



Covid-19 impact on Curacao food security

Graduation project

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COVID-19 IMPACT ON CURACAO FOOD SECURITY

Covid-19 pandemic impact on Curacao's food security

Submitted to the Faculty of Social Sciences and Economics of the University of Curacao Dr. Moises da Costa Gomez in partial fulfillment of the requirements for the degree of Bachelor of Applied Science in International Business and Management Studies.

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Executive Summary

In collaboration with the University of Aruba, the University of Curaçao, and the University of St. Martin, this thesis contributes to the 'ZonMw Project COVID-19' a joint research initiative. The focus of this research is to investigate the impact of COVID-19 on the sustainability of food systems, specifically examining the availability and accessibility of food. Additionally, the study explores the responses of various stakeholders within the food system to the challenges posed by the COVID-19 pandemic. The COVID-19 pandemic brought unprecedented challenges to Curacao's food security and revealed vulnerabilities within its food system. This thesis investigates the multifaceted impact of the pandemic on various aspects of food security. Through qualitative research involving interviews with supermarkets and minimarkets, this study explores how the availability of food products, the socio-economic well-being of local consumers, critical factors for stimulating agriculture, and the stability of food security were influenced by the pandemic.

The pandemic disrupted the availability of food products in local supermarkets and minimarkets. Delays in shipping, disruptions in the global supply chain, and geopolitical events led to product shortages and increased prices. Panic buying and increased demand for sanitary products further contributed to price hikes and scarcity. Although some product availability and stability improved post-pandemic, challenges remain due to high freight costs and inconsistent supply.

The socio-economic impact of COVID-19 on local consumers was profound. Lockdown restrictions affected purchasing behaviors and overall stress levels. Consumers exhibited varied buying patterns, with initial panic buying followed by a shift towards cautious spending. Government support through subsidy cards influenced consumer purchasing power. Certain supermarkets observed changes in clientele, with higher-income individuals shopping more frequently due to embarrassment in using subsidy cards elsewhere.

The study identifies critical factors that can stimulate agriculture in Curacao. Efforts to promote healthier food choices were noted, though consumer preferences for certain products posed challenges. Local farmers play a pivotal role, and supermarkets are engaging with them, but opportunities for improvement in terms of variety and supply consistency were identified. The

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government's role in supporting farmers and enhancing conditions for local agriculture emerged as crucial components for stimulating production.

The stability of food security post-pandemic remains a concern. While some improvements in product availability and stability were observed, the situation has not fully normalized. Factors such as high freight costs and inconsistent supply continue to impact food security. Building a more secure food system in Curacao requires collaboration between stakeholders, including government, supermarkets, and farmers. Strategies to enhance local production, supply chain resilience, and consumer awareness of healthy diets are essential for ensuring a robust and stable food security framework.

In conclusion, this thesis underscores the intricate connections between the pandemic, food availability, consumer behaviors, agriculture stimulation, and long-term food security in Curacao. It highlights the need for proactive measures to mitigate vulnerabilities, enhance local food production, and promote sustainable practices. By addressing these challenges collectively, Curacao can fortify its food security against future disruptions and create a more resilient and sustainable food system.

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Chapter 1: Introduction

The world is already facing food and nutrition security challenges. The United Nations Food and Agriculture Organization (FAO) estimated that more than 820 million people worldwide are hungry. Due to inadequate dietary intake and nutrition, almost 144 million children worldwide suffer from stunting (WHO, 2020). A big contributor to the increased number of people affected by hunger is the Covid-19 pandemic. Hunger (undernourishment) affected 46 million more people in the year 2021 in comparison with 2020 and since 2019 before the Covid-19 pandemic a total of 150 million people became undernourished (Fao, 2022). The objective of this research is to review and analyze how Covid-19 pandemic affected Food Security of Curacao Island located in the Caribbean Sea.

Background

Food Security

The Food and Agriculture Organization (FAO, 2021) of the United Nations implies that food security consist of four pillars these are Food availability, Food access, Stability of supplies and

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Biological utilization. When it comes to food availability something important is that food is provided through domestic production and imports. This suggests the importance of physical availability of food at farms and local markets. A well-functioning market infrastructure with adequate road and rail networks, adequate storage and processing technology is also an essential part of the food availability. (Gibson, 2012). Food access is about ensuring that people have adequate physical and economic access to food through growing, purchasing, bartering or trading. This concept also entails that an individual is allowed to acquire and maintain appropriate foods for an adequate diet and nutritional level. This might be directly obtained as previously mentioned through growing, trading etc or indirectly via social arrangements at community or national levels such as through family, welfare systems and access to emergency food aid. (Gibson, 2012). Food stability is about the realization that food security can be lost and here lies the notion that risk management is gaining credibility and has become a tool in the fight against hunger. Issues of stability and vulnerability can be in relation with food supplies themselves concentrating on shocks, sudden or otherwise such as droughts, floods and pests etc. When it comes to Biological utilization the focus lies on the ability of a person to optimally and effectively absorb the food they eat. Research has shown that this ability is related to a person's health. Optimum biological utilization correlates with the need of proper health and child care, but also clean water, sanitation services and adequate knowledge of nutritional and physiological needs. (Gibson, 2012). In 2020 according to the report published by the High Level Panel of Experts on Food Security and Nutrition (HLPE) the concept of food security has evolved and it introduced two new pillars and these are Agency and Sustainability. The term agency refers to the capacity of individuals or groups to make their own decisions about what food they eat, how that food is produced and distributed within food systems. Sustainability refers to the long-term ability of food systems to provide food security and nutrition in a way that does not compromise economic, social and environmental bases that generate future generations' access to food. (HLPE, 2020).

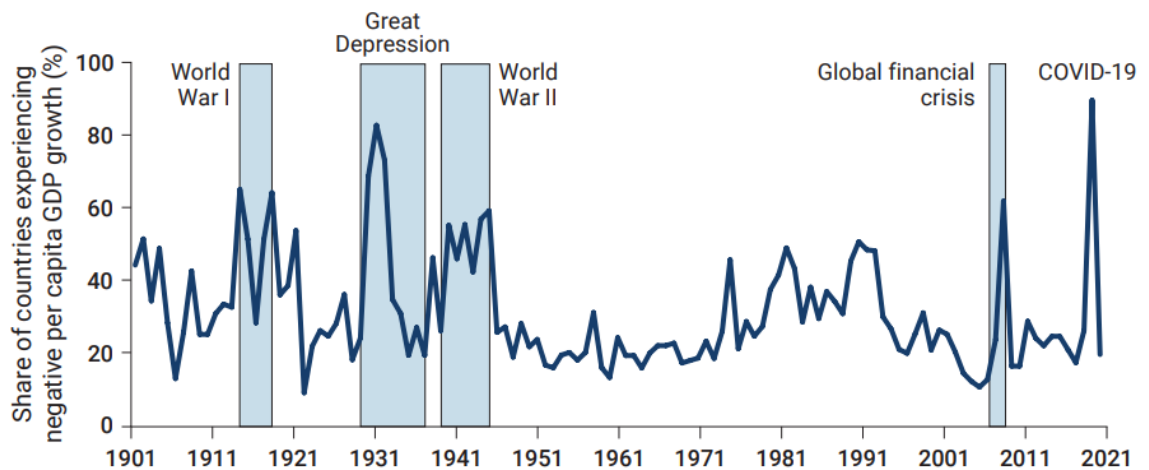
Problem statement

According to the (World Bank, 2022) governments around the world implemented a wide range of crisis response strategies in 2020 to lessen the worst social and economic effects of the pandemic as communities all over the world struggled to control the spread of COVID-19

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pandemic and manage the health and human costs of the pandemic. The pandemic-related restrictions, lockdowns, and other public health measures quickly led to the biggest worldwide economic crisis in more than a century. A decrease in demand as a result of the pandemic's impact on consumer behavior added to this. About 90% of countries experienced a fall in economic activity in 2020, more than during the two world wars, the Great Depression and the Global financial crisis of 2007-2009 as show below in the graph.

