BINDURA UNIVERSITY OF SCIENCE EDUCATION

FACULTY OF COMMERCE

DEPARTMENT OF ECONOMICS

RESEARCH PROJECT

TITLE: THE EFFECTS OF COVID-19 ON SUPPLY CHAIN EFFICIENCY. A CASE STUDY OF FREDA REBECCA GOLD MINE (FRGM).

BY

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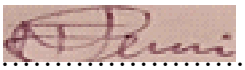
SIGNED:  ……

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The effects of covid-19 on supply chain efficiency. A case study of Freda Rebecca Gold Mine (FRGM).

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IN PARTIAL FULFILLMENT OF THE REQUIREMENTS OF THE BACHALOR OF COMMERCE HONOURS DEGREE IN PURCHASING AND SUPPLY.

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DECLARATION

I, TRYPHINE FARIRAI NJARAVA, declare that this research project is my own work and has not been copied or lifted from any source without the acknowledgements of the source. All information sources and literature used are indicated in the project. The contribution of supervisor and others was consistent with Bindura University of Science Education regulation and policies.

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DEDICATION

I acknowledge the divine guidance and wisdom that have been instrumental in the completion of this work. My gratitude extends to all those who have contributed to its success, including my family, friends, supervisor, and my own efforts. I'm thankful.

THANK YOU SO MUCH.

ABSTRACT

This study looks into how the COVID-19 epidemic has affected the Freda Rebecca Gold Mine's (FRGM) supply chain efficiency in Zimbabwe. A purposeful and basic random sample strategy was utilised in the study to create a 54-person population at the mine. Information was gathered via interviews and questionnaires. The analysis lists the different supply chain hiccups brought on by the epidemic, including shortages of raw materials, reduced productivity, workforce shortages, price fluctuations, longer lead times, poor product quality, poor communication with suppliers, transportation failures and delays, storage and access disruptions, port congestion and lack of flexibility. The study's objective is to investigate the tactics used by FRGM to handle these disturbances in more detail, such as electronic procurement, collaboration with suppliers, buffer stock, value chain optimization, incorporating departments into the collective innovation system, supplier development, reinforcing communication across the supply chain, new training and response programs, local sourcing, early supplier involvement, including partners in risk planning, diversifying the supply base, insourcing and transparency with partners. In addition, the research identifies the most effective strategies implemented by FRGM as; implementation of remote work arrangements, electronic procurement, investment in employee training and development, enhancing communication and collaboration and diversification of the supplier base. Tables, graphs, and pie charts are produced using information gathered from several mine departments. The study ends with suggestions for building a strong supply chain efficiency at FRGM. These include putting in place a comprehensive risk management plan, expanding supplier diversity and forming strategic alliances, investing in digital technologies, streamlining inventory control, creating an agile and flexible supply chain, improving teamwork and communication, funding staff development, and putting in place cost-cutting measures. As a result, this study advances knowledge about how COVID-19 affects supply chain effectiveness and offers insightful advice to mining firms looking to lessen the pandemic's detrimental consequences.

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CHAPTER I

1.0 Introduction

Production, transportation and distribution networks have all been disrupted by Covid-19 epidemic, which has had a huge effect on global supply chains (OECD, 2020). This has caused actors in various industries to re-think strategies for managing unexpected operational shocks to enhance operational efficiency within their organisations. The different approaches that can be used to lessen the effects of unforeseen risks like the COVID-19 pandemic are still hotly contested (McKinsey, 2020). Nevertheless, sufficient quantification of the amount of the impact of the unexpected COVID-19 on supply chain efficiency is lacking in order to properly evaluate the many intervention measures that might be employed to mitigate the shocks. The mining industry, like many others, has faced significant challenges due to the COVID-19 pandemic (S & PB Global, 2020). This study focuses on the Freda Rebecca Gold Mine (FRGM) in Zimbabwe, exploring how the pandemic has affected its supply chain efficiency.

1.1 Background of the study

The coronavirus pandemic has caused interruptions to both local and international trade in products and services since the end of 2019. The COVID-19 pandemic is the most severe public health crisis to cause a major economic crisis, according to the Organization for Economic Cooperation and Development (OECD, 2020). Affected countries have stopped producing, consumer confidence has collapsed, and stock markets have reacted negatively to the increased uncertainty.

The worldwide outbreak of a pandemic disease called coronavirus (covid-19) that emerged in China in the city called Wuhan in Hubei Province in year 2019 (Yang et al, 2020 affected the humanitarian supply chains at large. The pandemic severely disrupted production and manufacturing due to workforce shortages, factory closures, and supply chain restrictions. The COVID-19 pandemic resulted in widespread factory closures or reduced operating capacity due to lockdowns, employee absenteeism, and supply shortages. A survey by the Institute for Supply

Management found that 75% of businesses reported supply chain disruptions caused by COVID-19-related plant shutdowns and shipping restrictions (Ivanov, 2020).

Efficient transportation and logistics networks are crucial for the smooth flow of goods across the supply chain. However, pandemics severely disrupt these networks due to border closures, travel restrictions, and quarantine measures. The COVID-19 pandemic presented several difficulties for the world's shipping industry, including port closures, a lack of available containers, and delays in cargo handling (Notteboom et al., 2021). These disruptions led to longer lead times, higher transportation costs, and bottlenecks in the supply chain.

Supply chains are intricate networks that rely on a steady flow of materials and components from suppliers. Pandemics can disrupt this flow, causing delays or shortages that can have cascading effects throughout the chain, affecting production and delivery timelines. The COVID-19 pandemic, for instance, caused significant disruptions in the supply of semiconductors and other electronic components, leading to widespread shortages and manufacturing delays across multiple industries (Shih, 2020).

Pandemics created uncertainties in demand forecasting and inventory management, which are crucial for supply chain efficiency. Fluctuations in consumer demand, panic buying and supply shortages led to stockouts or excess inventory, resulting in revenue losses and increased costs. During the COVID-19 pandemic, many retailers faced challenges in managing inventory levels due to surges in demand for certain products, such as personal protective equipment (PPE) and essential goods (Quayson et al., 2020).

The pandemics resulted in workforce shortages due to illnesses, quarantines, or safety concerns. The Plague of Justinian (541–542), which is thought to have killed up to 25 million people in the Byzantine Empire (Stathakopoulos, 2004), and the Black Death (1347–1351), which is thought to have killed 75 to 200 million people in Eurasia and North Africa (Benedictow, 2005), are two examples of the recurring challenges that humanity faces. This affected the supply chain at several points, including manufacturing, shipping, and warehousing and distribution.

Maintaining operational efficiency while ensuring worker safety becomes a major concern. Further impeding mining operations were travel restrictions and quarantine regulations, which made it challenging for businesses to mobilise key staff and qualified workers.

Several businesses found it difficult to maintain appropriate workforce levels and put safety proc edures in place during the early phases of the COVID-19, which disrupted supply chain activities, (Araz et al., 2020).

Tension in relationships and trust are further effects of COVID-19. providers and buyers may find it difficult to maintain their ties if providers fail to fulfil delivery agreements. Buyers may perceive the supplier as unreliable, leading to potential disputes, penalties or termination of contracts. This can damage long-term partnerships and make it challenging to rebuild trust even after the pandemic subsides.

In some cases, Contract changes for instance, suppliers may seek to renegotiate payment terms or delivery schedules due to the exceptional circumstances caused by the pandemic. This can be a complex process, involving negotiations and adjustments to existing agreements, which can further strain the relationship if not handled properly.

Pandemics can expose the limitations of existing supply chain technologies and information systemsDuring the COVID-19 pandemic, there was an abrupt transition to remote labour and a greater reliance on digital platforms, which put stress on current systems and affected supply chain visibility and coordination. Companies with limited digital capabilities faced challenges in monitoring and managing their supply chains effectively (Queiroz et al., 2020).

In Africa, coronavirus was first noticed in Northern countries like Egypt, and Libya in February 2020. Due to the intensity of this virus, the governments of African closed their economies and all ports of entry as a way of managing the virus. According to Lone and Ahmad (2020), tig tight limitations imposed by African nations have severely disturbed the mining industry's supply chains, which has an impact on the operations of mining corporations and impedes the achievement of their goals. To stop pandemics, governments implemented a number of trade restrictions and prohibitions, including travel bans, export limitations and boarder closures. Global trade flows were disrupted and supply chain operations were severely affected by these actions. A number of nations imposed export prohibitions on essential medical goods and personal protec tive equipment (PPE) during the COVID19 pandemic, which resulted in shortages and supply ch ain disruptions (Evenett, 2020).
This affected the efficiency with which the gold mining sector could function.

The global economy relies heavily on the gold mining industry, which plays a vital role in supplying gold for use in jewellery, electronics, and investments. However, the COVID-19 pandemic has significantly disrupted the industry's complex supply chain, making it more difficult to transport resources and goods efficiently. This has led to inefficiencies and operational challenges within the industry.

Productivity rate at Freda Rebecca Gold Mines was affected by the COVID-19 pandemic, as the data presented below.

Table 1:First quarter production before covid- 19 era

Month	**Target (gold)**	**Actual (gold)**
January	150 kg	150 kg
February	140 kg	140 kg
March	130 kg	130kg
Total		420 kg

Table 2:First quarter production during covid-19 era

Month	**Target (gold)**	**Actual (gold)**
January	150 kg	127.5 kg
February	140 kg	119 kg
March	130 kg	110.5 kg
Total		357 kg

The information on the tables shows a significant decline in production at FRGM by 15%. This was derived from the total production for 150kg first quarter before the covid-19 era against the same period during the pandemic era.

More so, covid-19 caused delays in delivery of consumables such as oils, fuel, explosives and carbons at FRGM thus affecting its supply chain efficiency. This made it difficult to establish an effective supply chain and had a detrimental impact on the mine's operations. The COVID-19 pandemic's impact on the mine's supply chain efficiency led to increased medical expenses, putting significant financial pressure on its operations. These additional expenses affected the overall cost structure and financial performance of FRGM. Adding on, the mine faced a challenge of shortages of manpower being triggered by lockdowns, travel restrictions and illness among workers. This disturbed normal mining, processing and logistics operations. The manpower shortages caused inefficiencies throughout the mine's supply chain since mining activities had to be paused. Also, processing and refining of gold ore was hindered when there were not enough operators and technicians available.

Therefore, pandemics expose the vulnerabilities and interdependencies within supply chains, highlighting the need for increased resilience, agility and digital transformation to mitigate the impacts of future disruptions effectively.

1.2 Statement of the problem

The COVID-19 pandemic has had a devastating impact on the mining industry among other businesses. Complex supply chains involving the exploration, extraction, processing, and transportation of gold are essential to the gold mining sector (Duan et al., 2021). Freda Gold Mine, a major gold mining operation located in Bindura, has been grappling with the challenges posed by the pandemic, particularly in terms of supply chain efficiency.

There has been a decrease in productivity and financial losses of FRGM have been witnessed due to disrupted supply chain operations and also inefficiencies in the supply chainAccording to the Freda Rebecca Gold Mine Annual Report for 2020, supply chain disruptions were the main cause of a 15% drop in production output during the first quarter of 2020 compared to the same time in 2019. Disruptions in global supply chains of mining equipment led to longer lead times, production

disruptions, mining projects slowed down, and late deliveries and major bottlenecks within the supply chain of the mining sector have further affected the organizational performance of the company. Therefore, this study aims to understand how the pandemic has affected the efficiency of the Freda Rebecca Gold Mine (FRGM) supply chain in Zimbabwe.

1.3 Research objectives

The primary goal of the research was to evaluate how Covid-19 affected Freda's supply chain efficiency.

