BINDURA UNIVERSITY OF SCIENCE EDUCATION

FACULTY OF COMMERCE, DEPARTMENT OF ECONOMICS

AN ANALYSIS ON EFFECT OF SUPPLY CHAIN VISIBILITY ON SUPPLY CHAIN RESILIENCE. A SURVEY OF HARARE AGRI-FOOD MANUFACTURING INDUSTRY.

TINOTENDA CHIMWANGO

(B1851305)

A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE BACHELOR OF COMMERCE HONORS DEGREE IN PURCHASING AND SUPPLY OF BINDURA UNIVERSITY OF SCIENCE EDUCATION, FACULTY OF COMMERCE

SUPERVISOR: MR CHARI

2022

APPROVAL FORM

The undersigned certify that they have supervised, read and recommend to the Bindura University of Science Education for acceptance a research project entitled: An analysis on effect of supply chain visibility on supply chain resilience. A survey of Harare Agri-food manufacturing industry by Tinotenda Chimwango in partial fulfilment of the requirements for the **Bachelor of Commerce in Purchasing and Supply Degree Program**

………………………………………………   …/…………/…………/

 (Signature of Student)   Date

....   …/…………/…………/

 (Signature of Supervisor)   Date

………………………………………………   …/…………/…………/

(Signature of the Chairperson)   Date

RELEASE FORM

NAME OF AUTHOR: TINOTENDA CHIMWANGO

TITLE OF PROJECT: AN ANALYSIS ON EFFECT OF SUPPLY CHAIN VISIBILITY ON SUPPLY CHAIN RESILIENCE. A SURVEY OF HARARE AGRI-FOOD MANUFACTURING INDUSTRY.

DEGREE TITLE: BACHELOR OF COMMERCE DEGREE IN PURCHASING AND SUPPLY

YEAR TO BE GRANTED: 2022

SIGNED..

PERMANENT ADDRESS:

PHONE NUMBER:

DEDICATION

I dedicate this project to my parents Mr and Mrs Chimwango for always believing in me and supporting me.

ABSTRACT

The point of the study was to undertake studies on the influence of supply chain visibility on supply chain resilience. A survey of Agri-food manufacturing industry in Harare was used. The objectives are as follows: to investigate the effects of supply chain visibility on supply chain resilience in the Agri-food manufacturing industry; to identify the challenges of supply chain visibility on supply chain resilience in the Agri-food manufacturing industry; and to find ways to mitigate the effects of supply chain visibility on supply chain resilience in the Agri-food manufacturing industry. The instruments utilized (secondary sources, interviews, and surveys) had both negative and good effects. An exploratory and descriptive research methodology was used, with a confidence interval of 23. Findings revealed that males outnumbered females, that respondents had more work experience, and that all respondents were literate. The effects of supply chain visibility on supply chain resilience were asked of the respondents. There are too many ways of improving supply chain visibility but quite a few resources to execute. Implementation issues are also causing our company to fail to be resilient; suppliers providing incorrect information in order to obtain a supplying contract; and too many sourcing procedures cause blurred vision to supply chain visibility. Problems include having too much information to consider in their supply market analysis, as well as PESTLEE (political, economic, social, technological, legal, and ethical, and ecological) factors that can cause supply chain visibility to be distorted, compromising the firm's supply chain resilience. Recommendations are instead of stakeholders having to track down managers to find out how far along certain contracts are, that information becomes readily available in a central repository accessible to every member of the team. Another solution which was suggested was for a firm to have close relationship with clients and suppliers so as to quickly have information on less costs.

ACKNOWLEDGEMENTS

The first and fore most acknowledgement is directed to Doctor Chari my supervisor for commitment and guidance of this study. I also want to forward my gratitude all the staff members of Economics and purchasing department for their constant encouragement and the moral support given throughout the course. My friends were also of great importance, these include Tatenda and Mebren and Lyne for their encouragement. In addition, special mention is my lovely parents, I dedicate this project to them for the generous patience, technical and financial support all through my life. May the highest Lord, bless them all.

Table of Contents

LIST OF FIGURES

LIST OF TABLES

CHAPTER I

INTRODUCTION

1.0 Introduction

This research scrutinises the impact of supply chain visibility on supply chain resilience. This chapter deliberates the study's background, problem statement, and justification. The objectives, questions, assumptions, limitations, and delimitations of the research were also discussed. Furthermore, the significance and definitions were included in the chapter.

1.1 Background of the study

Supply chain evolution, there is a gradual increase in the levels of unknown Force Maguire's and vulnerabilities that require further investigation, affecting supply chain resilience and resulting from a deficit in supply chain visibility. Companies around the world failed to be more resilient in their operations due to a lack of supply chain visibility (Mangla, et al., 2018). These gaps caused issues such as the bull whip effect, delays in deliveries and logistics, communication breakdowns along the supply chain, and disruptions in material flow along the supply chain. Bulgarian Agricore had to discard a large amount of grain due to high moisture content, which harmed the company's supply chain resilience (Priday, 2021). The incident reflects the risks of economic loss due to a deficit in supply chain visibility globally countries are overwhelmed by famine and starved people. This demonstrates the significance of supply chain visibility in today's Agri-food manufacturing supply chains.

Still, the increasing frequency of financial market volatility, accidents, natural disasters, and terrorist attacks (force Maguire in legal business) over the last decade has caused exceptional disturbances and, in most situations, resulted in massive losses. According to Seuring and Muller (2018), this problem has existed for centuries in all parts of the world and has remained unsolved. According to Ketchen and Hult, 2017 supply chain visibility encourages more agile and flexible procurement. A Japanese Lean production model is more ideal for promoting supply chain visibility and resilience, but it is not applicable in the real world because it may result in stock out if a problem not anticipated by the entire supply chain occurs (Prajogo, et al., 2016). Scholars have identified several of these factors, including market globalization as seen by Wallace et al., (2018), outsourcing, strategic offshoring and (Kim et al., 2018), and

1

shorter product life cycles as well as technological advancements, such as information systems. (Kim, et al., 2018) and improvement in tools and systems used, e.g., information systems (IS) (Daneshvar Kakhki and Gargeya, 2019) and artificial intelligence (AI) (Baryannis, et al., 2019).

To meet the growing operational problems, supply chain resilience is developing as a significant focal area within Africa's supply chain management (SCM) (Machado, et al., 2018). Uganda to mitigate supply chain risk, agro-food industries are being pushed to implement supply chain visibility as a facet forward viable solution in their operations. Mozambique, the Democratic Republic of the Congo, and Rwanda, on the other hand, face numerous operational challenges as a result of the ever-changing business landscape. This is also true in Zimbabwe, where companies such as National Foods and Silo Food Industries, Zimbabwe's largest Agri-food manufacturers and the case study for this research, operate. Silo food businesses and National foods both control their supply chain visibility completely. The flow of materials within the supply chain is disrupted, resulting in supply chain resilience failure.

Good supply chain visibility can be obtained through effective relationship management from the raw material source to the final consumer. According to Ghadge et al. (2012), maintaining supply chain relationships is costly, but a company's resilience is dependent on these good supply chain relationships. As a result, the inspiration for this study came from a deep desire to address supply chain challenges by building resilience with supply chain visibility as a pragmatic solution.

1.3 Statement of the problem

According to supply chain management experts, Zimbabwean agri-food manufacturers lost more than 58.5 percent of their profits because their supply chain visibility is hazy (Nderitu and Ngugi 2014). Silo food businesses and National foods both entirely manage their supply chain visibility, resulting in stock outs or commodities becoming perishable in their warehouses. The flow of materials within the supply chain is disrupted, resulting in supply chain resilience failure.

1.4 Objectives

- To explore the effects of supply chain visibility on supply chain resilience in Agri-food manufacturing industry.
- To determine the challenges of supply chain visibility affecting supply chain resilience in Agri-food manufacturing industry.

- To find ways to curb the effects of supply chain visibility on supply chain resilience in Agri-food manufacturing industry.

1.5 Questions

- What are the effects of supply chain visibility on supply chain resilience in Agri-food manufacturing industry?
- What are the challenges of supply chain visibility affecting supply chain resilience in Agri-food manufacturing industry?
- What are ways to curb the effects of supply chain visibility on supply chain resilience in Agri-food manufacturing industry?

1.6 Significance of this Study

1.6.1 To the researcher

The research is done as part of the Bachelor (Honours) degree requirements and helps to understand the impact of supply chain visibility on supply chain resilience.

1.6.2 To the Silo food industries and National foods

The research helps firms understand how supply chain visibility affects supply chain resilience. Industry may use the study's solution to handle supply chain visibility and supply chain resilience disruptions, as well as identify areas for investment. The research also assisted organizations in considering supply chain visibility as a business driver for supply chain resilience.

1.6.3 To the University

This study adds to the university's library for scholars and other researchers who need to conduct similar research. The university is attempting to put some of the research recommendations into action.

1.7 Research Assumptions

According to Gates (2002), assumptions are issues and facts that exist in a study and have an effect on supply chain visibility and supply chain resilience due to the known existence of other facts. This study was founded on the following assumptions:

- That the researcher obtained access to all of the records required for the research study from Silo food industries and National foods.

- That the research was carried out and completed on time.
- That the participants of the inquiry provided independent and dependable information.

1.8 Delimitation of the Study

Delimitations are boundaries established by the researcher to control the scope of a study (Al-root, 2017). The researcher concentrated primarily on an examination of the effect of supply chain visibility on supply chain resilience in the agri-food manufacturing industries in Harare (2020-21). As a case study, data was gathered from the Silo food industries and National foods.

1.9 Limitations of the study

According to Gates (2002), limitations are variables over which the researcher has no control. Because some respondents were busy, not all of the questionnaires distributed to Silo food industries and National foods were completed. To overcome this limitation, the researcher used personal interviews and observations to improve the research's success.

1.10 Definition of Terms

Supply chain management is the link of firms and stakeholders that are involved in collaborating the distribution of products or services from the first tier supplier i.e. where raw materials are obtained to the last consumer (Tang, 2006).

A **supply chain vulnerability** is a fault or probable risks or disturbances in the supply chain network (CIPS, 2013).

Supply chain resilience means the capacity to plan and scheme the supply chain networks pro-actively anticipate unexpected challenges.

1.11 Chapter summary

The study's background, problem statement, and justification were all presented in the first chapter. The research's aims, questions, assumptions, limitations, and delimitations were also examined. The chapter also contained the significance of the study as well as definitions of essential words. The following chapter is a literature review.

CHAPTER II

LITERATURE REVIEW

2.0 Introduction

The literature review chapter conducts a thorough and rigorous critical examination of previously published and established scholarly work. The primary purpose of Chapter (ii) is to investigate crucial areas of supply chain visibility and resilience, as well as to identify critical concerns that must be addressed immediately. The research includes a thematic review of the literature. Thematic reviews of the literature, as opposed to chronological reviews, are organized and concentrated around the topic or theme under consideration. As a result, this method is suitable for identifying research gaps.

