SUSTAINABLE SUPPLY CHAIN STRATEGIES AND PERFORMANCE OF WORLD FOOD PROGRAMME IN SOUTH SUDAN

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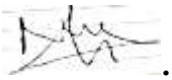
DECLARATION

I declare that this research project is my original work and has not been submitted for a degree in any other institution for purposes of examination.

Signature ……  **…… Date:21/06/2024**

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Supervisor Approval

This research project has been submitted for examination with our approval as the project supervisors.

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DEDICATION

This work is dedicated to my family for their unwavering support throughout my study.

ACKNOWLEDGEMENT

I give God praise for His mercy during my academic endeavors. My sincere gratitude is extended to my project supervisor, Dr. Peter Wamalwa Barasa, whose advice and criticism I much value. I am also really appreciative to Mount Kenya University for providing me with a conducive academic atmosphere. I genuinely appreciate the stimulating conversations I had with my classmates and course professors during the homework, which helped me narrow the subject of my research. May God richly bless you all.

ABSTRACT

Sustainable supply chain strategies are of paramount importance among humanitarian organizations for several reasons. The World Food Programme in South Sudan has adopted four key supply chain strategies, namely supplier relationship management, green procurement, reverse logistics, and transportation optimization. These strategies are employed not only to uphold World Food Program's mission of saving lives and changing lives for the better in South Sudan but also to enhance its operational efficiency, achieve cost reduction, and improve the overall effectiveness of its aid delivery. It however remains scantily explored in the South Sudanese body of knowledge, how these sustainable supply chain strategies have influence performance therefore, warranting the present study. Against this backdrop, this study set out to assess the effect of sustainable supply chain strategies on performance of World Food Program in South Sudan. More specifically, the study sought to establish the effect of supplier relationship management on performance of World Food Program in South Sudan; determine the effect of green procurement on performance of World Food Program in South Sudan; examine the effect of reverse logistics on performance of World Food Program in South Sudan; and assess the effect of transportation optimization on performance of World Food Program in South Sudan. The study adopted the descriptive design as it sought to collect data by survey tools, from which to give an accurate account of the effect of sustainable supply chain strategies on performance of World Food Program in South Sudan. The study relied on a mixed-method approach, whereby both quantitative and qualitative primary data were sought. While quantitative data were sourced from local suppliers that provide goods and services to World Food Program in South Sudan and members of the beneficiary communities through a structured questionnaire, in-depth key informant interviews were used to collect qualitative data from senior World Food Program staff involved in supply chain management, logistics, and procurement in South Sudan. The study furtherer employed a mixed-methods approach in data analysis, whereby both quantitative and qualitative data analysis techniques were used. Thematic analysis was used to analyze the qualitative data obtained from the in-depth key informant interviews. Both descriptive and inferential analysis were on the other hand be used to analyze the quantitative data obtained from structured questionnaires. The regression analysis results indicate that transportation optimization has the highest standardized coefficient ($\beta = 0.523$, $p < 0.001$), followed by green procurement ($\beta = 0.159$, $p = 0.011$) and reverse logistics ($\beta = 0.167$, $p = 0.026$), while supplier relationship management shows a non-significant effect ($\beta = 0.008$, $p = 0.890$). These results suggest that transportation optimization, green procurement, and reverse logistics significantly contribute to enhancing the performance of WFP in South Sudan, emphasizing the importance of these factors in humanitarian supply chain management.

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ABBREVIATIONS AND ACRONYMS

CSR	Corporate Social Responsibility
ICRC	International Committee of the Red Cross
IoT	Internet of Things
KPIs	Key Performance Indicators
MSF	Médecins Sans Frontières
NACOSTI	National Commission for Science, Technology, and Innovation
NGOs	Non-government Organizations
RBV	Resource-Based View
SPSS	Statistical Package for Social Sciences
SRM	Supplier Relationship Management
TCE	Transaction Cost Economics
UNHCR	United Nations High Commissioner for Refugees
WASH	Water, Sanitation and Hygiene
WFP	World Food Programme

CHAPTER ONE

INTRODUCTION

1.1 Background and Context

Humanitarian organizations are instrumental entities dedicated to addressing and alleviating human suffering in times of crisis, conflict, natural disasters, and other emergencies (Talib, Muhoho & Makali, 2020). Their importance is multi-faceted, as they play a critical role in saving lives, offering immediate relief, and providing essential services such as healthcare, food, and shelter to vulnerable populations. Beyond the immediate response, these organizations contribute to long-term recovery and resilience-building efforts (Van Wassenhove, 2022). They also uphold and advocate for the fundamental principles of humanity, neutrality, impartiality, and independence, ensuring that aid is delivered without discrimination, regardless of nationality, race, religion, or political affiliation (Kovač & Wallace, 2019). By providing assistance, protection, and support, humanitarian organizations help prevent further escalation of crises, support sustainable development, and promote social cohesion, making them indispensable in the global effort to address and mitigate the impact of emergencies and conflicts while upholding human rights and dignity (Bahadori, Bolinger, Alimohammadlou & Göransson, 2021).

Globally, humanitarian organizations have been particularly instrument in delivering food aid to vulnerable populations in times of crisis and emergency. In Asia, organizations like the United Nations World Food Programme (WFP) have responded to complex humanitarian situations, such as the Rohingya refugee crisis in Bangladesh (WFP, 2021). WFP, in partnership with various Non-government Organizations

(NGOs) and government agencies, provides food assistance to hundreds of thousands of displaced individuals, ensuring their nutritional needs are met (Kovač & Wallace, 2019). In Yemen, a nation affected by a protracted conflict, humanitarian organizations like the International Committee of the Red Cross (ICRC) and Médecins Sans Frontières (MSF) have been involved in food aid distribution, saving lives by addressing severe malnutrition. In Syria, the WFP operates in challenging conditions to provide emergency food relief to conflict-affected populations, contributing to the stability and resilience of affected communities (Tatham & Spens, 2021).

In the Middle East, the United Nations High Commissioner for Refugees (UNHCR) and various NGOs have been actively engaged in delivering food aid to vulnerable populations affected by conflicts and displacement (Van Wassenhove & Martinez, 2022). The Syrian crisis, for instance, has witnessed substantial efforts to address food insecurity through the provision of food packages and nutrition support to internally displaced people and refugees in neighboring countries like Jordan, Turkey, and Lebanon (Tatham & Kovács, 2020).

Regionally, Sub-Saharan Africa has also seen significant humanitarian food aid efforts, particularly in countries facing drought, famine, and displacement. In the Horn of Africa, organizations like Save the Children have been involved in combating malnutrition and hunger in countries like Ethiopia and Somalia. These efforts are a testament to the dedicated work of humanitarian organizations in ensuring that food aid reaches those who need it most in some of the most challenging and volatile environments (WFP, 2021).

Locally, South Sudan has Over the years, been a focal point for numerous humanitarian efforts aimed at alleviating the multifaceted challenges faced by its population. Humanitarian organizations, including the United Nations agencies, international NGOs, and local partners, have engaged in a range of interventions to address food insecurity, conflict-driven displacement, and health crises (Akol, 2021). These efforts have involved the provision of emergency food aid, nutrition support, and healthcare services, particularly in response to recurrent conflicts and natural disasters. Organizations like WFP have implemented food distribution programs, employing innovative approaches such as cash transfers and nutrition-sensitive interventions to combat malnutrition. Additionally, initiatives have been undertaken to enhance water, sanitation, and hygiene (WASH) infrastructure, offering essential resources to communities grappling with waterborne diseases (Government of South Sudan & WFP, 2019).

South Sudan, a young and war-torn nation in East Africa, has been grappling with a complex humanitarian crisis characterized by ongoing conflict, severe food insecurity, and displacement of its population (Akol, 2021). In this challenging context, the WFP, as one of the largest and most critical humanitarian organizations globally, plays a pivotal role in providing vital food assistance to millions of South Sudanese who are affected by the conflict and food shortages (Government of South Sudan & WFP, 2019). WFP's operations in South Sudan encompass a range of activities, including food distribution, nutrition programs, school feeding initiatives, and support for internally displaced persons and refugees.

Central to the foregoing humanitarian efforts is the sustainable distribution of aid to far flung vulnerable populations are often affected by conflict, displacement, and food insecurity, through various supply chains (Fawcett, Magnan & McCarter, 2021). As such, sustainable supply chain strategies enable humanitarian organizations to optimize the sourcing, transportation, and distribution of aid, minimizing costs, reducing environmental impact, and ensuring the efficient delivery of life-saving resources to vulnerable populations (Crainic & Kim, 2019). Sustainable practices also contribute to the long-term resilience of communities, promoting self-reliance and reducing dependence on aid (Christopher, Peck & Towill, 2022). With frequent disruptions to infrastructure and supply chain operations, WFP has over the years resorted to a range of sustainable supply chain strategies aimed at addressing these unique challenges in delivering aid efficiently and sustainably in South Sudan. These include the adoption of supplier relationship management, green procurement, reverse logistics and transportation optimization (Maxwell, Gordan, Moro, Santschi & Dau, 2018).

Supplier relationship management (SRM) is a sustainable supply chain strategy that humanitarian organizations employ to foster long-term and mutually beneficial partnerships with suppliers. By building strong and sustainable relationships with suppliers, humanitarian organizations can enhance the reliability and efficiency of their supply chains (Beamon, 2019). This involves not only ensuring a consistent supply of goods but also promoting ethical and environmentally responsible sourcing practices. SRM helps in the selection of suppliers who align with sustainability principles, reducing the environmental impact of procurement and ensuring that

products meet quality and ethical standards (Cousins & Spekman, 2020). Through SRM, humanitarian organizations can make informed decisions regarding suppliers, supporting sustainability in their supply chains, and contributing to responsible and transparent sourcing, which is essential for the long-term resilience and effectiveness of humanitarian operations (Kannan, Sasikumar, Devika & Haq, 2020).

Green procurement is a sustainable supply chain strategy that involves the selection and sourcing of goods and services with a focus on environmental responsibility and minimal impact on the planet (Kosut & Moran, 2019). In the context of humanitarian organizations, green procurement means making environmentally conscious choices in the sourcing of materials and supplies, such as selecting energy-efficient vehicles, reducing single-use plastics, and favoring eco-friendly packaging (Li, Wang & Huang, 2019). This strategy is employed to minimize the carbon footprint of procurement activities, conserve natural resources, and reduce waste. Green procurement aligns with humanitarian organizations' commitments to sustainability by ensuring that their operations are not only effective but also environmentally responsible, contributing to a more resilient and sustainable future for the communities they serve and the planet as a whole (Quayson & Jiao, 2019).

Reverse logistics is a sustainable supply chain strategy that involves the management of the return, recycling, or responsible disposal of products and materials, focusing on reducing waste and environmental impact (Russo & Comi, 2022). In the context of humanitarian organizations, reverse logistics plays a critical role in ensuring the responsible disposal of aid materials, including medical supplies, relief items, and

equipment (Talib, Muhoho & Makali, 2020). Humanitarian organizations employ this strategy by efficiently handling the return and recycling of unused or expired items, reducing the environmental footprint of their operations, and adhering to ethical disposal practices. This not only minimizes waste but also promotes environmental responsibility, contributing to the broader sustainability goals of humanitarian efforts and fostering a culture of responsible resource management and environmental stewardship (Srivastava, 2017).

Transportation optimization is a sustainable supply chain strategy that involves maximizing the efficiency of transportation processes, reducing costs, and minimizing the environmental impact of moving goods and resources (Li et al., 2019). In the context of humanitarian organizations, transportation optimization is crucial for ensuring the timely and cost-effective delivery of aid to vulnerable populations, especially in challenging and resource-constrained environments. Humanitarian organizations employ this strategy by implementing route optimization, load consolidation, and the use of energy-efficient vehicles to minimize fuel consumption and carbon emissions (Kannan, Sasikumar, Devika & Haq, 2020). By streamlining transportation operations, these organizations reduce costs and environmental impact, ensuring that more resources can be directed towards delivering aid and supporting the long-term sustainability of their operations, while also contributing to environmentally responsible humanitarian efforts (He & Bai, 2019).

In such conflict-affected and resource-constrained environment as South Sudan, such strategies are not only instrumental in ensuring the efficient and responsible delivery

of food aid but also in minimizing the environmental footprint of operations and fostering the long-term resilience of communities (Ibreck & Pendle, 2017). WFP's commitment to sustainability in its supply chain operations goes beyond immediate relief, aiming to empower vulnerable populations, reduce dependence on aid, and contribute to the overall well-being of the environment and society (WFP, 2021). Through integrating sustainable practices, WFP not only aims at uphold its mission of saving lives and changing lives for the better in South Sudan, but also enhance its operational efficiency, achieve cost reduction and overall effectiveness of its aid delivery (Maxwell et al., 2018).

1.2 Statement of the Problem

The performance of humanitarian organizations, particularly in complex and vulnerable contexts like South Sudan, plays a critical role in ensuring effective aid delivery and sustainable development outcomes (IPC, 2023). The WFP is instrumental in providing crucial food assistance and support to millions of people affected by conflict, political instability, and environmental challenges in the region (IPC, 2023). However, amidst these challenges, there remains a pressing need to enhance the efficiency, effectiveness, and sustainability of humanitarian operations. Sustainable supply chain management strategies have been identified as pivotal in achieving these goals, as they not only optimize resource allocation but also align with global sustainability agendas (Fawcett et al., 2021). Key among these strategies include supplier relationship management, green procurement, reverse logistics, and transportation optimization (Maxwell et al., 2017; Fawcett et al., 2021).

Accordingly, the WFP in South Sudan has adopted the foregoing sustainable supply chain strategies (WFP, 2021). Despite WFP's efforts, South Sudan continues to face severe food insecurity, with over 7.2 million people in crisis or worse (IPC Phase 3+) as at mid-2023 (IPC, 2023). The specific influence of the adopted sustainable supply chain strategies on WFP's performance, however, remains inadequately explored in the South Sudanese context. Previous studies on supply chain strategies (Mulwa, 2020; Kinyanjui, 2019; Talib et al., 2020) have predominantly focused on regions outside of South Sudan, neglecting the unique operational challenges faced in this region. Therefore, this study aims to bridge this gap by assessing the effect of sustainable supply chain strategies on the performance of WFP in South Sudan. In doing so, it not only contributes to the broader humanitarian literature but also addresses the pressing need for context-specific insights in a region with distinctive challenges, thereby enhancing the effectiveness of aid delivery and fostering long-term sustainability and resilience in the local communities.

1.3 Purpose of the Study

To assess the effect of sustainable supply chain strategies on performance of world food program in South Sudan.

1.4. Specific Oobjectives of the Study

i. To establish the effect of supplier relationship management on performance of World Food Program in South Sudan

ii. To determine the effect of green procurement on performance of World Food Program in South Sudan

iii. To examine the effect of reverse logistics on performance of World Food Program in South Sudan

iv. To assess the effect of transportation optimization on performance of World Food Program in South Sudan

1.5 Research Questions

i. To what extent does supplier relationship management influence the performance of World Food Program in South Sudan?

ii. To what extent does green procurement influence performance of World Food Program in South Sudan?

iii. To what extent do reverse logistics influence the performance of World Food Program in South Sudan?

iv. To what extent does transportation optimization influence the performance of World Food Program in South Sudan?

1.6 Significance of the Study

The research study holds significant importance to various stakeholders involved in humanitarian and development efforts. The study's significance can be understood through its potential impact on different groups:

1.6.1 Humanitarian Organizations

For humanitarian organizations like the WFP, this study is of paramount significance. It provides an opportunity to assess and improve their supply chain strategies, thereby enhancing their ability to deliver essential food and aid to vulnerable populations in South Sudan. By understanding the relationship between sustainability practices and

supply chain performance, WFP can optimize its operations, reduce costs, and increase the efficiency of reaching those in need. This, in turn, allows them to fulfil their mission of alleviating hunger and suffering more effectively.

1.6.2 Local Communities

The study's significance extends to the local communities in South Sudan who are recipients of aid from WFP. Improved supply chain strategies can lead to more reliable and consistent food distribution, reducing food insecurity and helping communities become more self-reliant. Sustainable practices can also have positive environmental and social impacts on the communities, contributing to long-term well-being.

1.6.3 Donors and Funding Agencies

Donors and funding agencies play a crucial role in supporting humanitarian efforts. The study's findings can help donors make informed decisions about where to allocate resources. When they see that sustainable supply chain strategies lead to better performance in delivering aid, they may be more inclined to invest in these initiatives. Transparency in performance measurement can also increase donor confidence in the efficient use of their contributions.

1.6.4 Government and Regulatory Bodies

Governments and regulatory bodies in South Sudan have an interest in ensuring that humanitarian organizations operate efficiently and sustainably within their borders. The study can provide insights into areas where government policies and regulations can support or align with sustainable supply chain practices. It may also facilitate

collaboration between humanitarian organizations and government agencies, leading to more effective disaster response and recovery efforts.