The specific objectives of the study were:

- To investigate how the COVID-19 outbreak has caused disruption in the mining industry's supply chain.
- To determine strategies used to control COVID-19 on the effectiveness of FRGM supply chain.
- To establish most effective measures to be applied during covid-19 at the company.

1.4 Research questions

- Which supply chain disruptions were caused by the pandemic covid-19 at FRGM?
- What strategies that can be used to manage covid-19 on the supply chain efficiency of FRGM.?
- What are the most effective strategies to be during covid-19 at the company?

1.5 Significance of the study

As the mining sector is highly dependent on efficient supply chains to ensure productivity. A study's significance outlines the potential benefits or contributions it could make to theory, practice, or policy, (Creswell & Creswell, 2018). In the same context, this research is relevant to:

1.5.1 The student or researcher

This study enables the student to gain essential experience in research techniques and contribute to the student's knowledge and professional growth. The research is being carried out in partial fulfillment of the requirements of Bindura University Science Education, Bachelor of Commerce Honors Degree in Purchasing and Supply. It also allows the researcher to have a deeper understanding of both theoretical and practical knowledge in the area of research and then enhances the application of the theoretical concepts of the area under research.

1.5.2 Community

The value of any scientific study is premised on its capacity to have some impact on a section of the community (Scotland, 2012). The research project can be used by different organizations not only those in the mining sector, other researchers in future, lecturers and the public at large as a source of reference. The study will come up with evidence that provides an understanding of the effect of covid-19 on supply chain efficiency in the mining industry. Other business organizations may also adopt the recommendations to improve the effectiveness in terms of making decisions.

1.5.3 Bindura University of Science Education

This study aims to contribute to the university's body of knowledge by addressing gaps in previous research and providing a more comprehensive understanding of the topic. The findings will also serve as a foundation for future research endeavors.

1.6 Assumptions

- Respondents will willingly cooperate by facilitating access to data and information that may be considered as sensitive and confidential.
- The research environment will remain constant throughout the study period.

- The researcher expected to sample members of staff and external service providers. Responses are largely expected to be positive and truthful from all participants.

1.7 Delimitations

The study's primary focus was on the supply chains of Freda Rebecca Gold Mine. It may be limited to examining the effectiveness of the supply chain from the viewpoint of particular stakeholders, including the management of Freda Gold Mine, suppliers, logistics companies, and clients like Fidelity Printers and Refinery (FPR). Rather than aiming to cover the full end-to-end supply chain process, this study concentrates on particular aspects of the supply chain, such as distribution, inventory management, transportation, and procurement. Due of the mine's close vicinity to the researcher, the investigation was also carried out in Bindura.

1.8 Limitations of the study

The study is will be done under the limitations below:

1.8.1 Concept of confidentiality

The nature of the study will call for confidential information about the company. Respondents may likely feel intruded when using interviews or requested to complete a questionnaire which requires them to disclose such information and may cause respondents to falsify information related to the research. Therefore, anyone who is not an integral component of the management is not permitted access to them.

1.8.2 Data availability

Research findings heavily depend on respondents' adaptability as well as understanding skills. The respondents must give reliable, measurable data and they must be responsible for the data they are disclosing. Despite the limited availability of respondents due to their work commitments presented a challenge for the research, but the researcher worked with their schedules.

1.8.3 Limited cooperation

Several respondents did not provide information and cooperation which may result in a researcher coming out with inaccurate and inadequate data. The best way to this problem faced by researchers is to show a good impression to the respondents and to clarify the main reasons why conducting the research and also the benefits they are going to enjoy after the research.

1.8.4 Finance

Conducting research during the academic year presented financial challenges for the researcher, particularly in terms of data bundles and transportation costs. To address this, the researcher utilized personal savings and carefully managed expenses to stay within budget.

1.9 Definition of terms

Supply Chain – a network of organizations and individuals involved in the production, distribution, and sale of a product or service.

COVID-19 –a highly infectious respiratory illness caused by the SARS-CoV-2 virus, a novel coronavirus that spreads primarily through respiratory droplets produced when an infected person coughs or sneezes (World Health Organization, 2020).

Efficiency – defined as the ability to minimize waste, cost, and effort while effectively moving goods, services, information, and resources through the supply chain.to meet customer demand with minimal waste, cost, and effort (Farrell, 1957).

1.10 Chapter Summary

This chapter introduced the topic under discussion and gave the background of the study, statement of the problem; research objectives that guided the research, research questions, assumptions, limitations and delimitations of the study within the study will be guided. The definition of terms and structure of the research covered in this chapter. At the end, the chapter gave the structure of the rest of the whole project.

CHAPTER II

LITERATURE REVIEW

2.0 Introduction

This chapter provides a comprehensive overview of existing knowledge on the topic, including a review of relevant theoretical and empirical literature, a summary of the literature, and an identification of research gaps.

2.1 Theoretical frameworks

2.1.0 Contingency theory

At the structural level of analysis in organization theory, contingency theory is viewed as a dominating, theoretical, rational, open system model (Betts, 2003). Contingency theory asserts that an organization's optimum way to organize is determined by the environment in which it functions. Organizational theorists believe that the best way to structure an organization is determined by the nature of its environment. The following are the fundamental tenets of contingency theory: firstly, there is no one ideal way to organise. Secondly, not every organisation strategy works the same way (Galbraith, 1973). This will assist the health sector in managing COVID-19 without relying solely on one technique.

Organizational theorists seek to identify the best fit between environmental and organizational elements for optimal performance. The term for this match is fit, and the greater the fit, the better the performance, therefore this enables mining companies to identify strategies which fit on changing environment. Contingency theory appears to be a promising framework for improving organizational performance, this provides the best framework on how health facilities are improving their supply chain performance during the period of covid-19. Contingency theory is characterized by its simple and elegant relationships, which often deal with situations and elements that have a broader scope, scale, and impact than other theories. This simplicity and

broad reach contribute to its potential for generating simple decision rules that can significantly affect organizational performance.

However, while contingency theory offers a potentially powerful framework, its assumptions about linear relationships and symmetrical effects between variables are problematic, as real-world relationships can be more complex and non-linear (Schoonhoven, 1981). When different circumstances and effectiveness measures are taken into account, these issues become even worse. There may be interaction effects and tradeoffs between variables can be significant and are not always captured by examining single context items (Gresov, 1989).

2.1.1 Supply Chain Risk Management Theory

The complexity of global supply chains, with their inherent risks ranging from minor delays to major disruptions, makes effective risk management essential for organizational success. This framework provides a structured approach to identifying, assessing, and mitigating these risks, ensuring uninterrupted operations and achieving organizational goals (Manuj & Mentzer, 2008).Supply Chain Risk Management (SCRM) is a fusion of concepts which combines Supply Chain Risk Management with supply chain partners in applying the risk management process **Invalid source specified.**. Supply chain partners include manufacturers, distributors, suppliers, transporters, warehouses, wholesalers, jobbers, retailers, other intermediaries and even the customers themselves. Below is Figure 1 showing the intersection of risk management and supply chain which makes Supply Chain Risk Management.

Figure 1: Structure of supply chain risk management

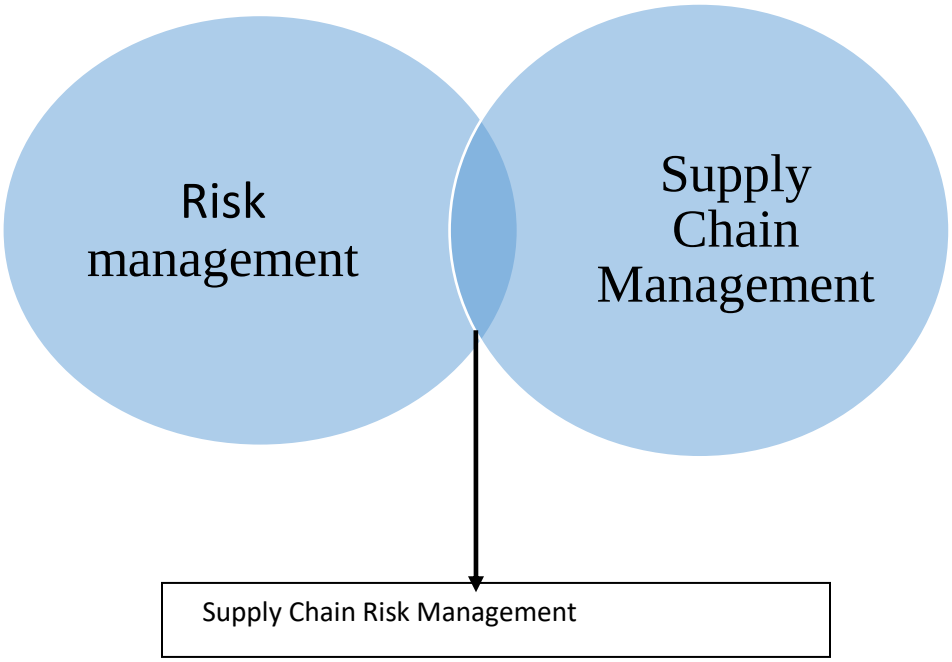


Fig 1 Structure of Supply Chain Risk Management adapted from Invalid source specified.

Supply chain risks can be categorized into two main types: those arising from within the supply chain network and those originating from the external environment. Those risks are inherent in planning, procurement, transportation to warehousing (Schlegel & Trent, 2014). Usually, one risk factor can trigger more than one risk event, for example, problems in a Tier 1 supplier's production line can result in a shortage of materials used in the production process of the buying organization. The occurrence of risk can lead to losses that are an unintended negative consequence and uncertainty to the supplying organization's revenue and customers and the buying organization as a whole. Therefore, the ability to manage risk effectively is considered important in ensuring the smooth flow of products along the supply chain. Due to globalization, economies have been greatly integrated and this has created dynamic business environments where risks are always present, (Tang, 2006).The unpredictable nature of the business environment, as demonstrated by recent events like the Mozambique flooding, terrorist attacks in Kenya, the Covid-19 pandemic, and the Suez Canal blockage, underscores the importance of developing resilient business strategies and

supply chains. All these examples show how the field of risk management is important in supply chain management.

Risk is a variant of the expected outcome in which no one can guarantee what is expected. Professional supply chains face high uncertainty in managing the supply chain as every supply chain process allows risks to occur. Risks that organizations may face in changing the business environment, among others include changes in consumer demand, unexpected transit delays, supplier problems which result in delays in the fulfilment of materials or components, production problems, lack of warehousing that causes delays in the delivery of goods to consumers and cyber security to name a few. In addition to these problems, supply chain risks also occur due to natural disasters often termed acts of God for example earthquakes, floods, tsunamis, volcanic eruptions, epidemics, viruses, and others that can disrupt the supply chain system as a whole, (Riskmethods, 2021).Therefore, COVID-19 pandemic highlighted the importance of proactive risk management, to manage supply chain risk, namely identification, assessment, and risk management.

2.1.2 Resource dependency theory (RDT)

According to Pfeffer and Salancik, (2003), Resource dependency theory postulates that organizations depend on other actors in their environment for access to critical inputs such as materials, cash and labor. The essential notion of RDT is that an organization can be described as an open system, dependent on contingencies in the external environment, as a consequence of the RDT investigations (Pfeffer and Salancik, 2003). Understanding an organization's ecosystem provides insight into the context of that organization's behavior. Resource Dependency Theory (RDT) highlights the potential for bottlenecks in supply chains when demand unexpectedly surges. This is because a company's ability to adapt is limited by its dependence on external entities that control essential resources. For instance, a low supply of mining equipment restricted procurement ability to respond to significant surges in requisitions for spare parts during the covid-19 epidemic. Within a pandemic, spillover effects complicate addressing these resource-dependent time-induced bottlenecks. RDT identifies two primary organizational goals: minimizing dependence on external organizations and maximizing reliance on internal resources, this prediction can give insight into the mining sector on how to survive more independently during the time of covid-19 when there is mandatory national lockdown. This theory predicts that firm behaviour, including

the treatment of stakeholders, is predicted on environmental factors. Similarly, RDT is based on the notion that an entity, like a company, needs to engage in transactions with other entities and organisations in its surroundings in order to obtain resources.