Figure 0.1 Economic impact of COVID-19 in historical perspective



Covid-19 has affected the world globally as previously stated but on a local scale how did Covid-19 impacted the food **availability, accessibility, stability, sustainability, utilization and agency** of **Curacao** seeing that the island imports the majority of its products. According to Central Bureau of Statistics (2022) Curacao imported a total of 1795 million guilders of goods while exporting only 147 million guilders in the year 2020.

Research purpose

Curacao Gross Domestic Product composition consists of 0.7% (agricultural) 15.5% (industry) 83.8% (services). The purpose of this research is to understand how Covid-19 has

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impacted food security in Curacao and what factors can potentially stimulate locals to start producing their own fruits/vegetables, seeing that refined food is high and local food production low and virtually everything has to be imported the emphasis is then on processed food, preserved in sugar, salt, vinegar and dried in order to increase its ‘consumption window’

Research objectives

The objective of this study is to examine the impact that Covid-19 has on the food security of Curacao by assessing the six pillars of food security and. The research will also analyze how the consumers feel about the local food industry. Furthermore the results of this study will make it possible to give recommendation and create awareness of the importance for a healthy diet/lifestyle.

Research question and sub-questions

Research question

What is the impact of Covid-19 for Curacao’s food security?

Sub-question 1: food availability & stability;

How was the availability of foods products in local supermarkets/minimarkets affected by Covid-19 pandemic?

Sub-question 2: food accessibility;

How was the socio-economic impact of Covid-19 for the local consumers?

Sub-question 3: food utilization & agency

What are critical factors that can stimulate agriculture in Curacao?

Sub-question 4: food sustainability

How stable is food security post Covid-19 pandemic in Curacao?

Hypothesis

Hypothesis is whether stimulating the local sector producing vegetables, fruit, meat and fish can increase the sustainability, transparency and control of the food supply chain and nutritional value of its products, and thus positively influence the health of the entire population. Increasing the local agricultura.

Assumptions

To obtain information on the food security of Curacao, semi-structured interviews will take place with different key players in the food industry including; supermarkets executives and managers, importers and consumers. Furthermore it is expected that participants will be sufficiently educated on the topic.

Limitations

A limitation is that there is no guarantee that all the different stakeholders will participate in the interview since it is not mandatory for them, regardless of this the researcher will try to get as much responses as possible without being biased. Major food providers are supermarkets and the researcher is planned to have interviews with most of them but it is not guaranteed that all of the supermarkets will be willing to participate in an interview.

Importance of studies

Covid-19 has impacted the world in different ways and it has shown that a number of countries heavily rely on import when it comes to food security and accessibility. This research is of added value because the results will show how different stake holders in the food industry may have different opinion on how Covid-19 have affected their economic resources and how to stimulate locals to start growing their own fruits and vegetables.

Structure of the report

This report will consist of 5 chapters, chapter 1 being the introduction, chapter two literature review and the theoretical framework, chapter three methodology (questionnaires with different stake holders of the local food industry), chapter 4 results and discussion and chapter 5 will be conclusion and recommendation

Chapter 2: literature review

Macroeconomic impact

The Covid-19 pandemic's effects are currently jeopardizing the food security of billions of people (Zurayk, 2020). According to the Food Agriculture Organization (FAO), and the World Health Organization (WHO) perishable food has been greatly impacted by Covid-19, which has led to notable food shortages in underdeveloped nations, conflict zones, and areas ravaged by war (Mouloudj, 2020). Additionally, Covid-19 endangered food security in certain wealthy countries as well, although poor nations were most negatively impacted because of their great reliance on securing their food supply (Mouloudj, 2020). Due to

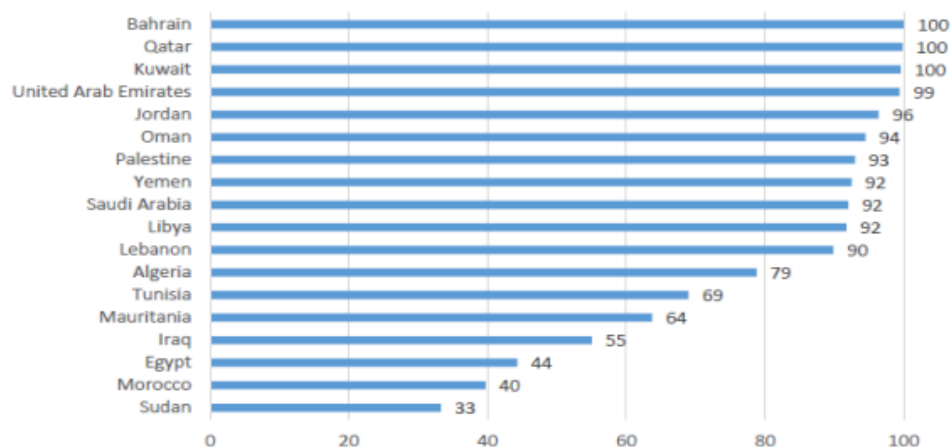
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restrictions on movement and low purchasing power, as well as a significant impact on the most vulnerable population groups, there is a significant impact on food demand and, consequently, food security. As cases of infection rise, governments implement more comprehensive and effective procedures to stop the spread of the virus, which has an impact on the world's food system (Siche, 2020, p.6).

Covid-19 impact on food supply chain

According to (Bouarar, 2020) food supply systems have been immediately impacted by the outbreak. Many farmers who sold their products directly to consumers saw their markets disappear as a result of a shortage of some basics and fresh items in grocery stores, while demand for other products increased. Farmers have scrambled to find other alternative places to sell off their perishable commodities when market routes were closed, including farmers' markets, restaurants, and institutions (Schmidt et al., 2020b). According to anecdotal evidence, the pandemic, which is endangering the health of people and businesses alike, including small- and large-scale farms, has caused businesses, farmers, and consumers to change their business models and behavior due to closed restaurants and schools and quickly emptying grocery stores (Kolodinsky et al., 2020, p.6). A real example of a disruption in the food supply chain is the following anecdote, the graph below shows that in 2017 there were three Arab countries that imported cereals at 100%, as well as UAE at 99%. Thus, these four countries are prone of any crises that may results from the Covid-19 pandemic in the event that several countries stop food export. It is also evident that seven countries that depend of 90 percent or more on imports of grains. In addition, almost half of the Arab countries produce less than 10 percent of their grain needs.