1.6.5 Research Community

The study contributes to the academic and research community by generating knowledge and insights into the relationship between sustainable supply chain strategies and humanitarian performance. This information can be used to further the academic understanding of humanitarian logistics, and it may lead to the development of new models and best practices that can be applied not only in South Sudan but also in other humanitarian contexts worldwide.

1.7 Scope of the Study

The scope of the study was to comprehensively investigate and analyze the relationship between sustainable supply chain practices and the performance of the WFP in delivering humanitarian aid in the challenging context of South Sudan. The conceptual scope of the study includes four sustainable supply chain strategies including supplier relationship management, green procurement, reverse logistics, transportation optimization, energy efficiency and renewable energy, waste management, and collaboration and partnerships. The geographical scope of the study will be South Sudan. To achieve its objectives, the study relied on a mix of primary data from WFP's supply chain operations in South Sudan, interviews with relevant personnel, and field observations, as well as secondary data sources, including reports and academic literature. The study was carried out over a two-month period, from April to May 2024.

The target population for this study, individuals, organizations, or entities directly involved or affected by WFP's supply chain operations in South Sudan, was chosen based on their direct interaction and impact on the humanitarian supply chain in the region. This includes WFP personnel, local suppliers, partner organizations, and beneficiaries who are integral to the logistics, procurement, and distribution processes of humanitarian aid. Their insights are crucial as they provide firsthand experience and perspectives on how supply chain strategies affect operational efficiency, sustainability efforts, and ultimately, the delivery of aid to vulnerable populations in South Sudan. Understanding their perceptions and experiences helps in identifying challenges, improving practices, and enhancing the overall effectiveness of humanitarian operations in this complex environment. The academic scope, which entails the study's potential contributions to the academic literature include filling gaps in understanding the effectiveness of supply chain strategies in humanitarian contexts and its practical implications for policy, practice, and future research.

1.8 Study Limitations

The study's insights are inherently context-specific, deeply rooted in the socio-political, economic, and environmental landscape of South Sudan. This region is characterized by its unique set of challenges, including ongoing conflict, political instability, and climatic vulnerabilities, which significantly impact supply chain operations. These conditions may not mirror those in other parts of the world or even within different humanitarian contexts. Therefore, the findings may not be directly applicable or transferable to other regions or humanitarian organizations without considerations of their specific operational environments. To mitigate this limitation,

the study proposes a framework for adapting the findings to different contexts and suggests areas for future research to examine the applicability of the study's conclusions across diverse humanitarian settings.

Collecting data in South Sudan poses significant challenges due to security concerns, logistical constraints, and the often fluid and unpredictable nature of humanitarian operations. These factors can affect both the availability and reliability of data. Recognizing these challenges, the study employs electronic data collection methods as a means to enhance accessibility and efficiency. However, it also acknowledges the potential biases and limitations inherent in these methods, such as the reliance on respondents with internet access and the possibility of reduced response rates. To address these concerns, the study incorporated a mixed-methods approach, combining quantitative data with qualitative insights gathered through interviews and focus groups. This approach aims to enrich the data set and provide a more nuanced understanding of sustainable supply chain strategies in this context.

The study involves qualitative assessments that may be subject to researcher bias and interpretation. While efforts are made to maintain objectivity and rigor through systematic analysis procedures, it is important to recognize that subjective judgment may influence aspects of the data interpretation and analysis process. To mitigate this, the study employs a triangulation method, corroborating findings across multiple data sources and perspectives to enhance the validity and reliability of the conclusions.

The volatile security situation in South Sudan can lead to sudden changes in operational contexts, affecting the feasibility of planned data collection activities and

potentially leading to gaps or inconsistencies in the data. The study acknowledges this challenge and includes contingency plans for data collection, such as the use of remote data collection methods and the establishment of partnerships with local organizations to facilitate access and engagement.

Acknowledging these limitations, the study underscores the need for further research to explore sustainable supply chain strategies in a broader range of contexts. Future studies could investigate similar strategies in other conflict-affected regions, compare findings across different humanitarian organizations, or examine the scalability of successful interventions. Additionally, longitudinal studies could provide deeper insights into the long-term impacts of these strategies on supply chain performance and sustainability.

1.9 Delimitations

In delimiting the scope of this study, certain constraints and boundaries are acknowledged to contextualize the research. Firstly, the study focuses exclusively on the sustainable supply chain strategies implemented by WFP in South Sudan, specifically supplier relationship management, green procurement, reverse logistics, and transportation optimization. While these strategies are integral to the WFP's operations, the findings may not be universally applicable to all humanitarian organizations or industries. Secondly, the investigation is limited to the specified sustainable supply chain strategies and their influence on performance, specifically in terms of timeliness and cost-efficiency. Other factors impacting performance, such as

political dynamics, regulatory environments, or broader economic conditions, are recognized but intentionally excluded from the current analysis.

1.10 Assumptions of the study

This study operated under several key assumptions to streamline its research framework. Firstly, it assumed that the information obtained from the WFP in South Sudan, particularly regarding the implementation and outcomes of sustainable supply chain strategies, is accurate, reliable, and representative of the organization's practices. Secondly, the study assumed that the specified sustainable supply chain strategies, namely supplier relationship management, green procurement, reverse logistics, and transportation optimization, are effectively and consistently applied within the WFP's operations. Additionally, it assumed that the selected performance indicators, namely timeliness and cost-efficiency, adequately capture the multifaceted nature of supply chain performance in the humanitarian context. The study also assumed that any potential limitations in data availability or quality can be addressed within the scope of the research design. These assumptions collectively underpin the study's methodology and interpretation of findings, recognizing certain prerequisites for the validity and generalizability of the research outcomes.

1.11 Operational Definition of Key terms

Green Procurement: The acquisition of goods, services, and resources by the WFP in South Sudan in an environmentally responsible and sustainable manner. This includes consideration of eco-friendly sourcing, reduced

environmental impact, and adherence to sustainable standards throughout the procurement process (Carter & Rogers, 2018).

Performance: The overall effectiveness, efficiency, and success of the WFP in South Sudan's supply chain operations. It includes key performance indicators such as timely delivery, cost-effectiveness, environmental sustainability, and overall impact on the program's objectives in providing food assistance in South Sudan (Ibreck & Pendle, 2017).

Reverse Logistics: The process of planning, implementing, and controlling the efficient flow of goods, services, and information from the end-users back to the WFP's supply chain. In the context of this study, it involves the management of product returns, recycling, and disposal activities with the aim of minimizing waste and maximizing value recovery (Guide & Van Wassenhove, 2019).

Supplier Relationship Management: The strategic approach and systematic management of the interactions and relationships between the WFP in South Sudan and its suppliers. This involves activities such as communication and

coordination to enhance the efficiency and reliability of the supply chain (Kosut & Moran, 2019).

Transportation Optimization: The strategic planning and management of transportation activities by the WFP in South Sudan to achieve the most efficient, cost-effective, and sustainable movement of goods within the supply chain. This includes route planning, mode selection, and the utilization of technology to enhance overall transportation performance (Crainic & Kim, 2019).

CHAPTER TWO:

LITERATURE REVIEW

2.0. Introduction

This section discusses the literature undertaken by earlier scholars in the area of sustainable supply chain strategies and performance of world food program in South Sudan. First the theories supporting the study are discussed followed by empirical studies on how each variable has been found to influence performance. Further, the section provides a summary of the literature and the gaps; and finally presents the conceptual framework linking the variables.

2.1 Empirical Literature

2.1.1 Supplier Relationship Management and Performance of WFP in South Sudan

Supplier Relationship Management is a vital component of modern supply chain management that focuses on fostering mutually beneficial relationships with suppliers (Kosut & Moran, 2019). In working closely with suppliers, companies can foster environmentally responsible practices, ethical labor standards, and efficient processes. According to Cousins and Spekman (2020), SRM goes beyond transactional supplier-buyer interactions and forms a foundation for long-term, strategic partnerships that can drive innovation, reduce costs, and enhance competitiveness. It involves a shift from a transaction-based perspective to a more holistic and strategic approach.

While Kosut and Moran (2019) highlight the potential of SRM in fostering environmentally responsible and ethical practices, the discussion lacks depth regarding

the specific challenges and strategies in conflict-affected areas like South Sudan. The literature could benefit from a more nuanced analysis of how SRM practices need to be adapted in such contexts to address unique operational challenges. The conceptualization of SRM by Cousins and Spekman (2020) as a foundation for long-term strategic partnerships is compelling. However, the study lacks empirical evidence or case studies, especially from humanitarian organizations like the World Food Program, to illustrate the real-world impact of SRM on supply chain excellence and sustainability within such unique environments.

Effective SRM necessitates collaboration and communication with suppliers. Lamming (2018) notes that strong communication and collaborative efforts enable organizations to align their goals with those of their suppliers, share information, and jointly address challenges. This collaborative approach can lead to joint product development and innovation, as stated by Luzzini et al. (2020), contributing to value creation. Supplier Relationship Management is crucial for risk mitigation in the supply chain. Wagner and Bode (2018) emphasize the role of SRM in identifying and managing risks associated with suppliers, including financial, operational, and environmental risks. Effective SRM enables organizations to develop resilience and preparedness to address potential supply chain disruptions, as highlighted in the study by Van der Vorst et al. (2019).

Lamming's (2018) emphasis on collaboration and communication is well-founded, but lacks practicality of achieving high levels of collaboration in the volatile context of South Sudan. It also fails to explore the specific barriers to effective communication

and collaboration in humanitarian supply chains and suggest strategies to overcome these challenges. The role of SRM in risk mitigation is crucial, yet Wagner and Bode (2018) discussion does not adequately address the complexity of risk in conflict zones. Literature could benefit from a more detailed examination of how SRM can be effectively utilized to manage not just financial and operational risks, but also the acute security risks prevalent in areas like South Sudan.

Sustainability is a recurring theme in SRM literature. Carter and Rogers (2018) argue that SRM is instrumental in aligning supply chain practices with sustainability goals. Organizations engage with suppliers who share their commitment to environmental and social responsibility, promoting sustainability initiatives in the supply chain. This alignment is essential for achieving corporate social responsibility (CSR) objectives. SRM involves the continuous evaluation of supplier performance. Key Performance Indicators (KPIs) are used to assess various aspects of supplier performance, as discussed by Handfield and Cousins (2020). These evaluations help organizations identify areas for improvement, facilitate fact-based decision-making, and ensure suppliers meet or exceed expectations.

While the importance of aligning SRM with sustainability goals is well-articulated, Carter and Rogers (2018) analysis may be critiqued for its lack of specificity regarding the implementation of sustainability initiatives within SRM in humanitarian contexts. The literature review could provide examples of successful sustainability initiatives within SRM in similar contexts, highlighting lessons learned and best practices. The discussion on using KPIs for evaluating supplier performance by Handfield and

Cousins (2020) is insightful. However, it could be critiqued for not discussing the adaptability of these KPIs to the rapidly changing environments of humanitarian missions. The review might explore how performance evaluation methods can be adjusted to remain relevant and effective in the face of such variability and uncertainty.

Modern SRM often leverages technology and software solutions. Literature acknowledges the role of digital tools in enhancing SRM effectiveness. Monczka et al. (2020) note that technology, such as supplier portals and relationship management software, streamlines communication, automates processes, and facilitates data management, allowing for more efficient SRM practices. The study emphasizes the role of relationship management in driving innovation, risk mitigation, sustainability, and performance evaluation, while acknowledging the influence of technology in modern SRM practices. The acknowledgment of technology's role in enhancing SRM is necessary; however, the discussion by Monczka et al. (2020) could be expanded to critique the accessibility and applicability of these digital tools in regions with limited infrastructure, like South Sudan. The literature review could benefit from an analysis of the challenges and opportunities in implementing SRM technology solutions in less developed or conflict-affected regions.

2.1.2 Effect of Green Procurement on Performance of WFP in South Sudan

Carter and Rogers (2018) argue that green procurement involves sourcing products and services from suppliers who prioritize eco-friendly practices, which contributes to reduced environmental harm. Organizations are encouraged to select suppliers who

align with their sustainability objectives, as discussed in their work. A core element of green procurement is sustainable sourcing. Organizations are advised to consider the entire lifecycle of products, including raw material extraction, production, transportation, and end-of-life disposal. This approach helps in reducing the carbon footprint and environmental impact of products.

Carter and Rogers (2018) provide a foundational perspective on the importance of green procurement practices in enhancing environmental sustainability. Their argument emphasizes the strategic selection of suppliers based on environmental considerations, aligning with broader sustainability objectives. However, the critique of the study lies in the lack of detailed discussion on the practical challenges and complexities involved in implementing green procurement. The authors could have expanded on the operational hurdles, such as assessing the true environmental footprint of suppliers or the premium costs associated with eco-friendly products and services. Additionally, exploring the dynamics of supplier engagement and the potential for capacity building among suppliers to meet green procurement standards would enrich the discussion.

The study by He and Bai (2019) discusses the role of environmental regulations in shaping green procurement practices and supplier selection. Green procurement offers cost-saving opportunities. According to the study, selecting environmentally preferable products can lead to operational efficiencies, reduced waste, and lower energy consumption, resulting in long-term cost savings. Additionally, green

procurement can enhance an organization's reputation and market advantage, as more consumers seek eco-friendly products and responsible companies.

The study by He and Bai (2019) highlights the significant role of environmental regulations in shaping green procurement practices. While this perspective is crucial, the critique here revolves around the narrow focus on regulatory compliance as a driver for green procurement. Expanding the discussion to include intrinsic motivations for companies to pursue green procurement, such as corporate social responsibility, brand image, and consumer demand, would provide a more comprehensive understanding of the multifaceted motivations behind green procurement practices.

Engaging with suppliers is a critical aspect of green procurement. Organizations should work closely with their suppliers to promote sustainability practices throughout the supply chain. Through collaborating with suppliers who share their environmental commitment, companies can create a collective approach to sustainability, as discussed in the research by Luzzini et al. (2020). This study emphasizes the importance of engaging with suppliers to promote sustainability practices throughout the supply chain. While the collaborative approach is commendable, the critique lies in the underestimation of the effort and resources required to foster such collaborations effectively. The paper could benefit from a deeper exploration of the mechanisms for successful supplier engagement, including the challenges of aligning diverse organizational cultures and priorities, as well as practical strategies for overcoming these obstacles.

Green procurement is not without challenges. Bals et al. (2019) highlight that organizations may face barriers such as higher initial costs for environmentally preferable products, lack of supplier transparency, and limited availability of green alternatives. Overcoming these challenges requires a dedicated commitment to sustainability and collaboration with suppliers. The study provides a realistic overview of the challenges faced by organizations in implementing green procurement. While their acknowledgment of barriers such as higher costs and lack of transparency is important, the study did not make a strong emphasis on potential solutions and innovative practices that companies can adopt to overcome these hurdles. For instance, detailing case studies of organizations that have successfully navigated these challenges, or discussing emerging technologies and platforms that facilitate more transparent and efficient green procurement processes, would significantly enhance the practical value of their insights.

2.1.3 Effects of Reverse Logistics on Performance of WFP in South Sudan

Reverse logistics, a vital aspect of supply chain management, encompasses the processes involved in handling returned or end-of-life products (Guide & Van Wassenhove, 2019). This multidimensional concept plays a crucial role in environmental sustainability, economic efficiency, and value creation, and it has garnered substantial attention in academic literature and industry practice. Reverse logistics addresses the management of product returns and the recycling or disposal of waste products.

Guide and Van Wassenhove (2019) offer a comprehensive overview of reverse logistics, emphasizing its role in sustainability and value recapture. Their work effectively outlines the processes involved and the benefits thereof. However, their study fails to conduct a deeper exploration of the specific strategies and technologies that facilitate effective reverse logistics operations. Additionally, while the importance of reverse logistics in environmental sustainability is well-argued, the paper could further benefit from real-world examples or case studies that illustrate successful implementations of reverse logistics, particularly in challenging environments like South Sudan.

Reverse logistics is pivotal in managing product returns, recycling, remanufacturing, and disposal. As organizations increasingly recognize the value of resource conservation and waste reduction, the importance of reverse logistics has grown. Guide et al. (2020) emphasize its significance in the context of closed-loop supply chains, where products and materials are reclaimed and reintegrated, thereby reducing environmental impact. The efficient management of product returns is a central focus of reverse logistics. The literature highlights that a well-structured reverse logistics process can lead to significant cost savings and customer satisfaction. Furthermore, it enables the recycling and reuse of materials, contributing to environmental responsibility.

The study by Guide et al. (2020) underlines the significance of reverse logistics within closed-loop supply chains, presenting a strong argument for its environmental and economic benefits. The emphasis on closed-loop supply chains is particularly

valuable. However, the study fails to delve deeper into the specific strategies for integrating reverse logistics into existing supply chains, particularly in sectors or regions where this practice is not yet widespread. The exploration of barriers to integration and strategies to overcome these would make the findings more actionable for practitioners.

