EVALUATING RWANDA’S YOUTH-CENTERED ENTREPRENEURIAL ECONOMIC DEVELOPMENT STRATEGY

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ABSTRACT

Entrepreneurship is a driver behind sustainable economic growth throughout Sub-Saharan Africa. Youth entrepreneurship, in particular, is seen as an opportunity to create employment for youth and address the growing youth bulge. The East African country of Rwanda has a rapidly growing youth population that is outpacing job creation. With much of the population being under the age of 25, economic growth and development heavily depends on a youth-centered entrepreneurial economic strategy. Understanding the challenges and opportunities of youth entrepreneurship in Rwanda can increase accessibility, reduce income inequality, and overall drive economic growth. The goal of this paper is to evaluate Rwanda's youth-centered entrepreneurial economic development strategy by evaluating the scope and opportunities for youth entrepreneurship in Rwanda and abroad and analyzing the needs and challenges of youth entrepreneurship as viewed from the lens of a private company, CARL Group. The paper concludes with recommendations for policies and public investments that are needed to facilitate an entrepreneurial-led economic development strategy in Rwanda.

BIOGRAPHICAL SKETCH

Emily Keast received her B.A. in Economics and Environmental Studies from Lake Forest College and went on to serve as an Agriculture Volunteer for the Peace Corps in Ethiopia. During her time in Ethiopia, she focused on nutrition-sensitive agriculture initiatives, focusing specifically on household gardens and poultry management. Following her time in the Peace Corps, she worked for Catholic Relief Services (CRS) Ethiopia for their USAID Farmer-to-Farmer (F2F) program. Following her time in Ethiopia, she enrolled in the Master of Professional Studies Program for International Agriculture and Rural Development at Cornell University, where she explored theories and practices for agriculture and economic development, specifically emerging markets. She traveled to Rwanda as a member of the Student Multidisciplinary Applied Research Teams (SMART) through the Charles H. Dyson School of Applied Economics and Management at Cornell University. It was through this program where she became interested in youth entrepreneurship.

To my grandfather
Eugene S. Eggers

ACKNOWLEDGMENTS

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

CHAPTER 1: Introduction

1.1 Introduction

Entrepreneurship is a driver behind sustainable economic growth throughout Sub-Saharan Africa. Businesses that entrepreneurs develop increase economic productivity by driving innovation, increasing structural changes, and introducing competition (Kew et al., 2015). Youth entrepreneurship, in particular, is seen as an opportunity to create employment for youth and address the growing youth bulge. Young entrepreneurs are more likely to hire youth and are responsive to new economic opportunities and trends (OECD, 2015). If regulated effectively, youth entrepreneurship has the potential to propel economic growth through the creation of new small and medium-sized enterprises (SMEs) and youth employment.

The East African country of Rwanda has a rapidly growing youth population that is outpacing job creation. In Rwanda, youth is defined as people between the ages of 15-35. In 2017, young people under the age of 25 represent 67% of Rwanda's population with nearly half of the youth population either unemployed or underemployed (Rwanigabo, 2017 and Root, 2016). With much of the population being under the age of 25, economic growth and development heavily depends on a youth-centered entrepreneurial economic strategy. While Rwanda is seen as a leader in youth entrepreneurship, many youth still face barriers that impede economic integration and limit business and employment opportunities (Afadhali, 2016). Understanding the challenges and opportunities of youth entrepreneurship in Rwanda can increase accessibility, reduce income inequality, and overall drive economic growth. The goal of this paper is to evaluate whether a youth-centered entrepreneurial economic development strategy can lead to wide-spread economic progress in Rwanda.

Figure 1: Map of Rwanda
Source: Lonely Planet, 2020

1.2 Economic Development in Rwanda

Rwanda’s long-term development goals are embedded in Vision 2050 which is built off the success of Vision 2020, a strategy to transform Rwanda from a low-income, agricultural based economy to a knowledge-based, service-oriented economy with middle-income status by 2020 (World Bank, 2019). Vision 2050’s overall goal is ensuring high standards of living for all Rwandans. To transform Rwanda from middle income status to prosperous upper middle-income status by 2035 and high-income status by 2050, Rwanda must increase productivity and competitiveness while providing jobs for Rwandans.

Rwanda’s medium-term strategy, 7 Year Government Program: National Strategy for Transformation (NST1), provides the platform and pillars for accelerated transformation on the pathway to achieve Vision 2050 (Republic of Rwanda, n.d.). Figure 1 shows the framework for Vision 2050 and NST1. The NST1’s ambitious strategy is for the years 2017-2024 and prioritizes economic, social, and governance transformation. Of the three, the Government of Rwanda heavily emphasizes the importance of economic transformation. The economic transformation pillar focuses on accelerating inclusive economic growth and development through the private sector (Republic of Rwanda, n.d.). The NST1 aims to achieve the following objectives by 2024: increase exports by 17%; create 1,150,000 jobs; modernize and increase agriculture and livestock productivity; and increase domestic savings and position Rwanda as a financial hub (Republic of Rwanda, n.d.). Achieving the objectives of NST1 through comprehensive economic growth will improve livelihoods and increase resilience in Rwanda.

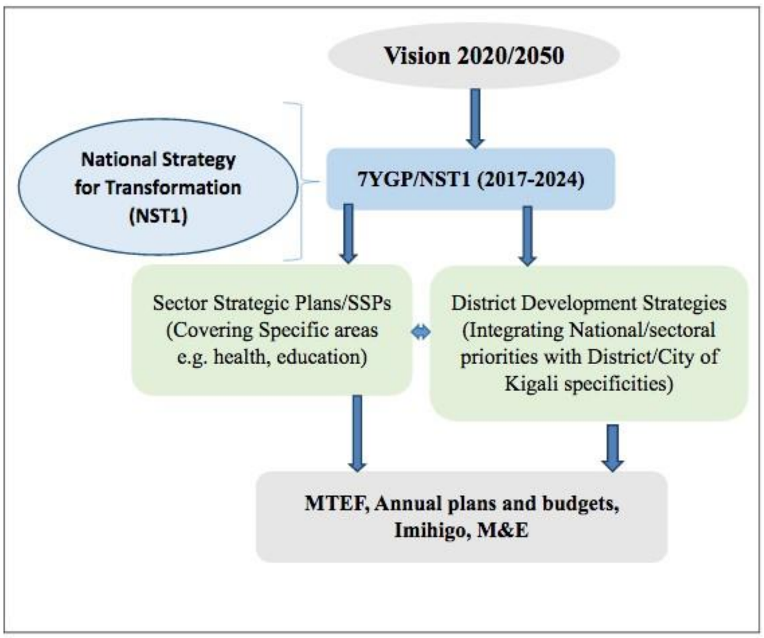

Figure 2: Framework for Vision 2050 and NST1
Source: The Republic of Rwanda, n.d.

The development of the non-agricultural sectors of the economy has been dominated by small businesses operating on an informal or formal basis. The magnitude of this trend has been large enough to make non-agricultural entrepreneurship and wage employment a significant source of new employment and income opportunities (Malunda & Musana, 2012). Non-farm wages have been one of the drivers of reduced poverty rates from 57% in 2006 to 44.6% in 2010 and 2011

(Malunda & Musana, 2012). It is essential that this development continues, so that SMEs grow and increase demand for non-farm labor.

1.3 Youth Entrepreneurship in Rwanda

With the average age of Rwandans being 20 years old, youth entrepreneurship is seen as a catalyst to resolve long-standing poverty and employment issues for its youth (Worldometer, 2020). Rwanda has established funds, programs, and institutions aimed at helping young Rwandans translate their entrepreneurial ambitions to tangible jobs (Herrero, 2016). A notable program is through Rwandan public schools. Since 2009, the Rwandan government has made entrepreneurship knowledge and skills available to most youth by creating mandatory entrepreneurship classes in secondary schools (Root, 2016). The current course covers the full cycle of business creation and development, including product development, registration and legal issues, marketing, accounting, and customer relations (Blimpo & Pugatch, 2019). In the capital, Kigali, youth have access to incubators that provide the necessary support and financial and technical services. The purpose of these incubators is to mentor and empower youth entrepreneurs and provide them the necessary resources to create a successful business. Going forward, Rwanda hopes to further facilitate economic growth driven by youth, urging them to be more innovative to address challenges faced in the country.

1.4 Scope of the Problem

While there has been some economic progress in Rwanda, there is a need for more interventions to limit the negative impacts of youth unemployment and underemployment on the Rwandan economy. Given the structural features of the Rwandan economy, could a youth-centered entrepreneurial economic development strategy lead to wide-spread economic and social progress?

This capstone will evaluate the scope and opportunities for youth entrepreneurship in Rwanda and abroad, analyze the needs and challenges of youth entrepreneurship as viewed from the lens of a private company, and recommend policies and public investments that are needed to facilitate an entrepreneurial-led economic development strategy. The primary research methods used to meet the capstone’s objectives include a literature review and the case study method.