2.1 Conceptual Framework

Supply chain Resilience   **Supply chain Visibility**
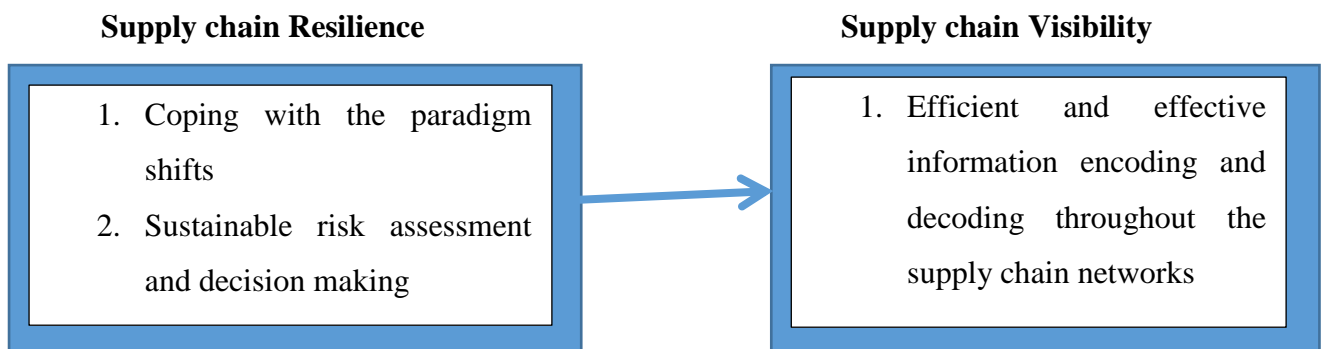
Source: Primary Data, (2022)

Figure 2. 1*: Conceptual Framework*

Supply chain Visibility is our independent variance, and Supply chain Resilience is our dependent variable, as seen in Figure 2.1 above.

2.1.1 Supply chain Resilience

The environment in which organizations function is becoming more unpredictable and volatile. As a result, supply chain disruptions could affect any company along the supply chain (Ambulkar, et al., 2015). As a result of this realization, academics and practitioners are searching for practical strategies for handling supply chain interruptions (Blackhurst, et al., 2011). Resilience is one of the most effective strategies for addressing risks and vulnerabilities

in the supply chain, according to both academics and practitioners (Melnyk, et al., 2016). Due to the significant negative effects of uncontrolled vulnerabilities and unabated risks, such as financial loss, subpar operational performance, etc., designing robust supply chains is essential (Hendricks and Singhal, 2003). According to a recent World Economic Forum research on global risks, 80 percent of the businesses surveyed thought that supply chain resilience was an urgent issue that needed immediate attention (World Economic Forum, 2017). As a result, businesses are concentrating on developing resilience to reduce risks (Melnyk, et al., 2010). Resilience is a crucial component of supply chain management, according to recent research, and this cannot be overstated.

Responsible supply chains enable businesses to effectively manage any disturbances that may occur, sustaining supplying products and services to their consumers (Wieland and Wallenburg, 2013). As a result, organizations must build resilience into their supply chains to mitigate the impact of unforeseen and unquantifiable risks. Whereas many scholars and practitioners believe that supply chain resilience is critical, there is conflicting information about what it is and how it works (Melnyk, et al., 2016). Furthermore, practitioners disagree on how and where and how to deploy resources in their supply chains to prevent risks and recover from interruptions.

2.1.2 Supply Chain Visibility

According to Sheffi and Rice, supply chain visibility (SCV) is the readiness of parts, constituents, or goods in transhipment to be checked from the production point to their final destination (2005). Through use of SCV can strengthen and improve the supply chain by making information more easily accessible to all parties involved, including the client. As organizations have outsourced segments of their supply chains and lost greater visibility and control over what used to be a part of their own operations, supply chain visibility has increased in importance. By enabling privileged users to take action and restructure demand or reroute supply, supply chain visibility technology fosters swift responsiveness to change (Chopra and Sodhi, 2014). Easing pain points should be the main goal of a business case for adopting supply chain visibility software. For instance, gaining visibility into disruptions that might affect product delivery might be a priority for a manufacturer who deals with contract outsourcing, whereas gaining visibility into supplier inventory shortages that might have an adverse effect on order fill rates might be a priority for a manufacturer of packaged goods.

Manufacturers use supply chain visibility as an assistance in complying with trade practices regulations, environmental duties, and imminent run and track-and-trace rules. Tallying to philanthropic an accurate, real-time depiction of demand indications and supplier inventory altitudes. Programs for supply chain visibility are coordinated with tragedy repossession strategies in several sectors.

2.2 Theoretical Framework

2.2.1 Three Phases of Supply Chain Resilience

Source: **(Kamalahmadi and Parast, 2016)**

Figure 2. 2: Three Phases of Supply Chain Resilience

The majority of Supply Chain Resilience models and frameworks are based on the three components of "anticipation," "resistance," and "recovery" (Melnyk, et al., 2016). However, as illustrated in the depiction in figure 2 above, Kamalahmadi and Parast (2016) created a three-phase model that announces the notion of anticipation. The phrase used for study view is connected to expectation, which encourages a practical approach (Ponis and Koronis, 2012). This level motivates supply chain managers to use all available tools to foresee disruptions and respond effectively (Kamalahmadi and Parast, 2016). As a result, managers must be able to understand the consequences of any disruptions, quantify the risk's probability, and put in place the required backup plans.

The major goal of resistance is to keep internal structure and function under control so that the department can preserve its position. While recovery and reaction require quick and efficient responses to the supply chain issue a corporation is now experiencing.

2.2.2 Resistance and Recovery Matrix
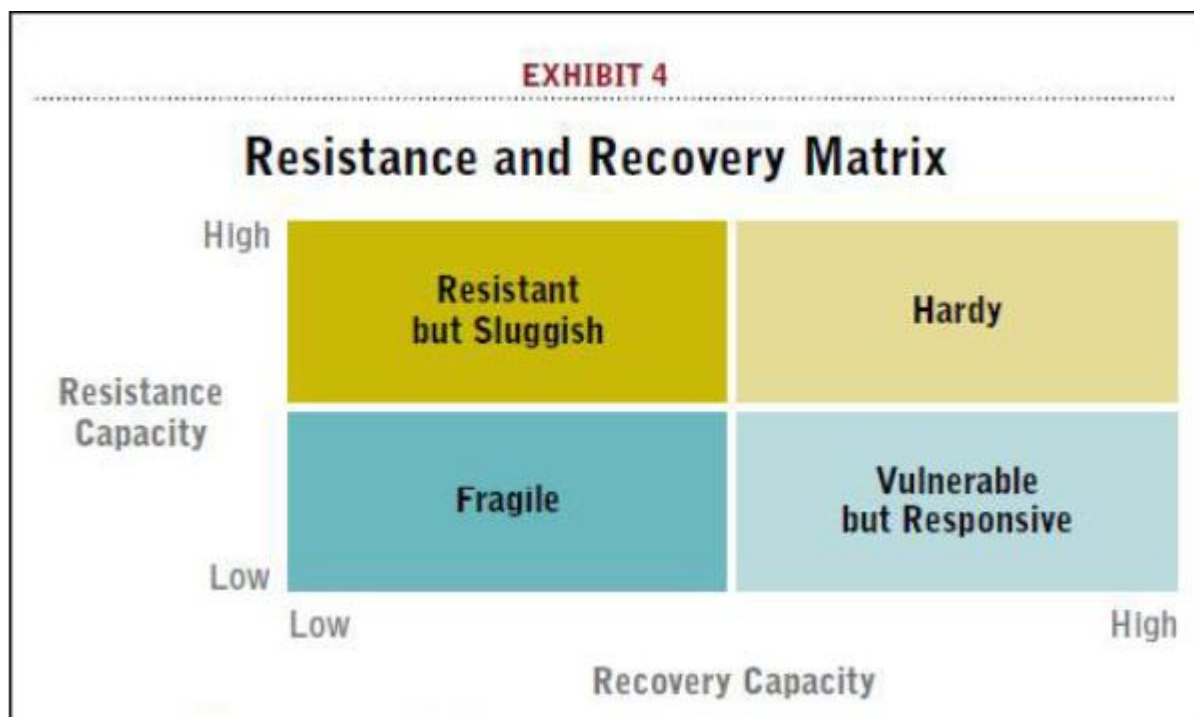
Source: (Michigan State University, 2015)

Figure 2. 3: Resistance and Recovery Matrix

According to a 2015 thesis from Michigan State University, when assessing supply chain visibility seriously, the matter of brittleness is crucial and, if not appropriately done, can put any firm in a very precarious position. The word "fragile" denotes a lack of resilience and capacity for recovery. 'Hardy' supply chains are capable of high levels of resistance and recovery. Research supports risk identification, assessment, mitigation, and actions as ways to reduce and address supply chain risks (Fan, et al., 2016). While information on supply chain risk (SCR) is essential for many of these tasks, including implementation and decision-making, the relevance of a firm's information processing capability cannot be overstated (Fan, et al., 2017).

2.2.2 Stakeholder Mapping

According to Edward Freeman's (1984) thesis, a company should map out its stakeholders and attempt to predict their demands. Stakeholder mapping enables organizations to continue operating effectively and efficiently. This covers visibility as well as resilience in supply chain, procurement and purcharcing. According to the principle, a company shouldn't run its operations as if it had no stakeholders; instead, it should tear down organizational silos,

collaborate closely with its stakeholders, and be more resilient. The theory also recognizes that because to the existence of constrained resources and unending needs, it is impossible to satisfy all stakeholders equally. Thus, it proposes that a company should have a priority list in order to balance protecting the interests of its stakeholders with its own. This will foster positive connections and upsurge the visibility.

2.3 Empirical Evidence

The goal of empirical literature is to connect the findings of one study to the findings of other researchers. According to McDaniel and Gates (2002), it aids in determining the study's gap.

Effects of stakeholder mapping on supply chain resilience on Local Council Board in Malaysia

Junli (2018) conducted a thesis on paraphernalia of stakeholder mapping on resilience in supply chain on the Malaysian Local Council Board. On a sample size of 300 respondents, the researcher used for data assemblage a structured cross-section survey, questionnaires, and focus group discussions. According to the discoveries, there is a link between stakeholder mapping and supply chain resilience. The findings suggested that poor stakeholder management was causing major supply chain disruptions in Malaysia, as evidenced by huge inconsistencies in the supplier-buyer relationship. The local council board was advised to order goods and services that they could afford in the near future.