Remanufacturing, an integral part of reverse logistics, involves restoring used products to their original or better condition. This aligns with the concept of a circular economy, which advocates for waste reduction and the extension of product lifecycles. Srivastava (2017) discusses how remanufacturing can contribute to both economic and environmental sustainability by decreasing the demand for new raw materials. Reverse logistics practices are shaped by environmental regulations and standards. Organizations are obligated to adhere to legal requirements related to product disposal, recycling, and hazardous materials management. These regulations often drive companies to adopt more environmentally responsible reverse logistics practices. Russo and Comi (2022) delve into the role of regulations in influencing the practices of reverse logistics.

Srivastava's (2017) discussion on remanufacturing as part of reverse logistics is insightful, highlighting its economic and environmental benefits. The connection between remanufacturing and sustainability is well-established, yet the analysis could be enriched by addressing the market demand for remanufactured products and the consumer perception challenges that might arise. Understanding consumer acceptance

and the marketing of remanufactured products are critical for the success of such initiatives, especially in diverse markets.

The literature acknowledges that reverse logistics can be complex and present challenges, including the management of returns, efficient transportation, recycling infrastructure, and managing customer perceptions. Kannan et al. (2020) discuss the various challenges faced by organizations when implementing reverse logistics, emphasizing the importance of efficient planning and technology integration. The environmental benefits of reverse logistics are evident in waste reduction and resource conservation. However, it also has economic advantages. Fleischmann et al. (2017) outline how effective reverse logistics can lead to cost savings, as the remanufacturing and recycling of products can create value and generate additional revenue streams.

Kannan et al. (2020) provide a detailed examination of reverse logistics, focusing on the environmental impacts and the concept of a circular economy. Their work is crucial in highlighting the strategic importance of minimizing the environmental footprint. Nonetheless, the critique lies in the limited discussion on the operational challenges and the logistical specifics of implementing reverse logistics in conflict-affected areas or in regions with underdeveloped infrastructure. A more nuanced discussion on overcoming these practical challenges would enhance the relevance of their findings, especially for organizations operating in such contexts.

The analysis by Fleischmann et al. (2017) on the economic benefits of reverse logistics through cost savings and revenue generation is a valuable contribution to the literature. However, the focus on economic advantages might overshadow the

practical challenges and initial investments required to establish effective reverse logistics processes. A balanced discussion that also considers the upfront costs, the need for specialized knowledge, and the potential for long-term ROI would offer a more nuanced understanding of the economic dimensions of reverse logistics.

2.1.4 Effect of Transportation Optimization on performance of WFP in South Sudan

Advanced technology solutions and data analytics play a pivotal role in helping companies make informed decisions regarding transportation optimization (Crainic & Kim, 2019). It is a topic widely covered in the literature, offering insights into various strategies, techniques, and tools to enhance transportation efficiency. Transportation represents a significant cost component within the supply chain, making its optimization vital. Literature underscores the importance of optimizing transportation for cost reduction and operational efficiency.

Crainic and Kim (2019) offer valuable insights into the role of advanced technology solutions and data analytics in transportation optimization. Their work underscores the importance of such technologies in enhancing operational efficiency and reducing costs. However, their study fails give a more detailed exploration of the specific challenges and barriers to implementing these technologies, especially in complex environments like South Sudan where infrastructure and technological capabilities may be limited. Including case studies or examples of successful implementations in similar contexts could also enhance the applicability of their findings.

According to Chopra and Meindl (2019), transportation optimization enhances an organization's competitive advantage by reducing logistics costs and ensuring timely delivery. Route optimization and vehicle selection are critical aspects of transportation optimization. Researchers have highlighted the role of advanced algorithms and software solutions in finding the most efficient routes and selecting the appropriate vehicles for transport. Chopra and Meindl (2019) highlight the strategic advantage gained through transportation optimization, emphasizing cost reduction and timely delivery. While their analysis is comprehensive in discussing the benefits of optimization, it may overlook the practical difficulties organizations face in conflict-affected areas. The unique challenges of operating in South Sudan, such as security issues and infrastructure deficits, could have been addressed to provide a more rounded perspective on how transportation optimization strategies can be adapted or modified in such settings.

Zografos and Androutsopoulos (2021) discuss the utilization of vehicle routing and scheduling systems to improve transportation operations and reduce fuel consumption. Literature recognizes the advantages of intermodal transportation, which involves using multiple modes of transportation (e.g., road, rail, sea, air) in a single journey. Intermodal transportation can lead to significant cost savings and environmental benefits. The discussion on route optimization and vehicle selection by Zografos and Androutsopoulos (2021) is insightful, showcasing the potential of advanced algorithms and software solutions. Nonetheless, the study fails to delve deeper into the feasibility and implementation challenges of these technological solutions in regions with less developed technological infrastructure. Furthermore, considering the context

of humanitarian supply chains, an exploration of how these solutions cater to the unpredictability and urgency of humanitarian logistics would add value.

According to Crainic and Kim (2019), intermodal transportation strategies enhance overall supply chain efficiency by combining the strengths of different transportation modes. This work provides an important analysis of intermodal transportation's benefits for supply chain efficiency and environmental sustainability. However, the feasibility of implementing intermodal transportation strategies in South Sudan could be further examined, considering the limited transportation infrastructure and logistical challenges unique to such regions. A discussion on potential strategies to overcome these limitations would make the findings more relevant to practitioners in the field.

Transportation optimization also addresses environmental concerns. Researchers have explored the environmental impact of transportation, emphasizing the reduction of carbon emissions and energy consumption. Attia et al. (2020) discuss the integration of environmental considerations into transportation optimization models and tools, highlighting the importance of sustainability in supply chain management. Technology plays a pivotal role in transportation optimization. Literature discusses the utilization of data analytics, real-time monitoring, and Internet of Things (IoT) technologies to track and optimize transportation processes.

Attia et al. (2020) address the critical aspect of incorporating environmental considerations into transportation optimization. While their focus on sustainability is

commendable, the application of these models and tools in contexts with significant logistical and infrastructural challenges, such as South Sudan, remains underexplored. Insights into adapting these environmental considerations to local conditions and constraints would enhance the practical applicability of their research.

Lai et al. (2017) emphasize the significance of real-time data for route planning, load optimization, and performance monitoring. Collaboration among different organizations and stakeholders in the supply chain is another key aspect of transportation optimization. Collaborative transportation strategies aim to reduce empty miles, improve load consolidation, and minimize transportation costs. The emphasis on technology, particularly real-time data and IoT, by Lai et al. (2017), is crucial for transportation optimization. However, the study fails to give a more nuanced consideration of the technological readiness and infrastructure availability in various operational contexts, especially in developing countries or conflict-affected regions. The paper could explore alternative or complementary strategies for contexts where the deployment of such advanced technologies is not feasible.

Tokar et al. (2020) discuss the benefits of collaborative transportation efforts and provide insights into successful collaborative practices. Tokar et al. (2020) present an important discussion on the benefits of collaborative transportation strategies. Their insights into reducing transportation costs and improving efficiency through collaboration are valuable. Yet, the study fails to explore the challenges and dynamics of establishing and maintaining such collaborations in complex humanitarian contexts, where organizations often have to navigate a myriad of logistical, political, and

security challenges. A deeper dive into strategies for fostering effective collaboration in such environments would provide a more comprehensive understanding of transportation optimization in challenging contexts.

2.2 Theoretical Review

The study will be grounded on three theories, including Transaction Cost Economics (TCE), Institutional Theory, The Resource-Based View (RBV), and Stakeholder thory.

2.2.1 Transaction Cost Economics

Transaction Cost Economics (TCE) is a theory developed by Ronald Coase, further expanded by Williamson (1975). TCE focuses on the analysis of economic transactions within organizations, emphasizing the costs and benefits associated with the governance structures chosen to coordinate these transactions. The central tenet of TCE is that economic transactions involve costs, including those associated with information, negotiation, and enforcement (Müller & Schmitz, 2021). TCE distinguishes between market transactions, characterized by arm's-length relationships, and hierarchical transactions within organizations, characterized by greater coordination and control (Schmitz, 2019). Williamson (1975) identified specific transaction attributes, such as asset specificity, uncertainty, and frequency, that influence the choice between market and hierarchical governance structures.

Critics of Transaction Cost Economics raise several concerns. One critique is that TCE tends to oversimplify the decision-making process by focusing primarily on minimizing transaction costs (Anderlini & Felli, 2022). Critics argue that other

important factors, such as strategic considerations, long-term relationships, and organizational culture, may be neglected in TCE analyses. There's also a debate about the subjective nature of assessing transaction costs, as they can be challenging to quantify accurately (Schmitz, 2019). Critics suggest that TCE may not adequately account for social aspects of transactions and the embeddedness of economic activities in broader social contexts. Additionally, some argue that TCE's binary framework of market versus hierarchy may not capture the diversity of governance structures and arrangements observed in real-world organizations (Pessali, 2020).

Transaction Cost Economics theory, which focuses on the costs associated with exchanging resources in the marketplace, is highly relevant to this study as it provides a framework for analyzing the efficiency of different supply chain structures and management strategies within the WFP in South Sudan. Grounded in TCE**,** this theory is pivotal in understanding how organizations like the WFP manage relationships with suppliers in contexts of uncertainty and complexity, such as South Sudan. TCE emphasizes minimizing transaction costs, which includes costs related to negotiating, monitoring, and enforcing contracts with suppliers. In humanitarian operations, where reliability and timeliness of supplies are crucial, effective supplier relationship management can enhance operational efficiency and reduce risks associated with supply disruptions (Williamson, 1985).

2.2.2 Institutional Theory

Institutional Theory, in the context of organizational studies, is attributed to scholars such as Meyer and Rowan (1977), DiMaggio and Powell (1983). It focuses on

understanding how organizations conform to and are influenced by societal norms, values, and expectations. The theory posits that organizations are embedded in a broader social context, and their structures, behaviors, and practices are shaped by institutional pressures from the external environment (DiMaggio & Powell, 1991). Institutional Theory identifies three pillars of isomorphism—coercive, normative, and mimetic—each representing different mechanisms through which organizations conform to institutional expectations. Coercive isomorphism involves compliance due to external pressures and regulations, normative isomorphism relates to adherence to professional and social norms, and mimetic isomorphism refers to imitating successful organizations (Scott, 2008).

Critics of Institutional Theory raise concerns about its determinism and the potential for organizations to become overly conformist. Some argue that the theory may oversimplify the complex interactions between organizations and their institutional environment, potentially neglecting internal dynamics and agency (Rosenzweig & Singh, 1991). Critics also contend that Institutional Theory can be less prescriptive in offering practical guidance for organizational decision-making, and it may not sufficiently account for variations in organizational responses to institutional pressures (Rodner et al., 2020). Additionally, the theory has been accused of neglecting power dynamics within and between institutions, potentially underestimating the ability of organizations to shape, resist, or influence their institutional context (Scott, 2008).

Institutional Theory is pertinent to the study as it explores how organizational practices are shaped by the norms, values, and expectations of the institutional

environment in which they operate. Anchored in Institutional Theory, green procurement practices within WFP are analyzed through the lens of organizational responses to institutional pressures and norms regarding environmental sustainability. Institutional Theory posits that organizations adopt practices and policies that align with external institutional expectations to gain legitimacy and reduce uncertainty. In the context of humanitarian aid, where environmental impact and sustainability are increasingly important, understanding how WFP integrates green procurement practices can shed light on its responsiveness to global environmental norms and its efforts to maintain legitimacy and credibility in its operations.

2.2.3 Stakeholder Theory

Stakeholder Theory, proposed by Freeman (1984), emphasizes the importance of considering and managing the interests and expectations of all stakeholders affected by an organization's decisions and actions. The theory posits that organizations exist within a network of relationships involving various stakeholders, including employees, customers, suppliers, communities, and even governments, each with their own interests and needs (Freeman, 1984). Unlike traditional profit-maximizing theories that prioritize shareholders, Stakeholder Theory argues that organizations should take a broader view of their responsibilities, striving to create value not only for shareholders but also for all stakeholders involved in or impacted by their operations.

Critics of Stakeholder Theory argue that its broad focus on multiple stakeholders can lead to challenges in decision-making and resource allocation, potentially diluting organizational focus and efficiency (Friedman & Miles, 2002). Moreover, skeptics

contend that identifying and prioritizing stakeholders' interests can be subjective and complex, particularly in contexts where stakeholders have conflicting priorities or where power dynamics are unequal (Phillips, 2003). To address these criticisms, proponents of Stakeholder Theory advocate for systematic stakeholder engagement processes that involve ongoing dialogue, transparency, and accountability (Donaldson & Preston, 1995).

Supported by Stakeholder Theory**,** the objective on examining the effect of reverse logistics on performance of WFP in South Sudan explores how WFP manages the return and recycling of relief items in line with stakeholder interests. Stakeholder Theory asserts that organizations should consider the interests and expectations of various stakeholders, including governments, local communities, and donors, in their decision-making processes (Freeman, 1984). In humanitarian logistics, effective reverse logistics practices not only optimize resource utilization but also enhance stakeholder satisfaction by demonstrating a commitment to ethical and sustainable practices.

2.2.4 Resource-Based View Theory

The Resource-Based View (RBV) is a strategic management theory developed by scholars such as Barney (1991) and Wernerfelt (1984). It posits that a firm's sustainable competitive advantage and superior performance are derived from the possession and deployment of unique and valuable resources that are difficult for competitors to replicate. According to RBV, these resources can be tangible or intangible and include physical assets, intellectual capital, human resources, and

organizational capabilities (Barney, 2001). The theory emphasizes that for a firm to gain a competitive edge, it must have resources that are rare, valuable, difficult to imitate, and not easily substitutable. The RBV framework is particularly influential in understanding how organizations can leverage their internal strengths to achieve and maintain a competitive advantage in their respective industries (Hunt, 2019).

Despite its popularity and widespread application, RBV has faced criticism from various scholars. One critique is that the theory can be vague in identifying which resources truly lead to sustained competitive advantage (Kale et al., 2021). Critics argue that the RBV framework may lack clear guidelines on how to identify and measure the uniqueness and value of resources. Additionally, some scholars contend that RBV's focus on internal resources may not adequately consider the dynamic and interconnected nature of modern business environments (Lavie, 2020). Critics also point out that RBV tends to overlook the role of external factors and industry dynamics in shaping a firm's performance.

The RBV theory is highly relevant to this study as it posits that an organization's internal resources and capabilities serve as the primary drivers of its competitive advantage and performance. Rooted in RBV**,** transportation optimization practices are explored in terms of leveraging internal resources to achieve competitive advantage and operational efficiency. RBV focuses on how organizations deploy and exploit their unique resources and capabilities to achieve sustainable competitive advantage. For WFP in South Sudan, optimizing transportation logistics involves maximizing the

efficiency of distribution networks, selecting cost-effective transportation modes, and ensuring timely delivery of humanitarian aid.

2.3 Conceptual Framework

The conceptual framework illustrated in Figure 2.1 demonstrates the hypothesized association between the independent and dependent variables.

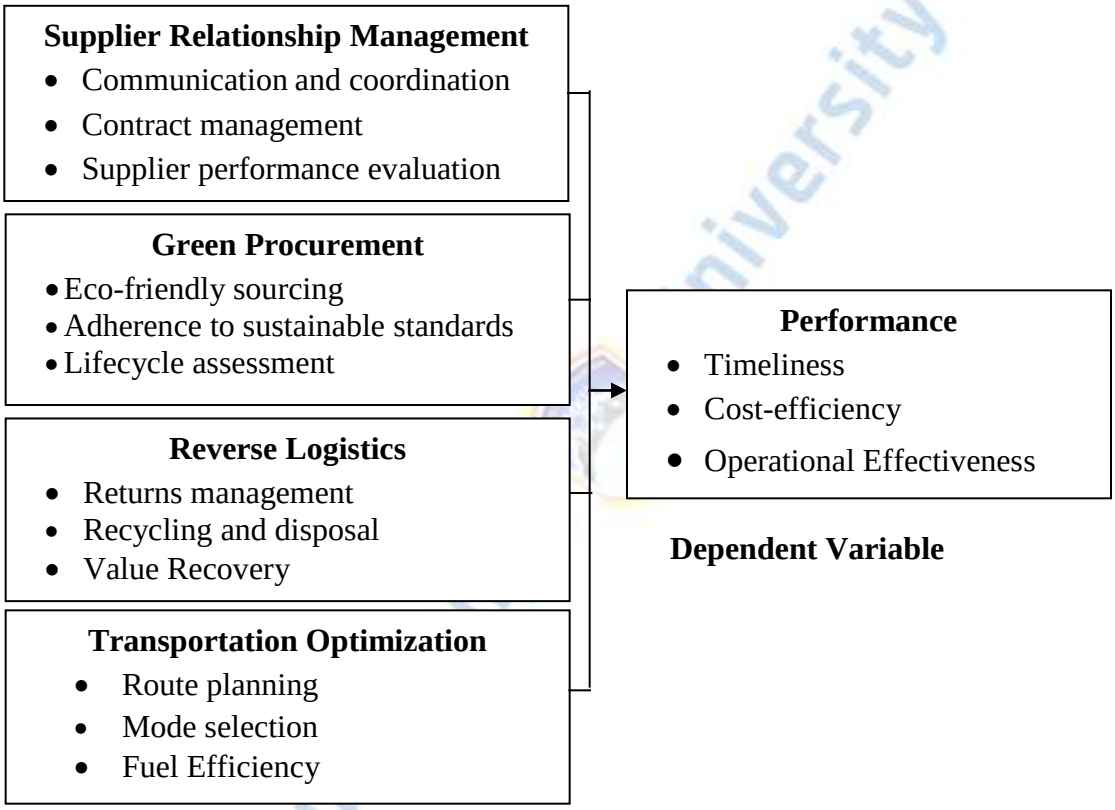

Figure 2.1: Conceptual Framework

The conceptual framework presented encompasses four distinct independent variables, each representing a critical aspect of sustainable supply chain management, and a dependent variable, namely Performance, assessed through timeliness, cost-efficiency and operational effectiveness. The first independent variable is supplier relationship management, assessed through communication and coordination, contract

management and supplier performance evaluation. Effective communication and coordination between the humanitarian organization and its suppliers are integral to successful SRM. Clear communication ensures that expectations are well-defined, potential challenges are proactively addressed, and collaborative decision-making is facilitated. The structured administration of contracts is vital for fostering strong relationships with suppliers. Clear contractual terms, performance metrics, and obligations contribute to transparency, trust, and accountability, ultimately influencing overall supply chain performance. Also integral in supplier relationship management is supplier performance evaluation which comprises regular assessment of supplier performance; feedback mechanisms for continuous improvement; and supplier development programs and training.