CHAPTER 2: METHODS

2.1 Literature Review

A literature review was conducted on youth entrepreneurship in Rwanda and Singapore, where youth entrepreneurship has been successful. Rwanda considers themselves the "Singapore of Africa" and analyzing Singapore's trends and successes in youth entrepreneurship can help identify ways where Rwanda can strengthen their youth-centered entrepreneurial economic development strategy. This will include looking at government programs and policies, and other youth entrepreneurial programs put on by research centers, non-governmental organizations, and the private sector. The goal of the literature review is to identify gaps and opportunities in the Rwanda context and identify potential recommendations by evaluating other countries who have successfully executed youth entrepreneurship programs and policies.

2.2 Case Study

The primary research method utilized is the case study approach. The case study method was chosen due to limited secondary data. The CARL Group case study analyzes a youth-led enterprise located in Kigali, Rwanda. From January 5-18, 2020 I traveled to Kigali, Rwanda as a member of the Charles H. Dyson School of Applied Economics & Management Student Multidisciplinary Applied Research Teams (SMART) Program. I was a part of a team that included three students from Cornell University, and we were led by a Cornell University faculty member and a PhD candidate who were both from the College of Veterinary Medicine. To gather and organize our data, we used an adaptation of the FAO Small-Medium Agro-Processing Enterprises Case Study Template for Data Collection (Appendix 1). Multiple stakeholders, including CARL Group employees and OFSP farmers, were interviewed. We also surveyed competitors and collected data from the company's reports, documents, newsletters, and financial records. Our field advisors were Nicholas Hitimana, Jan Low, Anu Rangarajan, Kirimi Sindi. Upon return to the United States, the SMART Program Rwanda team developed a corporate growth strategy case study based on the information collected in Rwanda. The goal of the case study is to analyze the needs and challenges of youth entrepreneurship in Rwanda as viewed from the lens of a private company.

CHAPTER 3: LITERATURE REVIEW

3.1 Introduction

This literature review provides information on the challenges youth entrepreneurs face in Rwanda. The literature review also examines Singapore's youth entrepreneurship strategy as Rwanda's economic development model mirrors Singapore's. When analyzing Rwanda's youth-centered entrepreneurial economic development strategy, it is important to identify challenges within the country, identify the nation's resources, and observe countries as examples of what is possible in Rwanda.

3.2 Literature Review

Rwanda Development Board

The Rwanda Development Board (RDB) was established to promote efficiency and coordination for investors to invest in Rwandan enterprises. RDB's investment promotion efforts take a 'sector-building' approach, whereby business environmental factors are identified on a sector-by-sector basis (PSDYE Sector Working Group Secretariat, 2017). The lack of a certain value-chain player is considered a prime business opportunity for investment (PSDYE Sector Working Group Secretariat, 2017). Investors and entrepreneurs have spoken highly of the RDB, specifically their executive management; however, investors and entrepreneurs complain of the delays as the process becomes bogged down in bureaucracy at the lower levels of RDB and government ministries (Crisafulli & Redmond, 2015). Additionally, many established businesses do not receive the necessary support from RDB when problems arise.

Financial Constraints

Youth entrepreneurs and SMEs struggle to mobilize finances for their operations (SDYE Sector Working Group Secretariat, 2017). The capacity of Rwandan companies to develop bankable and investable projects remains low (SDYE Sector Working Group Secretariat, 2017). Additionally, youth cannot easily access finance to start or expand their business because they do not have collateral (Sindambiwe & Mbabazi, 2014). The prime interest rate at the state-owned banks remains very high at 16-18%, limiting access to financing for most businesses except the most profitable ventures (SDYE Sector Working Group Secretariat, 2017). There have been many incidents where brilliant business ideas ‘die’ because of lack of funding; for example, in 2013, 70% of youth projects were rejected by banks (Sindambiwe & Mbabazi, 2014). Other financial barriers for youth entrepreneurship include bank charges, inability to evaluate financial proposals, and lack of financial management skills (Sindambiwe & Mbabazi, 2014). It is found that 98% of youth-owned enterprise do not keep accounting records and about the same percentage do not develop their products (Sindambiwe & Mbabazi, 2014). The Government of Rwanda is increasingly looking at private investors and while there is great potential for private investment, Rwanda must address the nation’s low domestic savings rate, low skill set and high energy costs (World Bank, 2019). Addressing these constraints will provide a platform for economic growth through private investments.

One method Rwanda is implementing to improve youth entrepreneurs’ access to finance information is through incubators. The Incubator Centre in Kigali has nurtured 64 enterprises out of which 58 have successfully graduated while a few have closed (Aggarwa et al., 2011). The success rate has been attributable mostly to qualities of the entrepreneurs, increased access to business development knowledge and the business network developed.

Business Development Fund

The Business Development Fund (BDF) was originally established in 2011 to address the obstacles and challenges faced by the Rwandan Government in enhancing SME financing and self-employment (Mpankaniye, 2017). To increase their presence, the BDF decentralized its structure and created centers in each of Rwanda's 30 districts (Mpankaniye, 2017). The BDF plays a large role in youth employment creation; it refinances grants, stimulates SME growth, and provides advisory and access to financial services (Mpankaniye, 2017). While the BDF has increased youth access to financing and advisory services, there are still many barriers faced by youth to acquire loans, especially those in rural areas. The BDF needs to increase the number of branches to increase youth entrepreneurship facilitation (Mpankaniye, 2017).

Singapore and Youth Entrepreneurship Success

Rwanda's pursuit of economic development reflects the East Asian "tiger" economies such as Hong Kong, Singapore, South Korea, and Taiwan (Crisafulli & Redmond, 2012). Specifically, Rwanda wants to become the "Singapore of Africa" (Crisafulli & Redmond, 2012). Much of Rwanda's economic policies are similar to Singapore; for example, the RDB is based on the Singapore Economic Development Board (Crisafulli & Redmond, 2012).

In 2013, Singapore was ranked the seventh most innovative country out of more than 200 countries largely due to R&D expenditure, percentage of publicly traded technology companies and patent activity (Narasimhalu, 2015). The Ministry of Trade and Industry has been proactive in creating multiple channels through which start-ups can access funding (Narasimhalu, 2015). Recognizing the gap between demand and supply of seed funding, the Ministry offers different financing options such as grants, co-investments, tax incentives and loan programs (SPRING Singapore, 2016). Financing options like crowdfunding offer new opportunities to start-ups and investors, changing the way entrepreneurs seed ideas and seek funds. (SPRING Singapore, 2016). Crowdfunding in Singapore has seen growing interest in the last few years and has reportedly raised tens of millions of dollars for local ventures (SPRING Singapore, 2016).

Singapore's entrepreneurship has been successful in commercialization largely due to strong government and public sector agencies such as the Economic Development Board, SPRING Singapore Agency for Science, Technology and Research and the National Research Foundation (Narasimhalu, 2015). These organizations and agencies administer programs and funding schemes to provide support throughout the innovation value-chain, from basic R&D through commercialization (Narasimhalu, 2015). Overall, a holistic R&D framework ensures long-term relevance of investment (Narasimhalu, 2015). As seen in Singapore, increasing R&D expenditure can lead to increased returns; Singapore grew its R&D expenditure from $760M USD in 1991 to $6.04B USD in 2009 (Narasimhalu, 2015).

3.3 Take Away from Comparative Published Reports

Available literature on Rwanda's youth-centered entrepreneurial economic development strategy shows that Rwanda possesses the necessary infrastructure, such as RDB and BDF, to support a youth-centered entrepreneurial economic development strategy. However, increased finance support is needed in Rwanda. Looking at other countries who are successfully implementing youth entrepreneurship programs can help Rwanda identify possible solutions to the challenges they face. Singapore, a country Rwanda strives to emulate, has been successful in financing youth entrepreneurs. Successful finance methods include multiple funding channels, tax relief for investors, and increased government funding towards R&D.

CHAPTER 4: CASE STUDY

CARL Group, Ltd.: ‘Nutritious and Vivacious Bread’

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Introduction

> *"We want to become the best bakery company of nutritious products in Rwanda and to ensure customers' health by providing nutritious food with affordable and reasonable means." - Regis Raj, CARL Group Managing Director*

In the Fall 2019 Regis Raj, Managing Director of CARL Group in Kigali, Rwanda was feeling hopeful and excited about the future of his small business. He had just left a meeting with the Ministry of Agriculture and Animal Resources concerning how CARL Group could scale up their business and make a greater impact in addressing vitamin-A deficiency through their VitA Bread made from orange-fleshed sweet potatoes (OFSP). The Minister wants Regis to compose a concept note that she can pass on to international agencies, such as the United Nations Food and Agriculture Organization (FAO) and the International Fund for Agriculture (IFAD), who are interested in funding small and medium-sized enterprises in Rwanda. The Ministry of Agriculture and Animal Resources is particularly interested in CARL Group because CARL Group has a strong relationship with the Minister and the company aligns with the Government of Rwanda's Fourth Agriculture Transformation Strategy (PST4) which sees value-addition as a catalyst for economic growth and expansion. Regis' passion for helping Rwanda grow and transform as a nation is inevitable. He puts his heart and soul into CARL Group knowing that the company plays an important role in creating a healthier Rwanda.