Figure 1. Cereal import dependency ratios of selected Arab countries in 2017



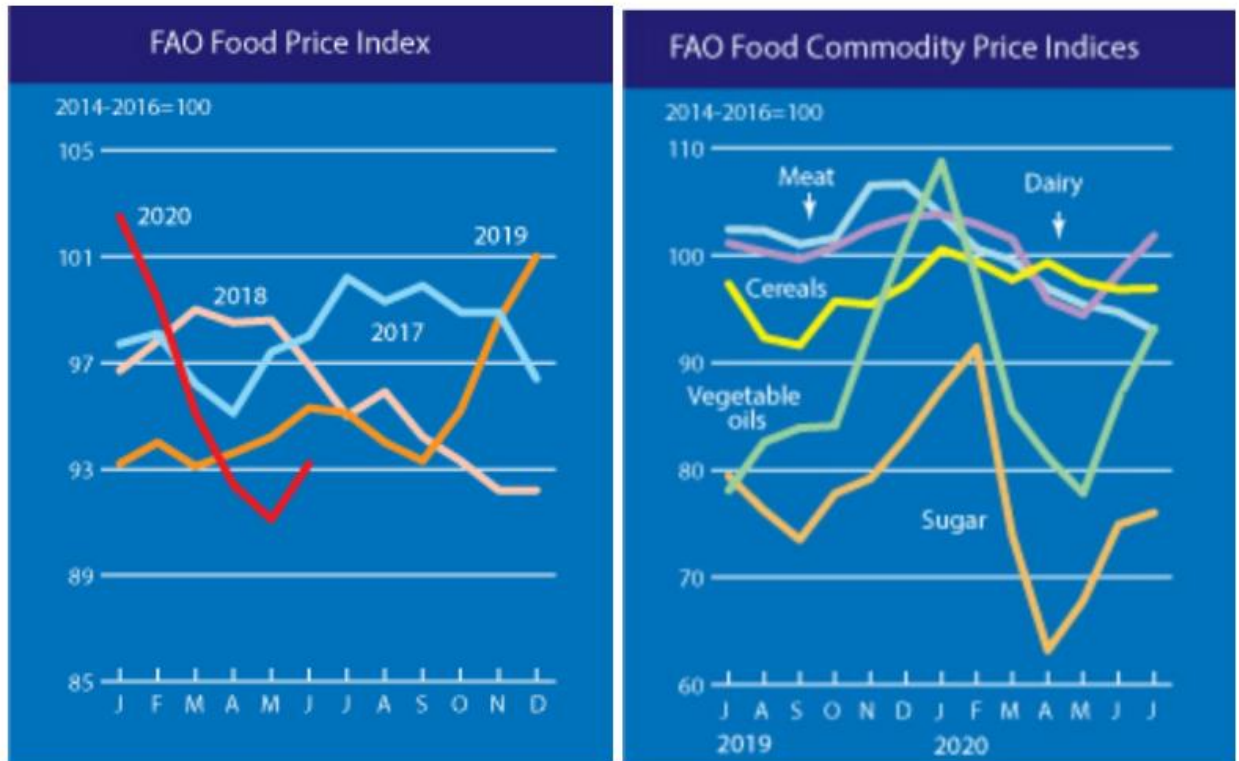
Note: cereal import dependency ratio is defined as the share of imported cereals in domestic consumption. It is calculated using the following formula: Imports/ (imports + domestic production – exports).

Source: FAO, (2020a). "COVID-19 and the impact on food security in the Near East and North Africa: How to respond?", Food and Agriculture Organization of the United Nations, Cairo,

Covid-19 impact on world food prices

Food security is inextricably related to the volatility of global food prices because of external dependency (Lacirignola, Adinolfi, & Capitanio, 2015). Understanding depends heavily on preferences, costs, and finances. How the Covid19 crisis affects the demand for food (Cranfield, 2020). According to the United Nations food agency, global food prices decreased for a fourth consecutive month in May as a result of the economic downturn brought on by the corona virus epidemic, which has restricted demand (UNFA, 2020). The Food and Agriculture Organization's (FAO, 2020) food price index, which tracks monthly changes for a variety of foods including cereals, oilseeds, dairy, meat, and sugar stated that the sharpest fall was in vegetable oil and sugar prices, followed by the prices of meat and dairy products as shown in the graph below.

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Source: FAO.

Agriculture prices are not strongly connected with economic development, and only slightly increased in the first quarter of 2020, according to the World Bank (April 23, 2020). Overall, prices are most expected to remain stable in 2020 due to record-high output and stock levels for the majority of staple items. However, there may be a disruption in the commerce, the distribution of inputs, or the availability of labor during the production of agricultural commodities. Exports of perishable goods like flowers, fruits, and vegetables to emerging markets and underdeveloped nations have already seen supply chain disruptions (World Bank, April 23, 2020).

Covid-19 impact on agriculture and food system in the Caribbean

According to (Guyader, 2021) Covid-19 had significant socio-economic impact in the Caribbean at local and regional levels. The lockdown reduce air traffic, slowdown in the flow of

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imported and exported goods had significant consequences on agriculture and food systems in general. One important aspect regarding the Caribbean is that growth in agricultural productivity has been slow in recent years and the sector suffers from high trade cost and low capacity to comply with modern food quality and safety standards. The consequence of this is that the agriculture sector has been unable to adequately respond to the rapid growing demand for high-standard food products and the demand for these products is fulfilled mainly by imports. (Causeret, 2021).

The pandemic had strong impact on Caribbean farmer and has greatly weakened agriculture systems (keep in mind that some Caribbean islands/ countries have better soil than others). Some of the main impacts on the farmers were the following: 1) drop in income, 2) lost production due to difficulties in marketing through conventional channels and 3) difficulties in managing farming systems due to reduced access to inputs and labor. In order for the farmers to survive, they had to adapt. The farmers did this by reducing the size of cultivated areas, searching for short marketing channels, production diversification, and reorientation towards the needs of the local market and recourse to mutual aid between farmers. (Guyader, 2021). When it comes to the impacts on the food systems, the pandemic led to major constraints such as reduction in food intake and diversity, increased reliance on social mutual aid. The table below shows an indication on the consequences/ impact of Covid-19 crisis on agriculture systems in the Caribbean region. A total of 94 participants were part of this questionnaire (Guyader, 2021).

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Consequences of COVID-19 crisis on agricultural systems.

	Producers Guadeloupe (n = 32)	Experts Guadeloupe (n = 38)	Experts Other Caribbean countries (n = 24)
Reduced production	68.8%	55.3%	66.7%
Increased the share of short marketing channels	62.5%	81.6%	58.3%
Stopped certain crops or productions	43.8%	42.1%	54.2%
Diversified their production	40.6%	44.7%	75.0%
Threw away part of the production because it was impossible to sell it	37.5%	39.5%	54.2%
Engaged in a new non- farming activity	18.8%	15.8%	41.7%
Sold livestock	12.5%	18.4%	29.2%
Stopped all production	9.4%	2.6%	16.7%
Sold or separated from farm land	0%	7.9%	12.5%
A majority has suffered economic damage	*	71.1%	83.3%
Agricultural systems have been resilient enough to this crisis	43.8%	50.0%	50.0%

The Covid-19 crisis had a noticeable impact on consumer's behaviors and their perception on the importance of the agriculture sector. This led to reduction of food waste, adaptation of diet, return to fresh and local products and cultivation of food gardens. This new perception also improved the relationship between farmers and the rest of the population. (Guyader, 2021).

Socio-economic impact of Covid-19 in Curacao

When it comes to the socio-economic impact of Covid-19, according to (CBS, 2020) the official registration of unemployment was set on-line by the Government of Curacao to track the numbers of jobs lost since Covid-19 and to potentially identify population that could benefit

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from unemployment compensation. As of 15th may 2020, a total of 4886 individual had been registered whom 59.2 % were females and the rest males. Additionally, official information provided by the Central Bureau of Statistics (CBS) indicated that as of 24th April 2020 approximately 2770 small business owners who employed less than 10 employees have observed their income dropped to zero. In the year 2020 according to (CBS, 2021) a severe decline in economic activities led to a contraction in the Gross domestic Product of 18.4%. The covid-19 pandemic had a negative effect on the economic activities in Curacao and this is partly in relation with various measurements to minimize the spread of the virus. The continuing shortcoming of the industrial activities continued in a decrease of 56 percent for the manufacturing sector. The cause for this was the failure of oil refining activities in 2020. The utility sector consisting of production and distribution of electricity, water and gas showed a decrease of more than 6 percent in 2020. When it comes to the trading sector, this fell by nearly 21% and this decrease was caused by the reduction of goods imported. A global overview of the number of overnight stays by tourists from the various tourist regions shows that there has been a general drastic decrease. The largest decrease was from South America with 80 percent, followed by the Caribbean which is declined by 76 percent. Tourist overnight stays from North America remained one decline of 61 percent. Europe again shows a decrease of 51 percent in overnight stays. This decline was caused by the lack of air transport and pandemic precautions. The Business Services (real estate activities; professional, scientific and technical activities; administrative and support activities), has also been hit hard with a contraction of more than 29 percent. (CBS, 2021).