The second independent variable is green procurement, indicated by eco-friendly sourcing and adherence to sustainable standards. Eco-friendly Sourcing pertains to the organization's efforts to procure products and services with minimal environmental impact. It involves sourcing from suppliers who adhere to environmentally friendly practices, use sustainable materials, and minimize their carbon footprint. Green procurement also involves ensuring that suppliers align with recognized sustainable standards, certifications, or industry best practices, promoting environmentally responsible sourcing throughout the supply chain. Also critical in green management is lifecycle assessment, which involves consideration of product lifecycle in procurement decisions; analysis of long-term environmental impacts; and encouragement of suppliers to adopt lifecycle thinking.

The third independent variable is reverse logistics, indicated by returns management and recycling and disposal. Efficient handling of product returns is crucial for minimizing waste and maximizing the reuse of materials. Effective returns management within the reverse logistics framework involves processes for product recall, evaluation, and redistribution. The responsible disposal or recycling of products at the end of their life cycle is a key aspect of reverse logistics. Sustainable disposal practices contribute to minimizing environmental impact and aligning with broader sustainability goals. Further, an essential component in reverse logistics is value recovery, which comprises processes for refurbishing and reselling returned items; maximizing the value from returned products; and recovery of valuable materials from end-of-life products.

The four independent variable is transportation optimization, as indicated by route planning and mode selection. Optimizing transportation routes involves strategically planning the most efficient paths for delivering goods. This reduces transit times, fuel consumption, and carbon emissions, contributing to both environmental sustainability and cost-efficiency. Choosing the most appropriate transportation mode, whether by road, rail, sea, or air, is essential for minimizing costs and environmental impact. Mode selection optimization ensures resources are utilized efficiently while meeting delivery requirements. Also critical in transportation optimization is fuel efficiency, which comprises use of fuel-efficient vehicles; implementation of fuel-saving practices; and monitoring and reduction of fuel consumption

The dependent variable that is performance is assessed through timeliness and cost-efficiency. Timely deliveries are crucial in humanitarian operations, ensuring that assistance reaches vulnerable populations when needed most, enhancing the overall impact of the organization's efforts. Cost-efficiency measures the economic effectiveness of the supply chain strategies. Achieving cost-efficiency ensures that resources are utilized judiciously, maximizing the humanitarian organization's ability to provide aid sustainably and respond to dynamic operational challenges. Operational effectiveness is also a critical performance metric, measured by the order fulfillment rate, supply chain flexibility and customer satisfaction.

2.4 Recap of literature review

The reviewed literature on Supplier Relationship Management (SRM) highlights several gaps, particularly in the context of conflict-affected regions like South Sudan. While Kosut and Moran (2019) underscore the potential of SRM for fostering sustainable practices, they lack specific insights into challenges and strategies relevant to such volatile environments. Cousins and Spekman (2020) offer a compelling conceptualization of SRM for strategic partnerships but fall short on empirical evidence from humanitarian organizations. Lamming (2018) and Wagner and Bode (2018) emphasize collaboration, communication, and risk mitigation but do not address the practical barriers in conflict zones. Carter and Rogers (2018) discuss aligning SRM with sustainability goals without detailing implementation in humanitarian contexts, and Handfield and Cousins (2020) highlight the use of KPIs without adapting them to rapidly changing environments. Monczka et al. (2020) note

the role of technology in SRM but overlook the challenges in regions with limited infrastructure. The present study fills these gaps by empirically examining SRM practices in South Sudan, focusing on communication and coordination, contract management, and collaboration. It offers practical insights and strategies for overcoming barriers in conflict-affected areas, demonstrating how effective SRM can enhance supply chain performance, sustainability, and risk mitigation in humanitarian operations.

Summary of Gaps and Contributions of the Present Study on Green Procurement

The literature on green procurement reveals several gaps, particularly in the practical application and operational challenges of implementing sustainable sourcing practices. Carter and Rogers (2018) emphasize the importance of selecting suppliers based on environmental considerations but lack a detailed discussion on the complexities involved, such as cost premiums and assessing suppliers' environmental footprints. He and Bai (2019) focus on the role of environmental regulations but overlook intrinsic motivations like corporate social responsibility and consumer demand. Luzzini et al. (2020) advocate for supplier collaboration to promote sustainability but underestimate the effort required for effective engagement and alignment of diverse organizational cultures. Bals et al. (2019) acknowledge the barriers to green procurement, such as higher costs and lack of transparency, but fail to provide in-depth solutions or innovative practices to overcome these challenges. The present study addresses these gaps by empirically examining green procurement practices within the World Food

Program's operations in South Sudan. It focuses on the constructs of environmentally responsible sourcing, supplier engagement, and the reduction of environmental impact. The study provides practical insights and strategies for overcoming the operational hurdles of green procurement, offering a nuanced analysis of supplier engagement mechanisms and highlighting successful case studies and emerging technologies that facilitate sustainable procurement practices.

Summary of Gaps and Contributions of the Present Study on Reverse Logistics

The literature on reverse logistics highlights its significance in sustainability and value recapture but lacks depth in exploring specific strategies and technologies for effective implementation. Guide and Van Wassenhove (2019) and Guide et al. (2020) emphasize reverse logistics' environmental and economic benefits but do not provide detailed real-world examples or case studies, particularly in challenging environments like South Sudan. Srivastava (2017) and Russo and Comi (2022) discuss the roles of remanufacturing and environmental regulations but overlook market demand and consumer perception issues. Kannan et al. (2020) and Fleischmann et al. (2017) focus on environmental impacts and economic advantages but fail to address the operational challenges in conflict-affected or infrastructure-poor regions. The present study fills these gaps by empirically examining reverse logistics practices within the World Food Program in South Sudan, focusing on the constructs of effective communication of procedures, efficient management of returns and recycling, and the environmental and economic impacts of reverse logistics. By providing practical insights and strategies

tailored to the unique operational context of South Sudan, the study offers a nuanced understanding of the barriers and solutions for implementing reverse logistics in humanitarian supply chains.

Summary of Gaps and Contributions of the Present Study on Transportation Optimization

The literature on transportation optimization underscores the role of advanced technology and data analytics (Crainic & Kim, 2019), the strategic benefits of route optimization (Chopra & Meindl, 2019), and the potential of intermodal transportation (Zografos & Androutsopoulos, 2021). However, these studies often overlook the practical challenges of implementing these strategies in regions with limited infrastructure, such as South Sudan. They lack detailed exploration of real-world examples, strategies for overcoming infrastructural and logistical barriers, and the adaptation of these solutions to the unique demands of humanitarian supply chains. Additionally, while environmental considerations are addressed (Attia et al., 2020), the feasibility of integrating these models in conflict-affected areas is not adequately examined. The present study fills these gaps by providing empirical evidence from the World Food Program's operations in South Sudan, focusing on the constructs of route optimization, vehicle selection, and the integration of environmental considerations. It highlights practical strategies for overcoming logistical challenges, adapting advanced technologies to low-infrastructure settings, and fostering effective collaboration

among stakeholders, thereby enhancing the relevance and applicability of transportation optimization strategies in complex humanitarian contexts.

CHAPTER THREE:

RESEARCH METHODOLOGY

3.0. Introduction

This chapter entails the research design adopted in the study, a description of the target population, the sample and sampling techniques employed and the data collection methods. The chapter also covers data analysis techniques that will unearth valuable insights from the collected data.

3.1 Research Design

The study adopted the descriptive design, defined by Saunders et al. (2019) as a type of research methodology that aims to describe and present an accurate representation of the characteristics, behaviors, opinions, or conditions of a particular subject or phenomenon. It involves gathering data from a sample or population and analyzing it to provide a comprehensive and detailed description of the research topic. Similarly, Kothari (2019) further opines that descriptive research depicts a detailed sketch of circumstances, events, and people, and it includes data collected from the population through such survey instruments as questionnaires and interviews. The present study thus adopted the descriptive research design as it seeks to collect data by survey tools, from which to give an accurate account of the effect of sustainable supply chain strategies on performance of WFP in South Sudan.

3.2 Target Population

The target population in this study comprised individuals, organizations, or entities directly involved or affected by WFP's supply chain operations in South Sudan. The

justification for selecting the target population in this study, lies in its relevance to understanding the impact of humanitarian supply chain strategies. Given the context of South Sudan, characterized by conflict, political instability, and environmental challenges, stakeholders directly engaged with WFP's operations offer critical insights into how supply chain strategies such as supplier relationship management, green procurement, reverse logistics, and transportation optimization influence organizational performance.

The target population include 228 staff members directly involved in supply chain management, logistics, procurement, and sustainability initiatives within the WFP in South Sudan; and 108 suppliers and vendors providing goods and services to the WFP in South Sudan. While the units of observation included WFP staff and individua suppliers and vendors, the unit of analysis was WFP. The total target population is thus 336, as broken down in Table 3.1.

Table 3.1: Target Population

Category	Population	% Proportion
WFP Staff	228	67.9
Suppliers and vendors	108	32.1
Total	**336**	**100**

Source: WFP (2023)

The units of observation encompassed individuals directly involved in or affected by WFP's supply chain, including procurement managers, logistics coordinators, local suppliers, and partner organizations. These stakeholders provided data through surveys

and interviews, offering insights into their perceptions and practices regarding supplier relationship management, green procurement, reverse logistics, and transportation optimization. The units of analysis in the study included aggregated responses from these stakeholders, performance metrics related to WFP's operational efficiency and effectiveness, and comparative analyses across different stakeholder groups. This approach facilitated a comprehensive examination of the impact of various supply chain strategies on WFP's performance in a challenging humanitarian context.

3.3 Sample and Sampling Techniques

In the present, the stratified sampling technique was employed through grouping the accessible population into strata, formed by the stakeholder category. The Yamane formula (Yamane, 1967) is going to be applied in this investigation to determine an acceptable sample size, as shown below:

$$n = \frac{N}{1 + N(e)^2}$$

Where: n = required sample

N=total population=336

e = margin of error=0.01

Therefore;

$$n = \frac{336}{1 + 336(0.01)^2}$$

n= 325

The determined sample size was therefore 336, comprising 228 WFP staff and 108 suppliers and vendors who for the units of observation, while the unit of analysis is

WFP. The sample was proportionately sampled across the two strata as shown in Table 3.2.

Table 3.2. Sample Distribution

Category	Population	Sample	% Proportion
WFP Staff	228	221	67.9
Suppliers and vendors	108	104	32.1
Total	**336**	**325**	**100**

Source: WFP (2023)

The allocated samples were then reached by the simple random sampling, defined by Bryman and Bell (2007) as a kind of survey research where the researcher chooses individuals at randomness from a demographic. Simple random sampling is highly relevant and widely applied in research contexts where every member of the population has an equal chance of being selected for the sample, making it a fair and unbiased method. In the study of humanitarian supply chains, such as that of the WFP in South Sudan, simple random sampling ensures that each stakeholder group, from procurement managers to local suppliers, has an equal opportunity to participate and contribute their perspectives. This method helps in obtaining a representative sample that accurately reflects the diversity and breadth of opinions within the population of interest.

3.4 Data Collection Instruments

The present study relied on a mixed-method approach, whereby both quantitative and qualitative primary data was sought. While quantitative data was sourced from local suppliers that provide goods and services to WFP in South Sudan and members of the

beneficiary communities through a structured questionnaire (Appendix I). In-depth key informant interviews were used to collect qualitative data from senior WFP staff involved in supply chain management, logistics, and procurement in South Sudan.

A structured questionnaire was utilized for the reason that it confines response to a set of predetermined questions aimed at directly addressing the study objectives. A structured questionnaire also has the ability to reach a large number of participants in a short period of time; and that it provides a sense of confidentiality to the participant. It is also an ideal methodology with no bias associated with personal character traits (Kumar, 2018). Cooper and Schindler (2018) recommend the use of structured questionnaires because they are advantaged in being easy to administer, analyze and inexpensive in terms of time. The use of structured questionnaires for local suppliers and members of beneficiary communities in this study was justified due to several key reasons. First, questionnaires are effective in reaching a large number of participants efficiently, allowing for a broad representation of perspectives from diverse stakeholder groups involved in WFP's supply chain in South Sudan. The structured format ensured that responses were standardized across all participants, facilitating direct alignment with the study objectives.

In-depth key informant interviews were utilized for the reason that key informants, typically individuals who are closely involved with the organization and its operations, possess in-depth insider knowledge. They can provide nuanced, context-specific insights that might not be available through other data collection methods. Their experience and expertise can offer a comprehensive understanding of the practical

aspects of supply chain strategies and their impact on humanitarian operations (Kothari, 2019). These interviews allowed for probing questions and follow-up discussions, leveraging the expertise and experience of key informants to uncover deeper perspectives on supply chain strategies and their operational implications in humanitarian settings.

3.5 Pilot Study

In order to determine the validity and reliability and objectivity of the questionnaire, a pre-test was carried out. This was done through reliability and validity tests (Kothari, 2004). Collis and Hussey (2009) observe that a research participant that were below 10,000 respondents as an illustration, a size of around 10% to 30% of respondents not included for the research study is an adequate population representation (Kumar, 2011) and hence 10% was adequate for a pilot test. So, 33 participants from the sample in South Sudan were chosen at random by the investigator for the pilot testing. These were not a part of the primary investigation.

The participants were chosen from the local supplier organizations and members of beneficiary communities associated with the WFP by simple random sampling. They were not part of the primary investigation but represented a subset of the broader target population involved in WFP's supply chain operations in South Sudan. The pilot participants provided critical feedback on the clarity, relevance, and comprehensibility of the structured questionnaire, ensuring that the final survey instruments were appropriately adapted to the local context and effectively captured the intended data. This process helped refine the research methodology and instruments before full-scale

data collection commenced, thereby enhancing the reliability and validity of the subsequent findings.

The pilot sample was not included in the final data collection for several reasons. Firstly, participants in the pilot phase were selected randomly to test the feasibility and effectiveness of the research instruments and procedures, not to contribute to the substantive findings of the study. Their primary role was to provide feedback on the clarity, relevance, and comprehensibility of the structured questionnaire used in the study. Secondly, including pilot participants in the final data would risk duplicating responses and potentially biasing the results, as they were already familiar with the survey questions and objectives. Therefore, to maintain the integrity and validity of the study's findings, the pilot sample was excluded from the final data collection, ensuring that only fresh responses from the targeted population involved in WFP's supply chain operations in South Sudan were analyzed.

3.5.1 Instrument Reliability

The dependability of the poll was examined using the Cronbach Alpha coefficient of coherence internally. A tool is considered dependable by Collis and Hussey (2009) if it accurately assesses what it ought to and generates results that are constant after the same thing is measured repeatedly. The Cronbach Alpha criterion with an index of 0.7 (Nunnally, 1978) was applied to determine the dependability of the questionnaires.

3.5.2 Instrument Validity

In the present study, the validity of facial tests along with content consistency assessments was combined in a complimentary manner. To ascertain face validity, the

researcher pursued expert counsel so as to firm up validity of content and appearance in the survey. To this end, the project supervisor's input on the questionnaire was sought, feedback from whom was used to make improvements on the questionnaire. To ascertain content validity, the questionnaire items were grounded on extensively reviewed literature and theoretical anchorage.

3.6 Data Collection Procedures

The data collection procedures for this study commenced with the acquisition of an introductory letter from the University, which served as a formal request to apply for a research license from the National Commission for Science, Technology, and Innovation (NACOSTI). Once the research license is granted, the study proceeded to formally seek permission from the respondents. Subsequently the questionnaires were self-administered either physically using a drop and pick approach or electronically via email. The physical administration involved delivering and retrieving questionnaires from the identified participants, while the online approach enabled participants to complete and return the questionnaires electronically.

