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COLLEGE OF HUMANITIES AND SOCIAL SCIENCES

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KNUST

TOPIC:

**IMPACT OF COVID ON PORT TERMINAL PERFORMANCE. CASE STUDY OF
MERIDIAN PORT SERVICES TEMA.**

BY

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DECLARATION

I, Justice Kofi Awiah, herewith affirm that this submission is my own work towards the achievement of a Master of Science certificate in Logistics and Supply Chain Management. It contains no material previously published by another individual nor material which has been accepted for the award of any degree, except where due acknowledgement has been made in the text.

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ABSTRACT

The emergence of the coronavirus disease (also known as COVID-19, SARS-CoV-2), and its subsequent rise to the status of a global pandemic, caused major disruptions that had catastrophic effects on international trade, the welfare of seafarers, economies, travel, demand and supply, supply chains, and logistics. It is now more important than ever for shipping lines, freight forwarders, port authorities, and terminal operators to work together and use resilience measures to control disruption because it is unclear when the virus will go away. In this study, I concentrated on defining resilience, port performance, factors that affect disruption growth, building a framework for resilience to deal with these changes, and assessing the effects of port performance at Meridian Port Service's (MPS) Terminal 3 in Tema, Ghana's busiest seaport.

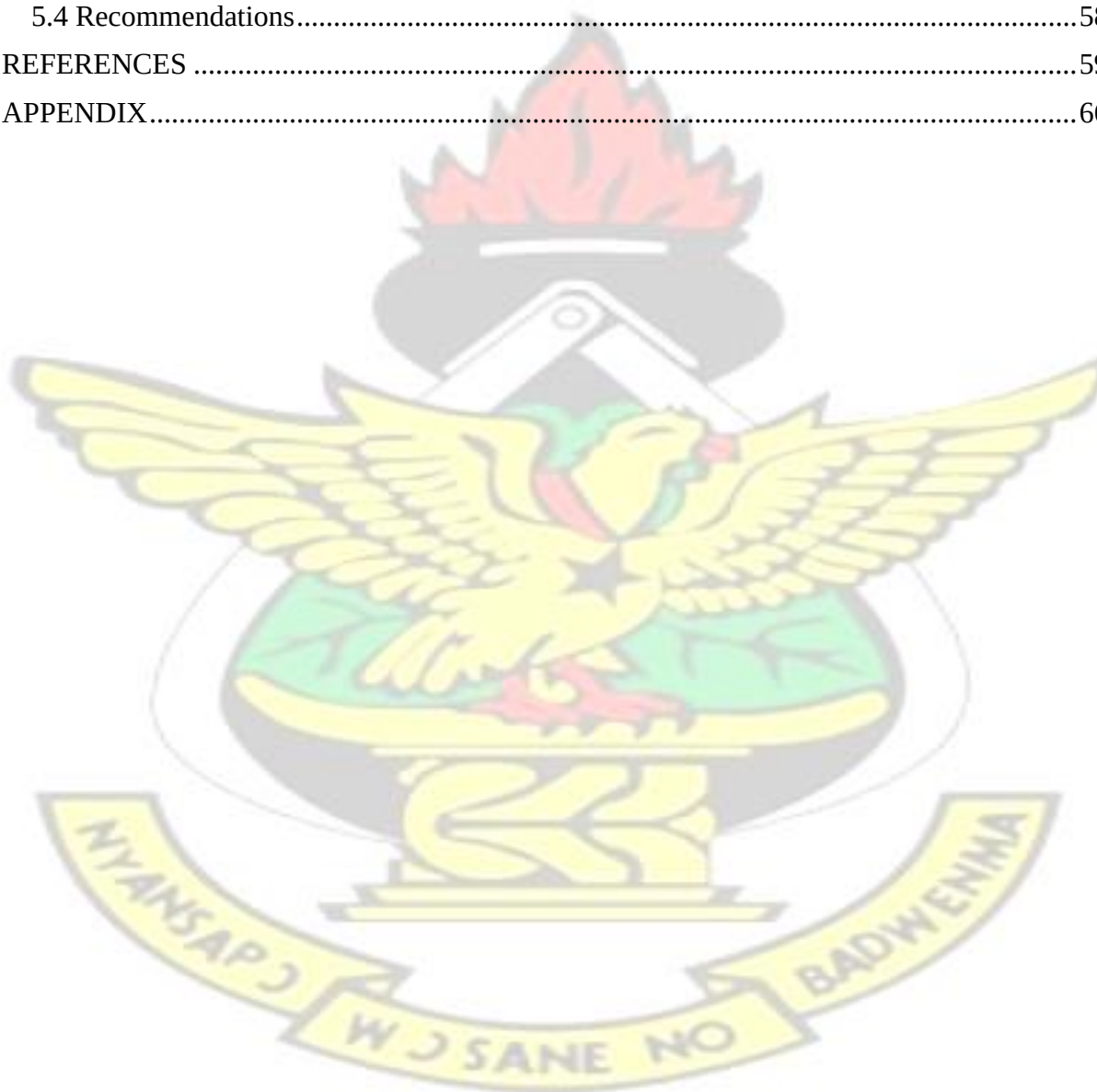
To find performance bottlenecks that were observed, I conducted a study utilizing key performance indicators (KPIs) from UNCTAD and IMO Publications. Among these results are those regarding the terminal volume capacity and throughput, turnaround, queuing, and dwell times. To support my conclusions, I also used a range of sources, such as a questionnaire, Google Scholar, Elsevier, Port Authority databases, and other databases. With the use of these sources, I was able to respond to the research questions I had on how COVID-19 has impacted port terminal performance, why it is recognized as one of the biggest disruptions to global marine trade, and what port executives should do to prevent further chaotic disruptions.

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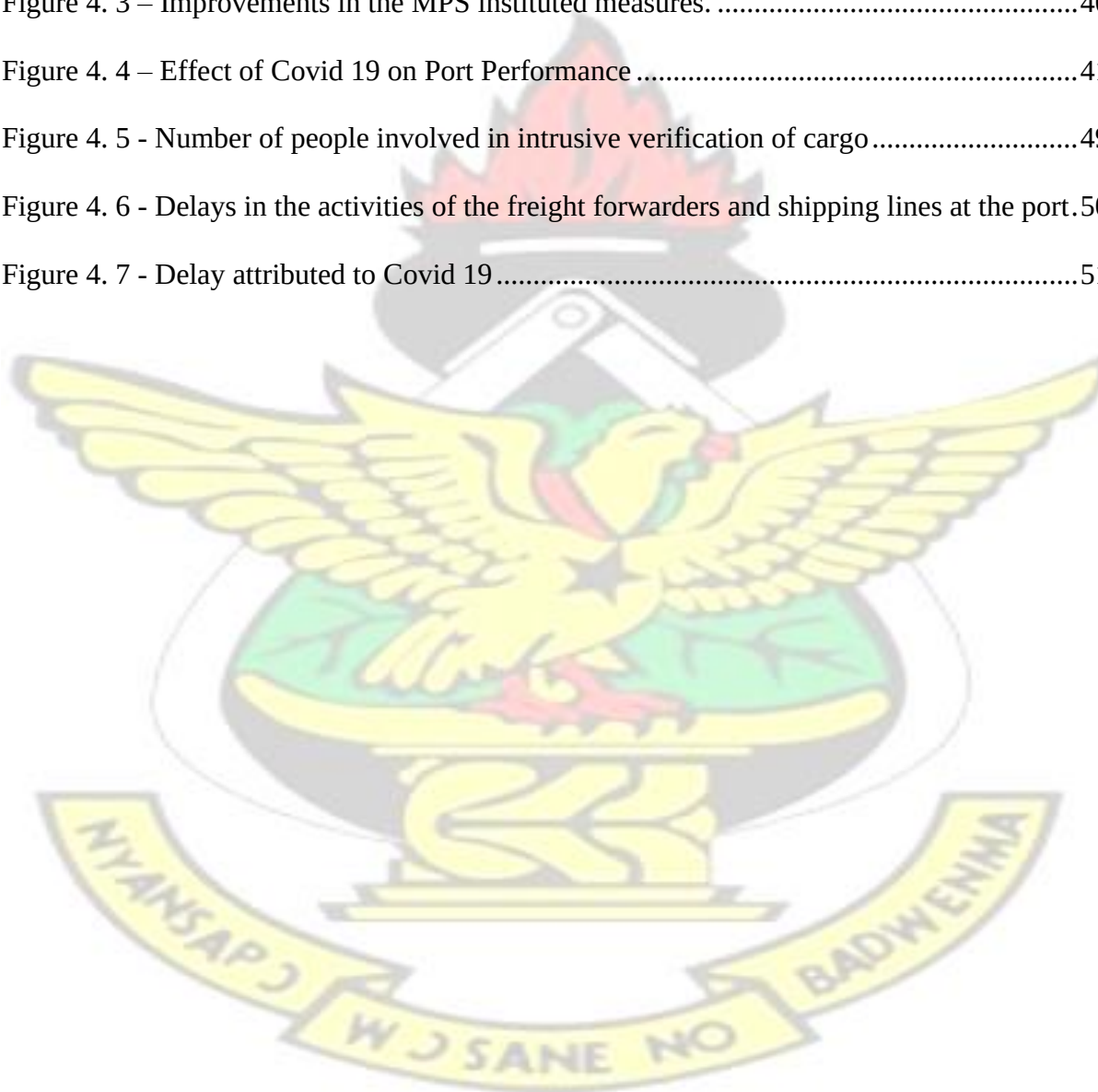
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LIST OF ABBREVIATIONS

Cargo Tonne-Kilometres (CTKs)

Container Port Productivity Index (CPPI)

Corona Virus Disease (COVID-19)

Customs Exercise and Preventives (CEPS)

Ghana Ports and Harbours Authority (GPHA)

Higher National Diploma (HND)

Institute Of Shipping Economics and Logistics (ISL)

International Air Travel Association (IATA)

International Maritime Organisation (IMO)

Landlocked Developing Countries (LLDCS)

Meridian Port Service's (MPS)

Performance Indicators (KPIs)

Senior High School (SHS)

Small Island Developing States (SIDS)

Supply Chain Risk Management (SCRM)

The United Nations Conference on Trade and Development (UNCTAD)

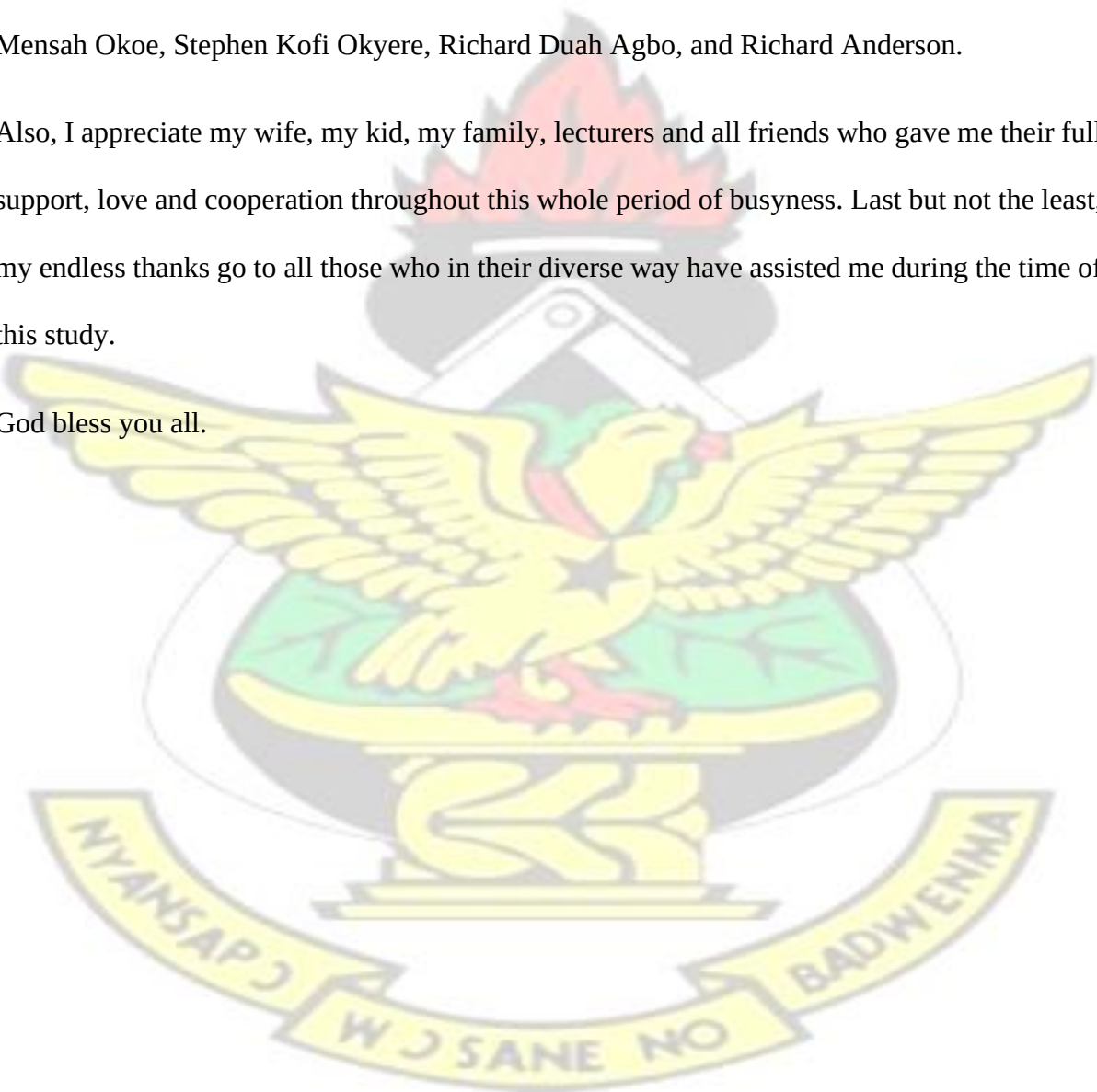
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God bless you all.