An assessment of stakeholder management and Supply chain resilient in food manufacturing firm: A Case Study of Kaliro , Uganda.

Machingauta (2014) used an exploratory research design to investigate stakeholder management and supply chain resilience in food manufacturing firms, using Kaliro as a case study. The findings revealed a link between stakeholder management and supply chain resilience work. More specifically, observations were utilised for gathering data, which was then qualitatively analyzed. According to the study, poor stakeholder management is the leading cause of failure in food manufacturing firms. However, findings revealed that food manufacturing firms were failing to provide promised services to the people by failing to compensate their workers on time, which resulted in supply chain corruption, compromising the firms' pliability.

The impact of supply chain visibility on food manufacturing firm development projects. A Case Study of 5 food firms in Kogi East a District of Nigeria.

Edogbanya and Sule (2013) investigated the influence of visibility on the development of food manufacturing firms. The study took a qualitative approach, with data collected through interviews in person and discussions online. According to verdicts, food manufacturing companies were providing poor services due to poor communication with their suppliers. Furthermore, food outlets such as Ojo Manufacturing had sufficient funds to maintain long-term relationships with available suppliers. The researcher advised food manufacturing companies to borrow more funds or seek donations in order to uphold good visibility in the procuring chain.

Supply chain visibility challenges in Western Province. A Case of Kakamega Maize grinding firm 2010-11.

Kerudo (2012) conducted research on issues with supply chain visibility. The sample size was 250 and the target population was 400. The participants were chosen by stratified random sampling. On the scheduled date, questionnaires were given out and collected. Some of the respondents, the study highlighted, did not even complete secondary education. The study showed that the Kakamega Maize Grinding Company was having issues with increasing supply chain visibility, in addition to being impacted by the bull whip.

2.3 Research Gap

Supply chain visibility appears to be a significant issue right now for resilience in the supply chain processes globally. So, decreasing the chances of a visibility discrepancy can significantly improve resilience. Numerous academics have strongminded deliberated that supply chain visibility exists as a factor in supply chain resilience issues, but the findings are insufficient or even conflicting, and no researcher has employed focus group talks as a method of data collection. The study is distinctive among works of literature in Zimbabwe. The goals that this study has adopted are distinct from those other researchers have undertaken. The individual perspectives on how visibility influences resilience in procurement upper and lower tier are still not well understood.

2.5 Summary

This chapter looked at the conceptual, theoretical, and empirical framework of the study. The next chapter, three, presents the research methodology.

<center>**CHAPTER III**</center>

<center>**RESEARCH METHODOLOGY**</center>

3.0 Introduction

A literature review was covered in the preceding chapter. This chapter discusses sample size calculations, sampling methodologies, population, and research design. Additionally, methods for data processing, analysis, and presentation as well as ethical issues are explored.

3.1 Research Design

According to Burns and Bush (2010), descriptive research design is the most organized and formal sort of research that is undertaken to understand more about the broad span of the study issue. A descriptive research design was used to guarantee that the gap was filled. A case study design was also employed to outline how, when, and where facts are acquired, as well as how consideration was given to a hands-on setting. According to Borg and Gall, the case study technique was chosen because it allowed the researcher to delve into depth and detail about the examples, circumstances, or events they had chosen (1993).

3.2 Population

Population is suggested by McDaniel and Gates (2002) as the total amount of the elements being studied. The whole workforce at Silo Food Industries Aspindale and National Foods Lytton is the study's target demographic. Finance, internal auditing, public services inspections, internal affairs, supply chain, logistics, service delivery operations, loss control, quality assurance, statistics and quantity surveying, administration and caretaking, human resources, and safety and health were among the departments that were under investigation. 32 people make up the entire target population.

3.3 Sample Size

A typical sample size, according to Braun and Clarke (2006), is the amount of research done on a portion of the population being studied. The sample size was established using the Yamane equation.

Below is Yamane equation;

The Yamane equation is $n = \dfrac{N}{1+Ne^2}$. Where n = Sample size

N= Population size

e = Margin of error

Source: Yamane, (1967)

The sample size is 32/ [1+32x (0.05)2] = 23 respondents using the formula N/ (1+Ne2). These sample size formula-determined respondents were drawn from the targeted population using sampling procedures.

3.4 Stratified sampling

The researcher utilized stratified random sampling since the target population under investigation has well-defined strata. Stratified sampling, according to Malhotra (2010), is a probability sampling approach that separates the population into subpopulations or strata in two phases. The responses were sorted into two groups by the researcher. Employees from Silo Foods and National Foods one were picked at random, as indicated in the table below;

Table 3. 1: Sample Population

Details	Targeted population	Sample Population
Silo Foods	89	15
National Foods	97	17
Total	186	32

Source: primary data, (2022)

3.5 Sources of Data

3.5.1 Secondary sources

According to Wimmie and Dominic (2013), secondary data is data that has already existed and was acquired for objectives other than those for which the researcher plans to utilize it. Secondary data was gathered from journal articles, textbooks, and theses to corroborate the existence of the problem.

3.5.2 Primary sources

Due to various Covid 19's implementation of social distance, primary data in this study was collected via an electronic questionnaire.

3.6 Data Collection Instruments

To collect qualitative information, an emailed questionnaire was also used.

3.6.1 Questionnaire

A questionnaire is a published or written series of questions with particular answer possibilities used for statistical research (Zohrabi, 2013). There were two surveys developed: one for committee members and one for staff. A 6-point Likert Scale to the questionnaire emailed to respondents was used to collect data and scale replies in survey research. The researcher's Likert Scale for this study is as follows key; **never (1)**, **rarely (2), sometimes (3)**, **Often (4), mostly (5), and always (6).** A well-designed questionnaire offered numerous advantages and few problems.

Advantages

The mailed questionnaire allowed individuals the option to respond and participate at their leisure. It was simple to connect data collected using this way.

Disadvantages

Questionnaires, on the other hand, lacked validity due to exaggeration or lying by certain individuals. Other strategies were utilized to increase the quality of the questionnaire's confirmation. The network was hazy and slow, but the operation was completed successfully.

3.7 Pilot Study

The researcher performs pilot testing on a small sample of respondents to analyze, identify, and correct flaws and limitations in the questionnaire or interviews (Taylor, 2013). The researcher issued ten questionnaires to subordinates to test the study apparatus.

Advantages

According to the pilot survey, respondents had difficulty comprehending bankruptcy law. The researcher used simple words and expressions to address this issue.

Disadvantage

It will not provide the genuine issues that may emerge in the investigated situation.

3.8 Data Collection Procedure and Administration

The methods used to collect main and secondary data are referred to as data collection procedures and administration. The researcher sent questionnaires to respondents through

email. The human resource manager and the finance manager gave the researcher permission to collect information from participants prior to delivering the questionnaires through email.

3.9 Reliability and Validity

3.9.1 Reliability

Reliability is the degree to which information mistakes are eliminated (Joppe, 2015). The number of questions used to assess the variable relevance has a strong relationship with reliability. To ensure data dependability, the researcher used interviews and questionnaires. The study questionnaire's reliability was further tested using Cronbachs alpha in the SPSS program.

The alpha coefficients from Cronbachs alpha follow the following interpretation guidelines;

Table 3. 2

Alpha	Interpretations
Less than 0.9 represent	Very highly reliable
0.80 to 0.9	highly reliable
0.70 to 0.79	reliable
0.6 to 0.69	marginal/minimally reliable
Greater than 0.6	unacceptably low reliability

Source: primary data, (2022)

In addition, interviews assisted the researcher to have an insight into the data collected using questionnaires. The researcher also used the triangulation method.

3.9.2 Validity

The validity of the questionnaire was checked using Product Movement Pearson Correlations with the total score in SPSS. A significantly associated questionnaire with a total value is discovered, indicating that the instrument is legitimate.

Product Movement Pearson Correlations follows the following guideline;

1)   The instrument is invalid if the significant value <0.05,

2)   The instrument is invalid if the significant value >0.05

3.10 Data Presentation and Analysis Procedures

Because raw data is usually large and difficult to understand, it must be reduced and simplified for analysis. To match similar patients and see patterns, Microsoft Excel and SPSS were used to codify and categorize the data collected for this study. After creating data summaries using the aforementioned procedures, the researcher presented the data using summaries, graphs, pie charts, and tables. This made it easier to handle, analyze, comprehend, and debate the gathered data.

3.11 Ethical Considerations

Respondents were treated with decency, fairness, and respect. All responders were assured anonymity, secrecy, and privacy. Personal identity information was not included in the questionnaire or interview guide.

3.12 Chapter Summary

This chapter discussed the methodologies used in this study, including the instruments, processes, and designs used to collect data. The following chapter discusses data presentation and analysis.

CHAPTER IV

DATA PRESENTATION, ANALYSIS AND DISCUSSIONS

4.0 Introduction

This chapter covered data that the researcher had gathered and examined with SPSS and Microsoft Excel.

4.1 Response Rate

Table 4. 1: Response Rate for questionnaire

Response Rate Target group	Sample Size	Responses	Response Rate
Top Management	2	2	100%
Middle Management	4	4	100%
Lower Management	3	3	100%
Non-Managerial Staff	7	7	100%
Other stakeholders	7	7	100%
Total	**23**	**23**	100%

Source: Primary Data, (2022)

A questionnaire emailed to these candidates was used to collect data from a total of 23 respondents out of the target figure of 23 respondents. As shown in table 4.1 above, this translated to a response rate of 100%, which the researcher deemed sufficient and representative for this study.

Table 4. 2: Response Rate for interview

Response Rate Target group	Sample Size	Responses	Response Rate
Top Management	1	1	100%
Middle Management	1	1	100%
Lower Management	1	1	100%
Non-Managerial Staff	1	1	100%
Other stakeholders	1	1	100%
Total	**5**	**5**	100%

On interviews all participants also responded and the response rate was 100% as shown by table 4.2 above. Saunders (2016), this response is perfect to make conclusive findings.

4.2 Demographic Information

The researcher sought information on various aspects concerning the demographic information under study. The results are presented and clarified below.