Regis is committed to growing his business and addressing vitamin-A deficiency; however, he lacks the necessary capital to expand his business to meet the company's goals. While receiving aid will give him the immediate capital that he needs, he loses the ability to organically grow and develop a business which could have long-term implications. Additionally, Regis will have to develop his business to satisfy his donors which may differ from his own vision for the organization. Is this a sustainable long-term solution for Regis? How can Regis sustainably grow and expand his business while continuing to make an impact in Rwanda by addressing vitamin-A deficiency?

Company History and Mission

CARL Group is a youth-led company established and registered in Kigali, Rwanda in 2014. It was founded when four young entrepreneurs named Clarisse, Ada Elyse, Regis, and Larissa (CARL) identified that adding value to OFSP might help to encourage the consumption of the highly nutritious crop. As young innovators, they are partaking in a common trend in Rwanda: youth entrepreneurship. With 67% of the population under 25, youth entrepreneurship is seen as a way to address youth unemployment or underemployment (Rwanigabo, 2017 and Root, 2016). Subsequently, it is very easy for entrepreneurs, in particular youth, to start a business in Rwanda. When CARL Group established and registered its business in 2014, it only took six hours and start-up capital was not necessary.

With eight permanent staff making 200 loaves of bread a day, CARL Group aims to add value to locally grown crops like OFSP to help alleviate nutritional deficiencies among vulnerable communities. They are guided by their mission "to ensure customers' health by providing nutritious food with affordable and reasonable means" (Nkulikiyinka & Nzayisenga, 2019). Beyond this, CARL Group seeks to increase the income of smallholder farmers, promote commercial agriculture, and support youth employment throughout their supply chain and business model.

After extensive research and development efforts to test various products made from OFSP including donuts and biscuits, CARL group decided in 2017 that bread products would be the focus of their business. Today, their main product is VitA Bread, a certified Made in Rwanda product (See Appendix 2). The label is a powerful marketing tool and hopes to reduce the country's reliance on imports. This policy also helps local entrepreneurs gain access to local Rwanda markets for their products. It is also one of two breads to receive a Standard Certification from the Rwandan Standard Board. This certification ensures the product is safe and of high-quality. Receiving this accreditation also allows products to enter and compete in international markets. Both labels give CARL Group a competitive advantage as many small and medium-sized enterprises in the food processing industry face adversity in obtaining the necessary safety certifications and do not use completely locally sourced ingredients.

VitA Bread is made from 60% OFSP which is a biofortified sweet potato rich in beta-carotene, a precursor of vitamin-A (see Appendix 3). This unique product helps to address the high levels of vitamin-A deficiency among young children and pregnant/lactating women in Rwanda. CARL Group sources the raw materials for the bread from around 200 individual farmers and cooperatives in the southern province in Rwanda. The end products are processed daily by a highly qualified team of six young visionaries. The products are then sold in 25 supermarkets and grocery stores across several neighborhoods in Kigali, primarily to low- and middle-income urban consumers. The price of one loaf of bread is 1000 RWF ($1.07 USD).

The company has seen much success since the product was released to the market in May 2019. Within the past six months, CARL Group has sold 9,000 loaves of bread bringing their total sales value to 7.2 million RWF ($7,563.98 USD). They continue to produce 200 loaves of bread per day for each of their 25 distributors. They currently receive funds from Rwanda Genocide Student

Survivors Fund and Global Alliance for Improved Nutrition (GAIN). They also have received a loan through the BDF. The BDF's overall objective is to help small and medium-sized enterprises access finance, especially those with insufficient collateral needed to obtain a loan. Most youth entrepreneurs fall into this category and subsequently the BDF have aided in creating youth employment through the BDF credit guarantee, which provides supplementary collateral for the borrower in order to fulfill the lender's required collateral coverage ratio (Rwanda Cooperative Agency, n.d).

Within the next five years, CARL Group will use the expansion plan they have developed to scale-up production and reach consumers nationwide. They are looking forward to offering more products including OFSP biscuits, pasta, and cassava gluten-free bread to reach a broader range of consumers. As Rwandans are becoming more aware of Celiac Disease and gluten-free options, there is a potential new market. Increased production will also create job opportunities for the Rwandan youth and contribute to overall economic development, which is another important part of their mission.

Malnutrition in Rwanda

In Rwanda, many people face a form of food insecurity known as hidden hunger, defined as an imbalance of macronutrients and micronutrients. Over 20% of the Rwandan population is food insecure with the greatest food insecurities in the northern and western parts of the country (USAID, 2018). In 2005 the Government of Rwanda initiated the National Multisectoral Strategy to Eliminate Malnutrition which decreased stunting, underweight, and wasting in children under five; however, today there are still 50% malnourished rural children, compared to 20% of their urban counterparts (Binagwaho et al., 2020). In Kigali specifically, 23% of children between the ages of 18-23 months are stunted (USAID, 2018). Poor nutrition and a lack of access to micronutrient rich foods contribute to stunting. The most common micronutrient deficiencies are vitamin-A, iron, zinc, and iodine.

In 2012, the International Potato Center (CIP) introduced OFSP to Rwanda as a nutritious option high in beta-carotene to address vitamin-A deficiency. Approximately 35% of children in Rwanda do not consume enough vitamin-A (Custodio et al., 2019). Vitamin-A deficiency causes night blindness, compromises immune systems, and is associated with stunted growth, posing a serious health threat to children and pregnant and lactating women. Eating Vitamin-A rich OFSP can reduce vitamin-A deficiency among young children and pregnant and lactating women, the populations most vulnerable to this deficiency. Thus, the nutritional advantages of OFSP can be extended to value-added products and distributed to urban and rural markets.

Supply and Value-Chain

CARL Group works with around 200 smallholder OFSP farmers throughout Rwanda, a majority of whom are women. The company works specifically with farmers in the Eastern province (in districts of Bugesera, Kayonza and Gatsibo) and the Southern province (districts of Muhanga, Ruhango and Kamonyi). Their farmers receive OFSP vines and extension services from Rwanda Agriculture Board (RAB), CIP and other NGOs. Farmers are becoming more involved in vine distribution and are selling them to other farmers in their communities as an additional source of income. Farmers can sell 1kg of vines for 70-100 RWF ($0.07-$0.11 USD). While farmers can easily access OFSP vines from neighboring farmers, transplanting OFSP has time constraints as it must be done before the vines dry up and die. To address this concern, CIP and RAB have devoted significant amounts of resources towards innovating optimized seeds for OFSP production (Feed the Future, 2018). Seeds are a viable alternative to vines; they address the constraint of time and perishability. Thus far, the two organizations have created disease-resistant varieties and varieties adapted to Rwanda's taste preferences, however, the seeds have not reached the majority of OFSP farmers.

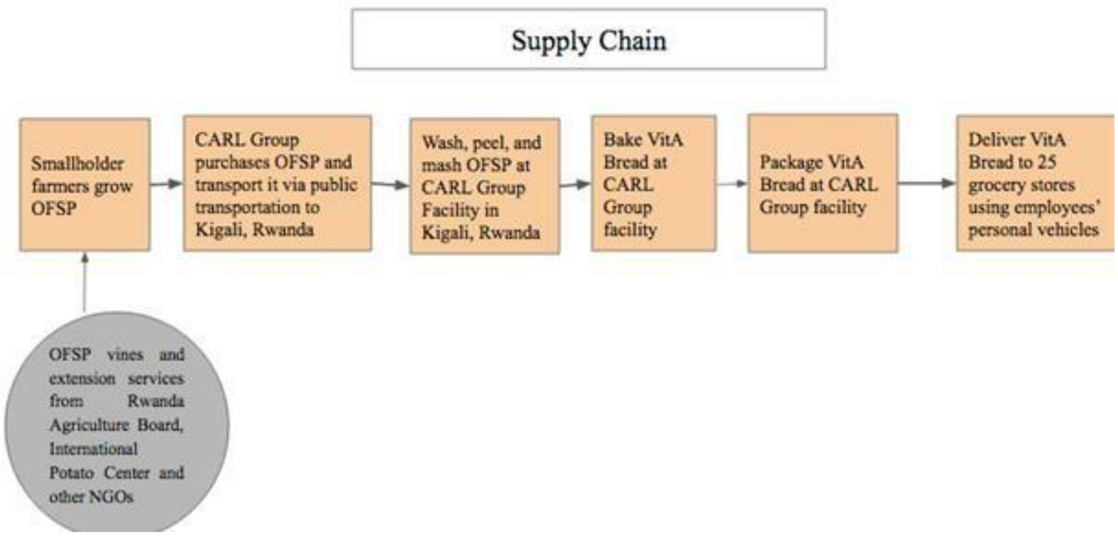


Figure 3: CARL Group's Overall Production Process
Source: SMART 2020 Team

OFSP is a low-labor intensive crop that has high yields; once planted, the vines and tubers beneath the soil grow with little oversight and reach maturity between 3-4 months (Feed the Future, 2018). In recent years, OFSP yields have improved with average yields increasing from 15T/ha to 18T/ha between 2017 and 2018 (CIP, 2018). When compared to other sweet potato varieties, OFSP has a comparative advantage in the short maturity period but has yet to reach the demand of other sweet potato varieties, especially the white-fleshed sweet potato. This has led to a problem of inconsistent market and price fluctuation. To help farmers overcome this issue, CARL Group pays farmers a set rate of 250 RWF per kilogram ($0.27 USD), which is 100 RWF ($0.11 USD) more than the market price. CARL Group pays their farmers directly with cash. To sustain production, CARL

Group says it needs to buy \$5.7 million RWF (\$6,088.98 USD) of OFSP per year from farmers, which is 22,800kg of OFSP needed per year.