DEDICATION

This project is dedicated to the Glory of the Almighty God and my family for their numerous blessings and guidance throughout my life.

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CHAPTER 1

INTRODUCTION

1.0 Introduction

This chapter introduces the background to the study, problem statement, objectives, research questions and the significance of the study. It also consists of the scope and limitation of the study as well as the organisation of the entire research work.

1.1 Background of Study

More than 45% of all goods traded globally (by volume) are transported by sea, making maritime transport the foundation of globalized trade and the manufacturing supply chain. The most affordable and dependable kind of long-distance transportation is provided by the maritime industry. The maritime trade sector has had 2.9 percent compound annual growth during the last 20 years. The COVID-19 pandemic affected marine commerce volumes in 2020, although the effects were less severe than anticipated. By year's conclusion, the quantities had recovered, but they were still down by 3.8 percent or 10.65 billion tons (Hoffmann, et al., Review of Maritime Transport 2021, 2021).

Container commerce decreased by 1.2 percent from 2019 levels, making up more than 60% of overall volume and almost 35% of total value. The 3.5% decline in global economic output was reflected in both the overall maritime trade and container traffic. Since the beginning of maritime trade, marine ports have been essential to economic and social growth. This still holds true today just as it did thousands of years ago. Containerization has increased since Malcom McLean's invention in 1958 has caused significant changes in the locations and methods of manufacturing, a dynamic process that is still developing (Levinson, 2006). As a result,

container ports have emerged as crucial hubs in global supply chains and are essential to the development plans and growth narratives of many emerging economies. Effective port infrastructure construction and management has frequently been a requirement for successful, frequently export-driven, growth strategies. Additionally, it offers the confidence required to encourage investment in production and distribution networks, enabling the development of manufacturing and logistics, generating jobs, and increasing income levels. To put it another way, if high-quality port infrastructure is developed and effectively run, it will provide investors the confidence they need to invest in production and distribution systems, enabling the growth of manufacturing and logistics, generating jobs, and improving income levels.

More particular, a country's cost of trade greatly depends on the efficiency of its marine ports. Trade growth is hampered by underperforming ports, with Landlocked Developing Countries (LLDCs) and Small Island Developing States (SIDS) feeling the effects most acutely. The port is a key link to the global marketplace and must run effectively together with the access infrastructure (whether it be an inland canal, rail, or road) to the hinterland. Performance that is efficient takes into account a wide range of variables, such as the effectiveness of the port itself, the availability of enough draught, quay, and dock facilities, the quality of the connections to road and rail services, the competitiveness of those services, and the effectiveness of the procedures used by the public agencies involved in container clearance. Shortcomings or nontariff costs will increase, competition will decline, and commerce will decrease as a result of barriers in any of these actors (Kathuria, 2018).

Gordon Wilmsmeier et al. (2006) found that increasing port efficiency in a pair of ports had the same effect on trade costs as reducing the physical distance between the ports, confirming the effect of port performance on international trade costs. Liner shipping cannot be disregarded when discussing containerization and port efficiency. Hoffmann, Saeed, & Sødal (2020) examined the immediate and long-term effects of liner shipping bilateral connectivity

on South Africa's trade flows, demonstrating that gross domestic product (GDP), the number of shared direct connections, and the degree of competition had a favourable and significant impact on trade flows. Sadly, ports and terminals are frequently the main causes of shipment delays, supply chain interruptions, increased expenses, and decreased competitiveness, especially for containers.

For container shipping lines that run liner services on set schedules based on set port turnaround periods, port performance is another important factor to take into account. In order to prevent a negative effect on the effective functioning of the service, delays at any of the scheduled ports of call on the vessel's route would need to be fixed before the vessel arrives at the following port of call. As a result, port efficiency and turnaround time at all ports of call are significant issues for operators, and in the current competitive environment, tracking port performance has gained importance. Lack of trustworthy metrics to assess operational performance across ports has been one of the biggest obstacles to improvement.

The adage "you cannot manage what you cannot measure" applies to management, and historically managing and overseeing the sector has been difficult. Modern ports gather data for performance evaluation, but the lack of comparable data makes it impossible to compare the results to those of rival ports or ports operating under similar conditions. Even though managers may be aware that performance is becoming better every year, they might not be aware of whether it meets the criteria of other major ports with comparable characteristics. It is maybe not unexpected that there has been a lengthy history of attempts to find a set of indications that can be compared to assess port or terminal performance.

The Container Port Productivity Index (CPPI) 2021 was created using information from S&P Global's Port Performance Program. In order to increase container port operations' efficiency and assist initiatives to maximize port calls, the Port Performance Program was established in

2009. The program includes 11 of the biggest liner shipping companies in the world, operating together nearly to 80% of the world's fleet capacity. For each specific port call, the liner shipping companies give the software a series of operating time stamps. Each liner shipping company and their affiliate shipping firms' whole global networks are covered by the statistics, which are delivered on a monthly basis. From the standpoint of the client experience and the speed and efficiency with which container ports operate, what assets of the customer are managed.

Reduced loading and unloading times at sea ports are under increasing pressure. Demand for quick service from the ports increased in tandem with rising shipping line demand. In order to increase performance, this led to the creation and upgrading of numerous ports across the world. The level of port performance attained will be evident from the shippers' level of satisfaction. In order to optimize the terminal logistic process, ports must improve their planning and operation capability by introducing cutting-edge machinery and technology. It is crucial to make sure that port operational flow can run properly in order to maximize port terminal resources.

The port performance indicators are merely a way to gauge how well certain port activities are being carried out. The port management should be able to calculate, analyse, and comprehend these signs with ease. They ought to offer trustworthy advice to the senior management in the crucial facets of port operations. These set of measurements and the numerous port performance indicators have a close link. Therefore, the performance of the port determines its productivity. Since ports are a hub of economic activity where numerous businesses collaborate to supply a variety of goods and services, measuring port performance is challenging (De Langen et al, 2007). Performance evaluation serves as a vital tool for port management's planning and oversight of port operations.

1.2 Problem Statement

An enormous global health disaster brought on by the 2019 Coronavirus Disease (COVID-19) began in the year 2020. Due to interruptions in transportation and logistics, the COVID-19 epidemic has shocked the flow of international trade. The epidemic has created disruptions in a number of industries, including travel and tourism, hospitality, and entertainment, with nations that depend on these industries for their economic development being the most severely impacted. Due to the COVID-19 pandemic's unusual characteristics, there was a great deal of uncertainty about how it might affect people's lives and livelihoods. Although treatments and vaccinations have been created as a result of epidemiological research, the situation is still unpredictable, particularly as new varieties appear.

The World Bank reported operational difficulties in the supply chain industry in 2020, resulting in delivery delays, traffic jams, and higher freight costs. The majority of small companies in the transportation and logistics industry have been adversely impacted by the lack of a recovery strategy, forcing them to shut down operations. However, because to COVID-19, elite players have resorted to using the "Force Majeure" clause on all of their contracts, which permits contracts to be annulled due to acts of God or other unforeseen events (IFC, 2020). The financial effects of COVID-19 on supply chains and trade are substantial. The container throughput index, which measures the volume of people and products passing through shipping ports each day, decreased from 113.3 in January 2020 to 107.7 in May 2020, according to the Institute of Shipping Economics and Logistics (ISL). This is a 9.5 percent decrease. In addition, the International Air Travel Association (IATA) reported that in the three months leading up to April 2020, the total industry air cargo tonne-kilometres (CTKs) decreased by 15.3% year over year. To further explain, while freight volumes decreased due to capacity constraints, loads and yields increased. This suggests that COVID-19 has had a negative impact on both

marine and air cargo shipping. According to the (Humphreys, Dumitrescu, & Biju, 2021), the number of port calls decreased significantly in 2020, especially from container ships, due to COVID-19. The drop was brought on by blank sailings, or scheduled container services that, as a result of low traffic, either did not run at all or did not call at specific ports along a scheduled itinerary.

We can build new techniques of strategy to boost elasticity and adaptability in maintaining uninterrupted performance at Port Terminals by realizing that disruptions are interruptions of a system's operation brought on by unpredictable cataclysmic events. One supposition is that all disruptions share repeated characteristics and cause historical ripples that follow similar patterns. Though disruptions with COVID-19 can have similar trends as the Financial Crisis of 2008, this is not fully the case as demonstrated earlier by (Notteboom, Palis, & Rodrigue, 2021). Knowing that history doesn't repeat itself but frequently rhymes is one thing; failing to recognize the tremendous variations in technology, science, medicine, and global position throughout each catastrophic event is quite another. It is not logical nor effective to compare the Spanish Influenza (A/H1N1) to the Novel Coronavirus (SARS-CoV-2) and the Black Death (Bubonic Plague) to Port Terminal Performance and Resilience. Despite the fact that they were all worldwide pandemics that resulted from naturally occurring mutations in the environment and caused the lives of millions of people (Aassve et al., 2021), no performance metrics or data have been recorded because of the outdated technology. Despite automation, digitization, larger containers, and higher transport volumes by ship, rail, and truck, we nevertheless repeatedly commit the same fundamental errors. In order to address the current problem with how COVID-19 has impacted Port Terminal Performance in Ghana, we must identify essential goals. Only then will we be able to understand why we keep making the same errors. The MPS Tema case study will be covered in more detail in the section that follows.

1.3 Objectives of the study

The Port of Tema is regarded as a crucial and indispensable asset to the stability and economy of Ghana because it contributes to 80 percent of the market share trade overall in Ghana and has a cargo volume of 56, 258,484 million in 2020 (B&FT Online, 2020). These numbers alone demonstrate the value and importance of port authorities and terminals to the economy. Ports offer an unending supply of opportunities, including jobs, protection for waterways, peaceful expressions of international trade, and connections to markets for commodities and consumables. However, by having a better grasp of the historical problems with disruptions that have impacted the Port of Tema, the Port Terminals within it, and associated Supply Chains, we will be better able to establish a solid foundation of knowledge and important goals.

The goals of this study are to define what resilience and port performance mean for port terminals in the years of pre-COVID (2019), global pandemic (2020), and futures (2021+), how an anomaly that originated from outside the nation eventually spread, entered Ghana, and disrupted the entirety of transportation systems, unbalancing import and export of containerized goods, and how learning from the supply chain collapse can teach us to build improved infrastructure.

1.3.1 Specific Objectives

This research sought to address the following specific objectives:

1. To identify effective MPS-instituted containment measures in halting COVID-19's spread across the Terminal.
2. To identify performance-related operational issues that the port faced at the height of the pandemic.
3. To examining the impact of Covid 19 on the performance of MPS Tema.