RDT's goal is to offer guidance on the establishment and administration of organisations with external restrictions (Pfeffer and Salancik, 2003). According to the RDT, the ability of an organization to obtain and preserve resources is critical to its existence. The RDT has been used as a leading approach in analyzing organizational environmental linkages since its debut in 2003 (Drees and Heugens, 2013). Therefore, this theory provides the best framework for the research under study because it has sought to observe organizational adaptations to dependencies and alterations in a business environment. This enables the researcher to attain the objectives under study which are; to identify strategies employed to manage covid-19 in the mining sector and to establish the most effective strategies during covid-19.

2.1.3 Institutional theory

It is a sociological perspective that examines how organizations are shaped by the social and institutional environment. This theory examines the influence of institutions, such as government regulations, industry standards and social norms, on organizational behavior. The theory helps understand how mining companies respond to the crisis and adapt to changing institutional environment.

The COVID-19 pandemic has led to changes in government policies, trade agreements, and consumer preferences, which have impacted supply chain operations and efficiency. Institutional theory provides another valuable lens through which to understand the effects of COVID-19 on gold mine supply chain efficiency. This theory emphasizes the role of institutions, both formal such as laws and regulations, and informal like industry standards and social norms in shaping organizational behavior and performance.

Gold mine companies are subject to various formal institutions, such as mining regulations, environmental laws and labor laws. These institutions can influence their supply chain practices and decision-making. In addition, informal institutions such as industry best practices, ethical standards, and community expectations shape their relationships with suppliers, customers and other stakeholders.

The COVID-19 pandemic has led to changes in formal and informal institutions, such as the introduction of new health and safety regulations and the increased importance of digital technologies. These changes have implications for gold mine supply chain efficiency. Therefore, the mine had to comply with new COVID-19-related regulations, such as social distancing requirements and travel restrictions. This can impact their supply chain operations and increase costs. Also, mines are under pressure to adopt digital technologies to improve their supply chain visibility and efficiency, in line with industry best practices. This requires investment in new technologies and training. The company have to engage with their stakeholders, such as suppliers, customers and communities, to address COVID-19-related concerns and maintain their legitimacy. This can involve transparent communication and collaborative problem-solving.

Henceforth, Institutional theory highlights the importance of considering the institutional environment when analyzing the effects of COVID-19 on gold mine supply chain efficiency. Gold mine companies need to adapt to changes in formal and informal institutions, comply with new regulations, adopt digital technologies and engage with their stakeholders to maintain their legitimacy and competitive advantage.

2.2 Empirical Evidence

Empirical evidence, gained through direct or indirect experience and past research, is used to link and review a study with previous findings (Merriam, 2014).

Nayler and Subramanian (2020) found that COVID-19 significantly disrupted health supply chains in Africa, particularly affecting procurement, planning, sourcing, forecasting, quantification, and inventory management. The researcher recommended strategies to minimize supply chain disruptions say, the need for improved forecasting tools across the supply chain, integrating demand and supply planning through an integrated approach and technology to stimulate similar supply chain disruptions to identify potential bottlenecks. In addition, the author also postulates that transparent communication, collaboration and information exchange among key supply chain partners will be critical to recovery.

Wincewicz-Bosy et al. (2020) conducted a qualitative study on copper mining supply chain, examining processes and determinants involved in its creation and operation, considering the influence of the COVID-19 pandemic. The researcher found that the mining supply chain is

significantly impacted by the integration and coordination of logistics procedures. It is important to note that mining and production processes are not the same thing. Numerous elements, including political considerations, economic conditions, social features, environmental concerns, legislative frameworks, natural and geological factors, technological breakthroughs, and regulatory frameworks, influence the supply chain for copper mining.

This pandemic highlighted the urgent need for innovations in technology, human security, communication, process tracking, and collaboration to issues with circular economy and sustainable development in the copper mining industry. The findings can be utilized to improve supply chain efficiency. The findings have major implications for supply chain architecture in terms of efficiency, security, and resilience. These researchers recommended that It becomes required to shift as many tasks as possible to cloud-based systems networks and raise the role of advanced technologies while minimising human participation (automation, robotization – now it is expensive and difficult owing to the variety of the tasks performed). It has become essential to forge greater relationships with equipment and service providers as part of existing partnerships (support repairs, expert opinions, technical condition inspections and transportation services). In response to the challenges posed by COVID-19, the researchers recommend adopting multi-sourcing procurement methods to improve communication, facilitate collaboration, and ensure a smooth process flow for all supply chain participants.

Galas et al. (2021) found that mining companies in selected European countries faced significant challenges due to COVID-19, including difficulties accessing finance, volatile commodity prices, workforce shortages, and limited access to essential services The researcher emphasized the need for strategies to address these issues and ensure the stability of the mining sector and raw materials supply. Also add that Covid-19 has several detrimental effects on mine productivity, the most notable of which is a drop in output. It caused by a variety of factors. The first cause is a drop in raw material demand as a result of global economic conditions. The second factor is related to epidemic constraints (workforce), market and transportation sales issues. Disruptions in the supply of minerals required for mining operations can also cause production constraints. The research concluded that the effects on current mining operations are relatively minimal and brief. This is mainly attributed to China's robust demand for minerals, which has counteracted the decline in consumption from other regions. However, the cessation of new mine exploration and

development will have significant repercussions in the long run. It will increase the likelihood of future disruptions in the supply of raw materials, creating a higher degree of uncertainty and potential risk. The researchers identified measures taken by the mining companies such as enable customers close access to their sites, continued to operate with a low staffing level and social distancing.

Paul et al.'s (2021) study delved into the challenges of supply chain recovery in the Readymade Garment industry (RMG) post the COVID-19 pandemic. The primary aim was to equip practitioners with insights for strategic formulation and value chain redesign. Their findings emphasize the future necessity of exploring resilience-focused approaches, particularly resource-based theory's focus on creating competitive resources and dynamic capabilities. Additionally, the researcher find out that recovery challenges such as: the covid-19 has had a wide range of effects and produced significant uncertainty in the production process, which could complicate recovery plans, many supply chain managers are unaware of the pandemic's scope, indicating a lack of preparedness that could hinder recovery, many constraints apply to supply chain activity in a pandemic situation, the supply chain's flexibility throughout the recovery may be limited and also border closure has resulted in greater difficulties in collaborating with supply chain partners during the recovery. The researcher also found that, several challenges, including changes in the distribution network, the closure of current supply chain partners' operations, a reduction in sourcing options, and a lack of preparedness, point to the need to restructure supply chains in order to better prepare for future severe disruptions like the current pandemic.

Simon M. Jowitt (2020) studied the COVID-19 and the Global Mining Industry providing a summary of COVID-19 mitigation's implications on the mining industry. The researcher notes that the world is currently experiencing a deep economic slowdown as a result of COVID-19 therefore there is need for mitigation efforts. The depth and global nature of this recession, will significantly affect the demand for metals and the global mining sector. The study reviews that governments consider mining to be essential, meaning that the issues of mitigation on the mining industry and on metal production has been minimal to date. Nonetheless, rising metal inventories and falling metal prices point to a short-term, at least, COVID-19 issue that will hurt the mining sector. The researcher presented the effects that includes variations in commodity prices, metal and stocks during the crisis and outlined two possible scenarios for COVID-19 related impacts. The first

involves persistent supply-chain disruptions, where metal supply is restricted by logistical or COVID-19–related mitigation impacts on intermediates such as smelters and refiners. This restriction of supply could cause higher metal prices or cause issues with demand for ores and concentrates that negatively affect individual mining operations. The second involves slower demand growth scenario in which a global decrease in demand for metals causes further lowering of metal prices with associated negative economic impacts on mining operations. However, deep research into global metal supply chains and the impact of the COVID-19 crisis on individual metals is needed.

2.3 Research Gap

There are several research gaps that need to be addressed. These gaps include limited empirical studies specific to Zimbabwe supply chain. The long term impacts of covid-19 on supply chain efficiency are still uncertain. Therefore, further research is needed to assess the long-term trends and implications for supply chain resilience. Also, more research is needed to evaluate the effectiveness of different mitigation strategies adopted by companies and identify best practices for building resilient supply chain.

2.4 Summary

The chapter presented a theoretical overview of the literature, which laid the foundation for examining empirical evidence on supply chain disruption. It also discussed various studies conducted by scholars that explored the effects of covid-19 on supply chain efficiency. The next chapter will look at the research methodology as a framework for gathering and analyzing of the data.

CHAPTER III

RESEARCH METHODOLOGY

3.0 Introduction

This chapter presents a description of the methodology employed in the study. It describes the research design, study population and sample size, sampling techniques, data collection procedures, validity and reliability of data, data presentation, and the sources of data.

3.1 Research Design

A research design is defined as a systematic and orderly approach taken toward the collection of data so that information can be obtained from the data (Collins, 2010). It is, therefore, a framework utilized to lead a research study linking to its objectives. The researcher collected data using a descriptive study strategy in order to assist the researcher on issues about the effects of Covid-19 on supply chain efficiency at Freda Rebecca Gold MineIt made it possible for the researcher to gather data using both quantitative and qualitative techniques, such as observation and questionnaires. Furthermore, it enabled the researcher to examine the consequences of supply chain interruptions in greater detail, as well as to take into account a variety of data sources and have a more comprehensive understanding of the problems. More so, it provided the researcher with insight of life experience in a way that other research methods may not offer. This study's design offered a framework for the processing and display of data. Hence, it makes the researcher get information on the current status of the problem.

3.2 Population

In this context, population refers to any group or individuals that have one or more characteristics in common that are of interest to the researcher. It is a set that consists of all respondents and will

be used to gather and evaluate data (Getu & Tegbar, 2006). The population of the study at the Mine was drawn from the procurement team, distribution officers, top management, store personnel and suppliers.

3. 3. Sampling

Selecting a subset of people from a statistical population in order to estimate the characteristics of the entire population is known as sampling. Most of the sample units that were surveyed and provided the questionnaires came from the chosen company, FRGM. The main respondents included the procurement management unit, procurement officer, administration personnel, stores personnel, accounting managers, suppliers and other staff members. To address the main issues and objectives of the study, personal interviews and questionnaires were distributed to the FRGM employees.

3.4 Sampling techniques

Probability sampling and non-probability sampling are the two methods for selecting a sample (Thomas, 2006). Any type of sampling where the observations are not chosen at random is considered non-probability sampling. Here, the selection of observations from the population is based on factors other than randomness. The sampling strategies employed in this investigation are listed below.

3.4.1Judgment (or Purposive) Sampling

This method, which is sometimes referred to as subjective or selective sampling, depends on the researcher's judgement in selecting participants. Because of this, researchers may unintentionally choose a representative sample to achieve their objectives or target people who possess particular characteristics (Etikan et al., 2017). Purposive sampling was employed in this study in order to gain a deeper understanding of the impact of COVID-19 on supply chain efficiency while also identifying people's experiences. The researcher's assessment, which takes into account the information required to satisfy the study objectives, guided the sampling strategy. One benefit of purposeful sampling is that it may be completed quickly and cheaply, and it can produce a wide range of outcomes.

3.4.2 Simple random sampling

To reduce bias, simple random sampling ensures that every member of the population has an equal probability of being chosen for the sample. The researcher prepares a sampling frame, or a list of every member of the population, in simple random sampling. The researcher then chooses a certain number of people from the sampling frame to take part in the study using a random procedure, like a random number generator. When used correctly, this technique can produce worker insights that are more trustworthy.