The choice of self-administered questionnaires, whether physically using a drop and pick approach or electronically via email, was justified based on practical considerations. Physically delivering and retrieving questionnaires allowed for personal interaction and ensured access to participants without reliable internet access, common in some areas of South Sudan. Conversely, the electronic approach provided flexibility and convenience for participants to respond at their convenience, minimizing logistical barriers and enabling a wider reach. Overall, these procedures

aimed to maximize response rates, ensure data confidentiality, and maintain ethical standards throughout the data collection process.

3.7 Data Analysis and Presentation

The study further employed quantitative approach in data analysis, whereby quantitative data analysis techniques were used. With the aid of Version 25 of the Statistical Package for Social Sciences (SPSS) version 27, both descriptive and inferential analysis were used to analyze the quantitative data obtained from structured questionnaires. Descriptive analysis involved summarizing and quantifying responses to specific questions, in which descriptive statistics such as frequencies, percentages, averages, and ranges were calculated to provide a clear overview of participants' responses. Inferential analysis was then employed to test the association between the different sustainable supply chain strategies and performance. The following regression equation was employed in this regard:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Whereby:

Y is performance

β_0 is model's intercept

β_1 to β_4 are regression coefficients

X_1 = Supplier relationship management

X_2 = Green procurement

X_3 = Reverse logistics

X_4 = Transportation optimization

ε is model error term

3.8 Ethical Considerations

The researcher guarantees that in the entire research process, ethics in research will be observed. Permission was first sought by the researcher from the pertinent authorities prior to embarking on data collection. The study particularly ensured that information given by participants is exclusively utilized for addressing the research objectives and for academic purpose. The researcher respected participants' rights to refrain to respond to the questionnaire. The researcher was particularly cautious not to force people to give data to the investigator that they have no desire to. In cases when responders are unwilling to disclose information that is personally identifiable to them, the investigator respected their wishes in order to avoid violating their privacy.

Additionally, responders were guaranteed that their personal details would be kept private. The investigator took care in this respect to avoid publishing any details given in confidentially or sufficient intimate data to reveal the respondents' identities. To ensure this, the investigator stayed away from sensitive information like names, addresses, and dates of the time of their birth amongst other things. Additionally, confidentiality was upheld through effective administration of information and protection. The study also adhered to the principles of honesty and avoid plagiarism. Through describing techniques, approaches, outcomes, information, and publishing status as truthfully as feasible, the investigation assured objectivity. There was no manufactured, false, or misleading information. Through appropriately crediting sources using both text-based citations and references, the investigation additionally avoided duplication.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.1 Introduction

This Chapter delves into the comprehensive analysis and interpretation of the collected data regarding the sustainable supply chain practices and performance of WFP in South Sudan. This chapter serves as the focal point where the empirical findings are presented, analyzed, and discussed in detail. Through statistical analysis, correlations, regressions, and other relevant techniques, this section aims to elucidate the relationships between sustainable supply chain practices such as supplier relationship management, green procurement, reverse logistics, and transportation optimization, and the performance of WFP operations in South Sudan.

4.1.1 Response Rate

In this section, the study provides an in-depth analysis of the participation level of the targeted sample in the study. This section thus offers insights into the extent to which entities within the sample pool engaged with the survey and responded to the research inquiries. Table 4.1 presents the study findings.

Table 4.1: Response Rate

	Administered		**Response**		**Non-Response**	
	n	**%**	**n**	**%**	**n**	**%**
WFP Staff	221	67.9	173	53.2	43	13.2
Suppliers and vendors	104	32.1	89	27.4	20	6.2
Total	**325**	**100.0**	**262**	**80.6**	**63**	**19.4**

Source: Survey Data (2024)

The table provides an overview of the response rate for the survey conducted in the study. Out of the total 325 entities approached for participation, 262 responded, representing a response rate of 80.6%. Conversely, 63 entities did not respond, accounting for 19.4% of the total sample. The response rate indicates the proportion of entities that provided feedback or participated in the survey relative to the total number of entities contacted. In tandem with Saunders et al. (2019), a response rate of 80.6% suggests a relatively high level of engagement and willingness among the target population to participate in the study. This robust response rate enhances the reliability and validity of the data collected, contributing to the credibility of the study findings.

4.1.2 Reliability Analysis

Table 4.2 below illustrates the results of the reliability analysis conducted for key variables in the study. The reliability analysis assesses the internal consistency or reliability of the measurement scales used in the questionnaire. It presents the Cronbach's alpha coefficient for each variable, along with the number of items comprising each variable. This analysis is crucial for ensuring the reliability of the data collected and the validity of subsequent analyses and interpretations.

Table 4.2: Reliability Analysis

Variable	Cronbach Alpha	Items	Decision
Supplier relationship management	0.798	8	Reliable
Green procurement	0.830	8	Reliable
Reverse logistics	0.850	8	Reliable
Transportation optimization	0.838	8	Reliable
Performance	0.814	8	Reliable
Overall	0.950	40	Reliable

The table presents the results of a reliability analysis conducted on several variables used in the study. Each variable, including Supplier Relationship Management, Green Procurement, Reverse Logistics, Transportation Optimization, and Performance, was evaluated for internal consistency using Cronbach's alpha coefficient. The Cronbach's alpha coefficients for all variables are above the generally accepted threshold of 0.70, indicating strong internal consistency among the items within each variable. Specifically, Supplier Relationship Management has a Cronbach's alpha of 0.798, Green Procurement has a Cronbach's alpha of 0.830, Reverse Logistics has a Cronbach's alpha of 0.850, Transportation Optimization has a Cronbach's alpha of 0.838, and Performance has a Cronbach's alpha of 0.814. The overall Cronbach's alpha for all variables combined is 0.950, indicating a high level of internal consistency across the entire measurement instrument. Based on these results, it can be concluded that all variables are reliable measures, providing confidence in the validity and consistency of the data collected for the study.

4.1.3 Validity Analysis

The validity of the survey instrument used in this study was ensured through rigorous measures. Face validity was addressed by seeking expert advice from the project supervisor, who provided valuable feedback on the questionnaire's content and appearance. This feedback guided improvements to ensure clarity, relevance, and appropriateness of the survey items for the study's objectives. Content validity was precisely established by aligning questionnaire items with a thorough review of existing literature and theoretical frameworks. Each question was crafted to reflect key concepts derived from established theories such as the Resource-Based View,

Institutional Theory, Transaction Cost Economics, and Stakeholder Theory, ensuring that the survey comprehensively covered the dimensions relevant to supplier relationship management, green procurement, reverse logistics, transportation optimization, and performance in the context of humanitarian operations in South Sudan. This process ensured that the survey instrument was both theoretically grounded and practically relevant for capturing meaningful data related to the study objectives.

4.2 Research Presentation and Interpretation

In this section, the study provides a comprehensive overview of the respondent profile, highlighting key demographic characteristics such as job cadre, length of service in the organization, and nature of goods or services supplied to WFP. This profile offers valuable insights into the composition of the sample population and provides context for interpreting the subsequent findings. Following the respondent profile, the study presents a detailed descriptive analysis of each of the four objectives of the study. This analysis encompasses the mean scores, standard deviations, frequency distributions and percentage scores.

4.2.1 Respondent Profile

Figure 4.1 presents the distribution of responses by job cadre among the valid responses received for the study. It categorizes respondents into three main job cadres: Top management, middle management, and operational staff. The data provides insights into the participation of individuals from different levels of organizational

hierarchy, allowing for a nuanced analysis of perspectives within WFP in South Sudan.

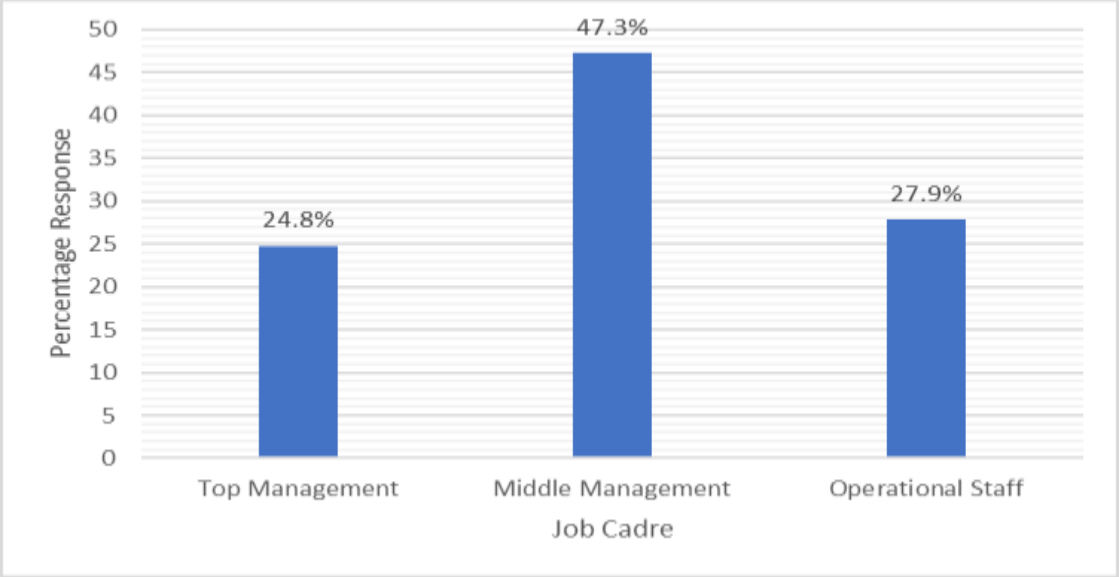

Figure 4.1: Respondent Profile

The figure provides a breakdown of the response rate by job cadre among the valid responses received. The majority of respondents were from middle management, accounting for 47.3% of the valid responses, followed by operational staff at 27.9%, and top management at 24.8%. This distribution indicates a relatively balanced representation of different job cadres within the organization, allowing for a comprehensive understanding of perspectives across various levels of responsibility. This balanced representation allows for a comprehensive understanding of how supplier relationship management, green procurement, reverse logistics, and transportation optimization strategies are perceived and operationalized across various levels of responsibility within the organization. Middle management's substantial representation suggests that perspectives from those directly involved in implementing supply chain strategies are well-captured, offering insights into day-to-day operational

challenges and successes. Operational staff, comprising a significant portion of the respondents, provides frontline insights into the practical implications of these strategies on humanitarian operations. Meanwhile, input from top management ensures strategic perspectives are considered, aligning organizational goals with the findings to enhance decision-making and policy formulation for sustainable supply chain management in humanitarian contexts.

4.2.2 Length of Service

Figure 4.2 provides a breakdown of respondents based on the duration of their tenure in their current designation, rank, or position. Understanding the tenure of respondents is essential for assessing experience levels.

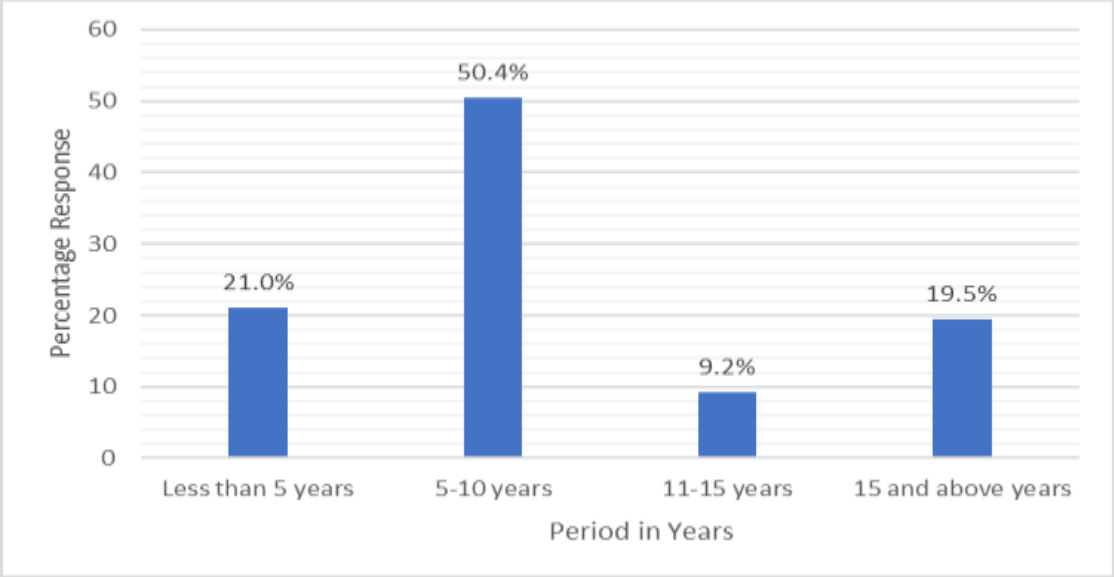

Figure 4.2: Length of Service

The demographic breakdown of respondents based on their tenure in current roles provides valuable context for understanding the depth of experience and perspectives brought to bear on the study's findings. A notable 21.0% of respondents have served for less than 5 years in their current role, indicating a relatively fresh perspective

among a segment of the workforce. This group may offer insights into newer trends and challenges faced by WFP in South Sudan, potentially highlighting evolving dynamics in supply chain management practices. A larger proportion, constituting 50.4% of respondents, falls into the "5-10 years" category, suggesting a substantial cohort with moderate experience in their current positions. Their responses likely reflect a blend of established practices and recent developments within WFP's supply chain operations. Furthermore, the 9.2% of respondents in the "11-15 years" category bring a seasoned perspective, possibly offering insights into long-term trends and enduring challenges. The 19.5% of respondents who have served for 15 years or more bring extensive institutional knowledge and historical context to their responses, offering insights into how supply chain strategies have evolved over time and their impact on organizational performance. Overall, this distribution ensures a comprehensive examination of experiences across different tenures, enriching the study's findings with diverse perspectives critical for enhancing supply chain management strategies in humanitarian contexts.

4.2.3 Supplier Relationship Management

The study sought to establish the effect of supplier relationship management on performance of World Food Program in South Sudan. To achieve this, participants were asked to rate their respective levels of agreement with the following items with regard to supplier relationship management as applies in their organization’s arrangement with WFP. A 5-Point Likert scale was used, with denoting strongly disagree, 2 for disagree, 3 for neutral, 4 for agree and 5 for strongly agree. The scale of

2.4 and less implies low disagreement, while the scale of 2.6-3.4 implies moderate agreement; while the scale of 3.5 and above implies strong levels of agreement:

Table 4.3: Supplier Relationship Management

	Mean	Std. Dev
The World Food Program maintains clear and open lines of communication with our organization regarding procurement and delivery schedules	4.531	.781
WFP actively seeks feedback from our organization on its procurement processes and performance, and we feel our input is valued	4.081	.997
We have a mutually beneficial and collaborative working relationship with WFP, which contributes to the success of our partnership	4.342	.795
WFP provides clear and transparent information about their supply chain requirements, standards, and expectations	4.488	.701
We find that WFP's procurement practices are consistent and reliable, which helps us plan and allocate resources effectively	4.354	.759
WFP's payment terms and procedures are fair and reasonable, making it easier for our organization to do business with them	4.200	.885
The World Food Program considers our organization's needs and constraints when making procurement decisions	4.248	.842
We believe that our relationship with WFP positively impacts our organization's ability to provide goods and services efficiently and effectively to support humanitarian efforts in South Sudan	4.409	.769

Based on the means and standard deviations provided, the findings suggest that respondents generally perceive the supplier relationship management practices of WFP in South Sudan favorably. The high mean scores, ranging from 4.081 to 4.531 out of 5, indicate a strong level of agreement among respondents across various aspects of supplier relationship management, including communication, feedback mechanisms, collaboration, transparency, consistency in procurement practices, fairness in payment terms, and consideration of organizational needs. The relatively low standard deviations ranging from 0.701 to 0.997 suggest a degree of consensus

among respondents regarding these perceptions, indicating that the responses are relatively consistent. Overall, the findings suggest that WFP's efforts in supplier relationship management are perceived positively by its partners, contributing to a mutually beneficial and effective partnership in supporting humanitarian efforts in South Sudan.

Responses from the key informant interviews with senior management revealed that WFP in South Sudan maintains clear and open lines of communication with local suppliers to ensure smooth procurement and delivery processes. This approach fosters transparency and collaboration, contributing to a strong and mutually beneficial working relationship between WFP and its suppliers.

Effective communication and collaboration between WFP and local suppliers are crucial for ensuring the timely delivery of goods and services in humanitarian operations. Through maintaining clear lines of communication and actively engaging with suppliers, WFP can address potential supply chain disruptions proactively, ultimately enhancing the performance of its operations in South Sudan. This aligns with the findings of previous studies highlighting the importance of supplier relationship management in improving supply chain performance and resilience (Pagell & Wu, 2019).

It was also established from the interviews, that WFP encourages feedback from local suppliers on its procurement processes and performance, valuing their input as essential for continuous improvement. The proactive solicitation of feedback from local suppliers reflects WFP's commitment to fostering a collaborative and responsive

procurement environment. By actively seeking input from suppliers, WFP can identify inefficiencies or bottlenecks in its procurement processes and implement targeted improvements to enhance overall performance. This approach is consistent with best practices in supply chain management, which emphasize the importance of incorporating supplier perspectives to drive continuous improvement and innovation (Cousins et al., 2019).