1.4 Research Questions

1. How effective were the MPS-instituted containment measures in halting COVID-19's spread across the Terminal?
2. What performance-related operational issues did the port face at the height of the pandemic?
3. What is the impact of Covid 19 on the performance of MPS Tema?

1.5 Significance of Study

A successful completion of this dissertation will highlight the impact of covid on port performance in Ghana. Case study of MPS Tema, and also highlight the extent to which disruption has impacted on the overall performance and business continuity of the port as well as its resilience. Besides, a successful completion of this research will help build improved performance and resilience procedures to be enacted when future disruptions begin to display themselves. Moreover, the completion of this dissertation will serve as the basis for further research work in the academia as well as being a guide for policy making with respect to port performance and resilience for port development.

1.6 Scope and Limitation

The research is particularly concerned with the impact of Covid on Port performance in MPS Tema. As such the work shall be limited to the Meridian Port Services, however mention shall be made of other ports most especially Tema Port for a complementary analysis or for benchmark purpose to aid a reliable analyses and conclusion of the work. The work shall also extend coverage to all the relevant players in supply chain and logistics. This sector of the

scope shall include the Meridian Port Services, Ghana Ports and Harbours Authority, the Shipping Lines and users of the port facility. The research also contains the views of different principal users of the port and related services. This category shall cover the views from freight forwarders, Ship Agents, logistics companies, ports and terminal operators and other stakeholders. The work also contains the review of literature that relates to covid 19, port terminal performance, port terminal resilience, cargo throughput, global disruptions and supply chain resilience. The study covers the period between 2016 (due to availability of data) till the completion of this work.

The study's limitations include the lack of particular data on container throughputs, individual shipping lines' total discharges, average TEUs per hour, and crane hours in the port of Tema and MPS Tema. This information will be regarded as extremely sensitive, confidential, and only temporarily available for use in open research.

1.7 Organization of Work

This research work was divided into five chapters:

Chapter one contains the introduction of the background to the study, the problem statement and the research questions, as well as the justification of the study and the organization of the study. Chapter two deals with the review of literature related to the study. Chapter three discusses the methodologies used in collecting data and how the data shall be analysed. Chapter four deals with data presentation and interpretation. Chapter five deals with the summary of findings, conclusion and recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter covers reviewed literature material relevant to the chosen topic “IMPACT OF COVID 19 ON PORT TERMINAL PERFORMANCE. A CASE STUDY OF MPS TEMA”.

The literature materials used includes the following: books, journals, on-line information, documents cited at Meridian Port Services, Ghana Ports and Harbours Authority, and other institutions.

2.1 Definitions

COVID-19: Coronavirus disease (COVID-19) is an infectious disease caused by the SARS-CoV-2 virus. The majority of virus-infected individuals will experience a mild to severe respiratory disease and will recover without the need for special care. However, some people will get really ill and need medical care (World Health Organisation, 2020).

International trade: It is the movement of goods and services across countries. International trade is the backbone of the economic growth and development of nations. Its contributions to nations include contribution to gross national product (GNP), generation of employment opportunity, foreign exchange, just to note a few.

Transport infrastructure: This is composed of the fixed installations of canals, waterways, roads, terminals, as well as pipelines such as seaports, refuelling depots, trucking terminals, warehouses, bus stations railway stations and airports.

Transportation systems: can be defined as combination of elements and their interactions, which produce the demand for travel within a given area and the supply of transportation services to satisfy this demand.

2.2 The Revolutionary Container and the “Ideal X”

Globalization has played a significant role in connecting continents separated by seas, bringing business and trade to the populace, and enhancing our capacities and prospects for growth into the contemporary era we now inhabit for hundreds of years. Break-bulk loading, often known as loading cargo in discrete pieces, was labour- and time-intensive. The creation of the standardized container by Malcolm McLean in 1956 was a significant milestone in break-bulk transport operations. The first containership, "the Ideal X", a converted World War II T-2 oil tanker, had its first journey from Newark, New Jersey to Houston, Texas in the United States at the same time as the container.

The largest class of container ships from EVERGREEN have a 24,004 TEU maximum holding capacity as of 2022 (Wikipedia, 2022). In the past 66 years, the ability to move more cargo over longer distances and at higher speeds has accelerated global economic growth, fostering more innovation, technology, and "just in time" logistics to satisfy consumer demand. However, new levels of turmoil and disturbances also emerge as a result of this growth and expansion. Geopolitical events at home or abroad, natural disasters, changes in the economy, or acts of God can have a big impact on both. Therefore, the impact of containers on port operations, terminals, and buildings has been significant and positive (Hayut, 1981).

2.3 Overview of Tema Port as a Transit/Hub Port

Ports are conveniently placed on the edges of oceans, seas, rivers and lakes, and may either be natural facilities or man-made structures that allow for cargo or passengers to be loaded and

unloaded. According to Brian Slack and Jean-Paul Rodrigue the authors of "Geography of Transport Systems," the word "port" derived from the Latin "Portus," meaning gate or gateway. It is defined as the point of convergence between two domains of freight circulation that is, land and maritime (and sometimes passengers). Water depth often dictates ship size that can berth at a port and dock. Ports usually have a governing body referred to as the Port Authority, Management, or Administration that help with the governing of the port. (Rodrigue, 2017).

2.4 Challenges of faced by the Maritime Sector during the Covid 19 pandemic:

The Covid 19 outbreak has mostly not had much of an impact on the marine sector (Arab Trade Union Confederation, 2020). Despite the challenging times we are experiencing, the vast majority of ports have managed to continue operating as cargo ports. But the majority of them are still inaccessible to passenger travel. The maritime industry has mostly continued to function globally despite port disruptions and crew changes, supporting the transportation of crucial goods and medications that are required to keep governments operating and to address the worldwide public health crisis. The shipping industry has suffered a number of difficulties, including the Covid 19 pandemic, the economic slump, and challenging operating circumstances, according to safety4sea (Saftey4sea, 2020).

2.4.1 Cargo damage and delays as supply chains come under strain

The coronavirus pandemic has caused abrupt changes in the way that cargo is transported, affecting shippers, air freight, and transportation firms globally. Despite the fact that cargo transportation is universally acknowledged as a crucial industry, many cargo handling businesses suspended operations during the outbreak while ports were subject to restrictions. Without the proper security measures or protective measures, cargo held in high-risk areas

stands the danger of suffering significant losses from fire or severe weather, and delays may potentially cause harm to perishable or temperature-sensitive cargo.

2.4.2 Disruption to maintenance raises machinery damage concerns

Ship owners incur the risk of delays and equipment failure since the epidemic makes it difficult to perform necessary maintenance and servicing. Insufficient supplies of spare parts and necessary consumables, such as hydraulic oils, can cause crews to use different grades or brands, which can cause scheduled maintenance to be postponed. Additionally, travel restrictions might make it more difficult for specialized engineers to reach ships for repairs. The most frequent reason for shipping disasters over the past ten years is already machinery damage, which accounted for more than a third (9,081) of the 26,071 occurrences examined between January 2010 and December 2019.

2.4.3 Cruise ship industry faces new reality with the increased hindrance

The epidemic basically put an end to the cruise sector, which supports over one million jobs globally and contributes more than \$150 billion to global economic activity. Prior to the outbreak, the sector had experienced remarkable expansion, with projections for 32 million passengers to board cruise ships globally in 2020, up from 30 million in 2019. However, significant coronavirus outbreaks, travel bans, and port closures on a number of cruise ships. With ships idle, cruise operators face an uncertain future.

2.4.4. Increase of floating oil storage brings potential exposures

Demand for floating storage reached record highs as the price of oil fell amid mounting worries about the coronavirus economy, driving up tanker rates. According to data from S&P Global

Platts, there were more than 200 million barrels of oil and other products on floating storage in tankers as of mid-May 2020, or about 5% of the world's carrying capacity. Major oil ports and terminals in the US, Europe, and Africa are home to a large number of tankers that could be exposed to political threats, bad weather, and piracy. which puts the health and safety of the ship's crew in danger.

2.4.5 Terminal Operations

The first wave of the pandemic forced a change in cargo and freight transportation from air to sea, necessitating an immediate need to speed up terminal operations to meet the demand from around the world without adding more staff. This increased the workload for dock workers, made their working conditions worse by extending their hours for less pay, and made them more susceptible to contracting the coronavirus. Global terminal operators in the area have been observed to have increased labour pressure and broken CBAs. For millennia, the Mediterranean Sea has served as a vital shipping and trade route. 87 ports of varying sizes and capacities that serve local, regional, and global markets are located there. Commercial shipping transports over 80 % of world trade, while intra-Mediterranean marine trade flows account for nearly 25% of global traffic volume. The COVID-19 epidemic has brought attention to the Mediterranean's marine networks, port efficiency, and hinterland connectivity as potential crisis points (Union for the Mediteerranean, 2020).

2.5 Covid-19 and Port Operations

The COVID-19 epidemic started to emerge in early 2020 and spread fast to several nations worldwide. Around 56,4962,000 confirmed cases and 7,479,000 fatalities had been reported globally as of 24:00 on October 31. To stop the virus from spreading, many nations have put

in place unheard-of mobility restrictions (March, Metcalfe, Tintor'e, & Godley, 2020). For instance, several governments have imposed restrictions to curtail citizens' social activities and suspended the operations of particular businesses to lessen inter-person interactions (Lau, et al., 2020). Furthermore, research has shown that one of the best strategies to deal with public health emergencies and stem the development of an epidemic is to restrict population movement (Chen, Wang, Wang, Hu, & Hua, 2020).

Commercial consumption, logistics, and transportation have incurred significant losses as a result of the execution of quarantine measures like work stoppages, industrial shutdowns, and even "city closures." According to Luo & Tsang (2020), the COVID-19 pandemic's effects led to a 1.0% year-over-year decline in global output in 2020. At the same time, the epidemic will become a significant threat to the global economy and may cause the annual growth rate of the global economy to fall to 2.5% in 2020, according to the analysis report on the impact of the COVID-19 pandemic on the global economy published by the United Nations Conference on Trade and Development (UNCTAD 2020) in March et al., 2020.

Shipping is crucial to maintaining the global supply chain open during this difficult time since it is the most efficient, dependable, and effective mode of transportation (Cleopatra 2020). The COVID-19 pandemic has particularly altered how people behave in the ocean, with port closures and changes in consumption patterns having an impact on a number of maritime industries, particularly fisheries, passenger ferries, and cruise ships industries, which heavily rely on the movement of people and goods (Bennett, et al., 2020). For instance, the cargo throughput of China's ports was roughly 3.073 billion tons in the first quarter of 2020, a 4.6% reduction from the same period last year (Depellegrin, Bastianini, Fadini, & Menegon, 2020). The global cruise tourist market has started to see industry-wide stagnation (Wan, Yan, Zhang, Qu, & Yang, 2019). Consider the case of Carnival Corporation. The company's stock price fell

\$50 to a low of \$7.80 during the COVID-19 outbreak, erasing approximately \$24 billion from its market value to barely \$6 billion (Rocklöv, Sjödin, & Wilder-Smith, 2020).

Many academics have researched this in order to examine the effects of banking, transportation, and numerous businesses throughout the pandemic period. Financial experts have mostly researched the characteristics and causes of stock volatility against the backdrop of the pandemic. Using a panel data model, Al-Awadhi, Alsaifi, Al-Awadhi, and Alhammadi (2020) examined the effect of daily newly confirmed cases on the average daily return of listed businesses. The findings demonstrate a negative correlation between daily newly confirmed cases and the stock returns of listed companies on that day. Liu et al. (2020) analysed the short-term stock price movements are primarily caused by investors' expectations and emotional swings during the COVID-19 epidemic, according to an analysis of the mechanism causing the pandemic's effects on the stock market. Negative feelings like anxiety and despair were rather common during the COVID-19 pandemic, according to a survey by Xiong et al. (2020) of people in eight nations, including Spain and China. The value-at-risk model's impulse response and GARCH regression were used by Michail and Melas (2020) to analyse the shipping market's reaction to COVID-19. According to experimental findings, COVID-19 had a detrimental effect on ships carrying dry bulk and crude oil.