Produce nutrients

Globally there is currently a worrying development that is the average nutrient density (per kilogram of fruit/vegetable has decreased by 50-90% compared to 50 years ago and this is mainly due to the intensity of industrial agriculture. (Fao, 2022)

The rise of industrial agriculture has changed the nutrient content of foods. Production for cash crops has pushed out more diverse food cropping at the expense of nutritionally-important foodstuffs. Breeding programs for major crops have focused mainly on productivity increases by

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altering plant height or disease resistance (Tadele & Assefa, 2012), resulting in varieties that are rich in energy but have a lower content of various macro- and micronutrients (Jones et al., 2014). Heavy use of agrochemicals also affects human health; pesticide exposure has been linked to increased incidence of Alzheimer's disease, asthma, birth defects, cancer, learning and developmental disorders, Parkinson's disease and sterility (Owens et al., 2010; Ye et al., 2013).

Human Microbiata

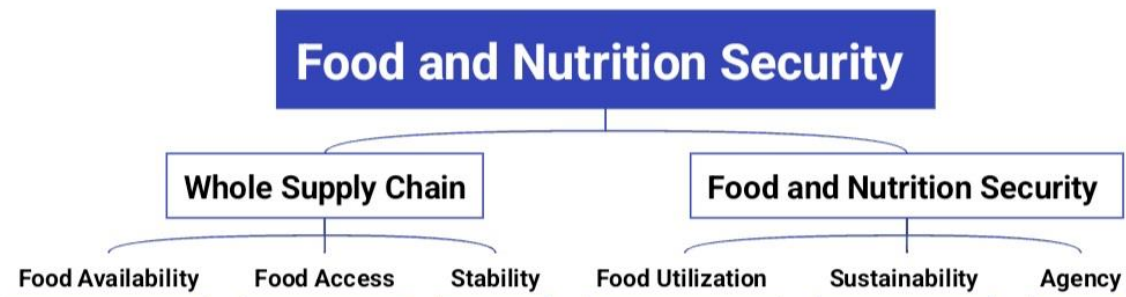
According to (Erica Sonneburg, 2017), the human microbiota regulates a number of biological processes in our bodies, including those that affect our immune system, metabolism, and neurology. Diet has a significant impact on which microbes flourish in the microbiome. The majority of the metabolic energy required by the gut microbiota is supplied by dietary fiber, which is mostly composed of carbohydrates that can be accessed by the microbiota (MACs).

Long term food demand

According to (Guariso, 2013) long term food demand is determined by three interlinked factors and these are population growth, urbanization and changes in consumption lifestyles. When it comes to population growth, developing countries continue to grow and the demand for food will increase and this leads to more pressure on natural resources and food production. Next when it comes to urbanization, especially in developing countries urbanization is expected to absorb a big part of the population growth and this will challenge access to appropriate food quality and quantity. Lastly income growth leads to changes in consumption and lifestyle because an increase in income leads to higher dietary diversity and changing lifestyles increase the demand for energy, which in turn affects the production cost of agriculture commodities. (Guariso, 2013).

Theoretical framework

According to (Pieters, 2013) food availability, food access and food utilization determines the food and nutritious status of an individual or household and stability refers to two additional dimensions that are vulnerability and resilience towards state of affairs. In addition, the relation between food and nutrition status and the stability of the food and nutrition status is non-linear and that both categories and their dimensions are highly interlinked. In the case of Curacao, Food Availability is the availability of sufficient quantities of food of appropriate quality supplied through importation or domestic production. Food Access is access by individuals or households to adequate resources for acquiring appropriate foods for nutritious diet. Food Utilization is the proper biological use of food, requiring a diet providing essential nutrients and sufficient energy, potable water and adequate sanitation. Resilience is the ability for individuals or households to deal with stressors such as extreme events, in this case Covid-19 impact on food security of Curacao and vulnerability is considered as the perspective of individuals or households susceptibilities, resilience is the capacity of individuals to overcome stressful events.