4.2.1 Academic levels attained by respondents

The positions in the organisation of the respondents that participated in the survey are shown on the pie chart below:
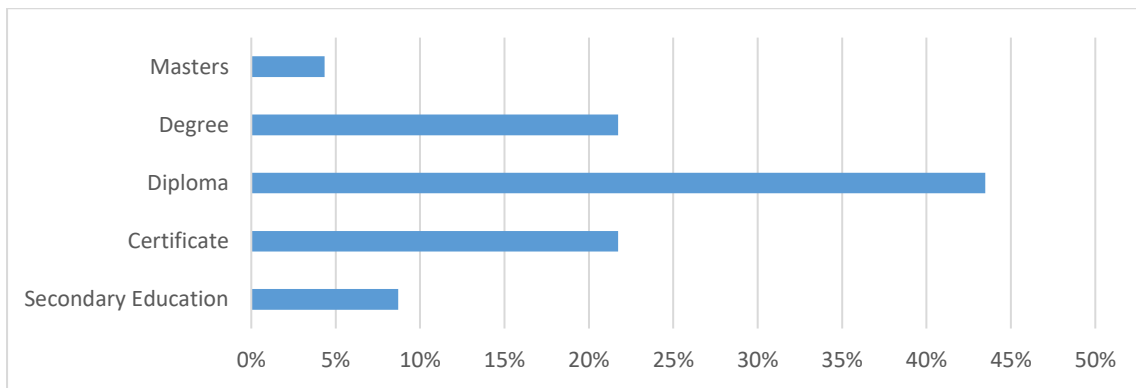
Figure 4. 1: Education levels attained by respondents

The above Figure 4.1 shows that most of the respondents have diplomas.4% which is the least have masters. This generally shows that the research data obtained is authentic since most of the participants are well educated and every participant is considered literate.

4.2.2 Distribution of Positions Held
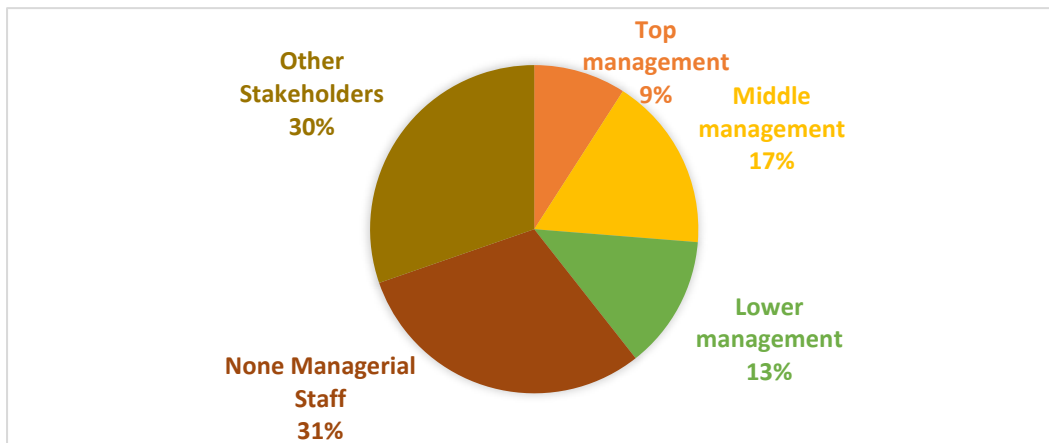
Figure 4. 2: Distribution of Positions Held

According to Figure 4.2, 38% of respondents were non-management staff, 31% were middle management, 25% were lower management, and 6% were top management. This indicates that the research incorporated findings from all levels of the organization.

4.2.3 Gender Distribution

81%

19%
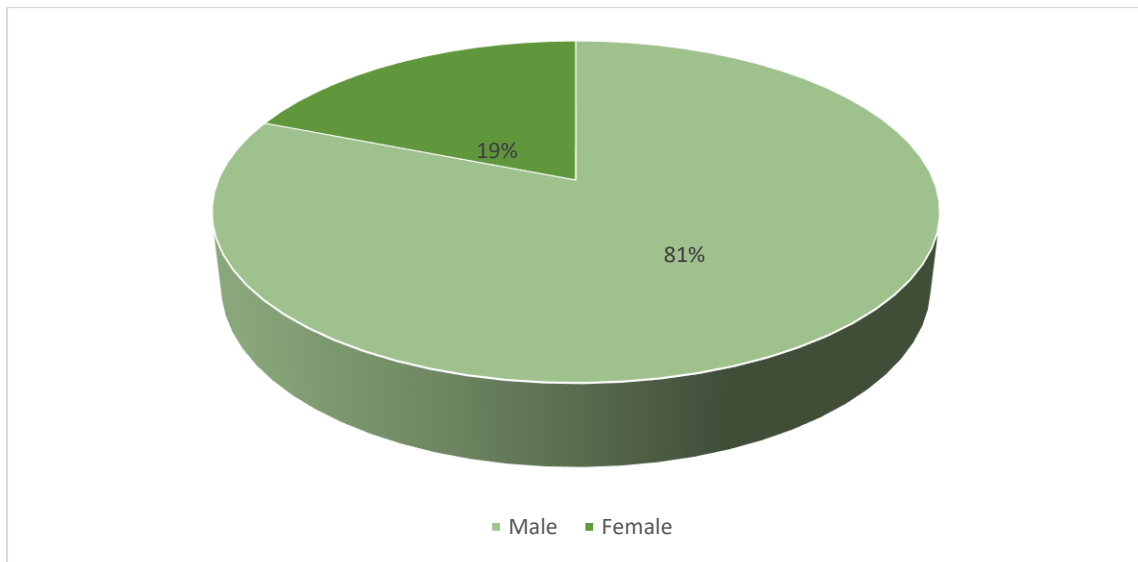
■ Male ■ Female

Source: Primary Data, (2022)

Figure 4. 3: Gender of Respondent

Figure 4.3 shows that 81 percent of respondents were male and 19 percent were female, indicating a clear gender disparity in the organization. As a result, this survey had more male respondents than female respondents.

4.2.4 Experience at work place

The Ages of the research participants are presented in the figure below:

18
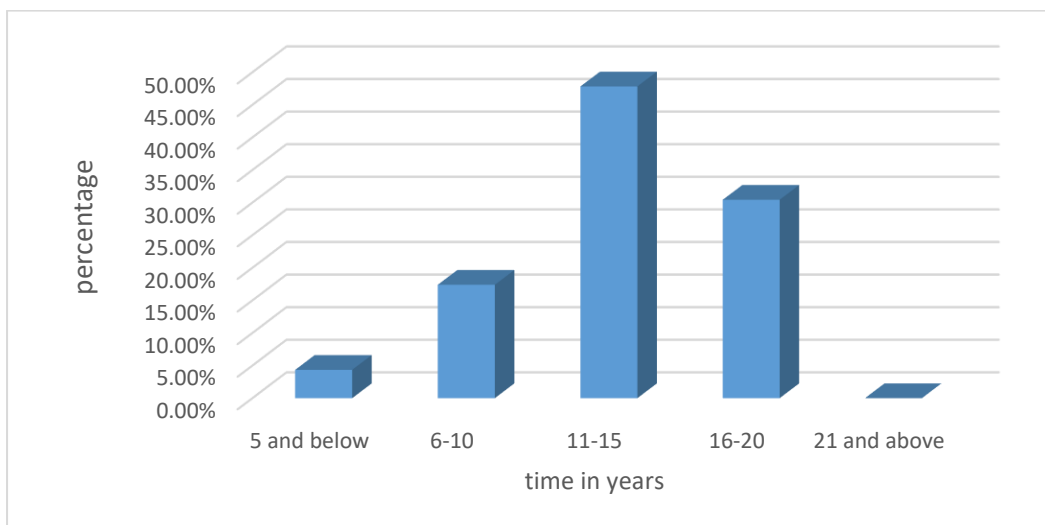
Source: Primary Data, (2022)

Figure 4. 4: Working experience of the respondents

As depicted in the figure 4.4 above, 4.35% of the respondents are 5 years and below, 17.39% of the respondents had work experience of 6-10 years. The majority 31% worked for 11-15 years with 47.83%. Whilst, 30.43% of the respondents had working experience of between 16 and 20 years. Lastly, there is no respondent worked 21 years and above. This information indicate that the research collected high quality data to a greater extend

4.3 SECTION B ACHIEVING OBJECTIVES

The study's objectives are to investigate the effects of supply chain visibility on supply chain resilience in the Agri-food manufacturing industry, to identify the challenges of supply chain visibility on supply chain resilience in the Agri-food manufacturing industry, and to find ways to mitigate the effects of supply chain visibility on supply chain resilience in the Agri-food manufacturing industry.

4.3.1 The effects of supply chain visibility on supply chain resilience

The participants were asked questions about the implications of supply chain visibility on supply chain resilience. Employees will be unable to operate normally if they are uninformed of what is going on in the supply chain, according to respondents. Respondent 6 (**5 April, 2022)** stated, for example, that "for supply chain management to be resilient, proper supply chain visibility is required," and that "failure to have supply chain transparency will result in bull whip consequences, late deliveries, interrupted material flow, bottlenecks in business processes, and a negative reputation among stakeholders."

4.3.2 The challenges of supply chain visibility affecting supply chain resilience

The respondents were asked to identify supply chain visibility challenges that affect their company's resilience in the agri-food industry. Respondents were most concerned about transportation and logistics issues. Participants stated that logistics was critical not only for moving from point A to point B, but also for maintaining product quality. Respondents felt that there were challenges in the transportation of goods, and that it was difficult to track vehicles as they moved to come and deliver goods because the suppliers were the ones to facilitate delivery logistics. Agri-food companies created long term relationships with their clients and suppliers.

19

The researcher used an interview to ask the respondents if they faced any challenges and if so, what those challenges were. All interviewees stated that they were difficulties. According to one interviewee, "t*here are too many ways to have supply chain visibility but limited resources to implement, so as a result, procurement team is confused on which strategy to adopt to ensure visibility."* (Interviewee 9**, April 13, 2022)**

Others say that "*some supply chain visibility strategies are determined by the stores team because they are the ones who know if there is space in the warehouse thus the buyers may fail to plan well ending up buying very few products which may fail to sustain the organizational needs thus no resilience will be met, leaving the buying team to blame*." (Interviewee 1, **April 13th, 2022**)

Other challenges mentioned include "implementation problems are also causing our company to fail to be resilient, suppliers providing incorrect information to gain a supplying contract, and too many sourcing procedures cause blur vision to supply chain visibility." *Suppliers, for example, may raise prices to account for inflation, but on th*e *other hand making the procuring entity fail to be resilience if they did not anticipate the problem."* (**Respondent 3 and 7**, *13 April 2022). "Most of the time if products are rejected by the customer its usually 2 or 3 cases of a product, so rather than bringing them back here, we just tell the driver to throw them away*" (Respondent 23, **April 2022**).

Moreover, participants state that *"Problems faces are too much information to consider in their supply market analysis, PESTLEE (political, economic, social, technological, legal and ethics and ecological) factors may cause distortion to supply chain visibility and hence compromised the firm' supply chain resilience."* (**Respondent 5**, *13 April 2022).*

4.3.3 Ways to curb the effects of supply chain visibility on supply chain resilience

The respondents believe that the more visibility and efficiency put into an organization's procurement strategy, the more productive the firm will become since visibility helps organizations to save someone's substantial amount of time formerly spent discussing the status from each contract. Rather of stakeholders needing to follow down management to find out that how far along various contracts are, that information is now easily accessible in a single repository accessible to all team members. "This simplified technique allows each individual participating in the process to reclaim a significant amount of time, which they can then spend in other critical problems," according to the authors (Respondent 5, **13 April 2022**). It also

allows all stakeholders to quickly discover whether personnel in different departments are working on the same projects. Another solution suggested was as a company to maintain close relationships with clients and suppliers in order to obtain information quickly and at lower cost.