Farmers that produce OFSP have limited options of postharvest storage options, which is why CARL Group's efforts in value-addition are essential to reduce postharvest loss. The ability to add value to agricultural products, in particular OFSP, can increase the longevity of goods that otherwise have high perishability rates and thereby reduce waste and increase profitability. To address post-harvest loss, some of CARL Groups' farmers work closely with CIP and have built storage facilities, however, most OFSP farmers face limited postharvest storage options. Postharvest storage innovation has attracted very little attention compared to other components of OFSP production as stakeholders are hesitant to invest in OFSP storage because the current OFSP production rate is not sufficient.

Currently there are no wholesalers specializing in OFSP, nor does there appear to be any general sweet potato wholesalers in Rwanda, indicating the auto-consumption and local trade aspect of OFSP in Rwanda (Feed the Future, 2018). Thus far, CARL Group has not faced supply shortages and they do not have a process to combat this challenge. CARL Group must address this challenge as Rwanda's susceptibility to climate shocks and strong reliance on rainfed agriculture pose a great threat to agriculture productivity and supply of OFSP.

Once harvested, farmers communicate with CARL Group and transport the potatoes on public buses to Kigali's main bus station, Nyabugogo Bus Terminal. CARL Group travels to the bus station and picks up the potatoes and transports them back to their facility located in the district of Kicukiro (in Nyarugunga sector; Kamashashi cell, Akindege village). With no designated Logistic Manager, CARL Group's Financial Manager oversees sourcing OFSP. This has created two challenges. First, the Financial Manager is overworked and cannot devote her entire time to the finances. Second, there is nobody dedicating their full attention to organizing transportation activities, including storage of goods, managing information accrued from point of origin to delivery, and orchestrating transportation movements. CARL Group can improve on coordinating and tracking movement of goods through logistic pathways. Therefore, as CARL Group intends to scale-up its production operations, it needs to hire more staff dedicated to logistics and procurement.

At the CARL Group's office in Kigali, OFSP are washed, peeled, boiled, mixed with other ingredients (flour, margarine, salt, yeast) and mashed into a purée. CARL Group currently has nine machines to process OFSP. The bread is then baked and packaged at the same facility. The packaging is a white paper bag with brown and orange color accents. Paper packaging must be used because Rwanda has eliminated the use of plastic bags and currently, white packaging is the only available option to package bread in Rwanda. The packaging also includes a picture of bread and the OFSP tuber (See Appendix 2) and will soon include the Made in Rwanda and Rwanda Standard Board labels. The bread is individually packaged for retail sale.

After the bread is packaged, CARL Group delivers the bread using employees' personal vehicles to the 25 supermarkets that sell their bread. Consumers then buy the bread and bring it home for consumption.

Products

VitA Bread

VitA Bread is currently the only product CARL Group sells. It comprises 60% OFSP puree, flour, salt, margarine, and yeast. The bread is 500 grams and is a yellow-orange color. The bread's total cost of production is 972 RWF and is sold for 1000 RWF ($1.07 USD), therefore the profit margin is 28 RWF ($0.03 USD). GAIN, one of CARL Group's funders, wants the company to sell the bread for 1500 RWF ($1.61 USD), however, that would make VitA Bread relatively expensive compared to its competitors. Additionally, compared to its competitors, the VitA Bread appears smaller, although it weighs the same. Customers are concerned with the smaller sized bread and its price, believing that they are getting less for their money when actually it is the same price per gram as its competitors.

VitA Biscuits

CARL Group intends to enlarge its production line by adding biscuits made from OFSP. The ingredients include: OFSP, flour, eggs, margarine, sugar, vanilla, and baking powder. The company has yet to produce biscuits because they are waiting on buying a machine to make the biscuits. The machine is very expensive ($26,935 USD), but has the potential to make 60kg of biscuits per hour. CARL Group eventually wants to sell two types of biscuits: small (100 grams) and medium-sized (300 grams). One hundred and 300 gram biscuits are the most preferred by customers according to CARL Group's market research on baked products conducted in Kigali, Rwanda in 2019.

The total cost of production to make a small biscuit is 161 RWF ($0.17 USD) and it is planned to be sold for 200 RWF ($0.21). The medium biscuit will sell at 800 RWF ($0.85 USD) and the total cost of production is 580 RWF ($0.62 USD). In general, the biscuits will have higher profit margins than the bread.

Competition

The competitors, namely Gorillas bakery, Simba, La Galette and Elite Bread, are also located in Kigali and produce wheat or wheat butter bread. They have higher production capacity and focus on adding sweetness to their products. On the other hand, CARL Group holds a vitamin A product value proposition that differentiates it from existing brands of baked products on the market. They have high qualifications in producing OFSP products and remain one of the few bakeries to add value in OFSP. The customers highly appreciate the products for their taste, natural sweetness, and sugar, as well as their softness. This quality is further supported with the CARL Group certification by the Rwandan Standard Board which makes it one of the two bakeries in Rwanda to be Rwandan Standard Board certified. The prices are similar to their competitors and are affordable for their low- and middle-income target consumers. Their value proposition has helped sustain the demand for their baked products in Kigali during their first year of commercialization.

Competitor	**Product**	**Price of Bread**
Gorillas Bakery	Wheat bread	1300 RWF ($ 1.39USD)
Simba	Brown bread	1400 RWF ($ 1.49USD)
Elite bread	Toasted butter bread	1000 RWF($ 1.07USD)
La Galette	Wheat bread	1800 RWF ($1.92USD)

Table 1: CARL Group's Competitors
Source: SMART Team, 2020

CARL Group's products are smaller yet denser than their competitors and this might be in favor of the competitors since most customers value product size. In addition, with an increasing success of their ventures, there are larger companies with greater access to capital who can easily replicate CARL Group's products and become greater competition in the future.

Financial Analysis

A compilation of the financial ratios of CARL Group for 2019 is found in Appendix 12 using the financial statements in Appendix 10 and 11, liquidity ratios. Liquidity ratios measure a firm's ability to convert assets to cash to pay short-term obligations quickly. According to the liquidity ratios calculated in Appendix 12, CARL Group's current and quick ratios are both higher than one. These numbers support that the company has enough assets to pay for its current liabilities. However, this advantage heavily relies on the lack of current liabilities of the company, which has received several grants to run its operations.

Leverage ratios assess a firm's ability to meet its financial obligations by calculating how much capital comes in the form of debt. In the case of CARL Group, their debt to equity ratio is less than ideal since it is much lower than one, which is due to the substantial long-term liabilities. Since a high debt to equity ratio in general suggests higher risk and that the company is financing its growth through debt, CARL Group should be careful when choosing how to finance its daily operations in the future.

In terms of profitability, the calculations indicate that CARL Group has a fair return on assets and return on equity, which means that the company is effectively using and managing its assets to generate profit. Hence, it can obtain the right amount of profit per RWF of sales.

Overall, while the company seems in a good financial position as of its first year of production, they must efficiently manage their assets to be able to meet future obligations and remain profitable. The grants that have allowed to acquire assets and generate revenues will be continuously diminishing and the company needs to solely rely on its sales to generate profit.

Management and Organization

As Managing Director, Regis manages and oversees most of the business process since Larissa, Clarisse, and Ada Elyse are abroad studying for their master's degree. In addition to Regis, the staff includes a Financial Accountant and a Production Officer. The other five employees assist with bread production and distribution. CARL Group currently does not have a Board of Directors to govern and provide direction; current company decisions are made by Regis and his three partners. Additionally, CARL Group lacks a Marketing Manager and a Logistics Coordinator. These positions must be created and fulfilled if CARL Group wants to increase market share and efficiently procure the necessary raw materials to meet the demand. CARL Group has created a plan of the company's future organization that they hope to follow (See Appendix 9). This would include a Marketing Manager, Logistic Coordinator, and designated Production Technician, Packaging Workers, and Assistant Production Technician for each product.

Consumers

The primary consumers of VitA Bread are low- and middle-income urban households living in the Kigali City as well as schools, both who are supplied from supermarkets and grocery stores. Recent economic success, including the creation of jobs, has created a strong Rwandan middle-class with disposable income. As Rwanda's middle-class continues to grow, the population's demands have changed; urban consumers are demanding more processed and faster cooking foods (Ndirigue & Sindi, 2015).