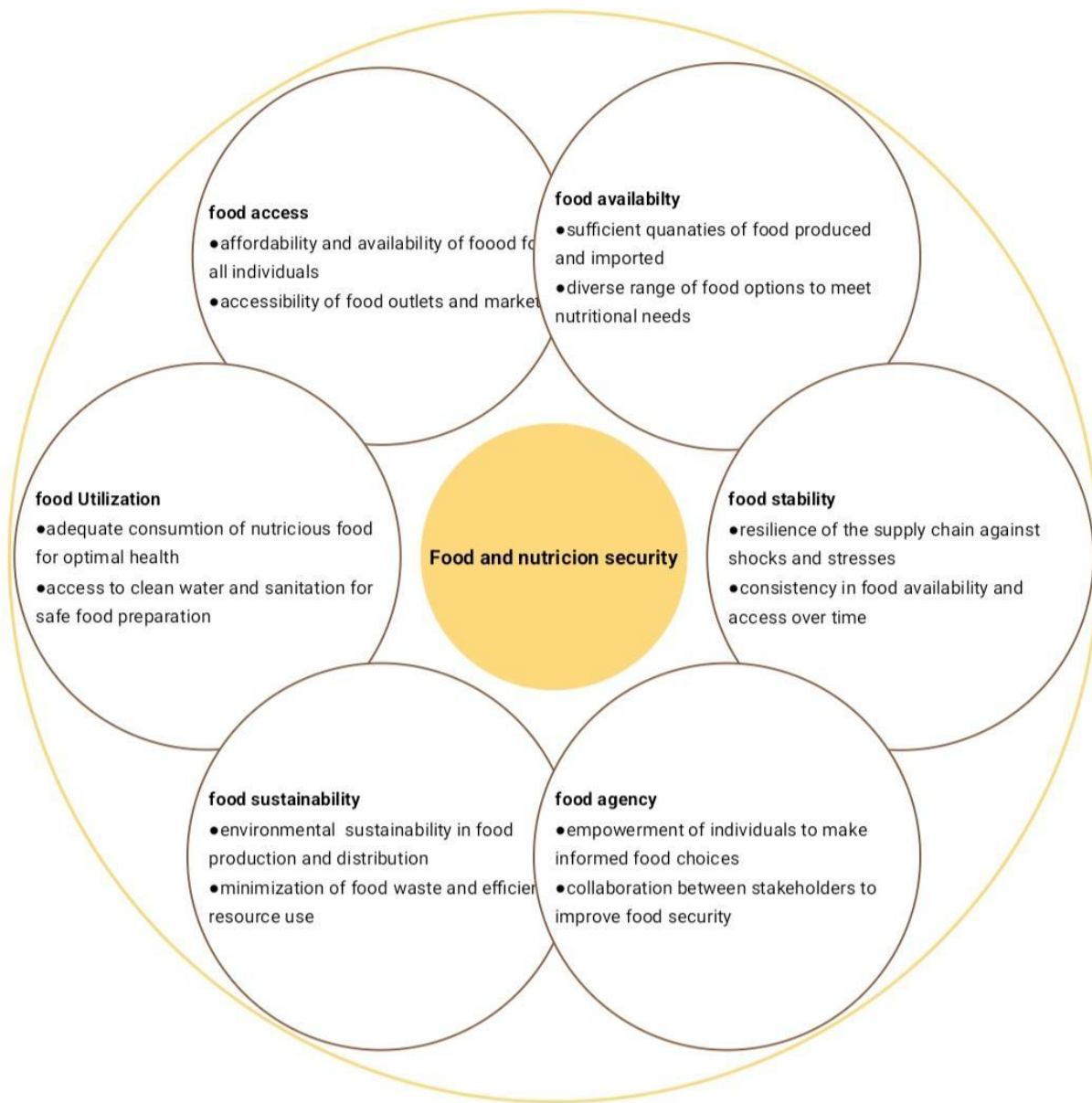


Conceptual framework

The conceptual framework highlights the multifaceted nature of food and nutrition security, encompassing dimensions of availability, access, stability, utilization, sustainability, and

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agency. Food and nutrition security is influenced by the effective functioning of the entire supply chain. Food availability and access are key components of food and nutrition security. Food stability contributes to long-term food security and resilience against disruptions. Food utilization ensures that accessible food is optimally consumed for health benefits. Food sustainability considers the environmental impact of the supply chain. Food agency empowers individuals and communities to actively engage in securing their food and nutritional needs.



Chapter 3: methodology

This chapter sets for the research methods used to examine the impact of Covid-19 pandemic on Curacao's food security. The sampling method, participant, measurement instruments and procedures will be available in this chapter.

Participants

This research focuses on the impact of Covid-19 pandemic on the food security of Curacao. Therefore, the target population of this research is the local grocery stores located in Curacao. The local grocery stores are the ones with the knowledge towards the impact of Covid-19 pandemic on the food security of Curacao. Grocery stores in this research refer to the local Supermarkets and Minimarkets.

Instruments

The instrument for this qualitative research was a semi-structured interview. Several researcher found out that one main advantage of using semi-structured interview methods according to (Galletta, 2012) is that this method is successful in enabling reciprocity between the interviewer and participant, enabling the interviewer to improvise follow-up questions based on participant's responses (Hardon et al. 2004 Rubin & Rubin 2005, Polit & Beck 2010). In addition, the semi-structured interview in this research was designed based on the data gathered from the literature in chapter two with the objective of investigating the impact of Covid-19 pandemic on Curacao's food security.

Sampling

According to Dörnyei (2007) the ideal sampling size is six to ten informants and the goal in qualitative research is to find participants who can provide varied insights into the research. Cohen (2007) explains that there are two different sampling strategies; probability and non-probability. A probability sample is a random selection while a non-probability sample selects a specific portion of the population to respond to the questions at hand. For this thesis, the researcher contacted most of the supermarkets via email and in person multiple times. Unfortunately not all of the supermarkets comply with the interview. The supermarkets who participated in the interview were the following: Centrum Piscadera, Alves Supermarket, Best Buy, Van Den Tweel Supermarket, Carrefour Supermarket and Boulevard Supermarket. This mix of Supermarket is ideal because they are situated in both poor and rich neighborhoods on the island. The same was done for the interview with both minimarkets.

Audio-recordings and transcription

The interviews for this research were carried out in person and audio-recorded via the researcher's phone. According to Davidson and Halcomb (2006), transcription is the process of reproducing words, for example from audio-taped interview into written text. For this thesis the transcription method was "intelligent verbatim transcription". When using the intelligent verbatim method, the researcher excludes discourse fillers such as "uhm" & discourse markers such as "like", while still preserving the participants meaning and interpretation (Eppich, Gormley, & Teunissen, 2019). For this thesis, the researcher focused on what the participants said rather than how they said it. This method of transcription was chosen for the proposed thesis in order to convey the participant's responses in a reader-friendly manner, while keeping the interview responses accurately.

Coding and analyzing the data

After the data was transcribed, it was coded & analyzed using content analysis. According to Cohen (2007), content analysis is described as;

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- Coding
- Categorizing (creating meaningful categories into which the unit of analysis can be placed, comparing (categories and making links between them)
- Concluding (drawing theoretical conclusion from the text.

In this thesis the categories will be interrelated with the sub- question in chapter one connected with the interviews questions as follows for the Supermarkets & Minimarkets (Sub-questions related to interview questions).

<p>Sub-question 1: food availability & stability; How was the availability of foods products in local supermarkets/minimarkets affected by Covid-19 pandemic?</p>	<p>Interview questions: How did covid-19 pandemic affect your importations of (international) goods? Did you experience any product shortages during the covid-19 pandemic period? Did you experience price changes in the products that you import? To what can the price changes be attributed to?</p>
<p>Sub-question 2: food accessibility; What was the extent of the impact on the socio-economic situation of local consumers?</p>	<p>Interview questions: How did the pandemic lockdown restrictions affect your business in Curacao, please elaborate? What is the composition of your clientele? Did you experience any changes in the purchasing power parity of your consumers during covid-19 pandemic?</p>
<p>Sub-question 3: food utilization & agency What are critical factors that can stimulate the health and wellbeing of the local population, and in extension thereof, local agriculture?</p>	<p>Interview questions: How are you contributing towards raising awareness of a healthy diet for your consumers? Do you buy produce from local farmers?</p>

	How is the relationship between local farmers and your grocery store and what can be done to optimize this?
<p>Sub-question 4: food sustainability</p> <p>How stable is food security post Covid-19 pandemic in Curacao?</p>	<p>Interview questions:</p> <p>Mention 3 most important measurements the government can take to increased locally sourced foods?</p> <p>After covid-19 did the product availability and stability improved or normalized as it used to be before covid-19?</p> <p>Now that the pandemic is over how prepared are you towards the safety of food security in Curacao if the borders close again?</p>

Chapter 4: results

Qualitative research method was used for this research. Six supermarkets, two minimarkets and one representative of the floating market were interviewed about their beliefs and reported experience regarding Covid-19 effects on Curacao’s food security. This chapter presents the data collected from the interviews. The findings are presented in categories related to the research sub-questions & interview questions and because semi-structured interview was used, additional questions were asked to a couple of supermarkets to receive a better understanding to the topic at hand. The sequence of the answered interviews questions will be in chronological order of whom participated in the interview first to last.

4.1 sub-question 1

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How was the availability of foods products in local supermarkets/minimarkets affected by Covid-19 pandemic?

When answering the question of; how did covid-19 pandemic affect your importations of (international) goods?

Centrum Supermarket (Piscadera) answered the following: It had impact since the start. We still had containers on the way. Normally when we request a big shipping order full of products, delivery takes approximately 2 months. Then in the month of April, May and June, when full effect of Covid-19 hit us, a lot of products didn't arrived on time. In addition, the Ukraine vs Russia war also had an impact on the importation of goods because all the wheat and grains that is produced in east Europe became scarce.

Alves Supermarket response to this question was; For starters, product became scare, prices increased overall. People received money from the government to buy foods (government card). Best Buy supermarket answered the following; It affected us mostly in the sense that logistically every container came way later than when they normally do.

Van der Tweel Supermarket answer was; it was bad because we ran out of products fast, because we import the majority of our products from the Netherlands and there the "hamster" effect took place where everyone started buying everything and there were no more products at the distributions center.

Carrefour Supermarket answer to this question was; it affected us in several ways. Logistically, as in availability and the price increase of sanitary products became astronomical.