4.4 The extend at which the Agri-food companies are resilience
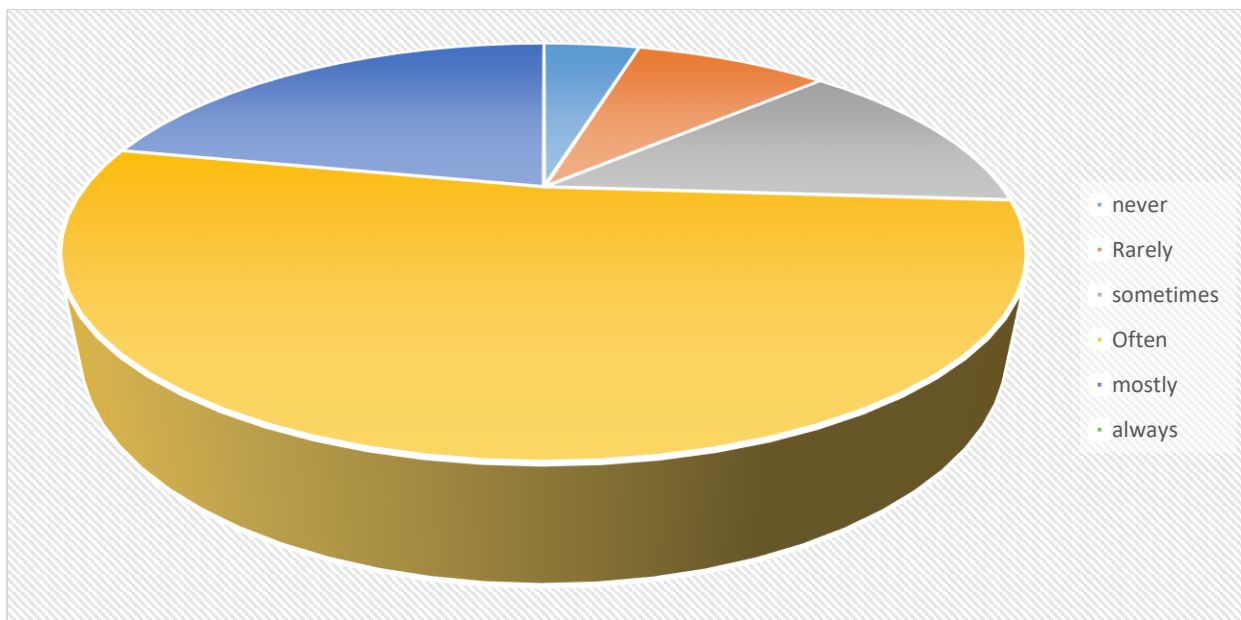
Source: Primary Data, (2022)

Figure 4. 5: The extend at which the Agri-food companies are resilience

The respondents were asked that the extent at which the Agri-food companies are resilience in their supply chain management.

4.4.2 Company Policy aims to maintain a relationship between buyers and suppliers
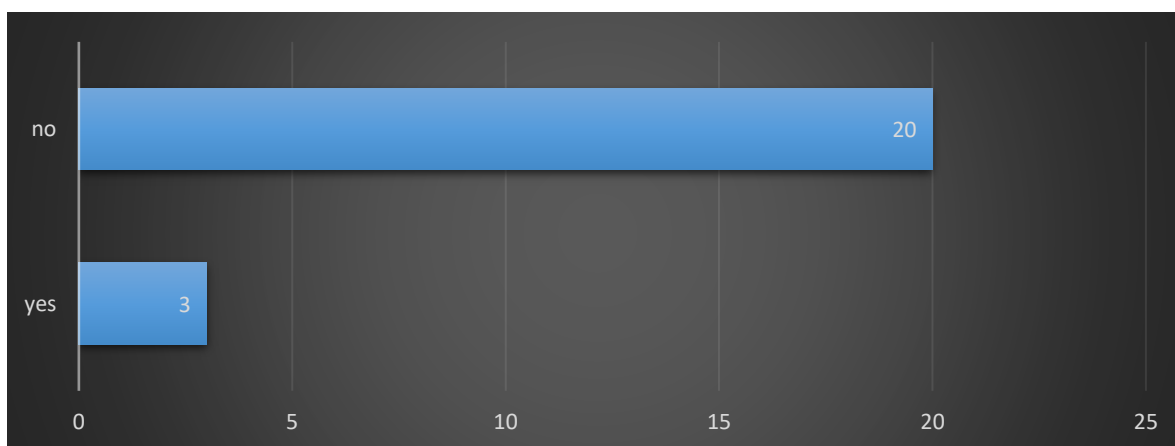
Source: Primary Data, (2022)

Figure 4. 6: Company Policy aims to maintain a relationship between buyers and suppliers

The above figure 4.6 shows that most respondents are saying there are no Company Policy which aims to maintain a relationship between buyers and suppliers. Only 3 respondents answered yes.

4.4.3 Strategies mainly used to be resilient

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Early supplier involvement	23	3.00	6.00	3.6087	.83878
Including suppliers in ERP systems	23	2.00	5.00	3.1739	.77765
Constant communication with stakeholders	23	4.00	6.00	4.8696	.45770
Stakeholder mapping	23	2.00	4.00	3.0000	.67420
reciprocity	23	1.00	3.00	2.3043	.70290
holding too many stocks	23	1.00	4.00	2.3478	1.11227
maintaing good relationships with suppliers	23	4.00	5.00	4.5652	.50687
researching and market analysis	23	4.00	6.00	4.7391	.68870
Valid N (listwise)	23				

Source: SPSS, (2022)

Respondents were asked the extent they used the above strategies to have visibility and resilient in their supply chain. As shown above they main communicate with stakeholders to be able to cope. However, they did not keep too much stock as a strategy to a greater extent.

4.5 Discussion

In this section of Chapter four, the researcher will discuss major findings in relation to the objectives in chronological order, compare research findings with a literature review and, most importantly, empirical evidence, and take note of commonalities and contrasts, as well as provide possible reasons for different variants..

4.5.1 Major Findings

As previously stated and displayed by the researcher under data presentation and analysis, the researcher attempted to meet the objectives of the research in order to provide suggestions to the statement of the problem Agri-food industry firms are experiencing. As a result, the findings attempted to answer all of the research questions.

In regards to respondents' demographic data, more males participated the females, more respondents had longer working experience and all respondents were literate. 38% of the respondents were non managerial staff 31% were middle management, 25% lower management and 6% top management. This generally shows that the research incorporated results from all levels in the organisation. The respondents were asked about the effects of supply chain visibility on supply chain resilience.

In an attempt to satisfy the objective that is to find to explore the effects of supply chain visibility on supply chain resilience in Agri-food manufacturing industry; to determine the challenges of supply chain visibility affecting supply chain resilience in Agri-food manufacturing industry; and to find ways to curb the effects of supply chain visibility on supply chain resilience in Agri-food manufacturing industry. The respondents were asked about the effects of supply chain visibility on supply chain resilience. Respondents suggested that if the employee of the company are not aware what is going on within the supply chain they won't be able to be robust on their work. There are too many ways to have supply chain visibility but limited resources to implement. Implementation problems are also making our company to fail to be resilience, suppliers giving wrong information to gain a supplying contract, too many sourcing procedures makes blur vision to supply chain visibility.

Problems faces are too much information to consider in their supply market analysis, PESTLEE (political, economic, social, technological, legal and ethics and ecological) factors may cause distortion to supply chain visibility and hence compromised the firm' supply chain resilience. Ways to curb the effects of supply chain visibility on supply chain resilience includes Instead of stakeholders having to track down managers to find out how far along certain contracts are, that information becomes readily available in a central repository accessible to every member of the team. Another solution which was suggested was for a firm to have close relationship with clients and suppliers so as to quickly have information on less costs.

4.5.2 Comparing research findings with literature review and notably empirical evidence

This research found out that there is a lack of knowledge in the application of supply chain visibility, as we can see that the company has limited measures to put a halt this problem since suppliers were sometimes not disclosing relevance information to the buying company which is the affecting their resilience as a company. This was in line with Junli, (2018) in his research **Effects of stakeholder mapping on supply chain resilience on Local Council Board in Malaysia** who clearly stated that although much has been documented about supply chain

visibility at their firm and suppliers were not telling the buyers everything especially changes in product tends and demands hence change what will be supplied. To promote supply chain visibility companies should promote the relationship between the buyer and the suppler.

There are no company policies which aims to maintain a relationship between buyers and suppliers. Companies who implement supply chain visibility are resilient **An assessment of stakeholder management and Supply chain resilient in food manufacturing firm: A Case Study of Kaliro , Uganda by** Machingauta (2014). In this research it has been found by the researcher that that the food manufacturing firms were failing to offer promised services to the people by not compensating its workers on time which led to corruptions in supply chain which compromised supply chain resilience of the firms. Also Edogbanya and Sule, (2013) assessed the **impact of supply chain visibility on food manufacturing firm development projects** found companies with no clear defined supply chain visibility policy cannot be resilient in supply chain. Furthermore, the food outlets like Ojo Manufacturing had in adequate funds to maintain long relationships with the available suppliers. Which was not the Agri-food companies as they created long term relationships with their clients and suppliers.

4.6 Chapter summary

This chapter covered data presentation, analysis and discussion. The next chapter is about summary, conclusions and recommendations.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

This chapter summaries findings, concludes the study and recommendations are also made. The previous chapter was on data presentation, analysis and discussion of major findings.

5.1 Summary of the study

The purpose of this study was to conduct research on the effect of supply chain visibility on supply chain resilience. A survey of the agri-food manufacturing industry in Harare. The goals are as follows: to investigate the effects of supply chain visibility on supply chain resilience in the Agri-food manufacturing industry; to identify the challenges of supply chain visibility on

supply chain resilience in the Agri-food manufacturing industry; and to find ways to mitigate the effects of supply chain visibility on supply chain resilience in the Agri-food manufacturing industry.