Specifically, the bread is marketed to women in the household because women are more likely to be shopping for the household compared to men. CARL wants their bread to be approachable to all people, but specifically be appealing for families and schools who want to keep their children healthy. This is strategic because the populations most at risk for vitamin-A deficiency are children and pregnant/lactating women.

Since the launch in May 2019, the bread is sold to mainly middle-class women in Kigali where the majority of the bread suppliers are located. However, CARL Group hopes to expand their audience to women throughout the country of all economic statuses. Because the most vulnerable populations to vitamin-A deficiency are in the lower-income, rural areas, it makes sense from a public health standpoint that their product would be most effective in these areas. Given that bread is a staple in Rwandan diets throughout the country and is eaten as part of breakfast, CARL Group's product can easily be integrated into the diet of a typical Rwandan household. However, Regis notes that historically the sweet potato has been perceived as a subsistence crop for low- income people. This has made it challenging to convince consumers to purchase the VitA Bread, but CARL Group continues to market the health benefits of the product to overcome these reservations.

Marketing

CARL Group's current marketing strategy is largely digital based. The employment of social media platforms such as Instagram and Facebook seek to engage the growing Kigali population. There is no one person who is charged with managing these accounts, rather each member of the team has an opportunity to participate in posts and digital outreach. Posts are made at irregular intervals, mostly occurring when a significant figure visits or an event takes place at the bakery. Additionally, these posts often are focused heavily on the members of the team or international and celebrity visitors. Mixed into these “group posts” are curated advertisements for different products which the CARL Group either currently offers or intends to offer in the future. These posts are largely in English, and occasionally in French.

Non-digitized advertisements are limited. However, most customers are more familiar with the product through its packaging and labelling, rather than with the company’s social media accounts. Pamphlets, packets, and other information regarding CARL Group are made available at various press related conferences. There is likewise a video advertisement made by the Ministry of Agriculture available to the company and even shown occasionally on television. This media primarily is centered upon the story of the company and secondly on the specific products which it may provide.

Growth

Within the next five years, CARL Group hopes to scale-up their business both by expanding their product offerings as well as creating an incubator for youth agripreneurs focused on OFSP value-added products. While CARL group currently focuses on OFSP in bread products, their long-term goal is to continue to use OFSP as well as introduce cassava as a partial substitute for wheat flour in other products including biscuits, noodles, and cassava gluten-free bread. Using wheat substitutes allows CARL Group to support local farmers and the economy rather than paying high prices for the imported product. To begin this expansion, CARL Group has proposed that within the next 5 years they will produce different sized bread loaves and biscuits, with the production levels as follows: bread 800gr (20%), bread 500gr (70%) and bread 250gr (10%); Biscuits 100gr (70%) and biscuits 300gr (30%) (Nkulikiyinka & Nzayisenga 2019). A full breakdown of the product objectives can be found in Appendix 7. This expansion will help to reach a larger audience, create job opportunities for the Rwandan youth, and contribute to overall economic development.

The second part of the growth plan is to establish an incubator program for youth agripreneurs interested in OFSP and cassava value-addition. Throughout Kigali, there are incubators with co-working spaces and portals providing innovators access to other entrepreneurs in global meetups over the internet. While Rwanda has many innovation labs and is on its way to becoming a tech hub, much of the technological innovation does not revolve around agriculture. Incubators can accelerate the sustainable growth of Rwandan startups in the agriculture industry (Nkurunziza, 2019). To address this gap, CARL Group would partner with Rwanda Polytechnic and other educational institutions to recruit young agripreneurs as well as the Ministry of Youth and Culture to train facilitators and develop a curriculum for the program. The purpose of this incubator would be to help youth to establish small-medium enterprises focusing on cassava and OFSP composite flour. Further, this project would encourage agro-processing innovation which in turn improves the quality of agricultural products and overall farmer livelihoods.

For CARL Group to expand their operations and offer additional products and services, they need capital. Currently they do not have investors and receive money from Rwanda Survivors Fund and GAIN. There is a potential partnership with either UN FAO or IFAD; however, this private-public partnership may interfere with CARL Group’s business development and may impact profit margins, which could have long-term implications. In general, the goal of processing OFSP has been met with many limitations surrounding the lack of synergy amongst stakeholders. There has yet to be the appropriate research-public-private sector partnership to move OFSP production from small-scale efforts to commercialization (Ndirigue & Sindi, 2015). As a socially conscious business, Regis wants to make a large impact and make a difference in Rwanda; however, he is faced with the challenge of earning enough money to support his growth aspirations.

Possible Sales Channels

Recent improved access to the internet and a booming hospitality industry, present a number of possible sales channels for CARL Group. The opportunity for bulk sales with the possibility of delivery to restaurants and hotels is a notable possibility, as they provide a regular source of business, which would still provide the desired nutritional impact for Kigali populations. There is a further possibility of delivery of CARL Group goods to private residences. As the bakery is well situated in close proximity to a number of Kigali's residential districts and a number of digital food service applications becoming increasingly popular in the city, this option could grow awareness of the company, as well as regularly reaching families who would otherwise have difficulty reaching the bakery, or local grocery stores. These options may additionally lead to the addition of different pastries, and healthy grain-based product alternatives. Moreover, these improvements in technological access will only continue beyond the boundaries of Kigali. As this development continues, the CARL Group's ability to adapt to and establish itself digitally could be telling of its ability to help create a more nourished Rwanda.

Conclusion

CARL Group is a young and motivated business driven to build off their early success and growth to continue to make an impact in Rwanda. They launched their first product in May 2019 called VitA Bread, a nutritious bread that is high in vitamin-A. After its first year in production, CARL

Group is in a good financial position; however, CARL Group wants to expand their business to include different products high in vitamin-A and provide services for youth entrepreneurs. Moving forward, CARL Group has many decisions to make regarding the future of the company. While there are international agencies who are interested in providing funds to CARL Group, taking such funding may interfere with organic business growth and development as they will have to expand based on the donor's priorities rather than their own. Driven by his passion for helping his fellow Rwandans, Regis is faced with a difficult choice with the direction of his business. Will CARL Group be profit-driven or mission-driven? As CARL Group continues to grow, they are faced with the challenge of choosing a vital business strategy to develop their business while simultaneously having a positive impact on nutritional outcomes, youth entrepreneurship, and the economic growth of farmers in Rwanda.

CHAPTER 5: CONCLUSION

This study examined the scope of opportunities for youth entrepreneurship in Rwanda and abroad and analyzed the needs and challenges of youth entrepreneurship as viewed from the lens of a private company, CARL Group. The literature highlighted the gaps in Rwanda's youth-centered entrepreneurial economic development strategy, namely finance, and analyzed Singapore's approach to youth entrepreneurship to identify possible solutions to the identified gaps. The CARL Group case study also featured the many struggles youth-led enterprises face when trying to grow and expand their operations. The problem for CARL Group is achieving strategic growth in a country where there are few financial resources. As CARL Group continues to grow, they are faced with the challenge of deciding on a strategy to develop their business while simultaneously having a positive impact on nutritional outcomes, youth entrepreneurship, and the economic growth of farmers in Rwanda. Before CARL Group can attract investors and increase their capital, they must evaluate their current growth strategy and decide the direction of the company: are they mission-driven or profit-driven? Understanding what is driving CARL Group can determine the future of the company.

Many of CARL Group's challenges could have been averted had there been more resources available for youth-led enterprises at the time of their registration. Access to an incubator would have provided CARL Group the resources to formulate a strong business plan with clear strategic goals and objectives. While Rwanda has many incubators, much of the technological innovation resolves solely around ICT. A cohesive growth strategy and knowledge on finance would have allowed CARL Group to identify and target the appropriate investors for their business.

5.1 Recommendations

The recommendations listed below are derived from the conducted literature review and the CARL Group case study. Based on evaluations and analysis, the following are recommendations for policies and public investments that are needed to facilitate an entrepreneurial-led economic development strategy in Rwanda. The recommendations align with Vision 2050 and NST1.

This capstone recommends improving access to incubators for youth entrepreneurs. Incubators are currently located in the capital; however, these incubators serve a small proportion of entrepreneurs in Rwanda. Most youth do not have access to incubators and thereby disregard opportunities to receive mentorship and develop a sound business. Incubators can also help young entrepreneurs navigate financing their start-up and develop a plan to manage their finances. Additionally, establishing incubators in rural areas outside of Kigali can generate economic growth throughout the country. Expanding youth entrepreneurship resources to rural areas can give youth increased access to business development knowledge and develop a strong business network, ultimately creating wide-spread economic growth.

The second recommendation is increasing R&D investment. As seen in Singapore, increasing government investment towards R&D has promising outcomes; increased R&D investment results in high returns. R&D allows entrepreneurs to produce innovative products and services that set themselves apart from the competition. R&D also employs the local knowledge pool, thereby creating solutions that are locally driven. Increased investment towards robust R&D will help guide companies to create a prosperous growth and marketing strategy and ensure long-term relevance of investment.