3.5 Data collection methods

Both primary and secondary sources of data were used to collect the research. With primary data, a comparison examination of theories and real practice may be undertaken that would not have been possible with just data alone. However, secondary data was also used due to its accessibility and affordability.

3.5.1 Primary source

Primary data are first-hand accounts and responses that a researcher has collected from the original sources they have access to. The term "primary source of data" describes information that was initially gathered by the researcher for a specific purpose without coming from any recorded records, (Jewell, 2000). They are often gathered using various approaches such as interviews and questionnaires (Cohen et al., 2000). This source was used because it provides recent information. Primary data was produced throughout the course of study and has an impact on data gathering procedures and methods.

3.5.2 Secondary Sources

This is second-hand data that is extracted from the records that are accessible, such as performance appraisal reports, stock flow material reports, and store records. What's left over after main data collection is called secondary data. Armstrong (2001) showed that secondary data might be combined and processed further into raw data. After the survey, raw data is the first step that needs to be processed and collated. Secondary data may come from sources inside or outside the

organisation being studied. External data is information that has been gathered outside the organisation by a third party, whereas internal secondary data is information that already exists within the organisation, such as internal records (Blumberg, 2005). Data generated and stored as part of an organization's regular operations are referred to as internal secondary data. The sources of secondary data that are used by the researcher data include internet search engines; articles form library databases, company reports, newspapers, scientific articles and academic journals. Secondary data, according to Kotler and Armstrong (1997), are details gathered for objectives other than solving the study question; yet, they have the advantage of being more readily available and less expensive than primary data. Additionally, if primary data cannot be collected at all, it might be easily accessible. As a result, secondary data provided the research study with a solid foundation and guidance.

3.6 Research methods/ instruments

These are the instruments that used to gather information that is necessary to solve the research problem. Research instruments are tools or technologies that are used to measure responses (Ormrod, 2011). Data from the respondents, who make up the sample of managers from procurement, finance, production, logistics, distribution, and administration of Freda Mine, was gathered for analysis using two research instruments. The questionnaire and interview formed the basis for collecting primary data for this research. It is essential to note that the criteria used to select the proper methods are validity, reliability, time constraints and costs.

3.6.1 Questionnaire forms

The study's research questions and objectives informed the development of the questionnaire used as a data collection instrument. It was deemed an appropriate tool as it facilitated the researcher's process of gathering information from participants in a more efficient manner.Furthermore, it is regarded as the most appropriate because it allows respondents to respond in greater depth, and they have a greater sense of anonymity, enabling people to speak more freely about delicate subjects that they might find uncomfortable discussing in-person, leading to more thorough information on the respondents' viewpoints on the matter. In a short period of time, the researcher

was able to obtain a substantial amount of data from the staff. Moreover, it made it possible for questions to be presented more consistently, which improved the comparability of the answers.

The research instrument was sent through email using a Google form. In addition to questions gauging agreement or disagreement, the questionnaire allowed respondents to share their thoughts on a range of subjects in open-ended questions. There were four sections to the survey: Section 'A' sought general respondent information; Section 'B' focused on the disruptions to the supply chain brought about by COVID-19; Section 'C' examined COVID-19 management strategies; and Section 'D' addressed the best COVID-19 management options.

The questionnaires, on the other hand, had limitations. One of the questionnaires' drawbacks was the significant likelihood of respondents misinterpreting the questions. Additionally, due to the absence of in-person interactions with the participants, the researcher could not identify nonverbal clues. Because respondents completed the questionnaires on their own time, there was minimal control over who completed them, resulting in skewed results. It was also contingent on the respondents' capacity and willingness to furnish the information required.

A cover letter gave assurance to respondents that the information they will provide on the questionnaire would remain confidential, which alleviated some of the concerns associated with their use. Furthermore, the researcher employed clear and direct language in their communication. The research instrument, namely the questionnaire, underwent pretesting and piloting to ensure its validity and reliability. This was done by assessing individuals' comprehension and their ability to effectively respond to the questions. The response rate was boosted by using reminders.

3.6.2 Interviews

Interviews are accurately described as "a process of talking more intentionally and methodically than the day-to-day addresses" by Saunders (2009). This indicates that interviews are truthful and adaptable to every circumstance. A purposeful conversation between the canvasser and the pole is all that constitutes an interview. Interviews can be categorized into two main types: semi-structured and fully structured. In a fully structured interview, a predetermined set of questions is prepared in advance, and the interview schedule is strictly followed according to a predetermined timeline. On the other hand, a semi-structured interview provides the interviewer with a pre-

prepared list of questions, but it allows for flexibility during the conversation, enabling the interviewer to modify or adapt the questions based on the flow of the discussion. The researcher used the semi-structured interviews during the data collection with the managers and head of department at the mine.

The following benefits of using interviews are related to their flexible and adaptive data collection system. Furthermore, interviews yielded immediate responses, resulting in a high response rate. The interview format facilitated the exchange of information between the interviewer and the interviewees. It also provided the researcher with the opportunity to seek clarifications on questions and assess the credibility and honesty of the respondents' answers. Therefore, the research benefited from the researcher's effective interview sessions and the success of every planned interview.

3.7 Data collection procedures

In order to ensure that surveys and questionnaires could be completed without any issues or participant doubt, the researcher secured the required clearances and approvals from the pertinent authorities of the participating companies. The information was also painstakingly assembled, guaranteeing correctness and comprehensiveness. To ensure the validity of the study results, any anomalies or discrepancies were thoroughly investigated and confirmed.

3.8 Validity and Reliability

3.8.1 Reliability

An instrument is considered reliable if it is stable, consistent, accurate, and dependable. According to Lewis Templeton and Byrd (2005), dependability in research is an assessment of how well the study's constituent parts correspond to the conceptual notion or variable being studied. The pilot test revealed serious flaws that were promptly corrected. The interviews and questionnaires were conducted to all individuals directly involved in the organization such as top management and other staff members (end users and user departments) of the Mine. This implies that accurate information was obtained. It was the responsibility of the colleagues to forbid any inquiries that were too clear to include and may indicate unnecessary incompetence in the researcher's question

design. The researcher used previously accessible data only when they were found to be credible, acceptable, and adequate for evaluating the impact of COVID-19 on Freda Rebecca Gold Mine's supply chain effectiveness.

3.8.2 Validity

The measure of an instrument's validity is how well it captures the intended data. The researcher employed a transferable approach to determine the extent to which quantitative study results were obtained. The researcher was responsible for doing a thorough job and making sound judgments. The researcher employed a self-administered questionnaire and a thorough interview guide as data-collecting tools. Both used jargon-free wording that reduced the need for respondents to clarify, hence both satisfied construction validity requirements. A considerable theoretical foundation, preliminary qualitative data, and a modified existing questionnaire were used to establish internal validity.

3.9 Data presentation and analysis

In eliminating errors and taking care of inconsistencies, the researcher crosschecked the completeness and accuracy of information provided on the administered questionnaires. The researcher also edited, coded and cleaned the collected data. The data collected from primary sources was organized, analyzed synthesized and examined using both quantitative and qualitative techniques. Microsoft Excel was used to create reports after the Statistical Package for Social Sciences (SPSS Version 21.0) program was used to analyze the data. Descriptions were used in analyzing the qualitative data. Tables, charts, and graphs were used to illustrate the results, which made it easier to analyze the data and make conclusions.

3.10 Chapter summary

The research plan, which is a comprehensive proposal pertaining to a certain area of archeological endeavour, was covered in this study chapter. This chapter also examined the research instrument, the intended population, sample size, sampling procedures, and the validity and reliability of these tools. The data analysis and data presentation techniques are also displayed in the approach.

CHAPTER IV

DATA PRESENTATION, ANALYSIS AND DISCUSSIONS

4.0 Introduction

This chapter servers to present and discuss the findings of the study. The findings of the study serve to strengthen the existing knowledge about the effects of covid-19 on supply chain efficiency. It includes presenting, analyzing, and interpreting the research findings. Tables presenting the data that have been evaluated and interpreted in accordance with the research objectives are based on the replies from study participants who were chosen during the data collection process. The findings discussion has been organized based on the study's aims and the demographics of the participants, as stated in the first chapter. The goal of the data interpretation process is to enable the researcher to draw valid findings and offer suggestions for improving comprehension of the study subject.

4.1 Response rate

The 54 surveys that the researcher self-administered were returned on schedule and filled out by the respondents. The reason been this could be that the researcher personally distributed each questionnaire. As a result, the responders were free to clarify any confusion they had by asking questions. The response rate was therefore translated to 100%, as shown below:

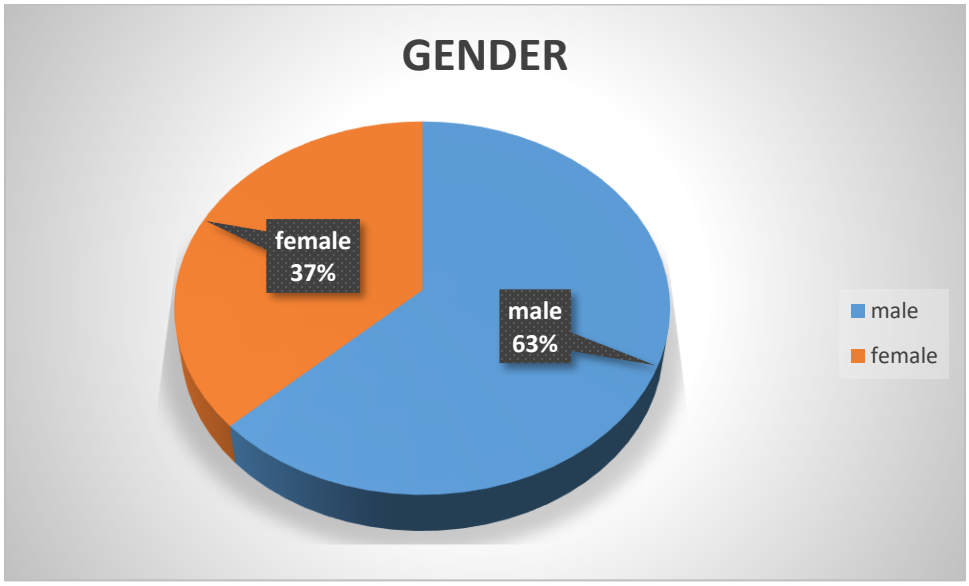
Table 3: return rate (n=54)

Issued	Received	Not received	Total	Percentage %
54	54	0	40	100%

Source: Primary data (2024)

4.2 RESPONDENTS BY GENDER

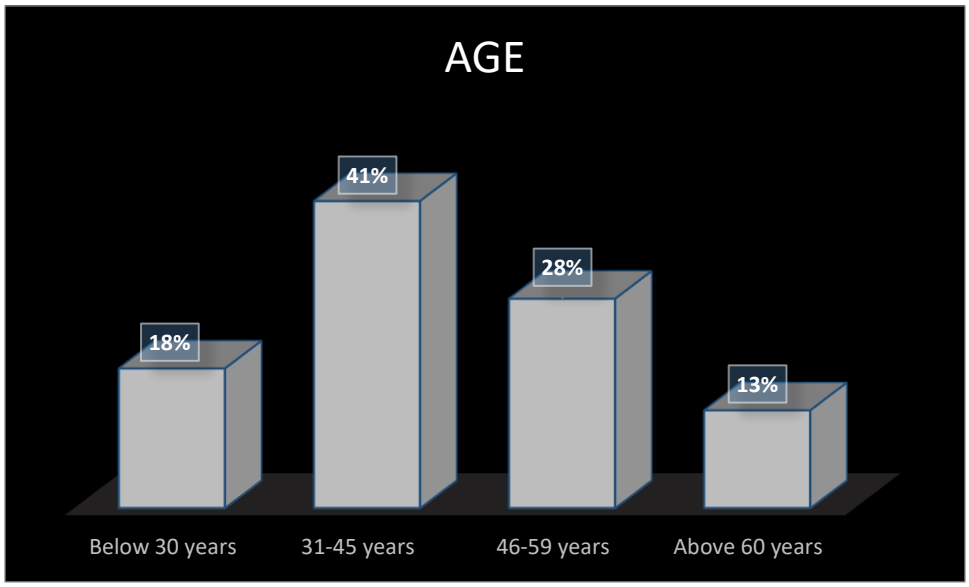
Figure 2: Respondents by gender



It is evident from the data in Figure 2 that every single one of the 54 respondents who took part in the survey filled out and returned the questionnaire, 34(63%) were males while 20(37%) were females. Therefore, the data in **figure 2** reveals an unequal gender distribution of respondents, where men are greater regular than ladies. It could be because women in the mining industry are hesitant to assume greater danger and responsibility. This illustrates the gender gaps in the workplace even though equal chances for men and women are promoted by the Zimbabwean constitution.