Summarizing the COVID-19 pandemic literature reveals that the majority of current study topics are in the financial or economic sectors, with little focus on the maritime sector. Additionally, the majority of the literature's research objective is to examine the relationship between indicators and the pandemic without taking into account the effects of governmental control measures and the cycle of the economy. This study chooses four indicators that indicate consumption, industry, government control measures, and the severity of the epidemic as the explanatory factors, using the import and export throughput of China's major ports as the dependent variable. The main elements influencing port throughput in the context of the

pandemic are investigated using the panel data model built from the aforementioned monthly data. By including time dummy variables in the model, we also looked into whether the shipping industry's cycle had changed. The model also highlights the benefits and drawbacks of governmental regulation in the shipping sector. Our study fills in the gaps in the body of knowledge and aids shipping firms in strategic decision-making.

2.6 Port Performance

Seaports must regularly and continuously assess their own performance to determine where they stand in respect to the competition and where they have space to grow. In countries all over the world, seaports are a key asset for the local and regional economies. According to the UNCTAD Study on Port Performance Indicators (1976), there are numerous approaches to accurately evaluate port performance using the seaport's own operational and financial capabilities. These abilities are essential because they allow port terminal high-level administrators to access information for planning and control. The information can be used to build a functional transport chain graph that comprises maritime transport, port navigational services, cargo handling services, freight transit storage services, and hinterland assistance. I focused on the cargo-handling services for the purposes of this study because this section describes in great depth how COVID-19 and other external factors can have a significant impact on Port Terminal Performance.

The 1976 report focuses mostly on financial indicators for freight-handling services since they demonstrate whether cargo handling is higher or lower based on yearly and economic trends. More market promotion to bring in more customers, increased tariffs to boost revenue, attempts to improve productivity, and changes to deferrable scheduled expenses are a few possible contingency plans. The following performance indicators are listed by UNCTAD as being

important for measuring the operational component of port performance: arrival rate, waiting time, service time, turnaround time, tonnage per ship, fraction time, number of gangs employed per ship each shift, ton per gang-hour, and fraction of time gangs idle. Even though these are vital steps in mapping performance evaluation, there is critical information about the times when capital equipment is really used that is lacking from the report. Other categories and thorough delineations of this data include crane hours, the number of containers offloaded each hour, truck pulls and turnaround times, truck queue times, gate transactions, and railing information. Up until the point of departure, these can be measured, but after that, additional performance indicators must be considered, especially for the capacity of the rail system, the storage capacity of warehouses, and the handling of additional imports into the domestic economy.

As part of the UNCTAD Monographs on Port Management, the previous study on port performance indicators received an additional update in 1987. The first change was to broaden the scope of port performance measures to include the quality of cargo handling equipment and how inland transport vehicles are treated when they pass through ports (De Monie, 1987). This solves the issue of big ports making reports on "productivity in ports" without referencing any actual performance or productivity indicators or numbers.

2.7 Supply Chain Resilience

In their 2016 study, Kamalahmadi & Parast focused on the vulnerabilities and risks of supply chain disruptions brought on by increased globalization and innovation rates. A variety of consumer and customer expectations, shorter product lifespans, and rising diversity needs are a few of the problems. Due to these negative effects, sectors of the economy that are essential to the operation of the port authorities and the terminals that operate inside of them to provide

these amenities must address the revitalization and adaptable structure required to build new supply chain clusters that are resilient to disruptions. Businesses are becoming more and more at risk of supply chain interruption.

The percentage of multinational enterprises reporting an income loss due to a supply chain disruption increased from 28% in 2011 to 42% in 2013, according to a recent analysis by Aon Risk Solutions (Sáenz & Revilla, 2014). Jüttner (cited in Kamalahmadi and Parast, 2016) states that supply chain risk management (SCRM) "identifies potential sources of risk and implements appropriate methods through coordinated approaches across risk members to reduce overall supply chain susceptibility." Businesses have caused irreparable harm, many have gone bankrupt, and millions of people have lost their jobs as a result of their inability to plan for unpredictable disasters like COVID-19. Supply chains play a useful role in port resiliency.

The ability of a supply chain to survive and thrive in a changing environment through the redesign of its architecture and the reuse of its performance with long-term effects is known as viability (Ivanov, 2020). In order to correctly manage their Supply Chains using COVID-19, the Port of Los Angeles needs a well-established framework to guide them in putting risk management techniques into practice. System reconfiguration can be used to construct supply chain resilience programs.

The methodological components required to develop a successful resiliency program are covered in great detail by Saenz and Revilla (2014). We contrasted two separate disruptions using CISCO Systems as an example. One took place during Hurricane Katrina's activities, and the other during the Tohoku Earthquake and Tsunami of 2011. Similar to COVID-19, these were both uncontrollable "Acts of God" that were beyond our control. The audience's effect and the devastation of the physical infrastructure were the only distinguishing factors. CISCO

restructured its supply chains using six strategies in order to give uninterrupted service to all customers first priority. Cisco initially established the strategy's priorities (Revilla, 2014). In this instance, the capabilities of the supply chain network were contrasted with certain competitors' products. For some products and services, business decision-makers have to prioritize over costs or response times. In terms of what cargo is deemed "essential" when it is imported and exported, the same can be said for port terminals. A notable example of essential supplies is Personal Protection Equipment (PPE) from Central Asian and Far Eastern manufacturers. vaccinations, despite the fact that these would be deemed priority equipment, have significantly more constraints (size of container, required temperature for storage with uninterrupted power supply, efficacy and life-span of the medicine in days and weeks).

In the strategic supply chain design decision-making process, it is calculated the cost of rushing vaccine supplies as opposed to waiting three weeks for a 16,000 TEU container ship to arrive with the required masks, clothes, coveralls, and other PPE. When mapping vulnerabilities, a variety of factors can be taken into consideration, including geopolitical situations, economic conditions, legal and regulatory needs, technology developments, spikes in demand and supply, and natural disasters. Comparing COVID-19 to other ports and port terminals in the US, resilience measures can take into account regional state governance and policies.

2.8 Tema Port Post Impressive Half-Year Performance

The Port of Tema has made some impressive progress for the first half of the year, according to data from the port's director's office, despite persistent problems brought on by the pandemic. Twenty-foot equivalent units (TEUs) of commerce climbed by 45.6 percent, from 504,749 in 2020 to 740,636 for the first half of 2021, according to the data, which shows that container traffic. Additionally, cargo traffic rose from 9,135.126 tonnes to 11,447.23 tonnes, a rise of

25.3 percent over the 2020 number. However, transshipment in boxes of trade saw the largest increase, rising by 4,190.3 percent from 25,004 tonnes in 2020 to 1, 072.750 tonnes during the study period.

Additionally, the volume of imports increased by 13.1% year over year, while the number of exports increased by 14.6% from 1,434,223 tonnes in 2020 to 1,643,426 tonnes in 2021. Transit by exports decreased by 63% during the time period, whilst transit by imports improved by 23.5%. In an interview with the B&FT, Sandra Opoku, the director of the Port of Tema, commented on the port's performance and called it encouraging given the challenges brought on by the COVID-19 pandemic. She credited the better service delivery method that the port authority used for the Port of Tema's half-year performance.

The port administration implemented effective measures to guarantee that clearance procedures, vessel safety, crew safety, and cargo safety are protected. We have added new cargo handling equipment to the ones we already have in order to improve delivery and vessel turnaround times, she said. The Tema Port Director outlined the short- to medium-term objectives and continued, “We are also strengthening our collaboration with our stakeholders in order to improve coordination, facilitate trade, and reduce the cost of doing business in order to achieve our vision, which is to be the leading container hub and the beacon of Trade in West Africa”. Mrs. Opoku also mentioned that the port administration will soon extend working hours at the Golden Jubilee Terminal in order to improve clearance processes (B&FT, 2021).

2.9 Performance and Performance Measurement

Performance and performance Measurement The impact of workers or personnel on performance is an important topic of research in all areas, as people in each workspace decide the accomplishment or disappointment of a project (Thwala & Monese, 2012). It is

consequently significant that every organization gets the right people, organizes and motivates them as individuals and as a team to deliver according to the company's goals. It is also important that these employees are recognized and rewarded for their achievements. Performance in any industry or organization is a function of engagement and ability (Thwala & Monese, 2012). Commitment is the ability to successfully complete a job and caliber are the personal qualities and skills that a person brings to the job. Unlike a caliber obtained through training and experience, which is therefore fairly consistent, engagement on the hand can change depending on many factors, most of which are in line with worker motivation. According to Mwita (2002) performance can be measured in three ways. First and foremost, he explains that performance can be measured by the production of goods and services. These could be either quantitative in terms of the units produced, the customers served, etc., or qualitatively in terms of the number of errors or customer complaints. Second, performance can be measured in units of time, including delay, absence, lost time, missed deadlines, and so on. Finally, performance can be measured using financial indicators that cover a wide range of possibilities. He stresses that all three ways can be related; For example, the absence of labour reduces piece production, which in turn reduces profit.

2.10 Conceptual Framework

Central Concept: Port-Terminal Performance

Inputs: Comprising resources, infrastructure, technology, workforce, regulatory frameworks, and market dynamics influencing operations at MPS.

Processes: Encompassing various operational activities such as cargo handling, logistics management, technology integration, supply chain coordination, and response strategies to disruptions.

Outputs: Reflecting the outcomes in terms of terminal throughput, efficiency, productivity, service quality, and adaptability in the face of the COVID-19 pandemic.

Variables Influencing Port-Terminal Performance:

COVID-19 Pandemic Impact:

Direct Impact: Disruptions in global supply chains, fluctuating cargo volumes, workforce shortages due to health measures, altered trade patterns, and regulatory changes driven by the pandemic.

Indirect Impact: Economic downturns, shifts in consumer behavior, government policies, and trade restrictions influencing port operations and trade dynamics.

Resilience Strategies and Adaptive Measures:

Resilience Planning: MPS's strategies, contingency plans, crisis management frameworks, and organizational agility to respond to and recover from disruptions caused by the pandemic.

Technological Resilience: The integration of technological innovations, automation, digital solutions, remote operations, and IT infrastructure to ensure operational continuity during the pandemic.

Supply Chain Dynamics and Management:

Supply Chain Resilience: MPS's efforts in managing disruptions in supply chains, inventory management, logistics, and collaboration with stakeholders to ensure uninterrupted cargo flow.

Disruption Management: Strategies implemented by MPS to mitigate challenges related to workforce safety, operational logistics, and changing market demands caused by the pandemic.

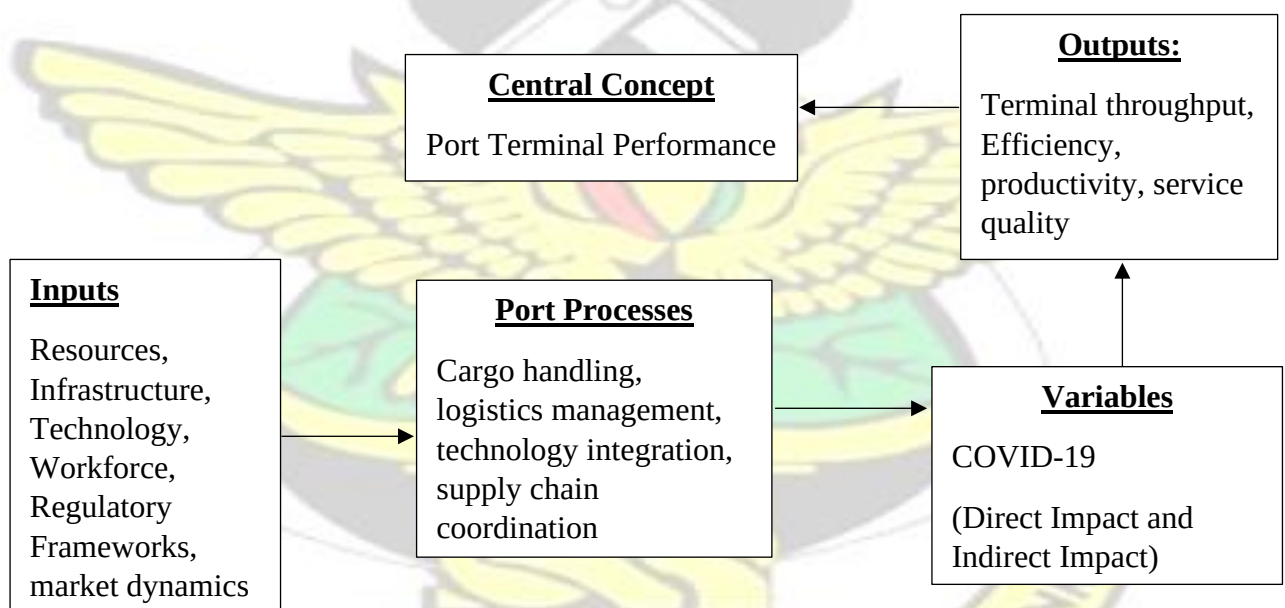
Impact Assessment and Performance Evaluation:

Performance Metrics: Utilization of key performance indicators (KPIs) such as terminal throughput, turnaround time, resource optimization, technology utilization, customer satisfaction, and financial performance metrics.