4.2.4 Green Procurement

The study sought to determine the effect of green procurement on performance of World Food Program in South Sudan. To this end, respondents were asked to rate their respective levels of agreement with the following items with regard to green procurement as applies in their organization's arrangement with WFP. A 5-Point Likert scale was used, with denoting strongly disagree, 2 for disagree, 3 for neutral, 4 for agree and 5 for strongly agree:

Table 4.4: Green Procurement

	Mean	Std. Dev
The World Food Program considers environmentally responsible sourcing practices when procuring goods and services from our organization	3.961	.943
We are encouraged by WFP to provide environmentally sustainable products and materials in our supply chain	3.851	1.002
WFP actively seeks to reduce its carbon footprint through its procurement decisions and practices	3.911	.966
Our organization incorporates environmentally responsible practices in the production and sourcing of goods and services for WFP	4.331	.789
WFP's procurement processes support the reduction of single-use plastics and other environmentally harmful materials	4.200	.887
We believe that our partnership with WFP positively impacts our organization's environmental sustainability efforts	3.907	1.019
WFP provides clear guidelines on environmentally friendly packaging and labeling of relief items	3.712	1.110

We feel that WFP's commitment to green procurement enhances our organization's ability to provide environmentally responsible products and services in support of humanitarian efforts in South Sudan	4.153	.898

The findings, based on the means and standard deviations, indicate that respondents generally perceive WFP in South Sudan as actively engaging in green procurement practices. With mean scores ranging from 3.712 to 4.331 out of 5, respondents express moderate to high levels of agreement across various aspects of green procurement, including the consideration of environmentally responsible sourcing practices, encouragement to provide sustainable products, and efforts to reduce the carbon footprint through procurement decisions. The standard deviations across the dimensions of green procurement reveal varying degrees of consensus among respondents regarding their perceptions of the WFP practices in South Sudan. Ranging from .789 to 1.110, these standard deviations imply that while there is generally positive agreement on WFP's efforts to incorporate green procurement practices, areas related to partnership impact and specific guidelines may require further clarity and alignment to enhance effectiveness and consistency across supply chain operations in humanitarian settings like South Sudan.

Results from the key informant interviews indicate that WFP in South Sudan has implemented various initiatives to promote environmentally sustainable procurement practices. These include sourcing products from eco-friendly suppliers, reducing packaging waste through efficient packaging designs, and prioritizing the use of renewable and energy-efficient materials in relief items. The adoption of green procurement practices by WFP aligns with its commitment to environmental

sustainability and responsible resource management. Through integrating eco-friendly criteria into its procurement decisions, WFP not only reduces its environmental footprint but also sets a positive example for other humanitarian organizations. The emphasis on green procurement reflects a growing awareness of the environmental impacts of supply chain operations and underscores the importance of sustainable procurement practices in mitigating these effects (Carter & Rogers, 2008).

It was also revealed from the interviews that WFP measures the impact of green procurement strategies on its operations in South Sudan through various key performance indicators, including carbon footprint reduction, waste minimization, and resource conservation.

The use of KPIs to measure the impact of green procurement strategies demonstrates WFP's commitment to accountability and transparency in sustainability efforts. Through tracking and analyzing relevant metrics, WFP can identify areas of success and areas needing improvement in its green procurement practices, facilitating continuous refinement and optimization of environmental performance. This approach aligns with recommendations from the literature emphasizing the importance of performance measurement in evaluating the effectiveness of sustainable procurement initiatives (Seuring & Müller, 2008).

4.2.5 Reverse Logistics

The study further set out to examine the effect of reverse logistics on performance of World Food Program in South Sudan. To realize this, responders were required to rate their respective levels of agreement with the following items with regard to reverse

logistics as applies in their organization's arrangement with WFP. A 5-Point Likert scale was used, with denoting strongly disagree, 2 for disagree, 3 for neutral, 4 for agree and 5 for strongly agree:

Table 4.5: Reverse Logistics

	Mean	Std. Dev
The World Food Program effectively communicates its procedures and requirements for the return and recycling of unused or expired relief items	4.208	.959
Our organization has found the reverse logistics process with WFP to be efficient and well-organized	3.953	.951
We believe that WFP's commitment to responsible disposal and recycling of relief items positively impacts the environment and local communities	3.985	1.070
WFP actively seeks to minimize waste in its supply chain operations and encourages the recycling and repurposing of materials	4.190	.848
Our organization has received clear guidance from WFP on the return and responsible disposal of unused relief items	4.226	.822
We consider our involvement in WFP's reverse logistics efforts to be mutually beneficial and sustainable	4.161	.807
WFP's reverse logistics practices contribute to our organization's commitment to environmental responsibility	4.038	.879
We believe that our relationship with WFP positively impacts our organization's ability to engage in ethical and sustainable reverse logistics practices in support of humanitarian efforts in South Sudan	4.084	.855

Based on the means and standard deviations provided, the findings suggest that respondents generally perceive the reverse logistics practices of WFP in South Sudan positively. The mean scores, ranging from 3.953 to 4.226 out of 5, indicate a strong level of agreement among respondents across various aspects of reverse logistics, including communication of procedures, efficiency of the process, commitment to responsible disposal and recycling, minimization of waste, provision of clear guidance, and mutual benefit of involvement. The relatively low standard deviations ranging

from .807 to 1.070 indicate a generally positive perception of WFP's efforts in reverse logistics, with opportunities to further enhance communication effectiveness and efficiency in recycling and disposal processes to strengthen environmental impact and operational sustainability in humanitarian efforts in South Sudan.

Responses from the key informant interviews reveal that WFP effectively communicates its procedures and requirements for the return and recycling of unused or expired relief items to local suppliers. This ensures that reverse logistics operations are conducted in a systematic and environmentally responsible manner.

Clear communication and guidance on reverse logistics processes are essential for facilitating the efficient and responsible return of relief items in humanitarian supply chains. Through providing detailed instructions to suppliers, WFP minimizes the risk of miscommunication or errors during the return process, thereby enhancing operational efficiency and compliance with environmental regulations. This approach is consistent with best practices in reverse logistics management, which emphasize the importance of effective communication and coordination among stakeholders (Rogers & Tibben-Lembke, 2001).

It was also established that WFP actively seeks to minimize waste in its supply chain operations and encourages the recycling and repurposing of materials wherever possible. Through partnerships with local recycling facilities and community organizations, WFP facilitates the collection and processing of recyclable materials, including packaging materials, containers, and expired relief items. The integration of recycling and waste minimization initiatives into reverse logistics operations reflects

WFP's commitment to sustainable supply chain management practices. Through diverting waste from landfills and promoting recycling, WFP not only reduces its environmental footprint but also contributes to the socioeconomic development of local communities through job creation and resource conservation. This approach aligns with the principles of circular economy, which emphasize the importance of closing the loop on material flows and maximizing resource efficiency (Ellen MacArthur Foundation, 2015).

4.2.6 Transportation Optimization

The study also sought to assess the effect of transportation optimization on performance of World Food Program in South Sudan. To this end, respondents were asked to rate their respective levels of agreement with the following items with regard to transportation optimization as applies in their organization's arrangement with WFP. A 5-Point Likert scale was used, with denoting strongly disagree, 2 for disagree, 3 for neutral, 4 for agree and 5 for strongly agree.

Table 4.6: Transportation Optimization

	Mean	Std. Dev
The World Food Program's transportation optimization practices enhance the efficiency and timeliness of goods delivery to our organization	3.824	.996
WFP actively seeks to minimize transportation costs and reduce the environmental impact of its logistics and distribution operations	4.023	.934
We find that WFP's transportation planning and route optimization contribute to reliable and on-time deliveries of goods	4.076	.956
WFP's commitment to using energy-efficient vehicles aligns with our organization's sustainability goals	4.034	.999
Our organization receives clear information from WFP regarding transportation schedules and requirements	4.229	.914

WFP's transportation optimization efforts have a positive impact on our ability to plan and allocate resources effectively	4.218	.883
We believe that our partnership with WFP positively influences our organization's transportation efficiency and cost-effectiveness	4.212	.963
WFP's transportation optimization practices contribute to our organization's commitment to sustainable and environmentally responsible supply chain operations	4.322	.723

Based on the means and standard deviations provided, the findings suggest that respondents generally perceive the transportation optimization practices of WFP in South Sudan positively. The mean scores, ranging from 3.824 to 4.322 out of 5, indicate a strong level of agreement among respondents across various aspects of transportation optimization, including efficiency of goods delivery, minimization of transportation costs, reliability of deliveries, use of energy-efficient vehicles, provision of clear information on transportation schedules, and positive impact on resource planning and allocation. The relatively low standard deviations ranging from .723 to .999 suggest a degree of consensus among respondents regarding these perceptions, indicating that the responses are relatively consistent. Overall, the findings suggest that WFP's efforts in transportation optimization are perceived favorably by its partners, contributing to their transportation efficiency, cost-effectiveness, and commitment to sustainable and environmentally responsible supply chain operations.

Responses from key informant interviews reveal that WFP's transportation optimization efforts have a positive impact on the ability of its partners to plan and allocate resources effectively. Through optimizing transportation routes, consolidating shipments, and leveraging technology such as GPS tracking and real-time monitoring

systems, WFP enhances the efficiency and reliability of its transportation operations in South Sudan.

Transportation optimization plays a critical role in improving the performance of humanitarian supply chains by enhancing the speed, reliability, and cost-effectiveness of deliveries. WFP's adoption of transportation optimization strategies reflects a proactive approach to addressing logistical challenges and maximizing the impact of its humanitarian operations in South Sudan. Through leveraging technology and data-driven decision-making, WFP can achieve greater efficiency and responsiveness in its transportation processes, ultimately enabling more effective delivery of aid to vulnerable populations. This aligns with recommendations from the literature emphasizing the importance of transportation optimization in enhancing the agility and resilience of humanitarian supply chains (Tomasini & Van Wassenhove, 2009).

4.2.7 Performance

The study also sought to assess the performance of World Food Program in South Sudan. To this end, respondents were asked to rate their respective levels of agreement with statements posed in regard to WFP's performance. A 5-Point Likert scale was used, with denoting strongly disagree, 2 for disagree, 3 for neutral, 4 for agree and 5 for strongly agree:

Table 4.7: Performance of WFP

	Mean	Std. Dev
WFP effectively collaborates with local suppliers to ensure the timely delivery of goods and services for humanitarian operations in South Sudan	3.797	1.106
WFP's procurement processes are transparent and accountable, fostering trust and integrity in its partnerships with suppliers	3.973	.980

We actively seek feedback from local suppliers to continuously improve our procurement practices and operations	4.000	.969
WFP is committed to promoting environmentally sustainable procurement practices, such as green procurement and waste reduction initiatives	4.119	.929
We believe that WFP's procurement strategies positively impact the efficiency and effectiveness of humanitarian operations in South Sudan	4.154	.839
WFP maintains open and clear communication channels with local suppliers to facilitate smooth coordination and collaboration	4.027	.879
WFP's performance in meeting the procurement needs and expectations of local suppliers has improved over time	4.008	.973
Overall, local suppliers perceive WFP as a reliable and trustworthy partner in procurement and supply chain activities for humanitarian efforts in South Sudan	4.135	.897

Based on the means and standard deviations provided, the findings suggest that respondents generally perceive the performance of WFP in South Sudan positively. The mean scores, ranging from 3.797 to 4.154 out of 5, indicate a moderate to high level of agreement among respondents across various aspects of WFP's performance, including collaboration with local suppliers, transparency in procurement processes, commitment to environmentally sustainable practices, efficiency of procurement strategies, communication channels with suppliers, and overall reliability and trustworthiness as a partner. The relatively low standard deviations ranging from .839 to 1.106 suggest a degree of consensus among respondents regarding these perceptions, indicating that the responses are relatively consistent. Overall, the findings suggest that WFP's performance in meeting the procurement needs and expectations of local suppliers is perceived favorably, contributing to its reputation as a reliable and trustworthy partner in humanitarian supply chain activities in South Sudan.

4.2.8 Correlation Analysis

In addition to the foregoing descriptive analyses, the study also conducted a correlation analysis to explore the relationships between various factors related to WFP's procurement and supply chain operations. This analysis thus aims to investigate the potential associations between different aspects of WFP's performance and key factors such as supplier relationship management, green procurement, reverse logistics, and transportation optimization. This will provide deeper insights into the factors that may influence WFP's performance in humanitarian operations in South Sudan.

Table 4.8: Correlation Analysis

		Performance	Supplier Relationship Management	Green procurement	Reverse Logistics	Transportation Optimization
Performance	Pearson Correlation	1	.554	.641	.686	.755
	Sig. (2-tailed)		.000	.000	.000	.000
Supplier Relationship Management	Pearson Correlation	.554	1	.627	.703	.657
	Sig. (2-tailed)	.000		.000	.000	.000
Green Procurement	Pearson Correlation	.641	.627	1	.723	.666
	Sig. (2-tailed)	.000	.000		.000	.000
Reverse Logistics	Pearson Correlation	.686	.703	.723	1	.778
	Sig. (2-tailed)	.000	.000	.000		.000
Transportation Optimization	Pearson Correlation	.755	.657	.666	.778	1

	Sig. (2-tailed)	.000	.000	.000	.000

. Correlation is significant at the 0.01 level (2-tailed).

The correlation matrix reveals significant positive correlations between various factors related to the performance of WFP in South Sudan and key aspects of its supply chain management. Specifically, there are strong correlations (r>.05) between performance and each of the factors assessed: supplier relationship management (r=.554; Sig.=.000; p<0.01), green procurement (r=.641; Sig.=.000; p<0.01), reverse logistics (r=.686; Sig.=.000; p<0.01), and transportation optimization (r=.755; Sig.=.000; p<0.01). These correlations suggest that as supplier relationship management, green procurement, reverse logistics, and transportation optimization practices improve, so does the overall performance of the World Food Program in South Sudan. The strength of these correlations, with all recording correlation values of above 0.5, indicates a robust relationship where changes in one variable are strongly associated with changes in performance. Therefore, enhancing any of these variables is likely to lead to improved operational performance outcomes for WFP in South Sudan, supporting efficient and effective humanitarian aid delivery.

4.2.9 Regression Analysis

In addition to the correlation analysis, the study conducted a multiple regression analysis to further explore the relationship between various factors related to the performance of WFP in South Sudan. This analysis aims to identify the significant predictors of WFP's performance in humanitarian operations based on factors such as supplier relationship management, green procurement, reverse logistics, and transportation optimization. Through utilizing multiple regression, the study seeks to

determine the extent to which these factors collectively contribute to explaining the variation in WFP's performance and to identify the specific impact of each predictor variable on performance outcomes.

Prior to conducting regression analysis, the study performed a multicollinearity test to assess the tolerance and Variance Inflation Factor (VIF) for each predictor variable in the model. According to Hair et al. (2019), tolerance values above 0.1 and VIF values below 10 are generally considered acceptable thresholds for multicollinearity. In this study, the tolerance values ranged from 0.305 to 0.461, and VIF values ranged from 2.168 to 3.282. These results indicate low levels of multicollinearity among the predictor variables (Tabachnick & Fidell, 2019). Specifically, the highest VIF observed was for the "Reverse Logistics" variable at 3.282, suggesting some correlation with other predictors but not to a problematic extent. Therefore, these findings affirm that the predictor variables—supplier relationship management, green procurement, reverse logistics, and transportation optimization—are sufficiently independent to proceed with regression analysis, ensuring the reliability of the results in assessing their impact on the performance of WFP in South Sudan.

Table 4.9: Multicollinearity Diagnostics

	Tolerance	VIF
Supplier Relationship Management	.461	2.168
Green Procurement	.433	2.308
Reverse Logistics	.305	3.282
Transportation Optimization	.347	2.881

The regression analysis comprises three key outputs: Model Summary, Analysis of Variance (ANOVA), and coefficients, which collectively provide insights into the overall predictive power of the regression model and the significance of individual predictor variables in explaining variations in WFP's performance.

Table 4.10: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.790[a]	.623	.617	3.07077

a. Predictors: (Constant), Supplier Relationship Management, Green procurement, Reverse Logistics, Transportation Optimization

The model summary indicates that the regression model has a coefficient of determination (R-squared) of 0.623, suggesting that approximately 62.3% of the variance in the performance of WFP in South Sudan can be explained by the predictor variables included in the model, namely supplier relationship management, green procurement, reverse logistics, and transportation optimization. The adjusted R-squared value, which accounts for the number of predictors in the model, is 0.617, indicating that the model's explanatory power remains robust even after considering the number of variables included. The standard error of the estimate is 3.07077, representing the average deviation of observed values from the predicted values by the model. The model summary suggests that the combination of supplier relationship management, green procurement, reverse logistics, and transportation optimization significantly contributes to explaining variations in WFP's performance in humanitarian operations in South Sudan.