4.3 AGE OF THE RESPONDENTS

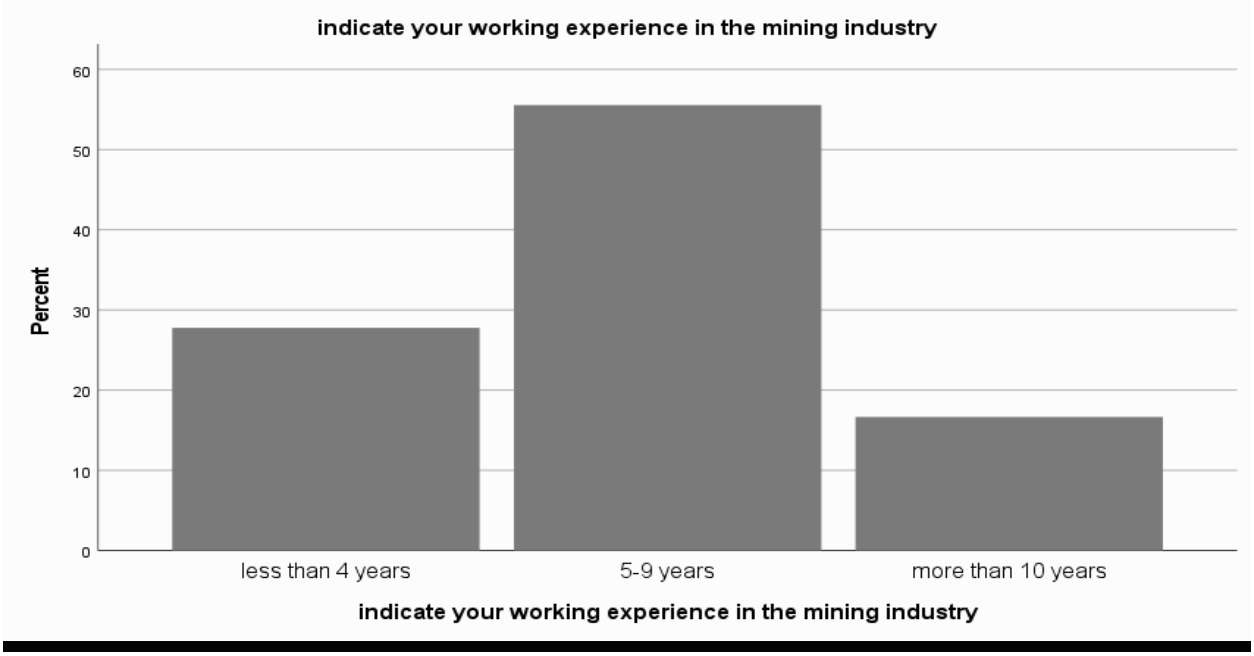
Figure 3: Respondents by age



According to the data above, 10 (18%) of the participants were under 30 years old, while 22 (41%) were between 31 and 45 years old, 15(28%) by respondents aged 46-59 years and 7(13) were 60 and more. It may be inferred from the above provided data that the majority of the participants were between the ages of 31 and 45. The participants shown sufficient maturity to provide candid, sincere, and informative responses regarding the study they were researching.

4.4 RESPONDENTS BY WORKING EXPERIENCE

Figure 4: Respondents' working experience



The bulk of the respondents which is 30(55.6%) have been with the organization for a period of between 5-9 years. According to the findings, 15(27.8 %) of the respondents had spent a minimum of 5 years in the organization and some were students on apprentice, 30(55.6 %) had spent 5- 9 years and 9 (16.7%) had been employed for more than 10 years at the company. This implies that most of the respondents have enough experience to give information and an in-depth understanding of the mining industry.

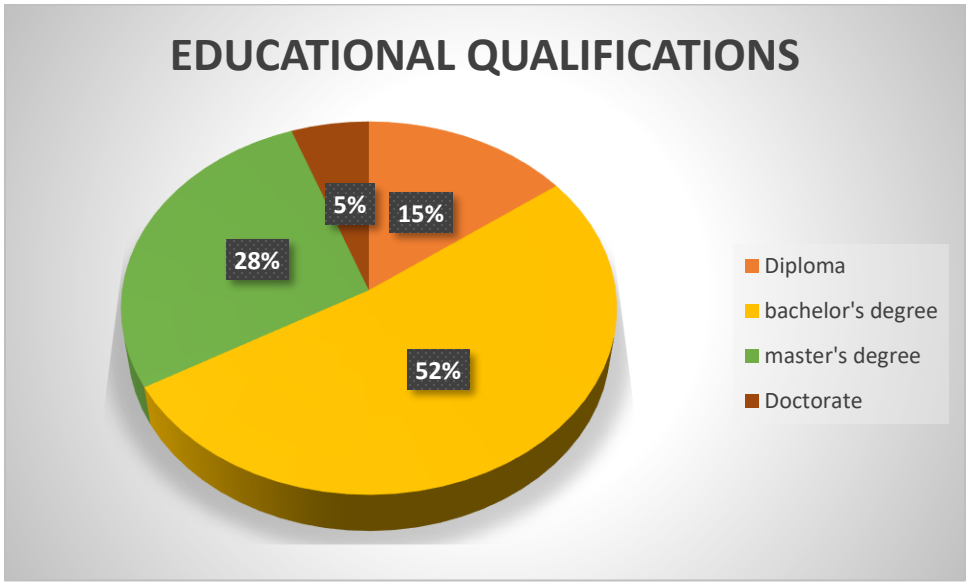
4.5 Level of education

Table 4: educational qualifications

Educational level	Frequency	Percent	Valid Percent	Cumulative Percent
Diploma	8	14.8	14.8	14.8
bachelor's degree	28	51.9	51.9	66.7
master's degree	15	27.8	27.8	94.4
Doctorate	3	5.6	5.6	100.0
Total	54	100.0	100.0	

Source: Field Research (2024)

Figure 5: Respondents' educational level



From the table majority of Bachelor's degree holders made up the respondents, followed by Master's degrees, diplomas, and up to doctorate degrees. From the data presented above, the research recorded 8(15%) of the respondents who possess Diplomas; 28(52%) have Undergraduate degrees; 15(28%) hold Masters Degrees and 3(5%) are holders of Doctorate. This suggests that the company employs qualified employees, which raises the legitimacy of the answers. This further

demonstrates that the respondents were able to correctly understand the questions in the surveys and interviews and adjust their responses accordingly. Consequently, this improved the accuracy of the information gathered.

4.6 Departmentalization response rate

The research was attended by many departments across the mine which include; Financial, Production, Logistics, Administration, Stores, Human Resources, Procurement department and officials made up the responders. The majority of responders either worked for the logistics, production or procurement departments. Due to their pivotal position in supply chain management and their wealth of knowledge, these individuals were essential to the study's accomplishment. These findings therefore show that the highest number of participants is the procurement department. The information was observed as follows:

Table 5: Department response rate

Department		Frequency	Percent	Cumulative Percent
	financial department	7	13.0	13.0
	procurement department	14	25.9	38.9
	production department	10	18.5	57.4
	logistics department	11	20.4	77.8
	administration department	4	7.4	85.2
	stores department	5	9.3	94.4
	human resources department	3	5.6	100.0
	Total	54	100.0	

Source: Primary data

4.7 Analysis of supply chain disruptions due to covid-19

The participants were requested to indicate the supply chain disruptions due to covid-19, listed in the table below are supply chain disruptions. The responses and representation percentage of the respondents are displayed in the table below.

Figure 6: Supply chain negative disruptions due to covid-19

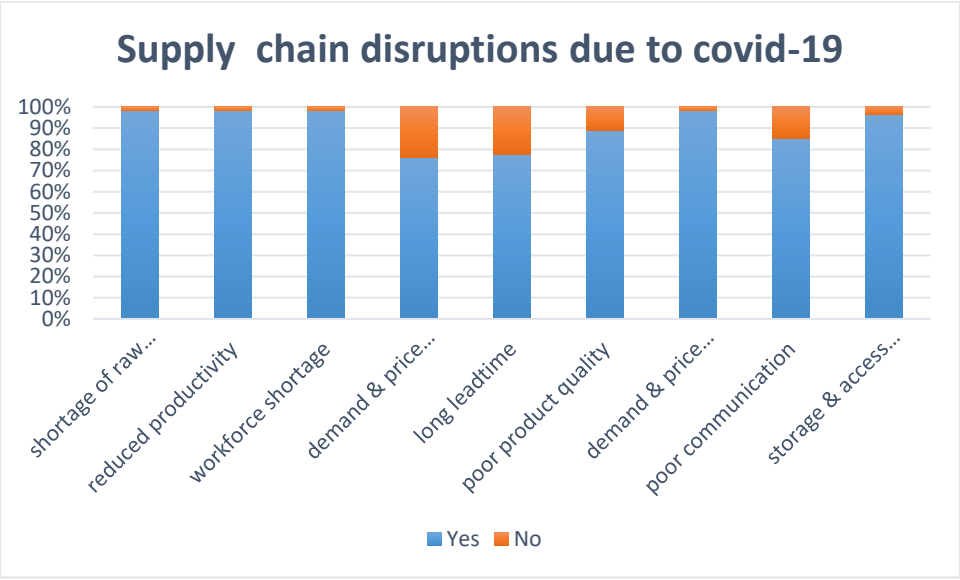


Table 6: Supply chain negative disruptions due to covid-19

Supply chain disruptions		**Responses**		**Totals**
		Yes	No	
shortage of raw materials	**Frequency**	**53**	**1**	**54**
	Percentage	98%	2%	100%
Reduce productivity	Frequency	**53**	**1**	**54**
	Percentage	**98%**	**2%**	**100%**

Workforce Shortage	Frequency	**53**	**1**	**54**
	Percentage	98%	2%	100%
Price fluctuations or demand uncertainty	Frequency	**41**	**13**	**54**
	Percentage	**70%**	**30%**	**100%**
Longer lead time	Frequency	**42**	**12**	**20**
	Percentage	**78%**	**22%**	**100%**
Poor product quality problems	Frequency	**48**	**6**	**54**
	Percentage	**89%**	**11%**	**100%**
Poor communication with suppliers	Frequency	**46**	**8**	**54**
	Percentage	**85%**	**15%**	**100%**
Transportation failure and delays	Frequency	**53**	**1**	**54**
	Percentage	**98%**	**2%**	**100%**
Storage and access disruptions	Frequency	**52**	2	**54**
	Percentage	**96%**	**4%**	**100%**
Port congestion	Frequency	**35**	**19**	**54**
	Percentage	65%	35%	100%
Lack of flexibility inhabitants	Frequency	27	27	54
	Percentage	50%	50%	100%
Inventory placement challenges	Frequency	41	13	54
	Percentage	76%	24%	100%

Source: the field data (2024)

Table 6 above, with regards to shortages of raw materials, the research findings showed 53 respondents (98%) that said shortages of raw materials is one of the supply chain disruptions due to covid-19, 1 respondent (2%) did not agree. This is an indication that shortages of raw materials was a supply chain disruption due to covid-19 in FRGM supply chain.