The third recommendation is creating multiple investment channels. The CARL Group case study demonstrated the limited investment channels currently available to youth entrepreneurs in Rwanda. Rwanda can follow Singapore's success and increase the number of investment channels. Potential investment channels include crowdfunding, grants, co-investments, tax incentives and loan programs. Channels that are new to Rwanda include crowdfunding and tax incentives. Multiple investment channels provide various options for all involved and can improve the ease of doing business in Rwanda. This in turn can attract more investors.

5.2 Conclusion

Rwanda has an increasingly growing youth population that is outpacing employment opportunities. To address the large youth population and provide economic opportunities, the Government of Rwanda is transforming Rwanda's economy from subsistence agriculture to a knowledge-based economy. Through Vision 2050, Rwanda aims to increase productivity and competitiveness while providing jobs for Rwandans. While Rwanda possess many of the structural features for a strong youth-centered entrepreneurial economic development strategy, there is a need for more interventions to limit the negative impacts of youth unemployment and underemployment on the Rwandan economy. Youth-led enterprises, such as CARL Group face the challenge of achieving strategic growth in a country where there are few financial resources. An improved entrepreneurial-led economic development strategy in Rwanda needs to include increasing access to incubators, increasing R&D investment, and creating multiple investment channels. Overall, these recommendations can strengthen the impact of youth entrepreneurship on the Rwandan economy. Going forward, Rwanda must continue to strengthen its youth-centered entrepreneurial economic development strategy for it to have a profound effect on economic and social development.

Appendices

Appendix 1: SMART 2019-2020 Template for Data Collection

SMART 2019-2020 Template for Data Collection

Adapted from the FAO SMAE Case Studies

You're about to embark on a journey of telling your company's story. The purpose of this tool is to guide and facilitate this process. Please fill in the following questions to the best of your ability. Feel free to cut and paste in from previous work on the case, use bullet points etc, as long as it is coherent. This is just to capture the crucial information from the case. It doesn't have to be great writing! Before editing this template for your purpose, please review the Appendix 1 to set a context to your data collection process. Also, for understanding the structure, please review Appendix 3.

Basic info	
Name of Company	
Name of Owner	
Location	
Year of Start Up	
Start-up Capital	Categorical
Current Value of Assets*	Categorical
Level of sales	Categorical
% yearly Growth of gross sales?	
Initial number of permanent employees	
Current number of permanent employees	
Current number of seasonal/temporary employees?	

Describe your main activities and what your business is about:

What is the problem or need that you're solving/attending to with your product(s) or service(s)?

Describe main markets - (you can break them down by product(s) or service(s)

1. History or story of the company. *(Please see Appendix 2)*

Give the narrative of your company from past until present, highlighting the characters and elements to build a more appealing case.

- Description of owners and major investors
- How has growth been financed?

- Major clients that have come into the fold?
- What is the legal status of the company and has this changed? (register/ permissions)

2. Human Resources and Management Structure

- What is the management structure of the company? Include organogram—if relevant.
- How do you recruit new staff?
- Do you have a register of employees?
- What are your challenges in recruiting and training people?
- What training do you offer?
- Please briefly describe the workplace/the values?
- How much of your total costs go towards wages?
- How you control work productivity?
- How you train people who have direct contact with clients?
- Do you have job descriptions (i.e. responsibilities, skills, requirements)?
- Do you have a strategy/policy to incorporate people with disabilities or people from minority groups? If so, please explain how.

3. Procurement/ Inbound Logistics (transport; storage; goods delivery, etc.)

- What are your key supply sources?
- Is the source material/product seasonal? How is this dealt with?
- How is it supplied? Percentage sourced from smallholders or small size companies?
- How is price negotiated?
- Are there provisions for Side selling in contractual arrangements? How often side selling is occurring? Is so, why?
- Are there constraints to the volume of supply? How is this dealt with?
- How is quality assured?
- Do you ask for standards/certifications to assure quality inputs?
- How is it transported to the facility?
- What are the costs associated with doing this?
- Are reverse logistics systems in place for the collection of raw materials, ingredients, packaging & labelling materials, return of containers/pallets? If so, what is the process?
- Are there inputs that you must import (directly or indirectly)? If so, which one(s)?

4. Operations and Financial Management

- What is your main equipment (e.g. machinery, software, etc.) for?

- Storage capacity/ facilities?
- What is your record keeping system like? Are there ever audits?
- What are the major costs associated with your operation?
- Are the company's processing facilities operating at full capacity?
- Does the company have business insurance (perils, theft, accident, key man, etc.)?
- Does the company belong to any association?
- Does the company receive support from other organizations or government institutions?
  (e.g. small enterprise development organizations, export promotion)
- Do the company have branches or facilities in other locations?
- What kind of operation strategy do the company has? (Pull or Push)?
- Is the company a multinational branch? Mention the name of the holding.
- Do founders own other companies in the same industry? (Vertical and/or horizontal integration?)

PRODUCTS	**VOLUME PRODUCED**	**% TOTAL SALES**	**PROFIT MARGINS**

5. Outbound Logistics

- What are the arrangements around shipping, transport and distribution of the goods produced?
- Is local/regional infrastructure an issue?
- What are the various product's shelf lives?
- How are decisions made about distribution?
- How are products stored after processing?
- What methods are used for shipping?
- What are the key drivers in selecting the shipping methods mentioned above?
- Do you outsource some of the outbound logistics activities?
- What is the level of the use of new technologies (IT) in the outbound logistics e.g. in warehousing, inventories etc.
- What are the environmental issues which affect/influence your outbound logistics?

6. Marketing and Sales (See Appendix 5)

- What is the business model to deliver your products/services: B2B, B2C, B2B2C?
- Who are the top buyers? How were those deals made?
- What is the company value promise? (Time, Cost, Quality, more for less, etc.)
- What is the company's sales strategy?
- What are the major sources of competition, how do they compete on price and quality?
- Is there fluctuating demand? How is it managed?
- What are the months with highest sales? Why?
- How are prices negotiated?
- Do liquidity issues effect sales (i.e. inability to offer credit)? What is the average number of days for payment? (in case the biggest client is a retail company?
- Looking to the future, what is the company's growth strategy?
- What kind of payment method do you have available for your customers: online, cash, credit/debit card, e-wallet, etc.
- Does the company have a webpage? How frequently is it updated?
- What are your main channels?
- What channels have you used to promote your products: Google ads, newspapers, social media?
- Does the company have social media pages? Which: Facebook, Twitter, Instagram, others.
- Does the company have consumer rewards or referral programs?
- Have the company implemented co-branding strategies?
- What kind of promotional material use the company? (fliers, brochures, etc.) • Have the company defined a logo or slogan? Is it register as a trademark?
- Have the company set partnerships with other business? (Hotels, restaurants, sports companies, etc.)
- Have the company exported? What percentage of its total sales?
- Does the company have the permission/authorization to export its products?

7. Use of financial services for daily operations and investments:

- What type of financial services are demanded by the firm (e.g. working capital credit, long-term credit, factoring, leasing, savings accounts, payment/transfer services, insurance)?
- For each type of financial service demanded by your firm, please specify if you have no access, partial access or enough access to the service.
- Does your firm provide any implicit or explicit financial services to any customer or commercial partner (e.g. accept deferred payments, provide inputs on credit, give direct loans)? If so, specify what type of financial service is provided.

8. Quality and Safety Aspects

- Do you have regular contact with relevant food safety authorities, if yes what form does it take? Inspection of your premises, sampling of food or water, advice on improving food safety and quality, etc.
- Is your food business registered with the relevant food safety authority/Ministry? Is your food business accredited/certified according to:
    - Voluntary standard(s) (e.g. HACCP/Ecological)?
    - Mandatory standard(s) (e.g. Tanzania Bureau of Standards Mark)?

- If you are not certified with a food safety standard, are you:
    - Applying good hygiene practices, good manufacturing practices as a key part of your business operations? If so, how?
    - In the process of developing a risk-based food safety management system, e.g. HACCP?
- Do you have food safety expertise within your company, or do you access it as required? If latter, from where? Paid consultant, government authority, industry association, NGOs, or other?
- Do you demand adherence to defined quality/safety requirements from your suppliers?
- Have you rejected supplies due to quality/safety issues?
- Have any of your products been rejected for quality/safety reasons?
- Can you trace your produce back to suppliers as well as forward to buyers?
- Have you ever had to destroy produce for safety/quality reasons?
- Can you list the main food safety hazards that are of relevance to your product(s)? [e.g. pesticide residues in fruit and vegetables, mycotoxin in feeds, etc.]
- Can you list the main quality issues that are of relevance to your product(s)?
- Do you perform any kind of in-process controls during processing (e.g. pH measurement, temperature checks, water quality)? If not, why?
- Do you keep records of any of these in-process controls, or of your suppliers, or sales? If not, why?

