to buy straight from the manufacturer and also support the local producers. The retail cooperative enterprise is in the early stages of formation. It is eager to collaborate with Limpopo agro-processing enterprises by selling agro-processing products in its retail supermarkets and even future co-op wholesalers. The retailer cooperative will be the one to buy sweet potato yoghurt from Kgarose Kgaros Pty Ltd, and then the co-op members will buy it from their retailers. The advantage of the retail cooperative is that the members enjoy profit twice; once from their businesses and the second in the form of dividends.

6. Findings and discussions

6.1. The state of Kgarose's business

The smallholder farmers currently farming sweet potatoes in Limpopo Province within the Sekhukhune and Capricorn districts are the suppliers of Kgarose Kgaros Pty Ltd. Currently, Kgarose Kgaros Pty Ltd is located within the Capricorn district to manufacture the sweet potato yoghurt. However, due to capacity constraints, the business can only supply two small retail stores situated in Polokwane. Kgarose says that he missed an opportunity to supply to big retailers such as Shoprite, as this retailer wanted 16 000 units which he is currently not able to produce daily. He also missed an opportunity with Woolworths due to the nutrient information required for the product to better specify the product and a target market which will benefit from the product.

The manufacturing setup needed in the Kgarose Kgaros Pty Ltd business requires R11,5 m. The business hopes to secure an accredited laboratory that may be used to test the product. The institution they use currently to test the product is not accredited; hence, Kgarose Kgaros Pty Ltd does not attract potential customers. The business was started in 2019 and should show a profit of R8 000 per month. The business can sustain itself by buying its raw materials, machinery and equipment itself. To date, the business has employed seven people of whom four were permanently employed and three were contract workers who produce 350 units per day. This small number of units are due to a lack of sufficient equipment, meaning if they were to have the opportunity to produce 16 000 units per day, the company could employ close to 320 employees which will then create more employment in the province.

(Currently, kgarose is within Capricorn district, enterprise hub plants, to manufacture the sweet potato yoghurt. Due to capacity constraints, the business can only supply the two small retail stores situated in Polokwane town. Kgarose says that he missed an opportunity to supply big retailers such as Shoprite, as the retailer wanted 16, 000 units, which he was not able to produce in a day. He also missed an opportunity with Woolworths, due to the nutritional information required from the product to better specify the product and the target market which would benefit from the product. The manufacturing setup needed in Kgarose Kgaros Pty Ltd's business requires 11,5 million rands. The business is also hoping to get an accredited lab that can be used to test the products, as currently the institution they are using to

test the products is not accredited, hence some of the customers are not getting them. The business started in 2019 and to date can make a profit of up to R8000 a month. The business can sustain itself by buying its raw materials, machinery, and equipment and paying for labour. To date, the business has employed seven people, four are permanently employed, and three are on a contract basis. The smallholder farmers currently farming sweet potatoes around Limpopo province are the suppliers of Kgarose Kgaros Pty Ltd. The farmers are within the Sekhukhune and Capricorn districts. The Kgarose Kgaros so far has employed seven people who are producing 350 units per day. The number of units produced per day is due to a lack of sufficient equipment. Meaning, that if they were to get an opportunity to produce 16, 000 per day, the company could employ close to 320 employees. which will then create more employment in the province.

If the machines used currently only required four people to produce the product, would there still be a need for more people or would the same people be able to operate if more equipment weres involved? The current machines in use are directly proportional to four people only.

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6.2. Overcoming Farming Challenges: Building Knowledge and Infrastructure in Sweet Potato Cultivation

The problem that Kgarose faces with rural farmers is the lack of knowledge and experience when it comes to farming sweet potatoes. The smallholder farmers plant sweet potatoes, using a cropping system due to their drought resistance, food security and versatility (Motsa et al. 2015). The smallholder farmers do not know the roots of the sweet potatoes with which they farm. They are not aware of when to harvest the sweet potatoes and at that time, they were cultivating the type of sweet potato not suitable for Kgarose's business. Kgorose, the founder and owner of Kgarose Kgaros Pty Ltd, says he plans on creating a supplier relationship programme within the business due to his passion for farming. His suppliers will be trained in such a way that they will be able to supply him with the expected raw materials needed for the business. Kgarose also plans to have an incubation programme for the youth in the area who would like to be farmers and supply Kgarose Kgaros Pty Ltd with the expected quality and quantity of raw materials.