Based on the information of reduced productivity presented in Table 6, the research findings showed that 53 respondents agreed that the company's increased attention on COVID-19 advertising above productivity caused a disturbance in the supply chain. Only one respondent disagreed. This represents 98% and 2% respectively. Therefore, this is an indication that reduction in productivity is one of the supply chain disruptions due to covid-19 on the FRGM supply chain.

From the table above, concerning workforce shortage, the findings revealed that 53 respondents said that shortage of workforce is a supply chain disruption due to covid-19, and 1 respondent disagreed with that. This represents 98% and 2% respectively. This shows that shortage of workforce is a supply chain disruption due to covid-19 on FRGM supply chain due to the isolation for a month or greater of the infected person.

Moving on to Price fluctuations or demand uncertainty, according to the table above, the study findings revealed that 41 respondents said Yes, Price fluctuations or demand uncertainty is a supply chain disruption due to covid-19, and 13 respondents said No. This represents 70% and 30% respectively. The drop in demand for the exportation of gold occurred. Therefore, this is an indication to greater extent Price fluctuations or demand uncertainty is a supply chain disruption due to covid-19 on FRGM supply chain.

From table 6 above, on longer lead time, the findings showes that 42 respondents agreed that the lengthening of lead time is a supply chain disruption due to covid-19, and 12 respondent said no. This represents 78% and 22% respectively. This is an indication that lengthening of lead time is a supply chain disruption due to covid-19 on FRGM supply chain.

According to the table above, on poor product quality problems, the research findings revealed that 48 respondents (89%) said Yes product quality problems are a supply chain disruption due to covid-19, and 6 respondents (11%) said No. Therefore, this is an indication that the product quality problem is a supply chain disruption due to covid-19.

From the table 6 above, on Transportation and logistics failure and delays, the researcher findings revealed that 53 respondents said Yes, Transportation failure and delays are a supply chain disruption due to covid-19, and 1 respondent disagreed with that. This represents 98% and 2% respectively. This is an indication that Transportation failure and delays is a supply chain disruption due to covid-19 on the FRGM supply chain as there were travel restrictions and quarantine measures.

From the table above, with regards to Storage and access disruptions, the research findings revealed that 52 respondents agreed that storage and access disruptions are a supply chain disruption due to covid-19, and 2 respondents said storage and access disruption is not a supply chain disruption due to covid-19. This represents 96% and 4% respectively. This is an indication that Storage and access disruptions are a supply chain disruption due to covid-19 on FRGM supply chain.

Considering poor communication with suppliers, from the table above the research findings revealed that 46 respondents agreed that poor communication with suppliers is a supply chain disruption due to civid-19, and 8 respondents said no. This represents 85% and 15% respectively. This is an indication that poor communication with suppliers is a supply chain disruption due to covid-19 to a greater extent.

The table 6 above shows that the Company experienced financial losses due to sudden implementation of comprehensive preventative measures. These includes, sanitizers, medical leave compensation, face masks and biweekly free rapid and PCR testing kits for personnel.

Also, the research findings revealed that 35 respondents (65%) mentioned port congestion as the supply chain disruption due to covid-19 in the mining sector supply chain. According to research findings on the table above, 27 respondents (50%) mentioned lack of flexibility among inhabitants as another supply chain disruption due to covid-19. 41 respondents (76%) identified Inventory placement challenges as another supply chain disruption due to covid-19. Therefore, this is an indication that to a greater degree inventory placement challenges and port congestion are the supply chain disruptions due to covid-19.

4.8 The strategies employed to manage covid-19 at FRGM

Figure 7: Strategies employed to manage covid-19

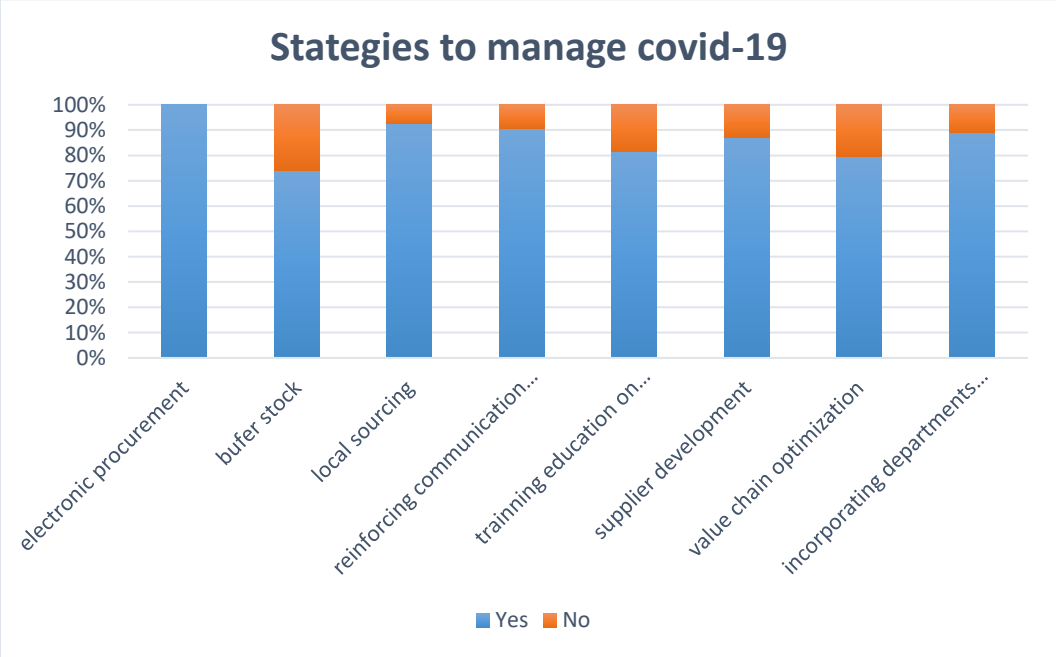


Table 7: Strategies employed to manage covid-19

Strategy		**Responses**		**Totals**
		Yes	No	
Electronic procurement	Frequency	54	0	54
	Percentage	100%	0%	100%
Collaboration with suppliers	Frequency	43	11	54
	Percentage	80%	20%	100%
Buffer stock	Frequency	40	14	54
	Percentage	74%	26%	100%

Value chain optimization	Frequency	43	11	54
	Percentage	80%	20%	100%
Incorporating the departments into the company's collective innovation system	Frequency	48	6	54
	Percentage	89%	11%	100%
Supplier development	Frequency	47	7	54
	Percentage	87%	13%	100%
Reinforcing communication across the whole supply chain	Frequency	49	5	54
	Percentage	91%	9%	100%
New training and response programs	Frequency	44	10	54
	Percentage	81%	19%	100%
Local sourcing	Frequency	50	4	54
	Percentage	93%	7%	100%
Early supplier involvement	Frequency	43	11	54
	Percentage	80%	20%	100%
Including partners in risk planning	Frequency	15	5	54
	Percentage	75%	25%	100%
Diversify the supply base	Frequency	10	10	54
	Percentage	70%	30%	100%
Insourcing	Frequency	13	7	54
	Percentage	58%	42%	100%
Transparent with partners	Frequency	3	17	54
	Percentage	45%	55%	100%

Source: Research data (2024)

According to table 7 above, regarding electronic procurement, the study's conclusions showed that every respondent stated that e-procurement is a strategy employed to manage covid-19, They explained by mentioning the benefits derived through electronic procurement which are listed below;

- E-procurement integrates with inventory management systems, enabling real-time tracking and optimization of inventory levels, which is critical during a time of supply chain disruptions.
- Minimize the need for face-to-face interactions with suppliers, reducing the risk of transmission and ensuring social distancing.
- accelerates procurement processes, enabling faster response times to changing market conditions and supply chain disruptions
- Electronic procurement platforms enable real-time monitoring of supplier performance, ensuring that critical supplies are delivered on time.
- Enhanced transparency and visibility as it provides real-time visibility into procurement processes, enabling better tracking and monitoring of transactions during a time of increased supply chain risk.
- Electronic procurement automates procurement processes, reducing manual errors and increasing efficiency during a time of reduced workforce availability.

This represents 100%, therefore this is an indication that Electronic procurement is a strategy employed to manage covid-19.

More so, regarding Collaboration with suppliers, from table 7 above the data revealed that 43 Yes respondents showing that Collaboration with suppliers is a strategy employed to manage covid-19. They suggested that collaboration with suppliers enables the buying organization and suppliers to work together to reduce bottlenecks, changes in the supply market communicated quickly, easy to manage any supply chain risks in the mining sector, enhanced Product Safety and Quality, Efficient Production additionally, they said that it permits the pursuit of more traditional supply chain optimization and procurement tactics with the same vendors while concurrently modernizing product designs and manufacturing procedures. 11 respondents disagreed. This represents 80%

and 20% respectively. Therefore, this is an indication that collaboration with suppliers is a strategy employed to manage covid-19.

In the above table 7 on Buffer stock, the findings revealed 40 respondents (74%) agreed that Buffer stock is a strategy employed when managing covid-19, and 14 respondents (26%) disagreed. This is an indication that Buffer stock is one of the strategies employed to manage covid-19.

According to the table above, on Value chain optimization, the findings revealed that 43 (80%) participants said yes, Value chain optimization is a strategy employed to manage covid-19, and 11 respondents (20%) was not agree. This is an indication that Value chain optimization is a strategy employed to manage covid-19.

On incorporating the departments into the Company's Collective Innovation System, the findings from table 7 above shows 48 respondents that said incorporating the departments into the company's collective innovation system is a strategy employed to manage covid-19. They suggested that, this strategy improves communication, reduces travel costs and also expresses the possibility of assimilating internal and external information, creating knowledge and of developing aptitudes to pose new problems and to bring answers. 6 respondents said it is not strategy employed. This represents 89% and 11% respectively. This is an indication that incorporating the departments into the company's collective innovation system is a strategy employed to manage covid-19.

From table 7 above, on Supplier development, the study findings revealed that 47 (87%) said that Supplier development is a strategy employed to manage covid-19. They suggested that; it improves lead time, enhances electronic procurement, streamlined and reduced sourcing activities, it resolves performance and quality issues. Lastly, they suggested that it drives innovation and 7 respondents (13%) said is not a method used to handle COVID-19. This is an indication that Supplier development is a strategy employed to manage covid-19.

On Reinforcing communication in the supply chain, the findings from table 7 revealed that 49 (91%) respondents said yes reinforcing communication across the whole supply chain is a strategy employed to manage covid-19, they said that, it enhances effective communication, any changes communicated early in the supply chain, also boosts the morality of the workers and improves their performance and at the same time encourage team spirit on handling supply chain disruptions.

5 respondents (9%) said no. This is an indication that Reinforcing communication across the whole supply chain is a strategy employed to manage covid-19.

From the table above, concerning new training and response programs, the findings revealed 44 respondents (81%) that said yes, New training and response programs is a strategy employed to manage covid-19, and 10 respondents (19%) disagreed. This is an indication that a new training and response program is a strategies employed to manage covid-19.

For local sourcing, the findings from table 7 revealed 50 respondents (93%) that said yes local sourcing is one of the strategies adopted to manage covid-19, and 4 (7%) respondents said no. This is an indication that local sourcing is a strategy employed to manage covid-19.