9. Anything else you would like to tell us about your company that we didn't ask?

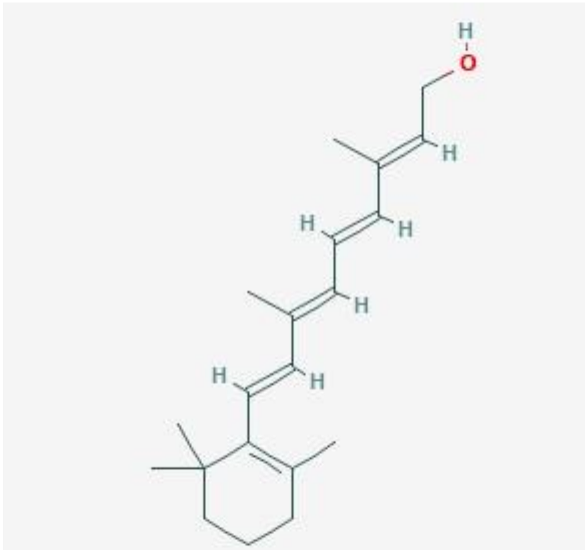
Appendix 2: CARL Group VitA Bread

Source: SMART Team, 2020

Source: SMART Team, 2020

Source:Nkulikiyinka & Nzayisenga, 2019

Appendix 3: Vitamin-A

	**Functions:** immune function, vision, reproduction, and cellular communication
	Food Sources: dairy products, liver, fish, fortified cereals, carrots, broccoli, cantaloupe, and squash
	Recommended Daily Intakes: vary depending on age, gender, and if a women is pregnant/lactating
	Deficiency: increases the risk of diarrhea, cause, increases the severity and mortality risk of infections, causes xerophthalmia (early sign of this is night blindness)

Source: National Institutes of Health, 2020 and
National Library of Medicine, n.d.(photo)

Appendix 4: Nutrition Label for CARL Group VitA Bread

Nutrition Facts

11 servings per container

Serving size **2 slices (46g)**

	Per serving		Per container	
Calories	**120**		**1320**	
		% DV*		% DV*
Total Fat	1g	**1%**	11g	**14%**
Saturated Fat	0g	**0%**	0g	**0%**
Trans Fat	0g		0g	
Cholesterol	0mg	**0%**	0mg	**0%**
Sodium	180mg	**8%**	1980mg	**86%**
Total Carbs.	23g	**8%**	253g	**92%**
Dietary Fiber	1g	**4%**	11g	**39%**
Total Sugars	0g		0g	
Incl. Added Sugars	0g	**0%**	0g	**0%**
Protein	3g	**6%**	33g	**66%**
Vitamin D	0mcg	0%	0mcg	0%
Calcium	3.9mg	0%	42.9mg	4%
Iron	1.08mg	6%	11.88mg	70%
Potassium	47mg	0%	517mg	10%
Vitamin A		15%		140%
Vitamin C		2%		20%
Vitamin E		0%		10%
Thiamin		0%		10%
Riboflavin		10%		130%
Niacin		10%		110%
Vitamin B6		2%		20%
Folate		2%		20%
Phosphorus		2%		20%
Magnesium		0%		10%
Zinc		0%		10%
Selenium		0%		2%
Copper		2%		20%
Manganese		2%		25%

*The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

Source: SMART Team, 2020

Appendix 5: CARL Group's Costs of Inputs and Packaging

Inputs

Ingredients	Year 1	Year 2	Year 3	Year 4	Year 5
Ingredients for bread (Rwf)	**21,120,111**	**26,400,138**	**30,360,159**	**34,914,183**	**40,151,310**
Cost ingredients bread 800gr (20%)	6,336,033	7,920,041	9,108,048	10,474,255	12,045,393
Cost ingredients bread 500gr (70%)	13,728,072	17,160,090	19,734,103	22,694,219	26,098,352
Cost ingredients bread 250gr (10%)	1,056,006	1,320,007	1,518,008	1,745,709	2,007,566
Ingredients for biscuits (Rwf)	**6,162,136**	**7,702,670**	**8,858,070**	**10,186,781**	**11,714,798**
Cost ingredients biscuit 100gr(70%)	2,711,340	3,389,175	3,897,551	4,482,183	5,154,511
Cost ingredients biscuit 300gr(30%)	3,450,796	4,313,495	4,960,519	5,704,597	6,560,287
Total cost for ingredients Bread &Biscuits (Rwf)	**27,282,246**	**34,102,808**	**39,218,229**	**45,100,963**	**51,866,108**

Packaging

Designation	Year 1	Year 2	Year 3	Year 4	Year 5
1.Bread					
1.1 Production bread 800gr (packets)	15,120	25,200	28,980	33,327	38,326
Qty packaging needs(nbr)	15,120	25,200	28,980	33,327	38,326
Packaging unit cost (Rwf)	80	80	80	80	80
Total cost packaging bread 800gr (Rwf)	1,209,600	2,016,000	2,318,400	2,666,160	3,066,084
1.2Production bread 500gr (packets)	52,920	88,200	101,430	116,645	134,141
Qty packaging needs(nbr)	52,920	88,200	101,430	116,645	134,141
Packaging unit cost (Rwf)	65	65	65	65	65
Total cost packaging bread 500gr (Rwf)	3,439,800	5,733,000	6,592,950	7,581,893	8,719,176
1.3Production bread 250gr (packets)	7,560	12,600	14,490	16,664	19,163
Qty packaging needs(nbr)	7,560	12,600	14,490	16,664	19,163
Packaging unit cost (Rwf)	50	50	50	50	50
Total cost packaging bread 250gr (Rwf)	378,000	630,000	724,500	833,175	958,151
Total cost packaging Bread (Rwf)	**5,027,400**	**8,379,000**	**9,635,850**	**11,081,228**	**12,743,412**
2.Biscuits			-		
2.1 Production biscuits 100gr(packets)	21,168	22,226	23,338	24,505	28,180
Qty packaging needs(nbr)	21,168	22,226	23,338	24,505	28,180
Packaging unit cost (Rwf)	8	8	8	8	8
Total cost packaging biscuit 100gr (Rwf)	**169,344**	**177,811**	**186,702**	**196,037**	**225,442**
2.2 Production biscuits 300gr (packets)	9,072	9,526	10,002	10,502	12,077
Qty packaging needs(nbr)	9,072	9,526	10,002	10,502	12,077
Packaging unit cost (Rwf)	120	120	120	120	120
Total cost packaging biscuits 300gr (Rwf)	**1,088,640**	**1,143,072**	**1,200,226**	**1,260,237**	**1,449,272**
Total cost packaging Biscuits (Rwf)	**1,257,984**	**1,320,883**	**1,386,927**	**1,456,274**	**1,674,715**
Total cost packaging Bread &Biscuits (Rwf)	**6,285,384**	**9,699,883**	**11,022,777**	**12,537,501**	**14,418,126**

Source: Nkulikiyinka & Nzayisenga, 2019

Appendix 6: CARL Group Pricing Strategy

Product	Average retail price on market (Rwf)*	Total cost of production for CARL products (Rwf)**	Proposed selling prices in Rwf (at company gate)
1.Bread			
Bread 800gr	1500	972	1000
Bread 500gr	1000	622	800
Bread 250gr	800	329	500
2.Biscuits			
Biscuits 100gr	200	161	200
Biscuits 300gr	1000	580	800

Source: Nkulikiyinka & Nzayisenga, 2019

Appendix 7: CARL Group Production Objectives for Year 1 (2019) -Year 2 (2024)

Product	Year 1	Year 2	Year 3	Year 4	Year 5
1.Bread					
Production per day (packets)	300	500	575	661	760
Production per month (packets)	6,300	10,500	12,075	13,886	15,969
Production per year (packets)	**75,600**	**126,000**	**144,900**	**166,635**	**191,630**
Production Bread 800gr (20%)	15,120	25,200	28,980	33,327	38,326
Production Bread 500 gr (70%)	52,920	88,200	101,430	116,645	134,141
Production Bread 250 gr (10%)	7,560	12,600	14,490	16,664	19,163
Production Bread per year (gr)					
Bread 800gr (in gr)	12,096,000	15,120,000	17,388,000	19,996,200	22,995,630
Bread 500gr (in gr)	26,460,000	33,075,000	38,036,250	43,741,688	50,302,941
Bread 250gr (in gr)	1,890,000	2,362,500	2,716,875	3,124,406	3,593,067
Total production bread (in gr)	**40,446,000**	**50,557,500**	**58,141,125**	**66,862,294**	**76,891,638**
2.Biscuits					
Production per day (packets)	120	150	173	198	228.13125
Production per month (packets)	2,520	3,150	3,623	4,166	4,791
Production per year (packets)	**30,240**	**31,752**	**33,340**	**35,007**	**40,258**
Production Biscuits 100gr (70%)	21,168	**22,226**	**23,338**	**24,505**	28,180
Production biscuits 300gr (30%)	9,072	9,526	10,002	10,502	12,077
Production per year (grams)					
Biscuits 100gr (in grams)	2,116,800	2,646,000	3,042,900	3,499,335	4,024,235
Biscuits 300gr (in grams)	2,721,600	3,402,000	3,912,300	4,499,145	5,174,017
Total production biscuits (in gr)	**4,838,400**	**6,048,000**	**6,955,200**	**7,998,480**	**9,198,252**
Total production bread & biscuits (packets)	**105,840**	**157,752**	**178,240**	**201,642**	**231,888**
Total production bread &biscuits (gr)	**45,284,400**	**56,605,500**	**65,096,325**	**74,860,774**	**86,089,890**