The tools used (secondary sources, interviews, and questionnaires) had both positive and negative outcomes. With a sample size of 349, an exploratory research design was used. The findings revealed that more males than females participated, that more respondents had more work experience, and that all participants The effects of supply chain visibility on supply chain resilience were asked of the respondents. Respondents suggested that if employees are unaware of what is going on in the supply chain, they will be unable to perform well. There are far too many ways to improve supply chain visibility but far too few resources to implement them. Implementation issues are also causing our company to fail to be resilient, with suppliers providing incorrect information in order to win a supplying contract. Problems faces are too much information to consider in their supply market analysis, PESTLEE (political, economic, social, technological, legal and ethics and ecological) factors may cause distortion to supply chain visibility and hence compromised the firm' supply chain resilience.

Ways to curb the effects of supply chain visibility on supply chain resilience includes Instead of stakeholders having to track down managers to find out how far along certain contracts are, that information becomes readily available in a central repository accessible to every member of the team. Another solution which was suggested was for a firm to have close relationship with clients and suppliers so as to quickly have information on less costs.

5.2 Conclusions

In a thesis, the research aimed to address the effects of supply chain visibility on supply chain resilience. Both, Silo food industries and National foods entirely manage their supply chain visibility in such a way that they either experience stock out or goods go perishable in their storages. This disrupts the flow of materials within the supply chain leading to failure in supply chain resilience. The main objectives of this research were to explore the effects of supply chain visibility on supply chain resilience in Agri-food manufacturing industry; to determine the challenges of supply chain visibility affecting supply chain resilience in Agri-food manufacturing industry; and to find ways to curb the effects of supply chain visibility on supply chain resilience in Agri-food manufacturing industry. Based on the research findings and analysis presented in the preceding chapters, the conclusions are that if Agri-Food companies

implement effective supply chain visibility, this has a positive impact on the firm's supply chain resilience, and thus the flow of material within the organization will be smooth.

5.3 Recommendations

Basing on the above findings, the researcher recommends that;

- Vehicle tracking and train transporter to be effective communicators so that they can be able to plan ahead and be resilient in their supply chain operations.
- Make use of Stakeholder mapping so as to know the needs of stakeholders and create good relationship which facilitates good information and visibility thus resilience.
- Collaborative culture towards risks mitigation and network vulnerability management to critically build Supply chain resilience and visibility.

5.5Areas for Further Studies

The research feels that further studies need carried out in private organizations for inventory management and supply chain visibility checking their impact on supply chain resilience. Compare the results with this research using different methods of collecting data.

5.6 Chapter Summary

This chapter covered the summary, conclusions, recommendations and areas for further research.

REFERENCES

Adam Jr., E.E. (1994), "Alternative quality improvement practices and organizational performance". Journal of Operations Management, 12(1), 27-44

Akan et al. (2006). Critical tactics for implementing Porter's generic strategies. Journal of

Business Strategy, 27(1), 43-53

Al-root, 2017. Organizations and Environments. Englewood Cliffs, N.J: Prentice Hall American Quality Foundation &Ernest and Young (1991).International Quality Study: The Definitive study of the best International Quality Journal Management Practices. Ernest and Young, Cleveland, OH

Ambulkar, et al., 2015Total Quality Management in Public Transportation", Research Result Digest, 3,pp 1-33

Antony, J. & Baneulas, R. (2002), "Key ingredients for the effective implementation of six sigma program", Measuring Business Excellence, Vol.6, Iss.4, pp.20-27.

Antony, J., Leung, K., Knowles, G., Gosh, S. (2002), "Critical success factors of PQD implementation in Hong Kong industries", International Journal of Quality & Reliability

Management, Vol. 19 No.5, pp.551-66.

Asher, M. (1996), „Managing Quality in the service sector', Kogan Page, London

Baryannis, et al., 2019 PQD ups revenues, productivity, studies Shows, Quality, December. Bounds, M, Cases in Quality Chicago, 11,Irwin Publishing.

Beckford, J 1998. "Quality: A critical Introduction", Published by Routledge, New York

Berman E &J.P West 1995"PQD in American Cities: Hypotheses regarding commitment and Impact'. Journal of Public Administration Business Excellence, 8(4), pp 26-33

Berman E, &J.P West 1995"PQD in American Cities: Hypotheses regarding commitment and Impact". Journal of Public Administration Business Excellence, 8(4), pp 26-33

Blackhurst, et al., 2011. Quality control. 7th Ed. New York: Prentice-Hall.

Borg, W. R. & Gall, M. D. (Eds.). (1983). Educational Research an Introduction (4th Ed.).

New York, London: Longman

Burns and Bush (2010) "A comprehensive survey on how companies improve performance through quality efforts", David Butler Associates, Inc., CA,

Carr and Littiman, 1991causal model. International Journal of Production sector. Industrial

Management & Data Systems, Economics, 55(1): 1-20.

Carr, David K. and Ian D. Littman. Excellence in Government Total Quality Management in the 1990s. Arlington, VA: Coopers & Lybrand, 1991 85

Cheng, C. W. M and Liu, A. M.M (2007), "The Relationship of Organizational

Chindo, P.G. and Adogbo, K.J. (2011), "Investigation into the use of total quality in Nigerian Construction Industry: A Case Study of Large and Medium Size Firms. In West Africa Built Environment Research (Waber) Conference 19-21 July 2011 Accra, Ghana (p. 683).

CIPS, 2013. The PQD Paradox: Supply Chain Management. Strategies for Action," McGraw-Hill

Collard R (2003), Achieving Total Quality, Short Run Press Limited

Cooper, M. and Ell ram, L. (1993), 'Characteristics of Supply Chain Management and the Implications for purchasing and logistics strategy", The International Journal of Logistics Management, 4(2) pp. 13- 24

Cooper, D.R.and Schindler, P.S.(2006)Business Research Methods 9th edition New

Delphi: Tata Mc Graw Hill

Crosby, P.B. (1979, 1980), "Quality Is Free", reissue edition, Signet Culture and the Implementation of Total Quality Management in Construction Firms", Surveying and Built Environment, Vol. 18 (1), 7-16

Curwin, J and Slater, R (2008).Quantitative Methods for Business Decisions 6TH Edition Thompson Learning.

Cyert, R.M& J.G.March 1963.A Behavioural Theory of the firm. Upper Saddle River, NJ Prentice Hall.

Daneshvar Kakhki and Gargeya, 2019 PQD: An overview. In B. G. Dale (Eds.), Managing quality (3rd ed.,pp. 3-33). Oxford, UK: Blackwell-Business

Day (1984) Strategic market planning: The pursuit of competitive advantage (p. 3). St- Paul, Minnesota: West Publishing Company

Day, G. S. (1990). Market-driven strategy: processes for creating value. New York: Free Press.

Day, G. S. (1994).The capabilities of market-driven organizations. Journal of marketing, 58(4).

Dean, J., Bowen, D. (1994), "Management theory and total quality: improving research and practice through theory development", Academy of Management Review, Vol. 19 No.3, pp.392-418.

Deming W.E (1986) Out of the crisis. Cambridge: MIT Press.

Deming, W. E. (1986). Out of the crisis. Cambridge, MA: Massachusetts Institute of

Technology, Center for Advanced Engineering Study. 86

Dillon, W.R., Madden, T.J. and Firtle, N. H. (Eds.). (1993). Essentials of Marketing

Research (4th Ed.).New York, USA: Irwin, Luleå University of Technology.

Dimitriades, Z.S 2000, "Team Performance Management: An International Journal",

Volume 6, pp. 117-121

Dobyns, L and Crow ford Mason, C.1991. Quality or else: The revolution in world business: Regional Business, 157

Doyle (1994), ISO Quality System Handbook, 2nd Edition, Prentice Hall.

Easterby-smith, M., R. Thorpe, & A. Lowe. (2002), Management Research, 2nd Ed., Sage, London.

Easton, G, S, &Jarrel, S, L (1998).The effects of total quality management on corporate perfomance. An empirical investigation Journal of Business.

Easton, G., Jarrel, S. (1998), "The effect of total quality management on corporate performance", Journal of Business, Vol. 71 No.2, pp.253-307.

Edogbanya and Sule, (2013). The impact of supply chain visibility on food manufacturing firm development projects. A Case Study of 5 food firms in Kogi East a District of Nigeria

Eng, Q. E., & Yusof, S. M. (2003). A Survey of PQD Practices in the Malaysian Electrical and Electronic Industry. Total Quality Management, 14, 63-77.

Eriksson, H and Hansson, J (2003). The impact of PQD on financial performance. Measuring Business Excellence, 7(1), 36-50.

Ernst & Young. (2012). Making the right moves Global banking outlook 2012-13 Retrieved

February 12, 2013 from Financial Times Prentice Hall.

Filppini, R. and Forza, C. (1998), 'PQD Impact on Quality Conformance and Customer

Satisfaction: A Causal Model', International Journal of Production Economics

Forza, C, Filippini, R, (1998).PQD impact on quality conformance and customer

satisfaction". International Journal of Production Economics, Vol.55.No 1, pp. 1-20.

Gates, (2002) Research Methods FOR Managers London: Paul Chapman Publisher.

Garvin, D.A. (1983) .Quality on the Line, Harvard Business Review, 61,4, p.65

Ghadge, et al., (2012). Quality value-chain: a meta-synthesis of frontiers of quality movement. Academy of Management Executive, 7(2).

George (2002) Aldrich, H, E, 1979.Organizations and Environments. Englewood Cliffs, N.J:Prentice Hall

Gitlow, H. S., Oppenheim, A. V., & Oppenheim, R. (1995). Quality management: Tools and methods for improvement (pp. 4-8). Homewood, Illinois: Irwin.

Goh, P, L and Ridgway, K 1994. The implementation of total quality management in small and medium-sized manufacturing companies. The PQD magazine, 6(2), 54-60.

Guimareas, T. (1996), "PQD's impact on employee attitude", The PQD Magazine, Vol. 8 No.1, pp.20-5.

Hackman, J.R., Wageman, R. (1995), "PQD: empirical, conceptual and practical issues", Administrative Science Quarterly, Vol. 4 No.2, pp.309-20

Hands field, R, Ghosh, S and Fawcett"s.(1998)."Quality-driven change and its effects on financial performance". Quality Management Journal 5(3:13-15)

Hassin et al, (2007) Information and uncertainty in a queuing system. Probability in the Engineering and Informational Sciences, 21(3), 361.

Hellstern U. and Klefsjo B (2000),PQD as a management system consisting of values, techniques and tools „PQD magazines,Vol 12 number 4 pp 238-244

Hendricks, K., Singhal, V. (1997), "Does implementing an effective PQD program actually improve operating performance?" Management Science, Vol. 43 No.9, pp.1259-74.

Hendricks and Singhal, 2003 "Firm characteristics, total quality management, and financial performance", Journal of Operations Management, Vol. 19 No.3, pp.269-85.

Hill, S.1991Why quality circles failed but total quality management might succeed. British journal of industrial relations, 29(4), 541-568 http://www.iso-quality-manuals.com/ accessed 17 April 2014 19:15pm

Hunt, V. Daniel. Quality in America – How to Implement a Competitive Quality Program.