Kgarose needs to start thinking of other suppliers that will be part of the business and decide on where the business will want the emerging entrepreneurs in the rural areas or who have well-established businesses for logistics purposes. Currently, the smallholder farmers and Kgarose Kgaros Pty Ltd do not have transport of their own. Even though Kgarose plans on establishing his manufacturing plant in his village, Ga-Lekgothoane, there will be a need for transportation between the business and the farmers. Kgarose Kgaros Pty Ltd must have its own transport which will then transport the sweet potatoes from the farmers to the manufacturing plant. Currently, the small manufacturing plant of the sweet potatoes is situated in Polokwane, an estimated 40 to 50 kilometres away from the farmers in the rural areas. Although the smallholder farmers will be working closely with one another and some will be operating in different villages, there will be a need for a central location where all the farmers may deliver their sweet potatoes to move the sweet potatoes from the rural areas to the plant.

Kgarosi states that, even though the sweet potato can withstand drought, the kind of sweet potato that he needs requires some water to be suitable for his business. There is a need for farmers to start thinking of a way of watering their sweet potatoes. This is a challenge, since the reason the farmers are currently discouraged from working the land is the lack of rain during the season when they usually plant their maize crop seed and sweet potatoes.

6.3. Benefits for Rural Farmers

Facing challenges like drought and climate change, rural farmers have struggled with underperforming farms. The collaboration with Kgarose Kgaros, where they become suppliers of sweet potato yogurt, offers significant benefits. This partnership not only ensures a steady income by supplying to this agro-processor but also educates them about the nutritional benefits of sweet potato yogurt. This knowledge aids in using the product as a nutritious meal substitute, enhancing food security for their families. Revitalizing unused farming fields, this initiative aims to address poverty and unemployment in the villages, increase engagement in productive activities, and potentially reduce substance abuse. Ultimately, it promises to build sustainable rural communities, ensuring that financial resources benefit each household and contribute to the overall wellbeing of the area.

6.4. Agricultural Challenges and Cooperative Solutions in Rural South African Farming

South Africans who are working the land or who are employed in the agricultural sector in rural areas are generally known to be uneducated and mostly over the age of 65. These challenges make it difficult for the agricultural sector to thrive in rural areas. While trying to manage the smallholders who work on different farms, the best model to use is to help them to form primary cooperatives which will be manageable. Even though cooperatives in South Africa have failed before, the cooperative model is known to have worked very well for farmers in the United Kingdom and in Kenya in farming with coffee.

The challenges with cooperatives formed in South Africa are that a top-down approach had been followed where there was a lack of knowledge from the cooperative members, as well as the agents who were serving the government to ensure the success of the cooperatives. Many people become involved in cooperatives without fully comprehending what they are getting themselves into when they form and become members. Within one to two years, most of the cooperatives that the government helped start and fund fail because they do not have enough money, machinery or people to keep them going.

As Kgarose is thinking of a supply chain cooperative model, which he would like to use in his business to ensure the development of his suppliers, they will deliver both the expected quality and quantity of the product. He also needs to start thinking about training the smallholder farmers in such a way that they will run an effective and efficient cooperative.

Kgarose will be able to make one payment to the cooperative and the cooperative will divide the money among the smallholders accordingly. He will also be able to get the same quality of sweet potato because the primary cooperative members will be attending the same workshops and agreeing on the ploughing and harvesting times of the sweet potatoes. With the success of these cooperative enterprises and the members' ongoing learning about the product and cooperative operation, there will be a need for members to form secondary and tertiary cooperatives to assist the primary cooperative with additional training, marketing and administration of all cooperative duties. The cooperatives may be able to have more than 1 000 members and employ a multitude of people.

There are several organisations in South Africa which are mandated to help people, especially the ones who are previously disadvantaged to form cooperative enterprises but to date, South Africa does not have a single cooperative enterprise where the three tiers of cooperatives – primary, secondary and tertiary cooperatives – operate effectively. Technological intervention in the challenges currently faced by farmers and Kgarose Kgaros Pty Ltd indicate many constraints that Kgarose and the farmers face. The main problem is water or the lack of rainfall. At first, when he started the business, he was excited that the sweet potato persisted through drought, meaning it was not the same as the maize crop which was farmed by all the farmers in the area. Due to the drought and unpredictable rain, farmers are now discouraged from continuing with farming.

The business requires the kind of sweet potato which needs water, while the farms targeted do not have any form of watering system which may be used to water the sweet potato slips. However, technology has made it possible that there are now two ways in which farmers can use the water for household and farming. But the water issue is fully

reliant on first is by partnering with relevant government departments to intervene into the water issues. First of all, the sweet potato plant requires one foot of water every three weeks, which is something like half an inch of water per day. It means that the farmers may hire a truck that carries 10 000 litres of water and use it to water their six-hectare farm once every three weeks.

Secondly, farmers may install an irrigation system that moves water from nearby dams to their farms and only pay the local municipality per litre of water usage. The infrastructure here are the pipes that run from the main dam to the farms. Most of the water sources belong to the municipality and is meant to service nearby villages. Therefore, it will not be harmful to anyone if the water is moved to the nearby farmers who are closer to the dams once every three weeks. These dams function more as storage facilities and draw water from the natural dams such as the Molepo, Cheune and Lepelle dams that surround the village. These dams are all re-used to supply the Sekhukhune and Capricorn districts with water. Therefore, adequate water supply will be possible for farms that are situated nearer to certain dams.