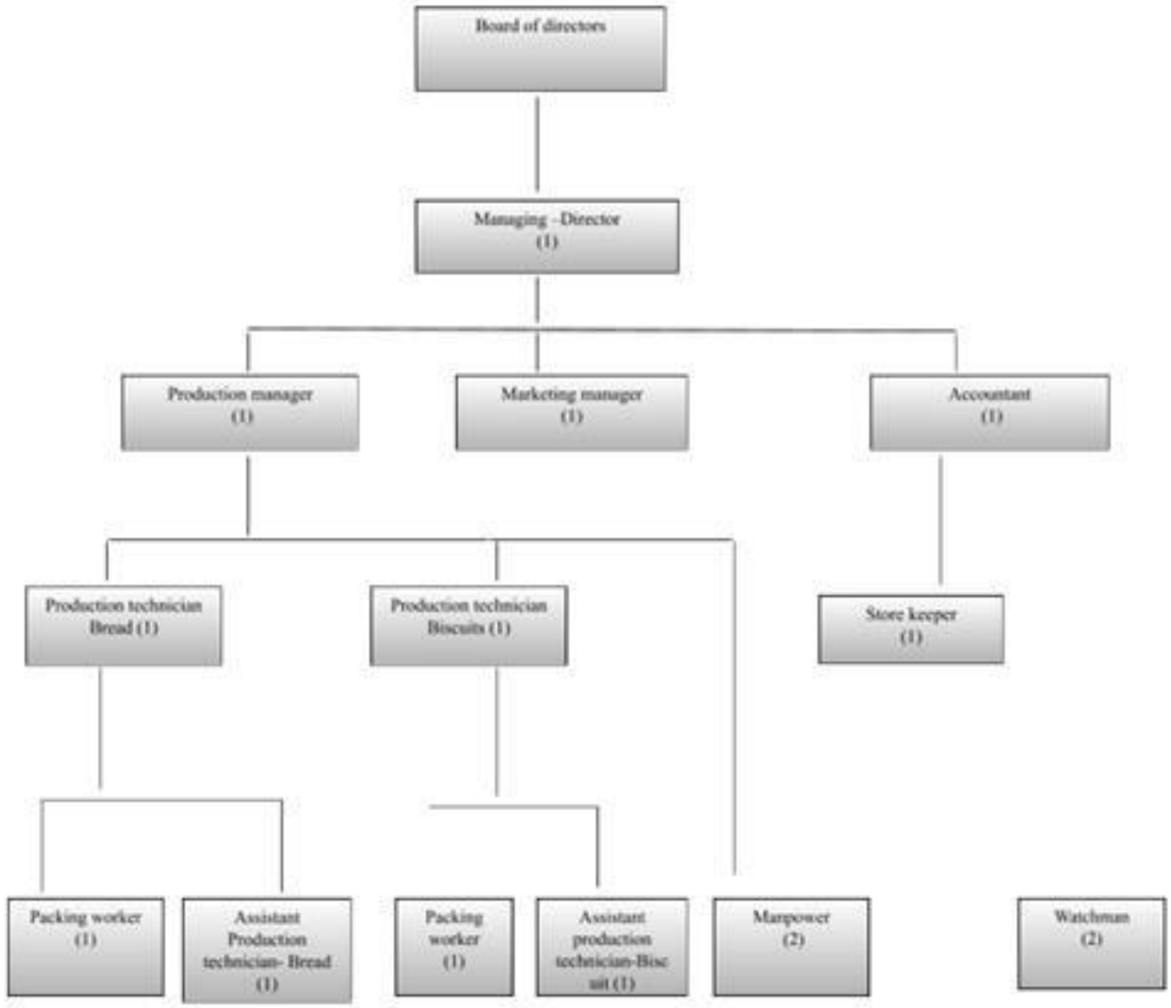
Source: Nkulikiyinka & Nzayisenga, 2019

Appendix 8: CARL Group Profit and Loss Statements (RWF) (Projections)

Designation	Year 1	Year 2	Year 3	Year 4	Year 5
1.Total Sales	**72,727,200**	**114,125,760**	**130,038,048**	**148,276,850**	**170,518,378**
2.Operating costs					
Inputs for bread and biscuits	27,282,246	34,102,808	39,218,229	45,100,963	51,866,108
Water and electricity	720,000	900,000	1,035,000	1,190,250	1,368,788
Packaging	6,285,384	9,699,883	11,022,777	12,537,501	14,418,126
Transport cost	1,200,000	1,200,000	1,200,000	1,200,000	1,200,000
Repairs and maintenance of durable assets	589,252	589,252	589,252	589,252	589,252
Rent	2,400,000	2,400,000	2,400,000	2,400,000	2,400,000
Communication	480,000	480,000	480,000	480,000	480,000
Publicity	1,500,000	1,500,000	1,000,000	1,000,000	1,000,000
Distribution cost	7,272,720	11,412,576	13,003,805	14,827,685	17,051,838
Office and hygiene consumables	360,000	360,000	360,000	360,000	360,000
Added value	**24,637,597**	**51,481,241**	**59,728,985**	**68,591,198**	**79,784,266**
Insurance	278,440	278,440	278,440	278,440	278,440
Staff cost	12,600,000	13,104,000	16,628,160	17,293,286	17,985,018
Taxes	220,000	220,000	220,000	220,000	220,000
Interest charges	0	0	0	0	0
Depreciation	4,090,526	5,476,586	5,476,586	5,476,586	5,476,586
Gross profit	**7,448,631**	**32,402,215**	**37,125,799**	**45,322,886**	**55,824,222**
Corporate tax (30%)	670,377	9,720,664	11,137,740	13,596,866	16,747,267
Net profit	**6,778,255**	**22,681,550**	**25,988,059**	**31,726,020**	**39,076,956**
Net cash flow	**10,868,781**	**28,158,136**	**31,464,645**	**37,202,606**	**44,553,542**
Cumulative net cash flow	10,868,781	39,026,917	70,491,562	107,694,168	152,247,710

Source: Nkulikiyinka & Nzayisenga, 2019

Appendix 9: CARL Group's Proposed Management and Organization Structure



Source: Nkulikiyinka & Nzayisenga, 2019

Appendix 10: CARL Group Balance Sheet at December 31, 2019

CARL Group Balance Sheet December 31, 2019	
ASSET	
Current assets:	
Cash	9,880,346RWF (10,295.32 USD)
Accounts receivable	700,000RWF (729.4 USD)
Inventories	5,600,000RWF (5,835.2 USD)
Total Current Assets:	**16,180,346RWF (16,859.92 USD)**
LIABILITIES AND SHAREHOLDERS' EQUITY	
LIABILITIES	
Current liabilities:	
Sales tax payable	3,737RWF (3.89 USD)
Long term liabilities:	
Deferred grants	3,000,000RWF (3,126 USD)
Long term loans	1,000,000RWF (1042 USD)
Total Liabilities	**4,003,737 RWF (7,171.89 USD**
SHAREHOLDERS' EQUITY	
Owners' equity	10,203,737RWF (10,632.29 USD)
BDF-preference shares	6,000,000RWF (6,252 USD)
Retained earnings	89,109RWF (92.85USD)
Total Shareholders' equity	**12,289,109WF (12805.25 USD)**
TOTAL LIABILITIES AND SHAREHOLDERS EQUITY	**16,292,846RWF (12,809.15 USD)**

Source: CARL Group, 2019

Appendix 11: CARL Group Income Statement for the year ended December 31, 2019

CARL Group Income Statement For the year ended December 31, 2019	
Sales Revenues	314,109RWF (327.3 USD)
Expenses:	170,000RWF (177.14 USD)
Payroll	140,000RWF (145.88 USD)
Administrative expenses	30,000RWF (31.26USD)
Net operating income	144,109RWF (150.16 USD)
Depreciation expense	25,000RWF (26.05 USD)
Bad debts expense	30,000RWF (31.26 USD)
Net income	**89,109RWF (92.85 USD)**

Source: CARL Group, 2019

Appendix 12: Financial Ratios of CARL Group for the year ended December 31, 2019

	CARL Group	Ideal value (US standard)
Liquidity ratios:		
Current ratio	4329.77RWF (4.51 USD)	>1
Quick ratio	2831.24RWF (2.95 USD)	>1
Solvency ratios:		
Debt to equity ratio	0.33	Close to 1
Profitability ratios:		
Return on assets	0.54%	High
Return on equity	0.73%	High

Source: CARL Group, 2019

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