At least all of the mining companies approached had a suggestion on the strategies employed to manage mining sector covid-19 besides the strategies on table 7 above. Table 7 above also demonstrates that the total respondents of 80% of suggested on early supplier involvement as a strategy employed in the mining sector supply chain for managing covid-19. 75% of the respondents revealed that, including partners in risk planning is a strategy employed to manage covid-19.

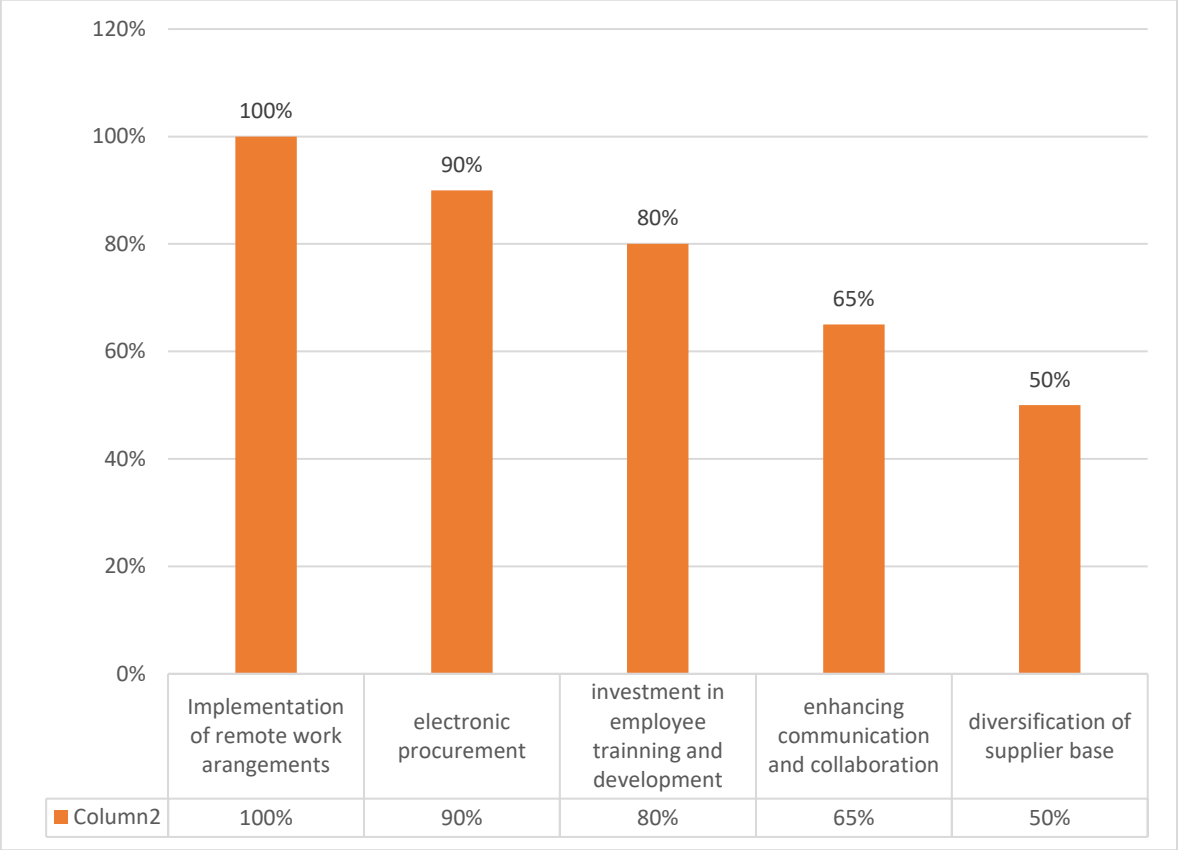
According to the table above, it is demonstrated that 70% of the total respondents revealed that, diversifying the supply base is a method used to control COVID-19. 58% and 45% of the total respondents, insourcing and transparency with partners are the strategies employed to manage covid-19 . This suggests that early supplier involvement is a powerful strategy to manage covid-19 followed by including partners in risk planning.

In addition, government regulations permitted the rewriting of agreements and duties that reduced delays in transportation thus facilitating smooth flow in the supply chaininteracting with important parties and being proactive in seeking out funding opportunities.

4.9 Strategies ranked as the most effective in maintaining supply chain efficiency during covid-19.

Figure 8: Most effective strategies to manage covid-19

Figure 4.8: Most effective strategy to manage covid-19



Source: Primary data

The research findings showed that the respondents mentioned the most effective strategies during covid-19 as follows:

Implementation of remote work arrangements for supply chain management staff was ranked as one of the most effective strategies with 100%. By allowing staff to work from home, the mine reduced the risk of in-person transmission of the virus and ensured that critical supply chain functions continued uninterrupted.

Electronic procurement (90%) enabled the mine to enhance supply chain transparency and traceability, reducing counterfeiting risks. Additionally, e-procurement enabled procurement teams to work remotely, lowering the possibility of transmission in person and guaranteeing business continuity. Therefore, e-procurement minimized the need for face-to-face interactions with suppliers, lowering the risk of transmission and making certain social distance.

The mine's investment in employee training and development (80%) was also critical in maintaining supply chain efficiency during the pandemic. By providing training on digital technologies and supply chain management, the mine developed a skilled and adaptable workforce that could respond effectively to changing circumstances

Enhancing communication and collaboration (65%) is critical for Freda Gold Mine help lower expenses, increase customer happiness, and optimize the efficiency of the supply chain. This includes implementing regular town hall meetings, supplier engagement programs, and digital platforms for real-time communication and collaboration. By enhancing communication and collaboration, Freda Gold Mine may increase confidence and connections with suppliers and customers while decreasing errors and increasing supply chain transparency.

The diversification of the mine's supplier base (50%) was another highly effective strategy. By reducing dependence on a single supplier, the mine mitigated supply chain risks and improved competition and pricing among suppliers. This strategy also increased access to new and innovative products and services, enabling the mine to adapt to changing market conditions.

Therefore, the most effective strategies to manage covid-19 at FRGM have been to lessen the effects of COVID-19 on their supply networks, guaranteeing business continuity and maintaining efficiency during a time of crisis.

4.10 Recommendations by respondents to create strong supply chain efficiency at the mine.

Table 8: Recommendations by respondents

Recommended Strategy		**Responses**
Implementing a Robust Risk Management Plan	Frequency	40
	Percentage	74%
Diversifying Suppliers and Developing Strategic Partnerships	Frequency	43
	Percentage	80%
Investing in Digital Technologies	Frequency	39
	Percentage	72%
Optimizing Inventory Management	Frequency	44
	Percentage	81%
Developing Agile and Flexible Supply Chain Operations	Frequency	30
	Percentage	56%
Enhancing Communication and Collaboration	Frequency	35
	Percentage	65%
Investing in Employee Training and Development	Frequency	39
	Percentage	72%
Implementing Cost-Saving Measures	Frequency	44
	Percentage	81%

Source: Primary data

4.10.1 Implementing a Robust Risk Management Plan

A comprehensive risk management strategy is necessary for Freda Gold Mine to mitigate the dangers posed by the COVID-19 outbreak. Potential risks should be identified in the strategy, along with their impact and likelihood, and solutions to reduce or eliminate them should be developed. This includes identifying alternative suppliers, developing contingency plans for supply chain disruptions, and implementing protocols for employee safety and health. When having a comprehensive risk management plan in place, Freda Gold Mine can reduce the likelihood of supply chain disruptions and ensure business continuity.

4.10.2 Diversifying Suppliers and Developing Strategic Partnerships

Diversifying suppliers and developing strategic partnerships is crucial for Freda Gold Mine to reduce dependence on single suppliers and ensure a stable supply of critical materials. This includes identifying new suppliers, developing relationships with existing suppliers, and collaborating with suppliers to share resources and expertise. Henceforth, Freda Gold Mine can lessen the possibility of breakdowns in the supply chain, improve quality, and reduce costs by diversifying suppliers and developing strategic partnerships.

4.10.3 Investing in Digital Technologies

Investing in digital technology such as blockchain, data analytics and the Internet of Things (IoT) help Freda Gold Mine improve supply chain efficiency, transparency, and traceability. Blockchain technology can provide real-time tracking and monitoring of goods, while data analytics can enhance demand forecasts and optimize supply chain processes. IoT sensors can provide real-time monitoring of equipment and machinery, reducing downtime and improving maintenance. Investment in digital technologies, Freda Gold Mine can improve supply chain agility, reduce costs and enhance customer satisfaction.

4.10.4 Optimizing Inventory Management

Optimizing inventory management is critical for Freda Gold Mine to lower inventory

holding costs, minimize waste, and improve supply chain efficiency. This includes implementing just-in-time delivery, reducing inventory levels, and improving inventory turnoverFreda Gold Mine can lower costs, increase cash flow, and improve supply chain agility by optimizing inventory management.

4.10.5 Developing Agile and Flexible Supply Chain Operations

Creating flexible and nimble supply chain processes is crucial for Freda Gold Mine to respond quickly to changing market conditions and customer needs. This includes implementing modular supply chain designs, developing contingency plans for potential supply chain disruptions, and improving communication and collaboration with suppliers and customers. If the mine develops agile and flexible supply chain operations, it can enhance the responsiveness of the supply chain, lower expenses while raising customer satisfaction.

4.10.6 Enhancing Communication and Collaboration

Enhancing communication and collaboration is critical for Freda Gold Mine to enhence supply chain efficiency, reduce expenses and enhance customer satisfaction. This includes implementing regular town hall meetings, supplier engagement programs, and digital platforms for real-time communication and collaboration. Therefore, by enhancing communication and collaboration, Freda Gold Mine can enhance supply chain transparency, lessen errors, and strengthen trust and relationships with suppliers and customers.

4.10.7 Investing in Employee Training and Development

Putting funds into the education and training of staff members is crucial for Freda Gold Mine to develop a skilled and adaptable workforce. This includes providing training on digital technologies, supply chain management, and leadership and management skills. As the mine invests in training and development of workers in order to increase employee productivity and reduce errors.

4.10.8 Implementing Cost-Saving Measures

Cost-cutting measures must be put in place for Freda Gold Mine to reduce costs, improve cash flow, and enhance supply chain efficiency. This includes reducing energy consumption, minimizing waste, and optimizing logistics operations. Implementing cost-saving measures at Freda Gold Mine can reduce costs, improve profitability, and enhance supply chain sustainability.

4.11 Discussion

Organizational supply systems are seriously at threat from the COVID-19 pandemic, disrupting the smooth flow of goods and raw materials. This disruption, as confirmed by Craighead et al. (2007), leads to increased complexity and challenges in product acquisition, highlighting the need for risk mitigation strategies. The research by Hendricks and Singhal (2005) corroborates the Craighead study, emphasizing that disruptions have negatives impact on shareholder value and a firm's long-term success. Additionally, Kim (2010) further validates these findings, noting that interruptions can significantly affect a firm's inventory levels. Furthermore, March and Shapiro's (1987) research highlights a common misconception among management regarding supply chain disruptions. Their study found that managers often underestimate the impact of such disruptions and react slowly, waiting till they are directly affected. Additionally, they stress that a disruption's duration directly affects how severe it is, meaning longer disruptions have a greater effect on the organization. For two years, the COVID-19 epidemic continues to exist., providing a real-world example of this, as it has significantly disrupted mine supply chains, leading to reduced efficiency.