Boulevard Supermarket answers was; a lot because products overall became really expensive, transportation of products also became expensive.

Chipi Chipi minimarket answer to this question was; it affects us bad because several of our containers couldn't arrive on time.

More & More minimarket response was; it was really bad, we ran out of merchandise really quick and it took long for our products to arrive.

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When answering the question: Did you experience any product shortages during the covid-19 pandemic period?

Centrum Supermarket (Piscadera) answer; Cornstarch, everything that has to do with corn, grains, paper products, wheat, a lot of farm animals eat grains so this was also affected. Fodder also became more expensive. Chicken and pigs became more expensive. Netherlands products were more stable but their prices did increase relatively for us.

Alves Supermarket answer to this question was; Yes in the first year not so much because we had a lot of products in stock but in the second year it became worse. Best buy response was; yes we experience shortages with most of our products.

Van Der Tweel Supermarket replied the following; yes we had shortages of toilet papers, canned products, water, healthy items like ginger, lemons. Because of the lead time when we order products from the Netherlands, it will be delivered in 5 to six weeks while products from USA takes about 3 weeks.

Carrefour Supermarket answer was; sure we did, all the sanitary products there was high demand for those products (facemask, alcohol etc).

Boulevard Supermarket response was; yes because there was a panic we had shortages of almost all our products.

Chipi Chipi Minimarket answer to this question was; yes some types of milks, cornflakes (Kellogs), various brands. Potato, bananas and advocatos.

More & More minimarket answer to this question was; yes we had shortages a variety of products, because people came and bought a lot of our products quickly.

When answering the question of; did you experience price changes in the products that you import? To what can the price changes be attributed to?

Centrum Supermarket (Piscadera) response was; Everything became more expensive, its like a chain reaction. Especially shipping cost. Lots of products had to come from china. Shipping cost from the Netherlands almost doubled up. Shortage of resources, shipping and freight cost increased drastically. Scarcity of products.

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Alves Supermarket responded with; Not the first year but the second, because companies in the exterior had shortage on workers and transportation cost increased drastically. Because price increase, people started buying less and became more careful and looking for alternative products.

Best Buy Supermarket answer was; because of Covid-19 cost price increased drastically.

Van Der Tweel answers to this question was; in the beginning there were no price changes yet, because the Covid situation started in late February and it affected us. Then later when the vendors realize that they started having shortages, they increased their prices. For example in the beginning, face masks were really cheap, then people started buying them and their prices increased drastically. Then the vendors had over-stock of face masks and the prices became lower again.

Carrefour Supermarket answers was; price changes were because of the high demand for the products and freight cost also increased.

Boulevard Supermarket response to this question was; prices were change by the exporters and naturally we will increase our prices because of that.

Chipi Chipi Minimarket answer was; yes so much the prices almost doubled up, even now after the pandemic.

More & More Minimarket responded with the following; the prices increased because everything we imported increased in the exterior.

4.2 sub-question 2

How was the socio-economic impact of Covid-19 for the local consumers?

When answering the question of How did the pandemic lockdown restrictions affect your business in Curacao, please elaborate?

Centrum Supermarket (Piscadera) replied with the following; bad in the beginning because people were in panic mode. Clients are more stressed. employees also became stressed. We had to

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be careful that not all employees become sick (covid precautions). In the period of vehicles registration plate, sometimes same people came to the supermarket the same day just to get out of the house.

Alves Supermarket replied with; It affected my workers psychologically, they were scared and had a lot of stress. 10 percent of my workers got covid. This led to a decrease in our production. Operational cost from overtime increased, cleaning cost increased, security cost increased. People started stealing more in my supermarket.

Best Buy Supermarket responded with; We worked less hours than usual and less people came in because of restriction, scarcity of workers.

Van Der Tweel Supermarket replied with; it affected us a lot, because we have two stores, one here in Salinja and one in Janthiel. The one in Janthiel was very very quiet because mostly we only have tourist there. But they couldn't come. We were considering closing that store and moving our products of Van Der Tweel Janthiel to the one in Salinja. Also because we were running out of stocks in our main store in Salinja.

Carrefour Supermarket replied with; it affected us in a good way, we learn how to adapt and because we were one of the few businesses that didn't close and people at home didn't had much to do so people were buying more than they used to.

Boulevard Supermarket replied with; in a bad way because sometimes we had to close store earlier than usual but our cost stayed the same, meaning we were losing money at that time because we weren't producing like normal. Remember we also sells food in here like "pastechi, chicken, fries, food in general.

Chipi Chipi Minimarket answer to this question was; it affected our employees the most because we started selling products by the window and we temporarily let the employees without work because we did not need them all for selling at the window, we did it ourselves. But after Covid we hired them back.

More & More Minimarket response was. It affected us in a bad way because we usually close the store at 10 pm every day, so in the pandemic we didn't had business as we used to although in day time we had more customer than what we normally have.

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When answering the question of what is the composition of your clientele?

Centrum Supermarket (Piscadera) answers with; Majority middle upper class customers, tourists, people from Bluebay. A little bit of people with lower income also.

Alves Supermarket replied with; people with low income, middle class. About 1 percent people with high income , high class. In Covid-19 pandemic period, a lot of middle class and high class people came in here with their government card to buy products. They were ashamed of using the cards in other supermarkets that's why they came here. You noticed them by the expensive cars that they were using.

Best Buy Supermarket replied with; a mix of every culture, we serve everyone.

Van Der Tweel Supermarket replied with; for our store in Janthiel we have 80 to 90 percent tourists, not only from the Netherlands but also Germany and the US. Here in Salinja we are more focused on the local and loyal customers, we also want to attract everybody, that why we have low price Albert Heijn brand products.

Carrefour Supermarket responded with; we have a big group of tourists and our local are more medium to upper-class. Because we are located in a mall we receive an extra advantage of people coming to our store.

Chipi Chipi Minimarket responded with. A mix of people, also tourists, they mostly buy alcohol and beach supplies here, especially in the weekends.

More & More Minimarket replied with; mostly lower class income people, but sometime they spent a lot. Also, loyal customers.

When answering the question of: Did you experience any changes in the purchasing power parity of your consumers during covid-19 pandemic?

Centrum Supermarket (Piscadera) replied with; yes of course, our customer buying patern changed drastically. At first they started buying out of fear, then they started buying less after the the beginning phase of Covid-19 pandemic.

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Alves Supermarket responded with; in the pandemic I did not experience people buying less, but buying more and the government subsidie card also played a role because the community used it regularly.

Best Buy Supermarket replied with; yes, people generally started buying less products mid pandemic.

Van der Tweel Supermarket respons was; yes the consumers started buying more, for example normally they buy one banana and now they buy six. The people started buying a lot of paper and bottled water too. One thing that did caught my attention was that people started buying a lot of products to bake themselves at home. They would fill their cart with baking products. The consumers stocked their meat in the freezer.

Carrefour Supermarket replied with; not really. The average basket increased with products because of the factor of panicked people, government support card. People that lost their job also used the card. I did see people in working uniform using the government support card to buy products. So of those people were buying snacks with it too.

Boulevard Supermarket replied with; yes people started being more cautious about what they buy. Instead of filling one full cart now they fill it half. Chipi Chipi Minimarket replied with; I've noticed that people started buying more beers (alcohol) than usual. Also cigarets. More & More Minimarket responded with; in the beginning people were buying consistently then a few months later they started buying less.

4.3 sub-question 3

What are critical factors that can stimulate agriculture in Curacao?

When answering the question of; how are you contributing towards raising awareness of a healthy diet for your consumers?