The third option will be techno farming of sweet potatoes in the Greater Sekhukhune and Capricorn districts. Takamine (2019) describes the sweet potato as a well-known semi-complete nutritional food and due to its well-balanced nutrient profile, it is highly nutritious. According to Motsa, Modi and Mabhaudhi (2019), sweet potatoes outperform most carbohydrate foods in terms of their dietary fiber, protein content, minerals and vitamins.

7. Conclusion

7.1. Supply chain development programmes (SCDPs)

Kgarose noticed a need within his business and now aims to build up a supply chain relationship programme. His business will be used as a training and development centre for all its suppliers who are connected to the network. The supply chain programme will be part of the solution in educating the smallholder farmers who are mainly located in rural areas while the use of technology will also play a role in ensuring that smallholder farmers, customers and other stakeholders have all the relevant needs can form part of the value chain. In the era of the 4th Industrial Revolution there is a need to use technology for organisations to remain competitive. According to Makhan and Heyns (2018), these changes have enabled organisations to interact with one another from great distances, at great speed and at a time that is convenient for them. Quesada, Gazo and Sanchez (2012:35) state that technology, such as telecommunication and computer-processing capabilities, allows supply chains to communicate with one another and reduce lead time, paperwork and other unnecessary activities which result in improved customer and supplier relationships. Additionally, the new era has resulted in significant changes in individual consumer behaviour. As a result of technological advancements such as the internet, customers have gained greater knowledge and quickly compare the quality and costs of products and services (Makhan & Heyns 2018).

Through continuous education and training, there are quite a significant number of organisations all over the world that ensure that they develop their suppliers and most of the time it has become very advantageous to the companies which do so. In the long term it turns into profitability and also reduces risks. The supply chain elements are crucial for the three agricultural sectors to work on the same supply network more efficiently and effectively. It has been learnt before with multinational companies who tend to outsource their businesses to emerging markets, taking advantage of being nearer to raw materials and cheaper labour. Kgarosw's idea of a supply chain relationship programme will work to his advantage, as he will have sustainable supply chain management within his business. It reduces the risk of exposing the business to negativity which most multinational companies find themselves facing within their businesses.

In such a case, most firms or farms do not follow the ethical standards that are typically required in the countries of origin of those companies. It is the same with South Africa. Even though it is an emerging market, it still enjoys the policies and regulations that generally protect human rights and, in some cases, the natural environment. Kgarose says that working closely with the farmers ensures transparency of his business, as well as hold the buying power of his suppliers. Then he is in a position to encourage the farmers to follow ethical standards and also farm in a way that does not harm the environment. By following the ethical standards, farmers ensure that they farm organic products.

7.2. Reverse logistics and by-products

Kgarose Kgaros Pty Ltd sweet potatoe yoghurt products come in a variety of flavours, including strawberry, banana and apricot. Kgarose plans on expanding into other products that may come from sweet potatoes such as juice and

alcohol. The business will also use the vegetable to produce fertilisers that will then be sold back to farmers to fertilise their fields. Kgarose Kgaros Pty Ltd has an opportunity to utilise the sweet potato and fill the gap where research states the sweet potato is not fully utilised.

Using the by-products from the same sweet potato that is used to produce the sweet potato yoghurt is a very good initiative, especially in ensuring that the by-products of the raw material are used to make other products. The business may consider its packaging to make it environmentally friendly and also find a way of recovering its end-of-use packages. Instead of being packaged with non-biodegradable materials, the yoghurt may be packaged with a material that is easily recycled and biodegradable at the same time.

For future research studies the authors suggest that such kinds of businesses require action research as a way of collaborating with farmers and manufacturers while ensuring sustainable supply chain management, internally and externally. Farming remains the most vulnerable market when it comes to sustainability due to farmworkers still living under the level of poverty despite intervention. The good part of Kgarose's thinking is that he might extend his business by producing pumpkin juice in the future.

There are so many advantages that will benefit the villagers in the areas of the Kgarose Kgarose Pty Ltd initiative. The pumpkin cultivar that Kgarose has identified is good for farming in the Sekhukhune and Capricorn districts. These districts are located mostly in an arid region with unpredictable rainfall. The farmers may plough both the sweet potato and the pumpkin or for a change in the season, they may plough sweet potato root in a certain season and pumpkin in another season. Farming concurrently will be advantageous for the farmers, as they will not run out of cash. As for Kgarose Kgaros Pty Ltd, it will run throughout the year instead of being a seasonal business.

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