Evaluation Criteria: Analysis based on comparative studies of pre-COVID and during-COVID periods, benchmarking against industry standards, and qualitative assessments from stakeholders' perspectives.

Port Terminal Performance and its output are dependent variables on the independent variables. The independent variables include the inputs and port process.

Figure 2. 1 – Conceptual Framework



Source: Research Data (2022)

CHAPTER THREE

METHODOLOGY AND ORGANIZATIONAL PROFILE

3.0 Introduction to methodology

In as much as there are much work to highlight the impact of covid 19 on ports, a detailed work to unearth the unique case of the impact of covid 19 on port performance in Ghana, a study of MPS Tema. This chapter presents an elaboration on the methods adopted and utilized in gathering, processing, analysing and the presentation of data as obtained in response to the research questions raised in chapter one. In doing this, the significance or relevance of every means adopted in the data acquisition and usage has been outlined with a provision for a highlight on field challenges.

3.1 Research Design

Kabir (2016), defines research design as the overall technique used to integrate the various research components in a logical and consistent manner. In order to respond to the research questions and objectives, this study will use a mixed methodology (qualitative and quantitative methodologies).

According to its definition, qualitative research is a type of market research that focuses on collecting information through in-depth conversations and open-ended questions (Bhat, 2020). With the help of this technique, one can learn or discover what individuals believe and why. With the help of reflection and analysis of the respondents' perspectives, experiences, and attitudes, the researcher can present their findings using the qualitative approach. With the aid of questionnaires and desktop research, it was possible to get quantitative data that identified the various performance methods used by other firms.

This study makes use of both qualitative and quantitative analysis because it will be the respondents' opinions and experiences that will be used to inform the conclusions and suggestions that are made.

3.2 Source of data

In this research work, data was collected from two main sources and these are, primary and secondary.

3.2.1 Primary Data

Primary data focuses on information gathered at the source. Through experimentation, observations, and surveys, this type of data is collected directly from first-hand sources without being altered or processed in any way (Forplus Blog, 2020). This field data was gathered through interviews and a questionnaire.

3.2.2 Secondary Data

This refers to pre-existing literature, which is crucial to the research study, was compiled from a variety of books, academic papers, journals, theses, and other publications.

3.3 Study Area – Meridian Port Service (MPS)

The research was carried out with a particular focus on the Meridian Port Services (Tema port). The Port of Tema is located 28 km east of Ghana's capital city, Accra. West Africa's promising container hub, Tema Port, is uniquely situated and geographically closest to the centre of the world than any other. Its strategic position allows for the passage of the Greenwich Meridian

(Longitude 0° 00.0') and provides for a time zone of GMT + 0000 hours at all times. The thriving Port of Tema is centered on coordinates 05° 37'N, 000° 00'. Tema Port has a capacity of 21 berths with draughts ranging from 8.2 to 16m. Terminal 1 and 2 have 16 berths which serve as multipurpose berths excluding Valco and Oil Berth. Terminal 3 is a dedicated container terminal that currently operates 4 berths and capable of receiving ships of 366m LOA and 16 meters draught (GPHA 2022).

Meridian Port Services Ltd (MPS) was incorporated under the laws of the Republic of Ghana in December 2002. MPS is a joint venture between Ghana Ports and Harbours Authority and Meridian Port Holdings Limited, which is, in turn, a joint venture with Bolloré Transport and Logistics and APM Terminals. MPS is widely recognized by all shipping lines as the best performing Container Terminal/Port in West and Central Africa. Over the years, we have considerably invested in Tema Port Infrastructure, Superstructure, Technology and Human Resource development. Through these investments, MPS turned Tema Port into one of the most competitive ports in West and Central Africa and managed to significantly reduce the transport costs for importers, exporters, shipping lines and all other port stakeholders (MPS 2022).

The choice of this study area is mainly inspired by the expansion works at the Port of Tema i.e., Meridian Port Service a Dedicated container terminal which is more focused on turning Ghana the best port performing port in west and central Africa. Figure 3.1 below shows the map of MPS Tema Port indicating the expansion work.

Figure 3. 1 - Showing map of Tema Port, MPS, Terminal 3



Source: MPS 2020

3.4 Population

Population is any group of people who share one or more qualities that are important to the researcher, according to Ariola (2006). According to Turkson (2011), it is necessary to know how many people make up a population in order to create a sample, as well as whether or not this total includes individuals who may be of interest to you and falls into various subgroups. The population of this study include container trade users of MPS.

3.5 Sample Procedure and Sampling Size.

Regarding this project work, two familiar sampling strategies were used to collect valuable data from the field of study. The techniques used were Simple Random and Purposive Sampling techniques.

The study adopted the purposive sampling technique to select 90 operations staff of GPHA, Super Maritime and Maersk and 10 Management of MPS, GPHA, Freight Forwarders, MSC and Maersk. The total sample size was 100.

Table 3. 1 - Target population and Sample size

<u>SAMPLE</u>	<u>SAMPLE SIZE</u>	<u>LOCATION</u>	<u>METHOD</u>
Management	10	MPS	Questionnaire / Interview
Operations Staff	50	MPS	Questionnaire
Freight Forwarders	10	Tema	Questionnaire
Shipping Lines	30	Maersk	Questionnaire

Source; Field Data, 2022

3.6 Sampling Techniques

Simple random sampling technique which is a subset of the statistical population makes each member of the subset has an equal probability of being chosen for the purpose of preventing the unbiased representation of a group (Lau, et al., 2020). Data gathered from operations staff was based on the simple random sample strategy. This is because their core business deals with handling the day-to-day shipping related activities at MPS.

The purposive sampling is the second sampling strategy used and is a non-probability sampling technique, which is also known as judgement, selective or subjective sampling. (Alchemer, 2018) This method was used to specifically select only respondents that by nature of their work are involved in container trade in MPS.

3.7 Data Collection Instrument

Desktop research, questionnaires, and interviews were employed as the three instruments for data collection in this study.

3.7.1 Desktop Research

Using desktop research as a tool for data gathering makes it easier to identify relevant data that has already been collected than it is to do so through questionnaires and interviews. Although it might not be able to address a particular query, desktop research gives you relevant data.

3.7.2 Questionnaires

A questionnaire is a form that asks a series of questions to a sample size that is statistically significant of the target population in order to collect data for a research or survey. In relation to the research, sample population members who work in MPS were given questionnaires.

3.7.3 Interviews

An interview is a structured conversation where one participant asks questions, and the other provides answers. In relation to the research, management members who take key decisions in MPS were interviewed.

3.8 Data Analysis Techniques

The results of the analysis of the samples collected and the data gathered using both quantitative and qualitative approaches were merged to complement one another. The social survey's qualitative and quantitative data were evaluated to offer a holistic and thorough explanation of the study, where the data confirmed and complimented one another to help understand the topics being investigated.

Using descriptive statistical techniques, multiple statistical analyses were generated and computed using the field data. Microsoft Excel was used to create pie charts, bar graphs, histograms, figures, and tables to improve the visual presentation of results.

On the other hand, the qualitative data was manually examined using pertinent topics discovered during the numerous interviews. Phone recordings of the interviews were made, and the audio files were then transcribed before further manual analysis was done to produce analysis for better comprehension.

Additionally, IBM SPSS Statistics 25 and Microsoft Excel were used to examine the data acquired.

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

4.1 Introduction

This research chapter covers the analysis and interpretation of the study data, the statistical tool used in the analysis of data is IBM SPSS Statistics 25 and Microsoft Excel 2021. The targeted institutions and respondents have been contacted and essential information has been derived from personal interviews and questionnaires. The analysis is carried out for target group of respondents in order to ensure clarity and ease of data analysis, taking into account the objectives of the study. All the respondents are staff of MPS, Shipping Lines, Truck drivers and Freight Forwarders.

Relevant data on this research which includes the impact of Covid 19 on Port Terminal Performance (a case study of MPS, Tema) it remains the busiest and biggest port in Ghana handling the highest percentage of goods have been collected from the employees. Although information was correctly collected, not all respondents were able to provide relevant information in the questionnaires. The data collected helped to develop significant statistical data.

4.1 Analysis of Questionnaires

A total of 100 questionnaires were distributed for the purpose of this research work. All the questionnaires were distributed to employees of MPS, Shipping lines and Freight Forwarders of which all 100 were received. Below is a table of the results.

Table 4. 1 - A total of all questionnaires distributed and answered

Questionnaires Distributed	100
Answered	100 (100%)
Unanswered	None

Source: Field data, 2022

4.2 Analysis of Respondents Identity

4.2.1 Age

An important element for the purposes of this research is age and it is to help researchers obtain relevant data from matured respondents. From the table 4.2, 37% (37 people) of total questionnaires was answered by people in 30-39 age group, 28% (28 people) of respondents were within 40-49 years of age, 21% (21 people) were within the age group of 20-29 while 14% (14 people) of respondents were within 50-59 years group.

Table 4. 2 - Age range of respondents for businesses around port

Age	Frequency	Percentage
20 - 29	21	21%
30 – 39	37	37%
40 – 49	28	28%
50 – 59	14	14%
Total	100	100%

Source: Field Data, 2022

4.2.2 Gender

Out of the total respondents 76% (76) was filled by males whereas 24% (24) were filled by females. See table 4.3.

Table 4. 3 - Gender of Respondents

Gender	Frequency	Percentage
Male	76	76%
Female	24	24%

Source: Field Data, 2022

4.2.3 Level of Education

The entire respondents who responded to the questionnaires have good educational background which has enabled them to read and write in order to provide answers to the questions asked correctly. About 46% accounting for 46 respondents had achieved a Higher National Diploma (HND) / Degree certificate, 33% accounting for 33 respondents have their master's degree, 12% representing 12 respondents had completed Senior High School (SHS) whiles 9% representing 9 respondents have PhD.

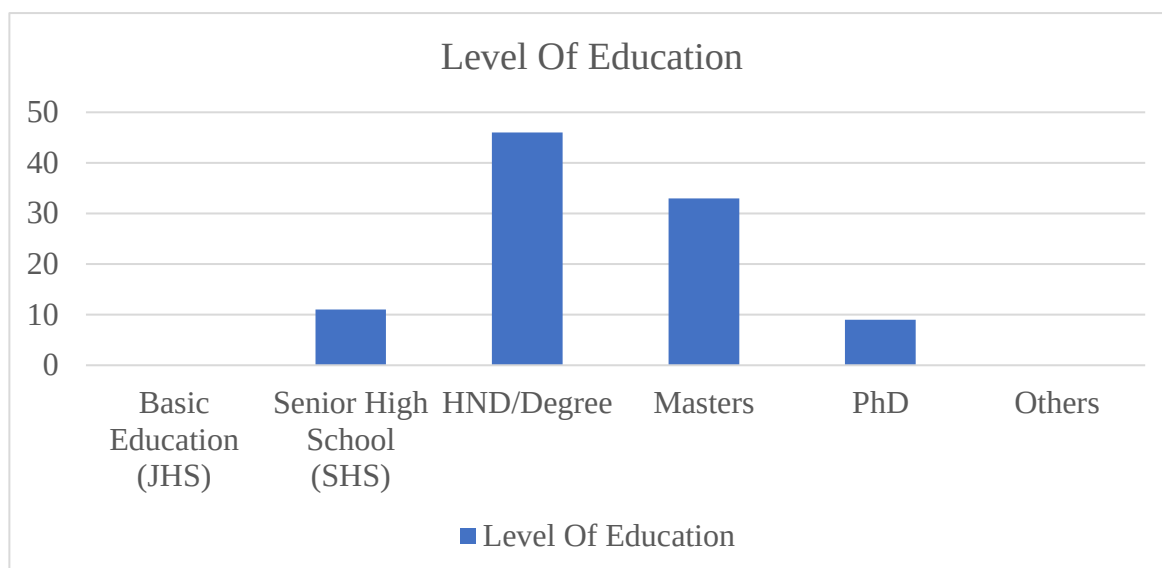


Figure 4. 1 - Level of education of respondents

Source: Field Data, 2022

4.2.4 Employment Status

Table 4.4 shows clearly that 13% (13) of respondents are casual workers i.e., people who work based on contracts and 87% (87) are permanent workers employed in various entities.