Centrum Supermarket (Piskadera) responded with; we try to bring more gluten free and natural products, we also try to bring most fresh products, but the local community prefers sweet and salty products. For example if we bake a cake or cookies with less sugar, it won't sell as

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good as the ones with more sugar. We are working now on an initiative to promote eating healthier for the near future (2024).

Alves Supermarket answer to this question was; I do not participate in those things. Best Buy Supermarket replied with; we don't do business towards that market.

Van Der Tweel Supermarket response was; we try to put as much attention to healthy items in our stores, we give more space for our healthy departments. For example we have promotion in the beginning of January when people want to start (new year, new me) healthy journey and also now since May so about 3 months now we are promoting local products. Buy local from the farmers and the money goes back to the farmers so they can invest the money into their productions. We promote "Kumpra Lokal" (Buy Local).

Carrefour Supermarket responded with; yes of course, you can see in our store that we have a variety of departments that have healthy products, organic products, veggie products etc. Boulevard Supermarket replied with; this neighborhood doesn't ask for these types of products, but occasionally a few people will ask for those healthy products but we only have a few.

Chipi Chipi Minimarket responded with; through our healthy fruits and veggies. We don't really have gluten free or organic products.

More & More Minimarket replied with; we don't offer a lot of fruits and veggies, people don't really come to our store to buy those items.

When answering the question of; do you buy produce from local farmers?

Centrum Supermarket (Piscadera) response was; yes, Eggplant, bell pepper, sweet potato, long bean, okra. The government of Curacao protects the farmers with the regulation of; if a fruit or vegetable can be produced locally, the grocery stores are not allowed to import them. What makes this difficult in curacao is the fact that there are not enough local produce for all supermarkets, restaurant etc and it is not stable.

Alves Supermarket replied with; yes but the local don't like to plant. Best Buy Supermarket replied with; yes we do but the supply is not enough. Van Der Tweel Supermarket response was;

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yes from different local vendors like plantashon soltuna, the home of fruits, Moderno, Happy Chicken, Bazbina Honey, Kunuku Salads and Yoghurt from Scherpenheuvel.

Carrefour Supermarket answers was; promenton, onion, sweet potato, spinach, garter and when it comes to fruits, we buy papaya, dragon fruits. The researcher ask; really dragon fruit? Carrefour replied with yes from the Chinese store (LunaPark Supermarket).

Boulevard Supermarket replied with; dragon fruit, onion, promenton, mint, sweet potato and bean sprout.

When answering the question of; How is the relationship between local farmers and your grocery store and what can be done to optimize this?

Centrum Supermarket (Piscadera) responded with; Most of the relationships with the farmers are good. If there is scarcity of a vegetable, the farmer may increase the price, but it needs to be balance and beneficial for both parties involved.

Alves Supermarket replied with; How can the farmers can be more interested in planting and profiting from it should be the question.

Best Buy Supermarket replied with; it is good as it is now.

Van Der Tweel Supermarket answer was; we try do give them as much space as possible in our stores, like a department.

Carrefour Supermarket replied with; the relationship is good, what we need more is consistency of products.

Boulevard Supermarket replied with; its not the best, climate is not the best, farming materials are becoming more expensive. The heat is the number one factor that is killing everything, this season you barely get any celder and sweet potato.

Chipi Chipi Minimarket responded with; the relationship is okay but I Wish the farmers would have more variety of products.

More & More Minimarket replied with; could be better, sometimes we don't get the amount that we asked for.

Sub-question 4

How stable is food security post Covid-19 pandemic in Curacao?

When asking the question of Mention 3 most important measurements the government can take to increased locally sourced foods?

Centrum Supermarket (Piscadera) responded with; Government is already protecting farmers and zero percent OB on vegetables. Initiative to eat healthier. Government helps with resources and research and development, new technologies and machines to optimize productions micorgrains.

Alves Supermarket response was; Priority when importing products and machine to produce products, give them like 500 guilder like an incentives. The farmers don't really make a living out of it. Government needs to make farming in Curacao more appealing.

Best Buy Supermarket replied with; Lower the production cost, electricity is very expensive is high, new equipments for products to support farmers.

Van Der Tweel Supermarket response was; make better conditions for farmers, give more tax discount for the people, promoting healthy lifestyle on television. Also I wanted to focus on the fact that the process of bringing the products to our stores takes to long. When they arrived on the island the process of the container reaching our stores sometimes takes too long and our fruits and vegetables parish or are not as fresh as they can be.

Carrefour Supermarket responded with; government needs to support the farmers more, the government should educate them more in the farming industry in both the are of product availability and quality. Sometimes the consistency of the product that we receive from the locals is not the best.

Boulevard Supermarket response was; lower prices of planting products, lower price for the farmers.

Chipi Chipi Minimarket responded with; open an agriculture school for farmers to improve their farming skills. Invest more in agriculture.

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More & More Minimarket response was; create opportunities for the farmers, lower the cost of production.

When answering the question of; After covid-19 did the product availability and stability improved or normalized as it used to be before covid-19?

Centrum Supermarket (Piscadera) response was; Majority of the products did normalize (availability and stability) chicken, cornstarch products and dog food are some of the products we still don't constantly have as we used to before Covid-19 pandemic. Also I wanted to tell you that majority of our products prices has increased drastically.

Alves Supermarket replied with; the situation became worse, you don't get the products you used to get, price increased drastically. For products like: milk, rice sugar, oil, butter. Inflation makes the products become too expensive.

Best Buy Supermarket responded with; Depends on the products, we still have shortage products from USA, and Holland. The products still don't arrived constantly as before the pandemic period.

Van Der Tweel Supermarket response was; how our business was running before Covid, we haven't reach their yet. The problem is in the exterior, producers are producing for their own countries first, when they get a surplus they will send more frequently.

Carrefour Supermarket replied with; it didn't not normalized as before Covid-19 pandemic. Prices from freights are still really high, and product availability is not stable as it used to be.

Boulevard Supermarket response was; still a lot of scarcity of products, flour shortage, some dogs food, coca cola that is produced here on the island, there are some occasions you don't get the bottle size you asked for.

Chipi Chipi minimarket responded with; the situation did improve but not as it used to be. For example we used to import a lot of products from Colombia, but now the their prices are too expensive. The researcher asked; from where do you import now, Chipi Chipi Minimarket replied; now from Venezuela, we receive potato, bananas, advocato, sweet potato and some type of onion.

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More & More Minimarket answer was; we still are having problems with our products not coming on time so the situation has not improved completely.

When answering the question of Now that the pandemic is over how prepared are you towards the safety of food security in Curacao if the borders close again?

Centrum Supermarket (Piscadera) responded with; we now have the knowledge and experience, new policies and guidelines, new protocols, government has now a calamity team now.

Alves Supermarket responded with; You can be psychological prepared but people are afraid. You never know what can happen. If a hurricane passes by Curacao, we would have no communications because how our utility are made now.

Best Buy Supermarket responded with; there is no strategy because we import almost everything unless the government comes with an incentive.

Van Der Tweel Supermarket responded with; I believe we are now mentally more prepared and the government should invest now more in agriculture because what we produce locally is not enough. Stimulate and promote the community to start planting in their garden for their own consumption.

Carrefour Supermarket response was; actually theres not much that we can do, as long as we are on an island like this, we are very depended on other countries.

Boulevard Supermarket responded with; its going to be a big issue, similar like the pandemic, people no longer will buy products on a weekly base but rather on daily base. They wil become more cautious than ever. What we can hope is that the government can come with incentives to stimulate more agriculture.