Homewood, IL: Business One Irwin, 1992

Imai, M. (1986), Kaizen: The key to Jana's Competitive Success, McGraw-Hill, NY.

Imai, M. (1997), Gemba Kaizen: A common sense, Low-Cost Approach to Management,

International Journal of Quality and Reliability Management, 24(5),pp. 442- 471, 2007.

Isaksson, R. (2004). Total Quality Management for Sustainable Development. ISO 8402 (1994),"Quality Management and Quality Assurance –Vocabulary" Journal of

Operations Management, Vol. 12 No.1, pp. 27-44

Johnson, R. B & Onwuegbuzie, A. J. (2004). Mixed Methods Research: A Research Paradigm Whose Time Has Come. Educational Researcher, 33(7), 14– 26.10.1177/1558689806298224 (12 Seiten)

Jung, J. Y., Wang, Y. J., & Wu, S. (2009). Competitive strategy, PQD practice, and continuous improvement of international project management: A contingency study.

International Journal of quality & reliability management, 26(2), 164-183.

Juran, J.M. and Gryna, F.M. (1993), "Quality Planning and Analysis", 3rd edition, 88

Juran, J.M. and Gryna, F.M. (1993), "Quality Planning and Analysis", 3rd edition,

 Junli, (2018). Effects of stakeholder mapping on supply chain resilience on Local Council Board in Malaysia

Kamalahmadi and Parast, 2016 "Quality and Statistical Concepts, In Total Quality Management: Proceedings of the first world congress (Ed: Kanji, G. K.), London: Chapman & Hill

Kanungo, R.N. (1982), "Measurement of job and work involvement", Journal of Applied Psychology, Vol. 67 No.3, pp.341-9.

Kaynak, H. (2003). The relationship between total quality management practices and their effects on firm performance. Journal of Operations Management, 21(2003), 405-435.

Ketchen and Hult, 2017. Principles of Marketing. Second Edition. USA: Prentice Hall Inc.

Kerudo (2012). Supply chain visibility challenges in Western Province. A Case of Kakamega Maize grinding firm 2010-11.

Kotter, J.P., 1995. Leading change: Why transformation efforts fail. Harvard Business Review, (March-April): 59-66.

Mangla. Sodhi, M. S., Son, B., 2018. The top five supply chain disruptions of 2018, London: Supply Management: CIPS vulnerability as a vicious cycle with exogenous hazards. Journal of Operations Management, Volume 45, pp. 101-113.

Machingauta (2014). An assessment of stakeholder management and Supply chain resilient in food manufacturing firm: A Case Study of Kaliro , Uganda.

McDaniel and Gates, (2002). Population. Research Methodology. USA: Prentice Hall Inc.

Melnyk, et al., 2016. Supply chain collaboration: capabilities for continuous innovation. Supply chain management: An international journal, 13(2), pp. 160-169.

Nderitu and Ngugi 2014. Risky business: expanding the discussion on risk and the extended enterprise. . International Journal of Physical Distribution and Logistics Management, 34(5), p. 414–433.

Prajogo, et al., 2016 Managing Supply Chain Risk. Electronic book: Springer.

Priday, 2021. Researchers' Perspectives on Supply Chain Risk Management. Production and Operations Management, 21(1), pp. 1 - 13.

Ponis and Koronis, 2012. Measuring supply chain resilience using a deterministic modeling approach. Computers & Industrial Engineering, Volume 74, pp. 11-25.

Souma, W., Fujiwara, Y. & Aoyama, H., 2003. Complex networks and economics. Physical A, 324(1/2), pp. 396-401.

Sousa, F. J., 2010. Chapter 9 Metatheories in research: positivism, postmodernism, and critical realism. In: Organizational Culture, Business-to-Business Relationships, and Interfirm Networks. s.l.:Emerald Group Publishing Limited, pp. 455-503.

Spence, L. & Bourlakis, M., 2009. The evolution from corporate social responsibility to supply chain responsibility: the case of Waitrose. Supply Chain Management: An International Journal, 14(9), pp. 291 - 302.

Spens, K. & Kovács, G., 2006. A Content Analysis of Research Approaches in Logistics Research. International Journal of Physical Distribution & Logistics Management, 36(5), pp. 374-390.

Squire, B., Cousins, P., Lawson, B. & Brown, S., 2009. The effect of supplier manufacturing Capabilities on buyer responsiveness: the role of collaboration. International Journal of Operations & Production Management, 29(8), pp. 766 - 788.

Srivastava, S., 2007. Green supply chain management: a state of the art literature review. International Journal of Management Reviews, 9(1), pp. 53-80.

Stadtler, H., 2015. Supply chain management: An overview. In: Supply chain management and advanced planning. Berlin, Heidelberg: Springer, pp. 3-28.

Stadtler, H., Kilger, C. & Meyr, H., 2015. Supply Chain Management and Advanced Planning: Concepts, Models, Software, and Case Studies. Hamburg: Springer publishing.

Statler, M. & Salovaara, P., 2017. Pragmatic Truths in Organization Studies. Philosophy of Management, 16(3), p. 265–278.

Stentoft Arlbjørn, J. & Halldorsson, A., 2005. Research Methodologies in Supply Chain Management— What Do We Know?. In: H. Kotzab, S. Seuring, M. Müller & G. Reiner, eds. Research Methodologies in Supply Chain Management. Heidelberg: Physica-Verlag (Springer), pp. 107-122.

Stone, J. & Rahimifard, S., 2018. Resilience in agri-food supply chains: a critical analysis of the literature and synthesis of a novel framework. Supply Chain Management: An International Journal, 23(3), pp. 207 - 238.

Sundkvist, A., Milestad, R. & Jansson, A. M., 2005. On the importance of tightening feedback loops for sustainable development of food systems. Food Policy (Elsevier Ltd), pp. 225-239.

Sun, S., Wang, X. & Zhang, Y., 2017. Sustainable Traceability in the Food Supply Chain: The Impact of Consumer Willingness to Pay. Sustainability (Switzerland), 9(6), pp. 999-.

Seuring and Muller, 2018. Supply Chain Operations Reference (SCOR) Model. [Online] Available at: http://supply-chain.org/f/Web-Scor-[Accessed 18 April 2018].

Swafford, P., Ghosh, S. & Murthy, N., 2006. The antecedents of supply chain agility of a firm: scale development and model testing. Journal of Operations Management,, 24(2), pp. 170-188.

Swanson, C. A., William M. & Lankford, W. M., 1998. Just-in time manufacturing. Journal of Business Process Management, Volume 4, pp. 333-341.

Swanson, D., Goel, L., Francisco, K. & Stock, J., 2018. An analysis of supply chain management research by topic. Supply Chain Management: An International Journal, 12(1), pp. 100 - 116.

Tang, C., 2006. Robust strategies for mitigating supply chain disruptions. International Journal of Logistics: Research and Application, 9(1), p. 33–45.

Tang, L., Jing, K., H. J. & Stanley, H., 2016. Complex interdependent supply chain networks: Cascading failure and robustness. Physica A: Statistical Mechanics and its Applications, Volume 443, pp. 58-69.

Tang, 2006. Supply chain risk management. International Journal of Production Economics, 139(1), pp. 1 - 2.

Tang, O. & Musa, S., 2011. Identifying risk issues and research advancements in supply chain risk management. International journal of production economics, 133(1), pp. 25-34.

Tan, K. C., Kannan, V. R. & Handfield, R. B., 1998. Supply chain management: supplier performance and firm performance. International Journal of Purchasing and Materials Management, Volume 34, pp. 2-9.

Tascioglu, M., 2015. Sustainable supply chain management: a literature review and research agenda. Journal of Management Marketing and Logistics, 2(1), pp. 1-11.

Tate, W., Bals, L. & Ellram, L. M., 2019. Supply chain finance: risk management, resilience and supplier management. London: KoganPage.

Tate, W. L., Ellram, L. M. & Kirchoff, J., 2010. "Corporate Social Responsibility reports: a thematic analysis related to supply chain management". Journal of Supply Chain Management, 46(1), pp. 19-44.

Teece, D., 2013. Dynamic Capabilities, UC Berkeley: The Scholar Entrepreneur.

Teece, D. J., 2018. Business models and dynamic capabilities. Long Range Planning, 51(1), pp. 40 -49.

Teece, D., Pisano, G. & Shuen, A., 1997. Dynamic Capabilities and Strategic Management. Strategic Management Journal, 18(7), p. 509–533.

Tendall, D.M., Joerin, J., Kopainsky, B., Edwards, P., Shreck, A., Le, Q.B., Krütli, P., Grant, M. & Six,

J., 2015. Food system resilience: defining the concept. Global Food Security, 6, pp.17-23.

Thekdi, S. A. & Santos, J. R., 2016. Supply Chain Vulnerability Analysis Using Scenario-Based Input- Output Modeling: Application to Port Operations. Risk Analysis, 36(5), pp. 1025 - 1039.

Thorelli, H. B., 1986. Networks: between markets and hierarchies. Strategic Management Journal, 7(1), pp. 37-51.

Thyer, B. A., 2002. Popper, positivism, and practice research: A response to Munor. Journal of Social Work Education,, 38(3), pp. 471-.

Timmermans, S. & Tavory, I., 2012. Theory Construction in Qualitative Research: From Grounded Theory to Abductive Analysis. Sociological Theory, 30(3), pp. 167 - 186.

Toshiba, 2004. Toshiba Installs Asyst Automation Tools in 300mm Fab, North America: Toshiba.

Touboulic, A. & Walker, H., 2015. Theories in sustainable supply chain management: a structured literature review. International Journal of Physical Distribution & Logistics Management, 1/2(45), pp.16 - 42.

Touboulic, A. & Walker, H., 2016. A relational, transformative and engaged approach to sustainable supply chain management: The potential of action research. Human relations, 69(2), pp. 301 342.

Tracy, S. J., 2010. Qualitative Quality: Eight "Big-Tent" Criteria for Excellent Qualitative Research. Qualitative Inquiry, 16(10), pp. 837 - 851.

Trienekens, J., Wognum, P., Beulens, A. & van der Vorst, J., 2012. Transparency in complex dynamic food supply chains. Advanced Engineering Informatics, 25(1), pp. 55-65.

Tsai, W. & Hung, S., 2009. A fuzzy goal programming approach for green upply chain optimization under activity-based costing and performance evaluation with a value-chain structure. International Journal of Production Research, 47(18), pp. 4991-5017. United Nations, 2015. World Food Programme. [Online]

Available at: https://www.wfp.org/hunger [Accessed 12 November 2015].

United Nations, 2015. World population projected to reach 9.7 billion by 2050, New York: United Nations Department of Economic and Social Affairs.