Table 4. 4 - Employment status of respondents

Employment Status	Frequency	Percentage
Casual Employees	13	13%
Permanent Employees	87	87%

Source: Field data, 2022

4.2.5 Years of Employment

The figure below shows that most of the respondents have been an active workforce in the industry for 11-15 years and that forms 38% (38 people), 23% (23 people) have been within the industry between 6-10 years, 16% (16 people) have been working in the industry for about

16-20 years, 15% (15 people) have been working in the industry for about 0-5 years, while 8% (8 people) have been in the working industry for more 21 years and above.



Figure 4. 2 - Years of employment

Source: Field data, 2022

4.3 Analysis of Questions and Responses

4.3.1 Responses from Management of MPS

Changes experienced in terms of operations at the Tema Port (MPS) after Covid 19

The researcher is keen to finding out whether there have been some changes in terms of operations at the port after Covid 19. This is to aid in obtaining information relevant to the study on examining the impact of Covid 19 on the performance of MPS terminal.

All respondents acknowledge there has been some few changes. Some of which includes washing of hands at vantage points, ensuring all covid protocols are adhered to, swift vessel operations and improved vessel turnaround time. Some stated that fewer vessels call even

though it got to the peak season. Also, transshipment of cargo through the port was not more as expected after covid 19. Washing of hands at vantage points, ensuring all covid protocols are adhere to, swift vessel operations and improved vessel turnaround time. In addition to washing of hands, sanitizing of hands, the use of nose mask, limited interaction with vessel crew and efficient and effect ways of operations before to ensure the vessel does not stay in port for long were other changes experienced.

Considering time of cargo handling activities during Covid 19 as Efficient and Effective

The researcher wanted to know if cargo handling activities during Covid 19 was effective and efficient or not.

All participants considered time spent at the port during cargo handling activities as efficient and effective. This is because the port had all the necessary equipment and personnel to handle cargo effectively. The equipment and human resource were adequate enough to make cargo handling time reduce and help improve the supply chain. In addition, the port had implemented resilient measures hence time of cargo handling was not affected.

For efficiency, some stated it is far more efficient because every activity with respect to cargo handling, was back to normal after Covid 19. The port had all the necessary equipment and personnel to handle cargo efficiently. Others also stated it is far efficient because every activity with respect to cargo handling, was back to normal after Covid 19. The number of staff required to facilitate efficient cargo handling was not increased or decreased hence, maintained. It ensured operation was normal with the exception of human interaction which was reduced to prevent the spread of the virus.

Delays in activities from vessel arrival, pilotage, berthing and cargo handling

To get information of productivity, the researcher asked if there were delays in the activities of the port from vessel arrival, pilotage, berthing and cargo handling.

All participants admonished there has been delays and was attributed to the cumbersome process to ensure all vessel crew are safe. Testing of crew for Covid and fumigation of vessel took an hour or two before start of vessel operations. The cumbersome nature of the process delay in start of port operations. A respondent stated that, management implemented decisions that made the port more resilient in ensuring continuous flow of operations to make operations ongoing in the time of covid 19.

Comparing vessel turnaround time from pre Covid era and during covid.

For more information of productivity, the researched asked if there were delays in the activities of the port from vessel arrival, pilotage, berthing and cargo handling.

Due to the cumbersome nature of the boarding processes, there is delay in start of operations hence, vessel turnaround time was same. The processes before start of operations changed which directly affected the turnaround time of vessels in port. Due to a more rigorous inspection and closer articulation of Maritime Health Authority such as specific control and quarantine procedures for vessels.

Instituted measures put in place after the outbreak of Covid 19

During Covid 19, a lot of organisations instituted measures to help curb the spread of Covid 19. The research asked this question know some steps taken by MPS to help solve this problem.

Some of the measure instituted after covid is with regards to eliminate waste and improve productivity. Lean training was implemented by the port facility to increase productivity and target as well as eliminate waste. Other measures instituted include constantly promote and enforce preventive hygiene measures, limited physical interaction between onboard and onshore staff, disinfect and monitoring cargo and established waste disposal policy for “suspicious” core.

The effects of covid 19 on port operations

The researcher needed information on the effect of Covid 19 on port operations. Hence, the researcher asked of the effects.

Delays in the start of operations. Most of the vendors MPS worked with were not working literally because Covid measure instituted by the state. They were not classified as essential workers hence were also part of those in total and partial lockdown. Others also mentioned delay on vessel operations because personnel were highly exposed to events beyond their control hence felt unsafe in working effectively compared to pre covid. Labour restrictions meant not every port user could use the facility. In addition, most of the vendors MPS worked with were not working literally because of the Covid measures instituted by the state. They were not classified as essential workers hence were also part of those in total and partial lockdown. Furthermore, sailing time was longer as the state implemented the quarantine for ships entering the port, large number of containers were stranded resulting in high detention fees. With the modernization of the port, the effects were not felt badly.

Improvement in the MPS instituted measures put in place at the port for future operations

The researcher asked the respondents if they see any improvement in the MPS instituted measures put in place at the port for future operations. 10 respondents representing 100% of the respondents noted there has been some improvements in the MPS instituted measure. None of the respondents ticked “No”. see figure 4.3

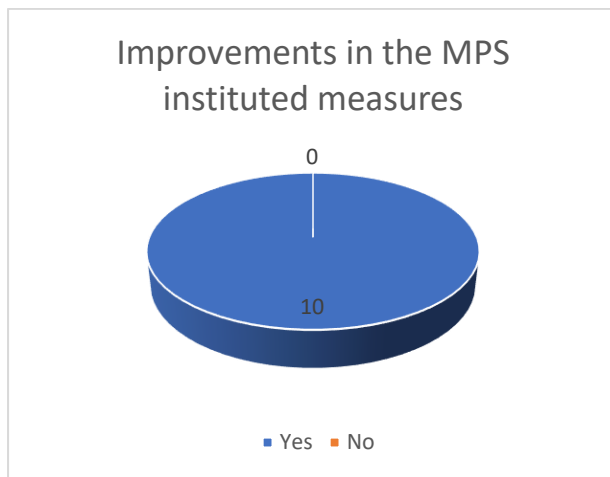


Figure 4. 3 – Improvements in the MPS instituted measures.

Source: Field Data, 2022

Benefit of automation to Port Facility

During Covid, a lot of processes were automated to help continuous productivity. Enhanced online submission of cargo related documents to government agencies was setup to minimize unnecessary human interaction. The respondents stated that Human interaction was reduced to prevent the spread of covid during the heightened period. This led to continuous operations of the port facility. During the covid 19 pandemic, the port continuously operated without interruption during port worker shortage and their performance remained constant. Also, human interaction was reduced to prevent the spread of covid during the heightened period. This led to continuous

operations of the port facility and helped reduced human interaction to prevent the spread of the virus with the port facility.

Effect of Covid 19 on Port Performance.

The researcher needed information on the effect of Covid 19 on port performance. Hence, the researcher asked of the effects. 7 respondents representing 70% stated there was little effect, 2 people (20%) were neutral while 1 person (10%) stated there was no effect. See Figure 4.4.

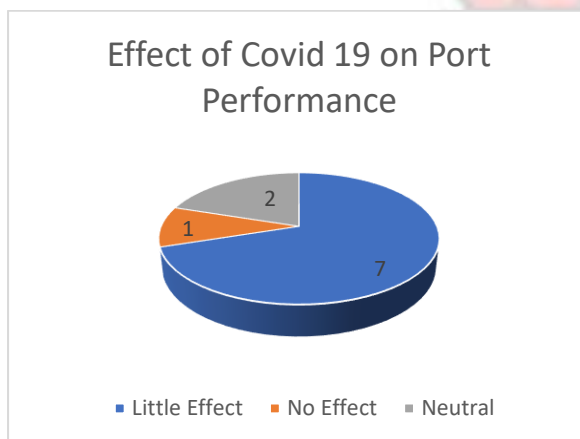


Figure 4. 4 – Effect of Covid 19 on Port Performance

Source: Field Data, 2022

Business responses to challenges faced due to Covid 19

In the height and outbreak of Covid 19, most business established several responses to challenges faced due to Covid 19 during the pandemic. This is to get responses from respondents on the best practices which helped bounce back to operations after the negative

effects and challenges caused by Covid 19. These were ranked by the respondents based on the following response showed in Table 4.5.

Table 4. 5 - Business responses to challenges faced due to Covid 19

	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
Hire More Labor	0	0	6	4	0
Work in shifts	0	0	3	4	3
Downscaled operations	0	1	1	7	1
Covid 19 tests	0	0	1	1	8
Working from Home	0	1	2	5	2
Introduction of port health as a lead agency	3	2	5	1	1
Dedicated transport for staffs	0	1	1	4	4
More or new clearance procedures	1	2	3	2	2
New Technology Requirements	2	1	2	3	2
Fumigation	0	1	1	3	5

Source: Field Data, 2022

From the responses showed in figure 4.5 above, hiring more staff was not a major option for them because they were neutral in their stands. 40% of the respondents stated that working in shifts was a major factor which helped whiles none of them disagreed neither did they strongly disagree. 70% participants said downscaling of operations help them rover from the effect of covid 19 whiles none of them disagreed. With covid 19 test, 80% strongly agreed it was best practice for them whiles none disagreed. 50% said working from home helped them keep to

operations and recover from the negative effect of covid 19, 10% disagreed while none of them strong disagreed.

With the introduction of Port health as the lead agency, 50% were neutral, 30% strongly disagreed, 20% disagreed, while 10% agreed and strongly disagreed. 40% said getting a dedicated transport for staff helped them so much while none strongly disagreed. With more or new clearance procedures, new technology requirements and fumigation, majority of the respondents noted that it was a major resilient factor which helped them.

4.3.2 Responses from Operations Staff of MPS

Port Performance

The researcher wanted to know if the respondents understand the term port performance. This would help give informed decision whether they understand or not and how they understand it to be.

Per the responses provided by the staff of MPS, all the participants understood the term port performance. They explained that it involves the maximum use of port facilities to generate the required and expected response as well as serving customer needs to utmost satisfaction. It also includes ensuring port activities are done in a manner that meets the stipulated KPI's designed and proposed by managers and attaining them. In terms of port performance, the average number of crane movements per hour can be used to describe terminal performance. This is significant because it affects how long ships spend in port and how many containers are transported back and forth to storage yards. Others explained it as measuring of many aspects of port operation is essentially what port performance is. Also, increasing the effectiveness of cargo handling to increase berth usage through quick vessel turnaround. While some

explained as the execution of port-related activities that fulfils the expectations of customers as well as the aim objectives of all port users.

Performance Challenges faced by MPS during and after Covid 19

The researcher wanted information on the challenges the staff faced during operations before, during and after covid 19 pandemic.

86% of the total respondents stated there was restricted interaction with port users, delays before the start of shift and difficulty in engaging government stakeholders at the port as they felt unsafe working during the height of covid. The remaining 14% were unsure of the challenges they encountered during these different faces.

Positive impacts of port performance on MPS after Covid 19

The researcher needed information on how port performance has impacted MPS positively after outbreak of covid 19. Majority of the respondents stated that there have been less delays in cargo clearance. In addition, there has been efficient use of equipment. There has been improved financial performance of the port. Furthermore, there is quick delivery of essential goods like medical supplies to customers. Lastly, the practice of personal hygiene has improved compared to pre covid. These are positive results and a good mark for MPS as a port.

Measures to curb some challenges face by MPS Staff

The researcher asked if there are some measures, they could suggest to help curb some challenges they face as staff of the company.

The participants stated that majority of the office staff worked from home but prompt reply of mails was a challenge. Some suggested that MPS could have provided good internet packages as it was not of benefit to staff working from home. They also suggested that there should be some sort of motivation from management for employees. In addition, they suggested there should be reduced working hours of employees to help contain and reduce the spread of covid.

Delays in Port activities from vessel arrival, pilotage, berthing and cargo handling

This was asked by the researcher to get information on various activities causing delay in Port activities from vessel arrival, pilotage, berthing and cargo handling if there was any which could be attributed to Covid 19.