Contingency theory is predicated on the following fundamental tenets: first, there is no one ideal way to organise. Furthermore, not every organisational strategy is equally successful (Galbraith, 1973). This was observed in the research understudy, where a variety of tactics, such as supplier development, e-procurement, and training initiatives, were used to manage COVID-19. Also, not all strategies employed which brings best results some are ranked as the most effective strategies. The goal of the Theory of limitations is to identify bottlenecks or limitations in any process and figure out how to reduce or eliminate their impact (Rahman, 1998). According to Goldratt (1990), any real system has to have one or more restrictions that prevent it from operating at higher or better levels. The performance of a system is predicted by the theory of constraints. This was

observed in the study's research, which revealed a number of supply chain disruptions, including port congestion, a shortage of raw materials, a decline in productivity, and stock outs, to name a few. Moreover, to eliminate their effects different strategies were employed such as the use of e-procurement, collaboration with suppliers and also early supplier involvement. Also, by identifying and addressing the constraints, businesses can improve the overall efficiency of their supply chains (Christopher & Holweg, 2021). For example, as FRGM faced a labor shortage it could implement automation or outsource production to mitigate the constraint.

The basis of Resource Dependency Theory (RDT) is the notion that an organisation, like a business, needs to engage in transactions with other individuals and organisations in its environment in order to obtain resources Pfeffer and Salancik, (1978). The research under study discovered that the strategies used to manage COVID-19 were integrating the departments into the organization's collective innovation system and enhancing communication throughout the entire supply chain. As a result, the theory's prediction and the study's findings matched. According to the RDT, an organization's capacity to acquire and preserve resources is critical to its existence, this was seen when the shortage of raw materials caused reduction in productivity.

The research suggests that businesses with effective risk management procedures recover more quickly than those with less developed capabilities. This aligns with Kraljic's (1983) emphasis on proactive assessment and management of supplier portfolio uncertainties, which serves as a safeguard against costly supply chain disruptions.

4.12 Summary

The chapter delves into the presentation, analysis, and discussion of the study's findings. Collected data effectively addresses the research objectives and provides valuable insights for drawing meaningful conclusions. The findings are presented in a clear and accessible manner using tables, charts and graphs, interpretation simple. The respondents' information about how COVID-19 is affecting Freda Rebecca gold mine's supply chain efficiency are particularly valuable, forming the basis for the study's key findings.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

Covid-19 disease has presented challenges to supply chains worldwide. The mining sector has not been spared, with companies facing challenges in sourcing essential materials, equipment and personnel. A summary of findings, conclusions and recommendations of the entire research whose aim was to study the effects of covid-19 on supply chain efficiency at Freda Rebecca Gold Mine FRGM in Zimbabwe is provided by this chapter. Furthermore, the chapter gives suggestions for further research.

5.2 Summary of Findings

The study's goal was to determine how COVID-19 affected the supply chain in Zimbabwe's mining industry.

The study revealed that raw material shortage, storage and access disruptions, reduction in productivity, transportation failure and delays, lengthening of lead time and shortage of procurement workforce were the supply chain disruptions in the mining sector due to covid-19. Border closures and travel restrictions made it difficult to import essential materials and equipment, as well as to bring in skilled personnel from outside the country. Lockdowns and social distancing measures led to reduced productivity at supplier facilities and transportation delays for the mining equipment. The pandemic led to an increase in demand for certain materials, such as personal protective equipment (PPE), and increased costs due to higher prices for materials, transportation, and labor which led to increased expenses for the company.

In addition, disruptions to the supply chain had a significant effect on the efficiency of Freda Gold Mine's operations since the mine experienced production delays due to shortages of essential materials and equipment. The mine also, experienced reduced productivity of gold extraction due to the need to implement social distancing measures and other safety protocols.

More so, Freda Gold Mine implemented various strategies to mitigate the COVID-19 effects on its supply chain efficiency. These strategies included; electronic procurement, collaboration with suppliers, supplier development, new training and response programs and also incorporation of departments into the company's collective innovation system.

The mine increased its sourcing of materials from local suppliers to reduce reliance on imports. FRGM built up stockpiles of essential materials to buffer against supply disruptions. Additionally, the mine invested in technological solutions thus improve supply chain visibility and communication. Another strategy was implementation of flexible work arrangements to allow subordinates to work remotely and reduce the risk of infection at the organization.

5.3 Conclusion

The research concluded that FRGM had experienced significant disruptions to its supply chain, including shortages of essential materials and equipment, increased costs and reduced productivity. The finding of this study showed that the mine had implemented various strategies to use when mitigating the effects of the pandemic which are; sourcing materials locally, building buffer stocks and investing in technology solutions. Throughout the study, issues have been discussed with respect to the research objectives.

Therefore, COVID-19 outbreak has had a significant effect on supply chain efficiency at Freda Gold Mine. The mine has experienced disruptions to its supply chain, increased costs, and reduced productivity. However, the mine has implemented various strategies to mitigate the impact of the pandemic and ensure the continued operation of its business.

5.4 Recommendations

The study's conclusions led to the following recommendations:

1. The study recommended that mining organizations should collaborate with their supply chain partners this improves information sharing, for instance, through the adaptation of ERP systems that will integrate the entire supply chains information into a common platform in other to reduce the level of risk due to covid-19.
2. The study also recommends that Freda Rebecca gold mine should fully concentrate on managing covid-19 negative impacts on its supply chain efficiency.
3. The study also recommends that the Government of Zimbabwe should work with the mining industry to support and develop strategies to mitigate the impact of future pandemics on supply chains.
4. The study also recommends that the Mine should diversify its supply chains and have buffer stocks of essential materials.
5. The study also recommends that mining companies should invest in technology solutions to improve supply chain visibility and communication.
6. The study also recommends that the company should develop flexible work arrangements to allow employees to work remotely.
7. The study recommends that FRGM should continue to diversify its supplier base and develop strategic partnerships with key suppliers. This will reduce dependence on single suppliers and ensure a more stable supply of critical materials.
8. The study also recommends that the mine should develop cross-functional skills and adaptability by training employees to perform multiple tasks and adapt to changing circumstances fostering a more flexible and resilient workforce.
9. The study also recommends that FRGM prioritize sourcing mining materials and services from local suppliers to reduce reliance on global supply chains.

5.5 Limitations

This study has several limitations. First, the data was collected from a single mine, which may not be representative of the entire mining industry. Second, the study was conducted during the era of the pandemic and the long-term impact of COVID-19 on supply chains is still unknown.

5.6 Areas for further research

Further research is required to understand the long term consequences of COVID-19 on the mining industry supply chains. Henceforth, the research should include studies of multiple mines and longitudinal studies to track the impact of the pandemic over time.

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APPENDIX I- QUESTIONNAIRE

BINDURA UNIVERSITY OF SCIENCE EDUCATION
FACULTY OF COMMERCE

DEPARTMENT OF ECONOMICS

Dear Participant

This interview question guide has been administered by TRYPHINE F NJARAVA, a student from the Bindura University of Science Education, studying Bachelor of Commerce in Purchasing and Supply. Research that I'm conducting is called, **'THE EFFECTS OF COVID-19 ON SUPPLY CHAIN EFFICIENCY. A CASE STUDY OF FREDA REBECCA GOLD MINE.'** You are kindly requested to fill out this form with your answers, it would be greatly appreciated. You don't need to include any personal information on the form because your responses will only be used for academic purposes. The information gathered from this research will be utilized solely for academic purposes, and your response will be treated as private and confidential.

Yours sincerely

TRYPHINE F NJARAVA

Contact Numbers: +263 783 411 129/ +263 716 356 797

Email address: tryphinenjarava@gmail.com

QUESTIONNAIRE

Instructions

- You may answer all the questions honestly.
- Please kindly indicate your answers by ticking where appropriate in the boxes and writing in the spaces provided.
- Your name or identity is not required.

SECTION A: DEMOGRAPHIC INFORMATION

Please tick in appropriate box

1. **Indicate your sex**

Male ☐ Female ☐

2. Age Group:

18-30 years ☐ 31-45 years ☐ 46-59 years ☐ 60 years and above ☐

3. **Indicate your working experience**

0-2 years ☐ 3-5 years ☐ 6-9 years ☐ 10 years and above ☐

4. **Indicate your educational qualification**

Diploma ☐ Bachelor's Degree ☐ Master's Degree ☐

Other (specify)……..

SECTION B: SUPPLY CHAIN DISRUPTIONS CAUSED BY COVID-19

The following are supply chain disruptions due to covid-19 at your organization. Do you agree?

SUPPLY CHAIN DISRUPTION	YES	NO
Communication failure with suppliers		
Lengthening of lead time		
Price fluctuations or demand uncertainty		
Product quality problems		
Raw material shortage		
Reduce productivity		
Shortage of procurement workforce		
Storage and access disruptions		
Transportation failure and delays		

SECTION C: STRATEGIES EMPLOYED TO MANAGE COVID-19

2. Are the following strategies employed to manage covid-19 in your organization?

STRATEGY	YES	NO
Buffer stock		
Collaboration with suppliers		
Electronic procurement		
Incorporating the departments into the company's collective innovation system		

Local sourcing		
New training and response programs		
Reinforcing communication across the whole supply chain		
Supplier development		
Value chain optimization		

SECTION D: MOST EFFECTIVE STRATEGIES TO BE APPLIED DURING COVID-19 AT YOUR COMPANY

3. Is implementation of remote work arrangements for supply chain management staff the most effective strategy implemented during covid-19?

YES ☐ NO ☐

If **Ye**s, support your answer.

……
……
……

4. Diversification of the mine's supplier base is the most effective strategy used during covid-19 to improve supply chain efficiency at your organization.

YES ☐ NO ☐

If **Ye**s, state the reason below.

……
……
……

5. Electronic procurement improves procurement effectiveness and efficiency during covid-19 period at your organization?

YES ☐ NO ☐

If **Ye**s, how does it improve, support your answer.

……
……
……

6. Reinforcing communication across the whole supply chain is the most effective strategy during covid-19 at your organization?

YES ☐ NO ☐

If **Ye**s, kindly explain how.

.....
.....
.....

7. Does collaboration with suppliers enables to manage supply chain disruptions due to covid-19 at your organization?

YES ☐ NO ☐

If **Ye**s, how does this strategy support your organization to overcome supply chain disruptions, briefly explain below.

……
……
……

8. Investment in employee training and development at the mine is is the most effective strategy during covid-19 at your organization?

YES ☐ NO ☐

If **Ye**s, briefly explain below.

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……
……

9. In your opinion, what recommendations do you suggest to create strong supply chain efficiency at the mine during the covid-19 pandemic?

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10. Do you have any additional insights, comments or suggestions regarding the effects of covid-19 on supply chain efficiency at Freda Rebecca Gold Mine?

……
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Thank you so much for your time.

APPENDIX II- INTERVIEW GUIDE

TOPIC: The effects of covid-19 on supply chain efficiency. A case study of Freda Rebecca Gold Mine (FRGM).

As a student, I'm pursuing towards a Bachelor of Commerce Honours Degree in Purchasing and Supply with Bindura University of Science Education. The university mandates that all students complete research projects as a partial fulfilment of the requirements for the degree, therefore students should research a topic that is relevant to their study. The research title is: The effects of covid-19 on supply chain efficiency. A case study of Freda Rebecca Gold Mine (FRGM). Document in this letter is a questionnaire which will help me in collecting data. All the information provided is strictly confidential and will solely use for this academic purpose.

Interview check list.

1. What are the supply chain disruptions experienced by your organization during covid-19 pandemic?
2. Of the disruptions you experienced, which ones had the most significant impact on the mine's operations?
3. Which are strategies were employed by your organization to maintain the smooth flow of supply chain during the pandemic?
4. Of the strategies you implemented, which ones do you believe were the most successful in addressing the supply chain disruptions?
5. What key recommendations would you provide to Freda Rebecca Gold Mine to create stronger supply chain efficiency and resilience in the face of future disruptions?
6. What challenges did Freda Rebecca Gold Mine face in implementing these strategies to manage the COVID-19 impacts?
7. Do you have any additional insights, comments, or suggestions regarding the effects of COVID-19 on the supply chain efficiency at Freda Rebecca Gold Mine?

THANK YOU FOR YOUR COPORATION

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