Table 4.11: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3481.567	4	870.392	92.304	.000[b]
	Residual	2102.801	223	9.430		
	Total	5584.368	227			

a. Dependent Variable: Performance

b. Predictors: (Constant), Supplier Relationship Management, Green procurement, Reverse Logistics, Transportation Optimization

The ANOVA table presents the results of the analysis of variance for the regression model predicting the performance of WFP in South Sudan based on supplier relationship management, green procurement, reverse logistics, and transportation optimization. The table indicates that the regression model is statistically significant, as evidenced by the F-statistic of 92.304, with a corresponding p-value (Sig.) of less than 0.001. This suggests that the variation in WFP's performance is not due to random chance alone, but rather, it can be attributed to the combination of predictor variables included in the model. Additionally, the significant F-statistic indicates that at least one of the predictor variables has a significant effect on WFP's performance. Therefore, the overall model provides a good fit to the data and offers valuable insights into the relationship between supplier management practices, procurement strategies, logistics operations, and WFP's performance in humanitarian operations in South Sudan.

Table 4.12: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	4.345	1.757		2.473	.014
	Supplier Relationship Management	.010	.073	.008	.138	.890
	Green procurement	.152	.060	.159	2.551	.011
	Reverse Logistics	.168	.075	.167	2.247	.026
	Transportation Optimization	.524	.070	.523	7.503	.000

a. Dependent Variable: Performance

The coefficients table presents the unstandardized coefficients, standardized coefficients (Beta), t-values, and significance levels for each predictor variable included in the regression model predicting the performance of WFP in South Sudan. Firstly, the constant term represents the intercept of the regression equation, indicating the expected value of WFP's performance when all predictor variables are zero. In this case, the constant term is 4.345, with a standard error of 1.757 and a significant t-value of 2.473 ($p = 0.014$), suggesting that it is significantly different from zero. Moving on to the predictor variables, the standardized coefficients (Beta) provide insights into the relative importance of each predictor variable in predicting WFP's performance while accounting for differences in scale. The standardized coefficients range from 0.008 to 0.523.

Among the predictor variables, transportation optimization has the highest standardized coefficient (Beta = 0.523), indicating that it has the strongest impact on

WFP's performance compared to other predictors. Furthermore, the t-values and associated significance levels indicate whether each predictor variable makes a significant contribution to the model. In this case, green procurement, reverse logistics, and transportation optimization are statistically significant predictors of WFP's performance, with p-values of 0.011, 0.026, and <0.001, respectively. Conversely, supplier relationship management does not significantly predict WFP's performance, as its p-value is greater than 0.05. Overall, the coefficients table provides valuable insights into the individual contributions of each predictor variable to WFP's performance in humanitarian operations in South Sudan.

The fitted model equation is:

Performance = 4.345 + 0.010 (Supplier Relationship Management) + 0.152 (Green procurement) + 0.168 (Reverse Logistics) + 0.524 (Transportation Optimization)

The unfitted model is represented by the intercept:

Performance = 4.345

4.3 Discussion

The study first sought to establish the effect of supplier relationship management on performance of WFP in South Sudan. Descriptive results indicate favorable perceptions of respondents regarding supplier relationship management practices within WFP in South Sudan hold significant implications for humanitarian supply chain management. While supplier relationship management did not emerge as a significant predictor of WFP's performance in the regression analysis (β=.008; Sig.= .890; p>.05), it remains a critical aspect of humanitarian supply chain management. The high levels of agreement regarding clear communication, collaborative working relationships, and transparency in procurement practices suggest that WFP is

effectively fostering strong partnerships with its suppliers. This aligns with the literature, which emphasizes the importance of collaborative relationships and transparent communication in supplier management for enhancing supply chain performance (Cousins & Spekman, 2020). Through maintaining open lines of communication, seeking feedback, and considering the needs and constraints of its partners, WFP can facilitate a more efficient and responsive supply chain, ultimately contributing to the success of humanitarian operations in the region.

The findings also underscore the importance of fairness and reliability in procurement practices for building trust and confidence among suppliers. The high mean scores for statements related to consistency in procurement practices, fairness in payment terms, and consideration of organizational needs suggest that WFP's efforts in these areas are positively perceived by its partners. This resonates with the literature, which highlights the role of fair and equitable treatment of suppliers in fostering long-term relationships and enhancing supply chain performance (Kosut & Moran, 2019). Through ensuring fairness and reliability in its procurement processes, WFP can strengthen its partnerships with suppliers, mitigate risks, and promote sustainability in its humanitarian supply chain operations in South Sudan and beyond.

Although not statistically significant in this study, maintaining strong relationships with suppliers is essential for WFP to ensure timely and reliable delivery of goods and services, minimize disruptions, and uphold its mission of supporting vulnerable populations in South Sudan. Literature suggests that effective supplier relationship

management enhances collaboration, trust, and reliability in supply chain partnerships, thereby improving operational efficiency and responsiveness (Luzzini et al., 2020).

The study also sought to determine the effect of green procurement on performance of WFP in South Sudan. The findings of the study on green procurement practices within WFP in South Sudan have significant implications for humanitarian supply chain management and sustainability efforts. The positive perceptions of respondents regarding WFP's green procurement initiatives underscore the organization's commitment to environmental responsibility and its efforts to integrate sustainability principles into its operations. Similarly, the significant positive relationship between green procurement practices and WFP's performance (β=.159; Sig.= .011; $p<.05$) underscores the importance of environmental sustainability in humanitarian supply chain operations. This aligns with the literature, which emphasizes the importance of sustainable supply chain practices in reducing environmental impact and promoting long-term resilience in humanitarian operations (Carter & Rogers, 2018). Through considering environmentally responsible sourcing practices, WFP not only contributes to environmental conservation but also enhances its reputation as a socially responsible organization, potentially attracting more support and funding for its humanitarian endeavors.

The findings highlight the potential for green procurement practices to drive positive outcomes for both humanitarian organizations and their suppliers. The respondents' perceptions of the positive impact of WFP's green procurement on their organization's ability to provide environmentally responsible products and services underscore the

mutual benefits of sustainability initiatives in supply chains (Seuring & Müller, 2021). This suggests that by fostering collaborative partnerships with suppliers and promoting sustainability throughout the supply chain, organizations like WFP can enhance operational efficiency, reduce costs, and contribute to broader sustainability goals. Overall, the findings underscore the importance of integrating green procurement practices into humanitarian supply chains to promote environmental stewardship and enhance the effectiveness of humanitarian efforts in regions like South Sudan.

The findings suggest that integrating green procurement practices into supply chain operations positively impacts WFP's performance, reflecting broader trends in sustainable supply chain management literature emphasizing the value of environmental responsibility for improving organizational performance and stakeholder satisfaction. This is in line with literature (He & Bai, 2019), in that green procurement initiatives, such as sourcing environmentally responsible products and reducing waste, align with WFP's commitment to sustainability and can enhance operational efficiency and cost-effectiveness.

The study further sought to examine the effect of reverse logistics on performance of WFP in South Sudan. The positive perceptions of respondents regarding the reverse logistics practices of WFP in South Sudan carry significant implications for humanitarian supply chain management and environmental sustainability. The high level of agreement on the effectiveness and organization of the reverse logistics process, as well as the clear communication of procedures, suggests that WFP is

successfully managing the return and recycling of unused or expired relief items. Accordingly, the significant relationship between reverse logistics and WFP's performance (β=.167; Sig.= .026; p<.05) highlights the importance of effective waste management and recycling practices in humanitarian supply chains. This aligns with empirical literature that emphasizes the importance of effective reverse logistics processes in reducing waste, minimizing environmental impact, and maximizing resource utilization (Guide & Van Wassenhove, 2019). Through actively seeking to minimize waste and encouraging recycling and repurposing of materials, WFP demonstrates a commitment to environmental responsibility in its supply chain operations, contributing to broader sustainability goals in humanitarian relief efforts.

The findings also indicate that respondents perceive their involvement in WFP's reverse logistics efforts as mutually beneficial and sustainable, with positive impacts on both their organization's commitment to environmental responsibility and their ability to engage in ethical practices. This underscores the importance of collaborative partnerships and shared responsibility in addressing environmental challenges within humanitarian supply chains (Ji et al., 2022). Through fostering mutually beneficial relationships with its partners, WFP can enhance the effectiveness of its reverse logistics practices and promote a culture of sustainability throughout its supply chain. Moreover, the positive perception of WFP's reverse logistics practices by its partners can enhance the organization's reputation and credibility in the humanitarian sector, potentially attracting more support and resources for its relief efforts in South Sudan and beyond.

The findings align with literature emphasizing the role of reverse logistics in mitigating environmental risks and improving supply chain sustainability. Reverse logistics processes, including the return and responsible disposal of unused relief items, contribute to environmental sustainability and operational efficiency (Guide et al., 2020). Through minimizing waste and promoting recycling, WFP can reduce environmental impact, optimize resource utilization, and enhance its overall performance in delivering aid to vulnerable populations in South Sudan.

The study further sought to assess the effect of transportation optimization on performance of World Food Program in South Sudan. The positive perceptions of respondents regarding the transportation optimization practices of WFP in South Sudan have significant implications for humanitarian supply chain management and sustainability. The strong positive relationship between transportation optimization and WFP's performance (β=.523; Sig.= .000; $p<.05$) emphasizes the critical role of efficient transportation management in humanitarian operations. The findings suggest that WFP's efforts in transportation optimization contribute to the efficiency and timeliness of goods delivery, as well as the reliability of deliveries. This aligns with empirical literature emphasizing the importance of transportation optimization in enhancing supply chain performance and responsiveness (Christopher, 2019). Through actively seeking to minimize transportation costs, using energy-efficient vehicles, and optimizing transportation planning and route optimization, WFP not only improves its operational efficiency but also reduces its environmental footprint. These practices are consistent with the literature on sustainable supply chain management, which

emphasizes the need for organizations to integrate environmental considerations into their logistics and distribution operations (Seuring & Müller, 2021).

The findings suggest that WFP's transportation optimization efforts positively influence its partners' transportation efficiency, cost-effectiveness, and commitment to sustainable supply chain operations. This underscores the importance of collaborative partnerships and shared responsibility in driving sustainability initiatives within humanitarian supply chains (Carter & Easton, 2021). Through fostering mutually beneficial relationships with its partners and promoting sustainable transportation practices, WFP can enhance the overall effectiveness and resilience of its supply chain. Moreover, the positive perception of WFP's transportation optimization practices by its partners can strengthen the organization's reputation and credibility in the humanitarian sector, potentially attracting more support and resources for its relief efforts in South Sudan and other regions.

The significant impact of transportation optimization on WFP's performance aligns with empirical evidence highlighting the importance of transportation efficiency for achieving operational excellence and ensuring timely delivery of humanitarian aid (Kannan et al., 2020). As per Srivastava (2017), optimizing transportation processes, such as route planning and vehicle utilization, reduces costs, improves delivery times, and enhances overall supply chain performance. Through prioritizing transportation optimization initiatives, WFP can enhance its operational effectiveness, strengthen its supply chain resilience, and ultimately, better serve the needs of vulnerable populations in South Sudan.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This Chapter encapsulates the study's findings, conclusions, and recommendations. Through summing up the key findings and drawing conclusions, the chapter aims to highlight the main contributions of the study, offer actionable recommendations for practice and research, and reflect on potential limitations. It serves as a bridge between theory and practice, informing decision-making and guiding future initiatives in humanitarian supply chain management.

5.2 Summary of the Result Findings

5.2.1 Supplier Relationship Management

The study sought to establish the effect of supplier relationship management on performance of World Food Program in South Sudan. The study reveals that respondents generally perceive the supplier relationship management practices of WFP in South Sudan favorably. The high mean scores, ranging from 4.081 to 4.531 out of 5, indicate strong agreement among respondents across various aspects of supplier relationship management, including communication, feedback mechanisms, collaboration, transparency, consistency in procurement practices, fairness in payment terms, and consideration of organizational needs. The relatively low standard deviations suggest a consensus among respondents regarding these perceptions, indicating consistency in their responses. Overall, the findings suggest that WFP's efforts in supplier relationship management are positively perceived by

its partners, contributing to a mutually beneficial and effective partnership in supporting humanitarian efforts in South Sudan.

5.2.2 Green Procurement Practices

The study reveals that respondents generally perceive of WFP in South Sudan as actively engaging in green procurement practices. Mean scores ranging from 3.712 to 4.331 out of 5 indicate moderate to high levels of agreement among respondents regarding various aspects of green procurement, including the consideration of environmentally responsible sourcing practices, encouragement to provide sustainable products, and efforts to reduce the carbon footprint through procurement decisions. The relatively low standard deviations suggest a consensus among respondents regarding these perceptions, indicating consistency in their responses. Overall, the findings suggest a positive perception of WFP's commitment to green procurement among its suppliers in South Sudan, underscoring the significance of sustainability in humanitarian supply chains.

5.2.3 Reverse Logistics

The study indicates that respondents generally perceive the reverse logistics practices of WFP in South Sudan positively. Mean scores ranging from 3.953 to 4.226 out of 5 suggest a strong level of agreement among respondents across various aspects of reverse logistics, including communication of procedures, efficiency of the process, commitment to responsible disposal and recycling, minimization of waste, provision of clear guidance, and mutual benefit of involvement. The relatively low standard deviations suggest a consensus among respondents regarding

these perceptions, indicating consistency in their responses. Overall, the findings suggest that WFP's efforts in reverse logistics are favorably perceived by its partners, contributing to their commitment to environmental responsibility and their ability to engage in ethical and sustainable practices in support of humanitarian efforts in South Sudan.

5.2.4 Transportation Optimization Practices

The study indicates that respondents generally perceive the transportation optimization practices of WFP in South Sudan positively. Mean scores ranging from 3.824 to 4.322 out of 5 suggest a strong level of agreement among respondents across various aspects of transportation optimization, including efficiency of goods delivery, minimization of transportation costs, reliability of deliveries, use of energy-efficient vehicles, provision of clear information on transportation schedules, and positive impact on resource planning and allocation. The relatively low standard deviations suggest a consensus among respondents regarding these perceptions, indicating consistency in their responses. Overall, the findings suggest that WFP's efforts in transportation optimization are favorably perceived by its partners, contributing to their transportation efficiency, cost-effectiveness, and commitment to sustainable and environmentally responsible supply chain operations.

The regression analysis results indicate that the predictors, including supplier relationship management, green procurement, reverse logistics, and transportation optimization, collectively have a significant effect on the performance of WFP in South Sudan. The model summary reveals a moderately strong relationship (R

=0.790) between the predictors and performance, explaining approximately 62.3% of the variance in WFP performance. The ANOVA table further confirms the significance of the regression model, with a significant F-statistic ($F = 92.304$, $p < 0.001$). Additionally, the coefficients table shows that transportation optimization has the highest standardized coefficient ($\beta = 0.523$, $p < 0.001$), followed by green procurement ($\beta = 0.159$, $p = 0.011$) and reverse logistics ($\beta = 0.167$, $p = 0.026$), while supplier relationship management shows a non-significant effect ($\beta = 0.008$, $p = 0.890$). These results suggest that transportation optimization, green procurement, and reverse logistics significantly contribute to enhancing the performance of WFP in South Sudan, emphasizing the importance of these factors in humanitarian supply chain management.

5.3 Conclusions

The positive perceptions of supplier relationship management highlight the importance of transparent communication, collaborative partnerships, and fair procurement practices in fostering trust and mutual benefits among stakeholders. Moreover, the favorable attitudes towards green procurement underscore the necessity of environmentally sustainable practices in mitigating the ecological footprint of humanitarian operations while promoting resource efficiency and resilience. However, supplier relationship management does not show a significant impact on performance, suggesting that while effective communication and collaboration with suppliers are essential, they may not directly influence the overall performance of WFP in South Sudan.

The results pertaining to green procurement reveal a positive perception among respondents regarding the WFP's commitment to environmentally responsible sourcing practices. The findings underscore the significance of integrating sustainability considerations into procurement decisions, encouraging the adoption of eco-friendly products and materials, and reducing the carbon footprint of humanitarian operations. This highlights the pivotal role of green procurement in fostering environmental stewardship, promoting sustainable development, and aligning humanitarian efforts with global sustainability goals. The positive attitudes towards green procurement underscore its potential to enhance the resilience and long-term viability of humanitarian supply chains while contributing to broader environmental objectives. Green procurement also demonstrates a significant positive relationship with performance, indicating the importance of environmentally sustainable sourcing practices in mitigating the environmental impact of humanitarian activities and promoting operational resilience.

The findings related to reverse logistics highlight the importance of responsible waste management practices in humanitarian supply chains. Respondents perceive WFP's efforts in reverse logistics positively, indicating effective communication of procedures, efficient disposal and recycling processes, and a commitment to minimizing waste. These results underscore the significance of integrating reverse logistics strategies into humanitarian operations to optimize resource utilization, reduce environmental impact, and support local communities. Through promoting ethical and sustainable waste management practices, WFP can enhance its operational efficiency, reduce costs, and reinforce its commitment to environmental

responsibility and social welfare. Reverse logistics shows a significant positive effect on performance, underlining the importance of responsible waste management practices in optimizing resource utilization, reducing costs, and supporting environmental sustainability efforts.