All participants acknowledged the fact that there were delays and attributed it to Covid 19 related activities. Some stated that the measures implemented to prevent the spread of covid was adhered to what resulted in delays. In addition, the boarding of vessel by ship agents delayed due to covid test and possible quarantine.

Increase in vessel turnaround time, comparison pre Covid and during Covid

The researcher needed information to validate is there is an increase in vessel turnaround time by comparing pre and post covid. All respondents stated there was no change in vessel turnaround time because the port instituted policies which made it more resilient to shocks of covid. Hence there was no change in vessel turnaround time.

Improvements in the MPS instituted measures

The researcher asked this question to get feedbacks from the respondents if there has been improvement in the MPS instituted measures put in place at the port for future operations.

Out of 50 respondents representing 100%, 47 people (94%) responded “YES”, there has been some improvements in the measure put in place by MPS for future operations and to increase productivity while the remaining 3 people (6%) had not seen any improvements yet. See figure 4.2 below.

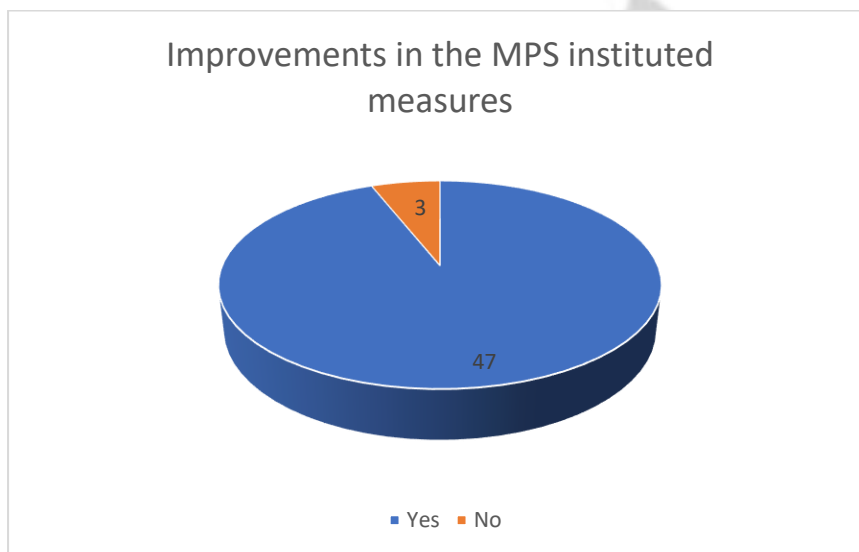


Table 4. 6 - Improvements in the MPS instituted measures

Source: Field Data, 2022

Business responses to challenges faced due to Covid 19

Below are some business responses to challenges faced due to Covid 19 during the pandemic. This is to get responses from respondents on the best practices which helped bounce back to operations after the negative effects and challenges caused by Covid 19. These were ranked by the respondents based on the following response showed in Table 4.6.

Table 4. 7 - Business responses to challenges faced due to Covid 19

	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
Hire More Labor	3	7	19	16	5
Work in shifts	0	3	7	12	28
Downscaled operations	8	5	14	18	5
Covid 19 tests	1	4	10	23	12
Working from Home	7	11	19	12	1
Introduction of port health as a lead agency	9	10	13	13	5
Dedicated transport for staffs	0	2	10	15	23
More or new clearance procedures	6	12	17	10	5
New Technology Requirements	4	4	12	19	11
Fumigation	0	2	9	25	14

Source: Field Data, 2022

As per the above responses shown in Table 4.6, 38% were neutral, 32% of the respondents stated that hiring more staff helped them curb the Covid 19 situation to be resilient, 14% disagreed while 6% strongly disagreed. 56% asserted to the fact that working in shift made them resilient against Covid 19 while 6% disagreed. With respect to downscaling of operations, 36% of the respondents admonished it helped them. 16% of the respondents strongly disagreed. Also, 46% respondents agreed that Covid 19 test helped them operate smoothly and resilient against the fortunes Covid while 2% strongly disagreed.

With respect to working from home, 38% were neutral on their stands, 24% agreed it was major resilient method used while 14% strongly disagreed. The port introduced port health as a lead

agency to help fight Covid 19. 32% of the respondents were neutral in their decision while 10% strongly agreed. 46% of the respondents strongly agreed that getting dedicated transport for staff helped a lot and none of the respondents strongly disagreed.

In terms of more or new clearance procedures, new technology requirements and fumigation majority of the respondents agreed to be a major resilient factor while the minority strongly disagreed.

4.3.3 Responses from Shipping Lines and Freight Forwarders

Port Performance

The researcher wanted to know if the respondents understand the term port performance. This would help give informed decision whether they understand or not and how they understand it to be.

All the respondents proved to understand the term port performance from their responses. Some of them stated that port performance is the overall performance of the port facility from effectiveness to efficiency with which the port operates to make operations smooth. Also, Port performance can be explained from the resilience perspective where the port can cope with shocks, absorb disruptions, quickly recover and restore operations to a similar level or even above a baseline. With respect to terminal performance, port performance can be described in terms of crane performance as the average number of crane movement per hour. This is important since it is related to the amount of time ships spend in port, how many containers are brought back and forth to storage yards. Others also stated that Port performance

is basically the measurement of various aspects of the port's operation. It also involves Improving cargo-handling efficiency to enhance berth utilization through fast vessel turnaround. Also, execution of port related activities that meet target goals of all port users and expectation of customers. Lastly, the time a vessel spends at port and rate with which cargo is discharged as loaded onboard vessels.

The number of people involved in intrusive verification of cargo by government institutions

In getting responses on whether the number of people involved in intrusive verification of cargo by government institutions reduced or increased, majority representing 82.5% (33 respondents) stated that it reduced while 17.5% (7 respondents) were not sure if it had reduced or not. See figure 4.3

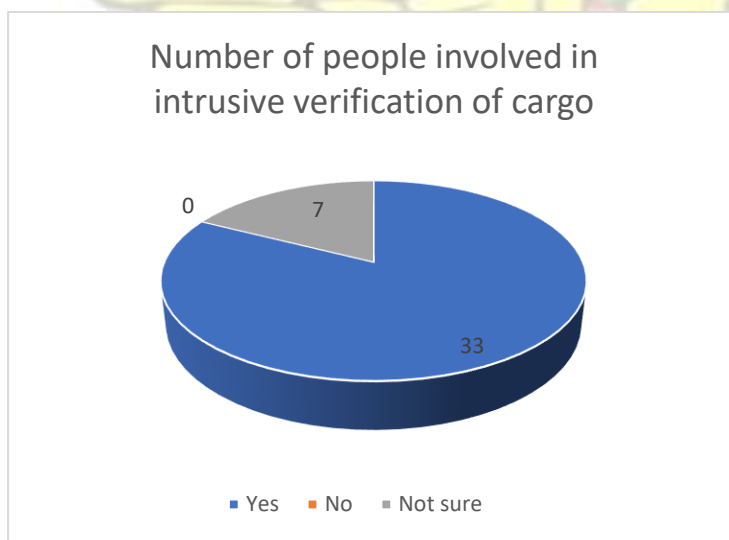


Figure 4. 5 - Number of people involved in intrusive verification of cargo

Source: Field data, 2022

Delays in activities at the port

To get responses on whether there has been delays in the activities of the freight forwarders and shipping lines at the port when vessels call till they render their services, this question was asked. 95% of the respondents acknowledged the fact that there has been delays while 2% said it was normal. See figure 4.4

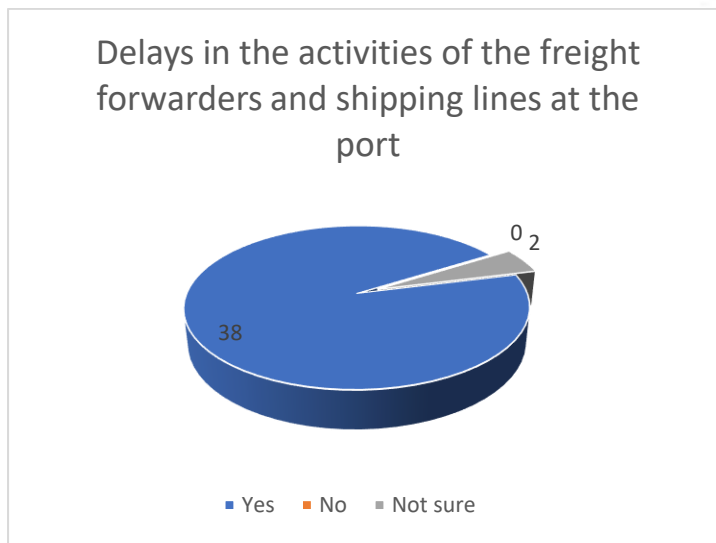


Figure 4. 6 - Delays in the activities of the freight forwarders and shipping lines at the port

Source: Field data, 2022

Delay attributed to Covid 19

The respondents were asked if the delays could be attributed to Covid 19 at port. 95% of the respondents attributed the delays to Covid 19 while 2% were not sure if it was Covid 19 or another factor. See figure 4.5

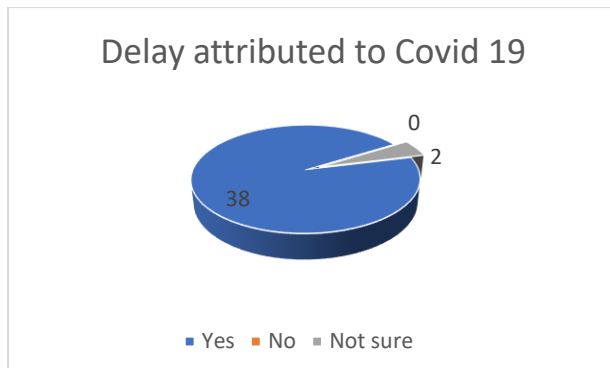


Figure 4. 7 - Delay attributed to Covid 19

Source: Field data, 2022

Input of freight forwarders or shipping lines to increase port performance

The researcher enquired if there has been any input by freight forwarders or shipping lines to increase port performance. All respondents stated, yes, there has been some form of input.

Some of which are by ensuring the right documentation on the part of shipping line is done on time to reduce bottlenecks when the vessel berths. Also, ensuring the documentation on the part of shipping lines are done swiftly and cargo release processes should not be cumbersome. Shipping lines ensure relevant documentation to the port and state organisations are done on time to reduce delays and stress in cargo operations. In addition, there is fast documentation and containers release services to ensure quick facilitation of cargo clearance from the port. This will reduce congestion in the port as cargo dwell time is less. Shipping lines ensure there are no blank sailings and continuous slots with vessels calling the ports. Hence performance is measured by berth occupancy and turnaround time of stay in port. Prevent delays with cargo clearance to reduce long stayed boxes in the port which later causes delays and congestion. Lastly, they ensure all processes and procedures are followed accordingly and required payment done to prevent challenges which moving cargo in and out of the port. This later prevents congestion in the port.

Port prioritized and guaranteed activities

When researcher asked if the port prioritized and guaranteed the continuity of port activities such as maritime access, berthing and cargo operations were made flexible, the respondents stated that they were made flexible to continue to provide services to vessels calling the port without difficulty during the height of the pandemic. Also, the port in its bid to make operations smooth and cargo getting to destinations on time, management implemented policies that aligned with safe operations during covid to reduce bottlenecks.

Others stated that continuity of port activities was important during the unusual time of Covid 19 so that goods such as food and medical supplies could get to its planned destination without disruption. A port plays a vital role in ensuring medical supplies got to the populace, ports made their activities flexible to prevent discontinuity. In addition, the port made these activities flexible so the continuity of business during the pandemic was continued. The port or terminal ensured continuous for medical supplies, food, raw materials as well as manufactured goods, continue to reach its intended destinations. The prioritisation of essential port activities should be considered to ensures to ensure the preservation of the cargo transportation and logistics chain for the supply of goods necessary towards containment of the pandemic.

Factors that negatively impacted the quality and performance of work

Below are some possible reasons which negatively impact the quality and performance of work of the freight forwarders and shipping lines in Ghana and hence, cause an increasingly number of delays. These were ranked by the respondents based on the following response showed in Table 4.5.