USDA, 2019. US Agriculture and Food Sectors and the Economy, Washington, DC: United States Department of Agriculture.

Validi, S., Bhattacharya, A. & Byrne, P. J., 2014. A case analysis of a sustainable food supply chain distribution system—A multi-objective approach. International Journal of Production Economics, Volume 152, p. 71–87.

Van der Vorst, J., da Silva, C. & Trienekens, J., 2007. Agro-industrial supply chain management: concept and applications, Rome: Agricultural Management Marketing and Finance, FAO, Occasional Paper No. 17.

Van Ruth, S. et al., 2018. Differences in fraud vulnerability in various food supply chains and their tiers. Food Control, Volume 84, pp. 375-381.

Varsei, M., 2016. Sustainable supply chain management: A brief literature review. The Journal of Developing Areas, 50(4), pp. 411 - 419.

Varsei, M. & Polyakovskiy, S., 2016. Sustainable supply chain network design: A case of the wine industry in Australia, In-Press: Omega.

Varsei, M., Soosay, C., Fahimnia, B. & Sarkis, J., 2014. Framing sustainability performance of supply chains with multidimensional indicators. Supply Chain Management: An International Journal, 19(3), pp. 242-257.

Veit, C., Lambrechts, W., Quintens, L. & Semeijn, J., 2018. The impact of sustainable sourcing on customer perceptions: Association by guilt from scandals in local vs. offshore sourcing countries. Sustainability (Switzerland), 10(7), pp. 2519-.

Voss, C., Tsikriktsis, N. & Frohlich, M., 2002. Case research in operations management. International Journal of Operations & Production Management, 22(2), pp. 195-219.

Wagner, S. & Bode, C., 2006. An empirical investigation into supply chain vulnerability. Journal of Purchasing and Supply Management, Volume 12, p. 301–312.

Wagner, S. & Bode, C., 2008. An empirical examination of supply chain performance along several dimensions of risk. Journal of business logistics, 29(1), pp. 307-325.

Wagner, S. M. & Neshat, N., 2012. A comparison of sup-ply chain vulnerability indices for different categories of firms. International Journal of Production Research, 50(11), p. 2877–2891.

Wakolbinger, T. & Cruz, J., 2012. Supply chain disruption risk management through strategic information acquisition and sharing and risk-sharing contracts. International Journal of Production Research, 49(13), pp. 4063-4084.

Wallace, C., Sperber, W. & Mortimore, S., 2018. Food safety for the 21st century: Managing HACCP and food safety throughout the global supply chain. Second ed. eBook (Online): John Wiley & Sons.

Walton, D. & Gore, G., 2013. Abductive Reasoning. Tuscaloosa: The University of Alabama Press.

Wang, J., Dou, R., Muddada, R. & Zhang, W., 2018. Management of a holistic supply chain network for proactive resilience: Theory and case study. Computers & Industrial Engineering, Volume 125, pp. 668-677.

Wartick, S. & Cochran, P., 1985. The Evolution of the Corporate Social Performance Model. Academy of Management, 10(4), pp. 758-769.

Waters, C. D. J., 2011. Supply Chain risk Management: Vulnerability and Resilience in Logistics. 2nd ed. London, New Delhi: Kogan Page.

Weber, R., 2004. The rhetoric of positivism versus interpretivism: a personal view. MIS Quarterly, pp. 3-12.

Weick, K. E., 2007. The generative properties of richness. Academy of Management Journal, Volume 50, pp. 14-19.

Wellenbrock, 2013. Theoretical Basis of Supply Management: The Network Theory in Supply Management,M, Enschede: University of Twente.

Wernerfelt, B., 1984. A resource-based view of the firm.. Strategic management journal, 5(2), pp. 171-180.

Whipple, J. & Russell, D., 2007. Building supply chain collaboration: a typology of collaborative approaches. The International Journal of Logistics Management, 18(2), pp. 174 - 196.

White, L. & Lee, G., 2009. Operational research and sustainable development: Tackling the social dimension. European Journal of Operational Research, Volume 193, p. 683–692.

WHO, 2016. Obesity and overweight Fact Sheet, Geneva: WORLD HEALTH ORGANIZATION.

Wicher, P. & Lenort, R., 2012. The ways of creating resilient supply chains. CD-ROM]. In: Proceedings of CLC , Carpathian Logistics Congress.

Wieland, A., Handfield, R. B. & Durach, C. F., 2016. Mapping the Landscape of Future Research Themes in Supply Chain Management. Journal of Business Logistics, 37(3), p. 205–212.

Wieland, A. & Wallenburg, C., 2013. The influence of relational competencies on supply chain

resilience: a relational view. International Journal of Physical Distribution & Logistics Management, 43(4), pp. 300-320.

Wiese, A. & Toporowski, W., 2013. CSR failures in food supply chains - an agency perspective. British Food Journal, 115(1), pp. 92 - 107.

Wilding, R., 2013. Supply chain temple of resilience. Logistics & transport focus, 15(11), pp. 54-59.

Wilding, R., Wagner, B., Chicksand, D., Watson, G., Walker, H., Radnor, Z. & Johnston, R., 2012.

Theoretical perspectives in purchasing and supply chain management: an analysis of the literature. Supply Chain Management: An International Journal.

Wilding, R. & Humphries, A., 2006. Understanding collaborative supply chain relationships through the application of the Williamson organizational failure framework. International Journal of Physical Distribution & Logistics Management, 36(4), pp. 309 - 329.

Williams, M., 2000. Interpretivism and Generalisation. Sociology, 34(2), pp. 209 - 224.

Williams, Z., Ponder, N. & Autry, C., 2009. Supply chain security culture: measure development and validation. International Journal of Logistics Management, 20(20), pp. 243-260.

Wolf, J., 2014. The Relationship Between Sustainable Supply Chain Management, Stakeholder

Pressure and Corporate Sustainability Performance. Journal of Business Ethics, 119(3), pp. 317-328.

Womack, J. & Jones, D., 1994. From lean production to the lean enterprise. Harvard business review, 72(2), pp. 93-103.

Womack, J., Jones, D. T. & Roos, D., 1990. The Machine That Changed the World. New York: Rawson Associates.

World Economic Forum, 2017. Global Risks Report, Geneva: World Economic Forum.

Wu, P.J. & Huang, P.C., 2018. Business analytics for systematically investigating sustainable food supply chains. Journal of Cleaner Production, Volume 203, pp. 968 - 976.

Wu, T. & Blackhurst, J., 2009. Managing Supply Chain Risk and Vulnerability: Tools and Methods for Supply Chain Decision Makers. London: Springer.

Wu, T., Huang, S., Blackhurst, J., Zhang, X. & Wang, S., 2012. Supply chain risk management: An agent-based simulation to study the impact of retail stockouts. IEEE Transactions on Engineering Management, 60(4), pp.676-686.

Wu, Z. & Choi, T., 2005. Supplier-supplier relationships in the buyer-supplier triad: Building theories from eight case studies. Journal of operations Management, Issue 24, pp. 27-52.

Wu, Z. & Pagell, M., 2011. Balancing priorities: decision-making in sustainable supply chain management. Journal of Operations Management, 29(6), pp. 577-590.

Xiao, C., Wilhelm, M., van der Vaart, T. & van Donk, D., 2019. Inside the buying firm: Exploring responses to paradoxical tensions in sustainable supply chain management. Journal of Supply Chain Management, 55(1), pp. 3-20.

Yawar, S. & Seuring, S., 2015. Management of social issues in supply chains: a literature review exploring social issues, actions and performance outcomes. Journal of Business Ethics, pp. 1-23.

Yildiz, H., Yoon, J., Talluri, S. & Ho, W., 2016. Reliable Supply Chain Network Design. Decision Sciences, 47(4), p. 661–698.

Yin, K., 2009. Case study research: design and methods. Fourth ed. London: Sage.

Yin, R. K., 2003. Case study research, design and methods. Third ed. CA: Thousand Oaks: Sage..

Yin, R. K., 2014. Case study research: design and methods. 5th ed. London: SAGE Publications Ltd.

Yusuf, Y.Y., Gunasekaran, A., Musa, A., El-Berishy, N.M., Abubakar, T. & Ambursa, H.M., 2013. The UK oil and gas supply chains: An empirical analysis of adoption of sustainable measures and Performance outcomes. International Journal of Production Economics, 146(2), pp.501-514.

Yvonne Feilzer, M., 2010. Doing Mixed Methods Research Pragmatically: Implications for the Rediscovery of Pragmatism as a Research Paradigm. Journal of Mixed Methods Research, pp. 6 - 16.

Zepeda, E. D., Nyaga, G. N. & Young, G. J., 2016. Supply chain risk management and hospital inventory: Effects of system affiliation. Journal of Operations Management, Volume 44, pp. 30 - 47.

Zhang, J., Zhang, Q., Tang, W. & Zaccour, G., 2019. Should a manufacturer give up pricing power in a vertical information-sharing channel? European Journal of Operational Research, 276(3), pp. 910

QUESTIONNAIRE

I am Tino , an undergraduate student at Bindura University of Science and Education, undertaking a degree programme in Purchasing and Supply. I am carrying out a research on the topic entitled: **"An analysis on effect of supply chain visibility on supply chain resilience. A survey of Harare Agri-food manufacturing industry."** I would like your cooperation by answering questions from this questionnaire truthfully. The research is purely for academic purpose and your response are to be kept with confidentiality.

SECTION A

1**. INSTRUCTIONS**

a) Do not write your name

b) The information you will give will strictly be used for educational purposes and will remain anonymous.

c) Please answer all questions

SECTION A: DEMOGRAPHICS

1. Attained educational level:

Secondary [ ]   Certificate [ ]   Diploma [ ]   Degree [ ]   Masters [ ]

2. How long you have been in the organization?

5 and below [ ]   6 - 10 years   [ ]   11 - 15 years [ ]   16-20   [ ]   21 and above [ ]

3. **Please indicate your age**

a) 20 - 30 years   [   ]

b) 31 - 40 years   [   ]

c) 41 - 50 years   [   ]

d) 51 -60 years   [   ]

e) 61 and over   [   ]

4. What is your job highest level?
  Top Management [   ]   Middle level [   ]   Supervisor   [   ]   Operative [   ]

5. Terms of employment:
  Temporary   [   ]   Permanent [   ]   Contract [   ]

SECTION B: DATA GATHERING

6. How do you ensure supply chain visibility at your firm?

....
....

7. What are the effects of supply chain visibility on supply chain resilience in Agri-food manufacturing industry?

....
....

8. What are the challenges of supply chain visibility affecting supply chain resilience in Agri-food manufacturing industry?

....
....

9. What are ways to curb the effects of supply chain visibility on supply chain resilience in Agri-food manufacturing industry?

....

....

....

THE END