Chipi Chipi Minimarket responded with; we really depend on other countries went it comes to food. We should have more canned food that don't expired that fast.

More & More Mininmarket answer was; maybe we should invest more in farming on the island. Trade more with other countries, build long lasting relationships.

Interpretation & discussion

Sub-Question 1: Impact on Food Availability and Prices due to COVID-19

The results show that the availability of food products in local supermarkets and minimarkets was significantly affected by the COVID-19 pandemic. Delays in shipping and disruptions in the global supply chain led to product shortages and increased prices. The impact was felt in terms of delayed shipments, scarcity of certain products (e.g., wheat and grains due to geopolitical events), and higher shipping costs. Additionally, panic buying and increased demand for sanitary products led to price hikes. Many supermarkets experienced shortages of items like toilet paper, canned products, and cleaning supplies. The pandemic highlighted vulnerabilities in the reliance on imported goods and the need for more robust local production.

Sub-Question 2: Socio-Economic Impact on Consumers

The socio-economic impact of the COVID-19 pandemic on local consumers was significant. Lockdown restrictions affected purchasing behaviors and overall stress levels. Some supermarkets experienced decreased business hours and reduced foot traffic due to restrictions. Consumers exhibited varied buying patterns, with initial panic buying followed by a shift towards more cautious spending. The government's support through subsidy cards influenced consumer purchasing power. Some supermarkets noticed changes in clientele, as higher-income individuals shopped more frequently due to embarrassment in using subsidy cards elsewhere. This highlights the complex interplay between economic factors, consumer behavior, and government support.

Sub-Question 3: Stimulating Agriculture in Curacao

Factors that could stimulate agriculture in Curacao include raising awareness of healthy diets, promoting local products, and government support for farmers. Supermarkets are making efforts to promote healthier food choices, but preferences for sweet and salty products among consumers pose challenges. Buying produce from local farmers is common, but there is room for

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improvement in terms of variety and consistency of supply. Enhancing the relationship between supermarkets and farmers involves addressing issues of supply stability, cost of production, and climate-related challenges. The government can play a crucial role by providing incentives, supporting research and development, and improving conditions for farmers.

Sub-Question 4: Food Security Post COVID-19

Post-pandemic, the stability of food security in Curacao remains a concern. While some product availability and stability have improved, the situation has not fully normalized. Factors such as high freight costs and inconsistent supply continue to affect the stability of food security. Supermarkets have adapted to the pandemic's challenges, but uncertainties remain, especially in the event of border closures. The responses suggest that building resilience in local food production and reducing dependence on imports could be key strategies to enhance food security in the long term.

In conclusion, the interviews with various supermarkets and minimarkets reveal the multifaceted impact of the COVID-19 pandemic on food availability, consumer behavior, and the agricultural sector in Curacao. The pandemic highlighted the vulnerabilities of relying heavily on imported goods and the importance of fostering local food production to ensure greater resilience and stability in the face of global disruptions. The findings underscore the need for collaboration between stakeholders, including government, supermarkets, and farmers, to create a more sustainable and secure food system for Curacao.

Chapter 5: Summary of Findings, Conclusion, and Recommendations

5.1 Summary of Findings

Chapter 4 showed into qualitative research methods, presenting data from interviews with key stakeholders in Curacao's food supply chain, including supermarkets, minimarkets, and local farmers. The interviews were structured around sub-questions that explored the impact of the

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Covid-19 pandemic on various aspects of food security. The findings are presented below in relation to each sub-question:

Sub-Question 1: Impact on Food Availability and Prices

The Covid-19 pandemic significantly disrupted the availability of food products in local supermarkets and minimarkets due to delayed shipments, disruptions in the global supply chain, and increased shipping costs. Some products experienced shortages, leading to higher prices. Panic buying and increased demand for certain items contributed to price hikes. The reliance on imports highlighted vulnerabilities in the food supply chain.

Sub-Question 2: Socio-Economic Impact on Consumers

Lockdown restrictions had notable socio-economic effects on local consumers, with altered purchasing behaviors and stress levels. Supermarkets experienced changes in business hours and reduced foot traffic. Government subsidy cards influenced consumer purchasing power. There were shifts in clientele, with higher-income individuals utilizing government support for groceries. The situation highlighted the complex dynamics between economic factors, consumer behaviors, and government assistance.

Sub-Question 3: Stimulating Agriculture in Curacao

Efforts to stimulate agriculture in Curacao included promoting healthy diets, supporting local products, and establishing better relationships between supermarkets and local farmers. Supermarkets aimed to promote healthier choices, yet consumer preferences for specific products posed challenges. While supermarkets purchased produce from local farmers, improvements were needed in terms of variety and consistency. Government incentives and support were identified as critical factors in fostering local agricultural production.

Sub-Question 4: Food Security Post Covid-19

The stability of food security in Curacao post-Covid-19 remained a concern. While some improvements in product availability and stability were observed, the situation had not fully normalized. Challenges such as high freight costs and inconsistent supply continued to impact food

security. Supermarkets adapted to pandemic challenges, but uncertainties remained, emphasizing the need for resilience and reduced import dependence.

5.2 Conclusion

The study's qualitative interviews provided valuable insights into the multifaceted effects of the Covid-19 pandemic on food security in Curacao. The disruptions in food availability, shifts in consumer behaviors, and challenges in stimulating local agriculture highlighted the vulnerabilities in the existing food supply chain. While certain improvements have been observed, the overall stability of food security remains a concern. This calls for collaborative efforts from various stakeholders to ensure a more resilient and sustainable food system in Curacao. **The impact of COVID-19 on Curacao's food security** encompasses disruptions in food availability, changes in consumer behavior, challenges in stimulating local agriculture, and ongoing concerns about stability. The pandemic underscored the vulnerabilities of relying heavily on imports and highlighted the need for resilient local food production systems. Building a more secure food system in Curacao involves collaboration between various stakeholders and considering strategies to enhance local production, supply chain resilience, and consumer awareness of healthy diets.

5.3 Recommendations

Based on the findings and discussions, several recommendations can be put forth to enhance food security and promote a more sustainable food system in Curacao:

Government Support for Agriculture: The government should consider implementing measures to incentivize and support local agricultural production. This could include providing financial incentives, technical assistance, and research support to local farmers.

Diversification of Food Sources: Supermarkets and minimarkets could explore diversifying their sources of food products, including building stronger relationships with local farmers and producers. This can reduce dependence on imports and enhance local food security.

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Consumer Education: Initiatives to raise awareness about healthy diets and locally sourced products can be intensified. Collaborative efforts between supermarkets, government agencies, and health organizations can help promote healthier food choices.

Supply Chain Resilience: The Covid-19 pandemic highlighted vulnerabilities in the global supply chain. Stakeholders should work together to develop strategies that enhance supply chain resilience, reduce lead times, and ensure consistent product availability.

Long-Term Planning: Supermarkets and minimarkets can work with local farmers to create long-term supply agreements, providing stability for both parties. Government policies that support such agreements could further incentivize local production.

Emergency Preparedness: Supermarkets and the government should collaborate to develop emergency preparedness plans that address potential disruptions in the food supply chain, including border closures or other crises.

Research and Innovation: Investment in research and innovation within the agricultural sector can lead to improved farming practices, increased crop yields, and greater overall efficiency.

In conclusion, the findings from this study underscore the importance of a resilient and diversified food supply chain, especially in the face of global disruptions such as the Covid-19 pandemic. Collaborative efforts between supermarkets, local farmers, and government agencies are crucial for achieving a more secure and sustainable food system in Curacao. By implementing the recommended strategies, Curacao can be better prepared to address future challenges and ensure food security for its population.

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