Table 4. 8 - Factors that negatively impacted the quality and performance of work

Negative Factors	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
Lack of competent personnel	3	12	17	4	4
Lack of cooperation from CEPs and other stakeholders in the port in facilitating cargo clearance	2	2	14	19	3
Insufficient cargo handling equipment	5	10	15	7	3
Inefficient cargo handling equipment	3	17	17	3	1
Lack of training of freight forwarders	5	19	10	4	2
Lack of training of MPS Operators	4	18	14	3	1
Covid 19 and its related complications and restrictions	0	0	1	14	25
Complexity of the industry	2	3	11	19	5
Lack of understanding the nature of the job	7	15	9	5	4
Political influence	0	1	3	15	21

Source: Field data, 2022

From the responses in Table 4. 5 above, it is evident that political influence and Covid 19 is a major factor affecting port performance negatively. The respondent further stated that there was lack of cooperation from CEPs and other stakeholders in the port in facilitating cargo clearance. 19 respondents representing 47.5% agreed to the fact that the industry is complex and that is causing a negative performance whiles 2 respondents representing 5% strongly

disagreed to this. 35% of the respondents attributed the negative performance of the port to insufficient cargo handling equipment while 7.5% of the respondents strongly disagreed. 47.5% and 45% of the respondents disagreed to the assertion that the negative performance of the port was as a result of lack of training for freight forwarders and MPS operators respectively while 5% and 2.5% strongly agreed.

Business responses to challenges faced due to Covid 19

Below are some business responses to challenges faced due to Covid 19 during the pandemic. This is to get responses from respondents on the best practices which helped bounce back to operations after the negative effects and challenges caused by Covid 19. These were ranked by the respondents based on the following response showed in Table 4.6.

Table 4. 9 - Business responses to challenges faced due to Covid 19

	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
Hire More Labor	4	6	15	15	1
Work in shifts	1	4	6	19	10
Downscaled operations	0	0	4	8	28
Covid 19 tests	2	4	4	10	20
Working from Home	0	1	2	4	33
Introduction of port health as a lead agency	7	10	14	6	3
Dedicated transport for staffs	0	2	4	15	19

More or new clearance procedures	4	13	10	5	8
New Technology Requirements	0	3	2	21	14
Fumigation	1	4	13	16	6

Source: Field Data, 2022

As per the above responses shown in Table 4.6, 37.5% agreed that hiring more staff helped them curb the Covid 19 situation to be resilient, 37.5% were neutral while 10% strongly disagreed. 47.5% asserted to the fact that working in shift made them resilient against Covid 19 while 2.5% strongly disagreed. With respect to downscaling of operations, 70% of the respondents admonished it helped them. None of the respondents disagreed or strongly disagreed. Also, 50% respondents strongly agreed that Covid 19 test helped them operate smoothly and resilient against the fortunes Covid while 5% strongly disagreed.

With respect to working from home, 82.5% strongly agreed it was great major resilient method used while 2.5% disagreed. The port introduced port health as a lead agency to help fight Covid 19. 35% of the respondents were neutral in their decision while 7.5% strongly agreed. 47.5% of the respondents strongly agreed that getting dedicated transport for staff helped a lot and none of the respondents strongly disagreed.

In terms of more or new clearance procedures, new technology requirements and fumigation majority of the respondents agreed to be a major resilient factor while there was none who strongly disagreed.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter of the research consists of a summary of the findings, the conclusion and recommendations made by the researchers according to the research findings.

5.2 Summary of findings

The summary of the findings obtained from this research work are as follows;

5.2.1 Effective MPS Instituted container measures in halting the spread of Covid 19 across the Terminal

From the study, the major factors which helped the fight against covid includes but not limited to getting dedicated transport services for staff, working in shifts, downscaling of operations, covid 19 test, new technology requirements, fumigation and adhering to Covid 19 protocols instituted by the state and World health organization.

5.2.2 Performance Related Operational Issues that the Port faced at the height of the Pandemic.

The researcher found out that the performance related issues include but not limited to delay in vessel operations, longer sailing time, limited physical interaction between onboard and onshore staff. In addition, there was difficulty in engaging government stakeholders at the port as they felt unsafe working during the height of the pandemic. Also, the port in its bid to make operations smooth and cargo getting to destinations on time, management implemented policies that aligned with safe operations during covid to reduce bottlenecks.

5.2.3 The impact of Covid 19 on MPS Performance

The study revealed that a major impact is with delays in the activities of the freight forwarders, shipping line boarding agents and port health staffs. This is due to the safety procedures being put in place. There was late start in shift also as a result, delaying in vessel operations. There was a downscale of operations to help curb these situations and to increase productivity and performance.

Again, the introduction of the paperless clearing system at the port has helped to reduce human interactions in the cargo clearing process by ensuring efficiency and effectiveness and this development has contributed to facilitate trade.

5.3 Conclusion

The study has examined various issues related to port productivity and performance. It revealed the impact of Covid 19 on the Port Terminal Performance. The survey was conducted in the Tema Port, Terminal 3, MPS. Using a total response of 100 from MPS management, Staff, Freight Forwarders and Shipping Lines. It emerged that MPS faced challenges during the outbreak of Covid 19 but have taken measures to help bounce back and increase productivity and performance.

The study revealed that MPS took several steps such as downscaling of operations, getting dedicated transport for staff, fumigation, operating in shifts and working from home helped them to increase productivity even though vessel turnaround time was reduced and delays in start of shift and other operations. In addition, the port has transitioned from the use of manpower to the use of modern technology with regards to port operations and related activities.

This is giving the port a competitive edge in achieving its aim of becoming the leading hub port of West Africa.

5.4 Recommendations

The following recommendations are made based on the research findings and conclusions.

- Shippers/shipping lines and port authorities are to adhere to covid 19 protocols.
- There should be constant training for all port users.
- Tema Port Authority should improve test rates, effective and efficient collaboration and communication with other port users.
- Ensure the documentation on the part of shipping lines are done swiftly and cargo release processes should not be cumbersome.
- Shipping lines should ensure relevant documentation to the port and state organizations are done on time to reduce delays and stress in cargo operations.
- There should be fast documentation and container release services to ensure quick facilitation of cargo clearance from the port.
- The port should adapt more automated systems in their operations to reduce human contact and time spent.

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APPENDIX

QUESTIONNAIRES

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

STUDENTS PROJECT QUESTIONNAIRES

INTRODUCTION

I am a student of the Kwame Nkrumah University of Science and Technology pursuing an MSc program in Logistics and Supply Chain Management. I am researching on **“Impact of COVID 19 on Port Terminal Performance (a Case Study of MPS, Tema Port)”** as a requirement for the award of a Master’s Degree in the above-stated program. This study aims to identify the effects of Covid 19 at MPS, Tema Port and its impact on port operations.

I shall be grateful if you can find time to respond to these questionnaires to enable us to successfully complete this research. This study is intended for academic purpose only and not for any commercial purposes.

I hereby assure you that all the information given shall be treated as confidential and shall only be used strictly for its intended academic purposes.

Please tick the appropriate box for your answers.

PART A (RESPONDENTS IDENTITY)

1. AGE

1. 20-29 years []
2. 30-39 years []
3. 40-49 years []

4. 50-59 years []
5. 60 and above []

2. GENDER

1. Male [] 2. Female []

3. LEVEL OF EDUCATION

1. Basic Education [] 2. SHS [] 3. HND/Degree [] 4. MBA/MSc []
5. Others []

4. EMPLOYMENT STATUS

- Casual Basis [] 2. Permanent Basis []

1.

5. YEARS OF EMPLOYMENT

1. 0-5 [] 2. 6-10 [] 3. 11-15 [] 4. 16-20 [] 5. 21 and above []

QUESTIONNAIRES FOR MANAGEMENT (MPS)

1. What has been some changes you have experienced in terms of operations at the Tema Port after Covid 19?

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2. Would you consider **time** of cargo handling activities during Covid 19 as **Efficient** []
Inefficient []

Explain.....

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3. Would you consider **time** of cargo handling activities after Covid 19 as **Efficient** []
Inefficient []

Explain.....

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4. Have you observed delays in the activities of the port right from vessel arrival, pilotage, berthing and cargo handling? **YES** [] **NO** []

What would you attribute your answer to? / explain your answer.....

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5. Has there been any increase in vessel turnaround time, comparison pre Covid and during Covid? **YES** [] **NO** []

6. If Yes, what could have been the cause?

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7. What has been the influence of the retrogression in the berth throughput on your operation?

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8. What are some of the instituted measures put in place after the outbreak of Covid 19 at the port?

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9. What are the effects of Covid 19 on port operations?

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10. Do you see any improvement in the MPS instituted measures put in place at the port for future operations? YES [] NO []

11. Enhanced online submission of cargo related documents to government agencies was setup to minimize unnecessary human interaction. Did automation be of benefit to the port facility?

YES [] NO []

Why?.....

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12. In your opinion, how strongly did Covid 19 affect port performance overall.

Little or No Effect.

13. Below are some business response to challenges faced due to Covid 19 during the pandemic. Rank based on the following response.

Strongly Disagree – 1 Disagree – 2 Neutral – 3 Agree – 4 Strongly Agree – 5

- Hire More Labor []
- Work in shifts []
- Downscaled operations []
- Covid 19 tests []
- Working from Home []

- Introduction of port health as a lead agency []
- Dedicated transport for staffs []
- More or new clearance procedures []
- New Technology Requirements []
- Fumigation []



QUESTIONNAIRES FOR OPERATIONS STAFF

1. Do you have any idea about what port performance is?

YES [] NO []

a) If Yes, could you tell us what port performance is in few words?

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2. What challenges do you face as a business due to performance of MPS during and after Covid 19?

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3. What positive impacts has the port performance had on MPS after Covid 19?

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4. What would you like MPS to do to solve some of these challenges faced by you?

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5. Have you observed delays in the activities of the port right from vessel arrival, pilotage, berthing and cargo handling? **YES** [] **NO** []

What would you attribute your answer to? / explain your answer.....

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6. Has there been any increase in vessel turnaround time, comparison pre Covid and during Covid? **YES** [] **NO** []

If Yes, what could have been the cause?

.....

.....

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7. What has been the influence of the retrogression in the berth throughput on your operation?

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8. Do you see any improvement in the MPS instituted measures put in place at the port for future operations? **YES** [] **NO** []

9. Below are some business response to challenges faced due to Covid 19 during the pandemic. Rank based on the following response.

Strongly Disagree – 1 Disagree – 2 Neutral – 3 Agree – 4 Strongly Agree – 5

- Hire More Labour []
- Work in shifts []
- Downscaled operations []
- Covid 19 tests []
- Working from Home []
- Introduction of port health as a lead agency []
- Dedicated transport for staffs []
- More or new clearance procedures []
- New Technology Requirements []
- Fumigation []

QUESTIONNAIRES FOR SHIPPING LINES AND FREIGHT FORWARDERS

10. Kindly describe or explain what port performance is in some few words?

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11. The number of people involved in intrusive verification of cargo by government institutions reduced?

YES [] NO []

12. Has there been delays in your activities at the port when vessels call till you render your service?

YES [] NO []

13. Could we attribute the delay to Covid 19 at port?

YES [] NO []

If No, please state reason

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14. What has been the input of freight forwarders or shipping lines to increase port performance?

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15. The port prioritized and guaranteed the continuity of port activities such as maritime access, berthing and cargo operations were made flexible?

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16. Below are some possible reasons which negatively impact the quality and performance of work of the freight forwarders and shipping lines in Ghana and hence, cause in an increasingly number of delays. Rank based on the following response.

Strongly Disagree – 1 Disagree – 2 Neutral – 3 Agree – 4 Strongly Agree – 5

- a. Lack of competent personnel []
- b. Lack of cooperation from CEPs and other stakeholders in the port in facilitating cargo clearance []
- c. Insufficient cargo handling equipment []
- d. Inefficient cargo handling equipment []
- e. Lack of training of freight forwarders []
- f. Lack of training of MPS Operators []
- g. Covid 19 and its related complications and restrictions []

- h. Complexity of the industry []
- i. Lack of understanding the nature of the job []
- j. Political influence []

17. Below are some business responses to challenges faced due to Covid 19 during the pandemic. Rank based on the following response.

Strongly Disagree – 1 Disagree – 2 Neutral – 3 Agree – 4 Strongly Agree – 5

- Hire More Labour []
- Work in shifts []
- Downscaled operations []
- Covid 19 tests []
- Working from Home []
- Dedicated transport for staffs []
- More or new clearance procedures []
- New Technology Requirements []
- Fumigation []