The results concerning transportation optimization emphasize the critical role of efficient transportation systems in enhancing the performance of WFP in South Sudan. Respondents perceive WFP's transportation optimization practices positively, indicating their contribution to efficient goods delivery, cost reduction, and environmental sustainability. These findings underscore the importance of strategic transportation planning, route optimization, and the use of energy-efficient vehicles in ensuring timely and reliable aid delivery while minimizing environmental impact. Through prioritizing transportation optimization, WFP can enhance its operational agility, responsiveness, and overall effectiveness in addressing food insecurity and humanitarian needs in South Sudan. Transportation optimization further emerges as the most influential predictor, with a significant positive effect on performance. This highlights the critical role of efficient transportation systems in enhancing operational efficiency, timely delivery of aid, and overall performance of WFP in humanitarian operations.

5.4 Recommendations for Practice

Based on the study findings, several recommendations can be proposed for various stakeholders involved in humanitarian operations in South Sudan. It is particularly recommended that the WFP and policymakers continue to prioritize and enhance supplier relationship management practices despite its non-significant direct effect

on performance in the regression analysis. WFP should maintain and strengthen clear communication channels and collaborative relationships with suppliers to ensure transparency and trust in procurement processes. This can be achieved through regular feedback sessions and inclusive decision-making processes. Policymakers should support the development of policies that promote fair and consistent procurement practices, ensuring that supplier concerns are addressed promptly and effectively. Additionally, WFP could implement supplier development programs to further enhance the capabilities of local suppliers, fostering a more resilient and reliable supply chain. Through continuing to invest in robust supplier relationship management, WFP can enhance overall supply chain efficiency and responsiveness, ultimately improving the effectiveness of humanitarian aid delivery in South Sudan.

Based on the study findings, it is recommended that the WFP and other humanitarian organizations in South Sudan intensify their focus on green procurement practices to further enhance organizational performance and sustainability outcomes. WFP should continue to prioritize eco-friendly sourcing, adherence to sustainable standards, and the reduction of its carbon footprint through procurement decisions. This can be achieved by establishing more stringent guidelines for suppliers, encouraging the adoption of green practices, and providing training and support for suppliers to meet these standards. Policymakers should create and enforce regulations that incentivize sustainable procurement practices and penalize environmentally harmful practices. Additionally, collaboration with local and international stakeholders to develop and implement green technologies and

materials in the supply chain should be promoted. WFP can not only improve its operational performance but also contribute to broader environmental sustainability goals through reinforcing these practices, ultimately enhancing the resilience and effectiveness of humanitarian efforts in South Sudan.

It is further recommended that the WFP and other humanitarian organizations in South Sudan place greater emphasis on enhancing reverse logistics practices to improve performance and sustainability. WFP should continue to refine its procedures for the return and recycling of relief items, ensuring they are efficient, well-organized, and clearly communicated to all stakeholders. This includes investing in training programs for staff and partners on reverse logistics processes and the environmental benefits of proper waste management. Policymakers should support these efforts by establishing frameworks and incentives that promote effective reverse logistics practices, such as subsidies for recycling initiatives and penalties for improper disposal of relief items. Furthermore, collaboration with local authorities and environmental agencies can enhance the implementation of sustainable practices, contributing to the reduction of waste and the promotion of recycling within humanitarian operations. In strengthening reverse logistics, WFP can enhance its operational performance and environmental impact, fostering more sustainable and effective humanitarian aid delivery in South Sudan.

Based on the study findings, it is recommended that the WFP and other humanitarian organizations in South Sudan prioritize the enhancement of transportation optimization practices to boost performance and sustainability in

humanitarian operations. WFP should continue to invest in advanced transportation management systems that optimize route planning, reduce fuel consumption, and minimize environmental impact. Implementing energy-efficient vehicles and incorporating renewable energy sources in transportation logistics can further enhance sustainability. Policymakers should support these initiatives by creating policies that encourage the use of green transportation technologies and infrastructure improvements that facilitate efficient logistics. Additionally, establishing partnerships with local and international transport providers can help ensure timely and reliable delivery of goods. By focusing on transportation optimization, WFP can improve cost-efficiency, timeliness, and overall effectiveness of its humanitarian aid delivery in South Sudan, thereby enhancing the organization's performance and contributing to broader sustainability goals.

5.5 Recommendations for Further Research

This study significantly contributes to the existing body of knowledge by providing empirical evidence on the impact of sustainable supply chain strategies—specifically supplier relationship management, green procurement, reverse logistics, and transportation optimization—on the performance of humanitarian organizations in conflict-affected regions like South Sudan. While previous research has primarily focused on commercial supply chains or humanitarian operations in more stable contexts, this study addresses a notable gap by examining these dynamics within the challenging environment of South Sudan. The findings highlight the importance of integrating sustainability practices into humanitarian logistics to enhance organizational performance, offering practical insights for improving efficiency,

sustainability, and effectiveness in aid delivery. This research not only extends the theoretical framework of sustainable supply chain management but also provides actionable recommendations for practitioners and policymakers, thereby fostering more resilient and responsible humanitarian operations.

For further research in this field of study, it is recommended to conduct longitudinal studies to assess the long-term effects of sustainable supply chain practices on humanitarian outcomes in South Sudan. Additionally, comparative studies across different humanitarian contexts and regions could provide valuable insights into the transferability and scalability of sustainable supply chain strategies. Furthermore, qualitative research methods such as interviews and focus groups could be employed to gain a deeper understanding of the perceptions, experiences, and challenges faced by various stakeholders in implementing sustainable supply chain practices in humanitarian operations. Lastly, exploring emerging technologies such as blockchain, IoT, and artificial intelligence in optimizing humanitarian supply chains could offer innovative solutions to address the complex challenges faced in delivering aid to vulnerable populations in conflict-affected regions like South Sudan.

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APPENDICES

Appendix I: Introduction letter

Veronica Nyidier
P.O Box 342-01000
Thika, Kenya

31st January 2024

Dear Respondent

Subject: Participation in a Masters Degree Research

I hope this letter finds you well. My name is Veronica, a student candidate pursuing a master's degree in procurement and supplies management of Mount Kenya University. The purpose of this communication is to extend an invitation to you to participate in a research study that is a critical component of my research. The study aims to investigate the effect of sustainable supply chain strategies and performance of world food program in South Sudan, and your expertise and insights would be immensely valuable in realizing this goal.

Your participation will involve filling the questionnaire items as appropriate. The information collected will be treated with the utmost confidentiality, and your identity will be kept anonymous in all research outputs. Your invaluable input will significantly contribute to the advancement of knowledge in the field and potentially influence policies that enhance government service effectiveness.

Thank you for considering this request, and I look forward to the possibility of collaborating with you in this important research endeavor.

Sincerely,

Veronica Nyidier Chagai

Appendix II: Research Questionnaire for Suppliers

Part A: Respondent Profile

1. Job Cadre:

Top Management [ ] Middle Management [ ] Operational Staff [ ]

2. Length of service in the organization:

Less than 5 years [ ] 5-10 years [ ]

11-15 years [ ] Above 15 years [ ]

Part B: Supplier Relationship Management

3. Please rate your level of agreement with the following items with regard to supplier relationship management as applies in your organization's arrangement with WFP. Use the scale: 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree and 5=Strongly Agree.

	1	2	3	4	5
The WFP maintains clear and open lines of communication with our organization regarding procurement and delivery schedules					
WFP actively seeks feedback from our organization on its procurement processes, and we feel our input is valued					
We have a mutually beneficial and collaborative working relationship with WFP, which contributes to our success					
WFP provides clear and transparent information about their supply chain requirements, standards, and expectations					
We find that WFP's procurement practices are consistent and reliable, which helps us plan and allocate resources effectively					
WFP's payment terms and procedures are fair and reasonable, making it easier for our organization to do business with them					
The World Food Program considers our organization's needs and constraints when making procurement decisions					
We believe that our relationship with WFP positively impacts our					

organization's ability to provide goods and services efficiently					

Part C: Green Procurement

3. Please rate your level of agreement with the following items with regard to green procurement as applies in your organization's arrangement with WFP. Use the scale: 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree and 5=Strongly Agree.

	1	2	3	4	5
The WFP considers environmentally responsible sourcing practices when procuring goods and services from our organization					
We are encouraged by WFP to provide environmentally sustainable products and materials in our supply chain					
WFP actively seeks to reduce its carbon footprint through its procurement decisions and practices					
Our organization incorporates environmentally responsible practices in the production and sourcing of goods and services for WFP					
WFP's procurement processes support the reduction of single-use plastics and other environmentally harmful materials					
We believe that our partnership with WFP positively impacts our organization's environmental sustainability efforts					
WFP provides clear guidelines on environmentally friendly packaging and labeling of relief items					
We feel that WFP's commitment to green procurement enhances our ability to provide environmentally responsible products and services					

Part D: Reverse Logistics

3. Please rate your level of agreement with the following items with regard to reverse logistics as applies in your organization's arrangement with WFP. Use the scale: 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree and 5=Strongly Agree.

	1	2	3	4	5
The WFP effectively communicates its procedures and requirements for the return and recycling of unused or expired relief items					
Our organization has found the reverse logistics process with WFP to be efficient and well-organized					
We believe that WFP's commitment to responsible disposal of relief items positively impacts the environment and local communities					

WFP actively seeks to minimize waste in its supply chain operations and encourages the recycling and repurposing of materials					
Our organization has received clear guidance from WFP on the return and responsible disposal of unused relief items					
We consider our involvement in WFP's reverse logistics efforts to be mutually beneficial and sustainable					
WFP's reverse logistics practices contribute to our organization's commitment to environmental responsibility					
We believe that our relationship with WFP positively impacts our organization's ability to engage in sustainable reverse logistics					

Part E: Transportation Optimization

3. Please rate your level of agreement with the following items with regard to transportation optimization as applies in your organization's arrangement with WFP. Use the scale: 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree and 5=Strongly Agree.

	1	2	3	4	5
The WFP's transportation optimization practices enhance the efficiency and timeliness of goods delivery to our organization					
WFP actively seeks to minimize transportation costs and reduce the environmental impact of its logistics and distribution operations					
We find that WFP's transportation planning and route optimization contribute to reliable and on-time deliveries of goods					
WFP's commitment to using energy-efficient vehicles aligns with our organization's sustainability goals					
Our organization receives clear information from WFP regarding transportation schedules and requirements					
WFP's transportation optimization efforts have a positive impact on our ability to plan and allocate resources effectively					
We believe that our partnership with WFP positively influences our organization's transportation efficiency and cost-effectiveness					
WFP's transportation optimization practices contribute to our organization's commitment to sustainable supply chain operations					

Part F: Performance

3. Please rate your level of agreement with the following items with regard to WFP's performance. Use the scale: 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree and 5=Strongly Agree.

	1	2	3	4	5
WFP effectively collaborates with local suppliers to ensure the timely delivery of goods and services for humanitarian operations					
WFP's procurement processes are transparent and accountable, fostering trust and integrity in its partnerships with suppliers					
We actively seek feedback from local suppliers to continuously improve our procurement practices and operations					
WFP is committed to promoting environmentally sustainable procurement practices					
We believe that WFP's procurement strategies positively impact the efficiency and effectiveness of humanitarian operations					
WFP maintains open and clear communication channels with local suppliers to facilitate smooth coordination and collaboration					
WFP's performance in meeting the procurement needs and expectations of local suppliers has improved over time					
Overall, local suppliers perceive WFP as a reliable and trustworthy partner in procurement and supply chain activities					

Appendix III: Research Questionnaire for WFP Staff

Part A: Respondent Profile

1. Job Cadre:

Top Management [ ] Middle Management [ ] Operational Staff [ ]

2. Length of service in the organization:

Less than 5 years [ ] 5-10 years [ ]

11-15 years [ ] Above 15 years [ ]

Part B: Supplier Relationship Management

3. Please rate your level of agreement with the following items with regard to supplier relationship management as applies in your organization. Use the scale: 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree and 5=Strongly Agree.

	1	2	3	4	5
The WFP maintains clear and open lines of communication with our suppliers regarding procurement and delivery schedules					
WFP actively seeks feedback from our suppliers on its procurement processes and performance, and we feel our input is valued					
We have a mutually beneficial and collaborative working relationship with WFP, which contributes to our success					
WFP provides clear and transparent information about their supply chain requirements, standards, and expectations					
We find that WFP's procurement practices are consistent and reliable, which helps us plan and allocate resources effectively					
WFP's payment terms and procedures are fair and reasonable, making it easier for our suppliers to do business with them					
The World Food Program considers our suppliers' needs and constraints when making procurement decisions					
We believe that our relationship with WFP positively impacts our suppliers' ability to provide goods and services efficiently					

Part C: Green Procurement

3. Please rate your level of agreement with the following items with regard to green procurement as applies in your organization's arrangement with WFP. Use the scale: 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree and 5=Strongly Agree.

	1	2	3	4	5
The WFP considers environmentally responsible sourcing practices when procuring goods and services from our suppliers					
We are encouraged by WFP to provide environmentally sustainable products and materials in our supply chain					
WFP actively seeks to reduce its carbon footprint through its procurement decisions and practices					
Our suppliers incorporate environmentally responsible practices in the production and sourcing of goods and services for WFP					
WFP's procurement processes support the reduction of single-use plastics and other environmentally harmful materials					
We believe that our partnership with WFP positively impacts our suppliers' environmental sustainability efforts					
WFP provides clear guidelines on environmentally friendly packaging and labeling of relief items					
We feel that WFP's commitment to green procurement enhances our suppliers' ability to provide sustainable products and services					

Part D: Reverse Logistics

3. Please rate your level of agreement with the following items with regard to reverse logistics as applies in your organization's arrangement with WFP. Use the scale: 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree and 5=Strongly Agree.

	1	2	3	4	5
The WFP effectively communicates its procedures and requirements for the return and recycling of unused or expired relief items					
Our suppliers have found the reverse logistics process with WFP to be efficient and well-organized					
We believe that WFP's commitment to responsible disposal and recycling of relief items positively impacts the environment and local communities					
WFP actively seeks to minimize waste in its supply chain operations and encourages the recycling and repurposing of materials					

Our suppliers have received clear guidance from WFP on the return and responsible disposal of unused relief items					
We consider our involvement in WFP's reverse logistics efforts to be mutually beneficial and sustainable					
WFP's reverse logistics practices contribute to our suppliers' commitment to environmental responsibility					
We believe that our relationship with WFP positively impacts our suppliers' ability to engage in sustainable reverse logistics					

Part E: Transportation Optimization

3. Please rate your level of agreement with the following items with regard to transportation optimization as applies in your suppliers' arrangement with WFP. Use the scale: 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree and 5=Strongly Agree.

	1	2	3	4	5
The WFP's transportation optimization practices enhance the efficiency and timeliness of goods delivery to our suppliers					
WFP actively seeks to minimize transportation costs and reduce the environmental impact of its logistics and distribution operations					
We find that WFP's transportation planning and route optimization contribute to reliable and on-time deliveries of goods					
WFP's commitment to using energy-efficient vehicles aligns with our suppliers' sustainability goals					
Our suppliers receive clear information from WFP regarding transportation schedules and requirements					
WFP's transportation optimization efforts have a positive impact on our ability to plan and allocate resources effectively					
We believe that our partnership with WFP positively influences our suppliers' transportation efficiency and cost-effectiveness					
WFP's transportation optimization practices contribute to our suppliers' commitment to sustainable supply chain operations					

Part F: Performance

3. Please rate your level of agreement with the following items with regard to WFP's performance. Use the scale: 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree and 5=Strongly Agree.

	1	2	3	4	5
WFP effectively collaborates with local suppliers to ensure the timely delivery of goods and services for humanitarian operations					
WFP's procurement processes are transparent and accountable, fostering trust and integrity in its partnerships with suppliers					
We actively seek feedback from local suppliers to continuously improve our procurement practices and operations					
WFP is committed to promoting environmentally sustainable procurement practices, such as green procurement and waste reduction initiatives					
We believe that WFP's procurement strategies positively impact the efficiency and effectiveness of humanitarian operations					
WFP maintains open and clear communication channels with local suppliers to facilitate smooth coordination and collaboration					
WFP's performance in meeting the procurement needs and expectations of local suppliers has improved over time					
Overall, local suppliers perceive WFP as a reliable and trustworthy partner in procurement and supply chain activities					

Appendix IV*:* Interview Questions

Part A: Supplier Relationship Management

1. How does the World Food Program manage its relationships with local suppliers in South Sudan?

2. Can you provide examples of how effective supplier relationship management has positively impacted the performance of WFP operations in South Sudan?

3. What initiatives has the World Food Program implemented to promote environmentally sustainable procurement practices in South Sudan?

Part B: Green Procurement

4. How do you measure the impact of green procurement strategies on the overall performance of WFP operations in South Sudan?

5. How does the World Food Program handle the return and disposal of unused or expired relief items in South Sudan?

Part C: Reverse Logistics

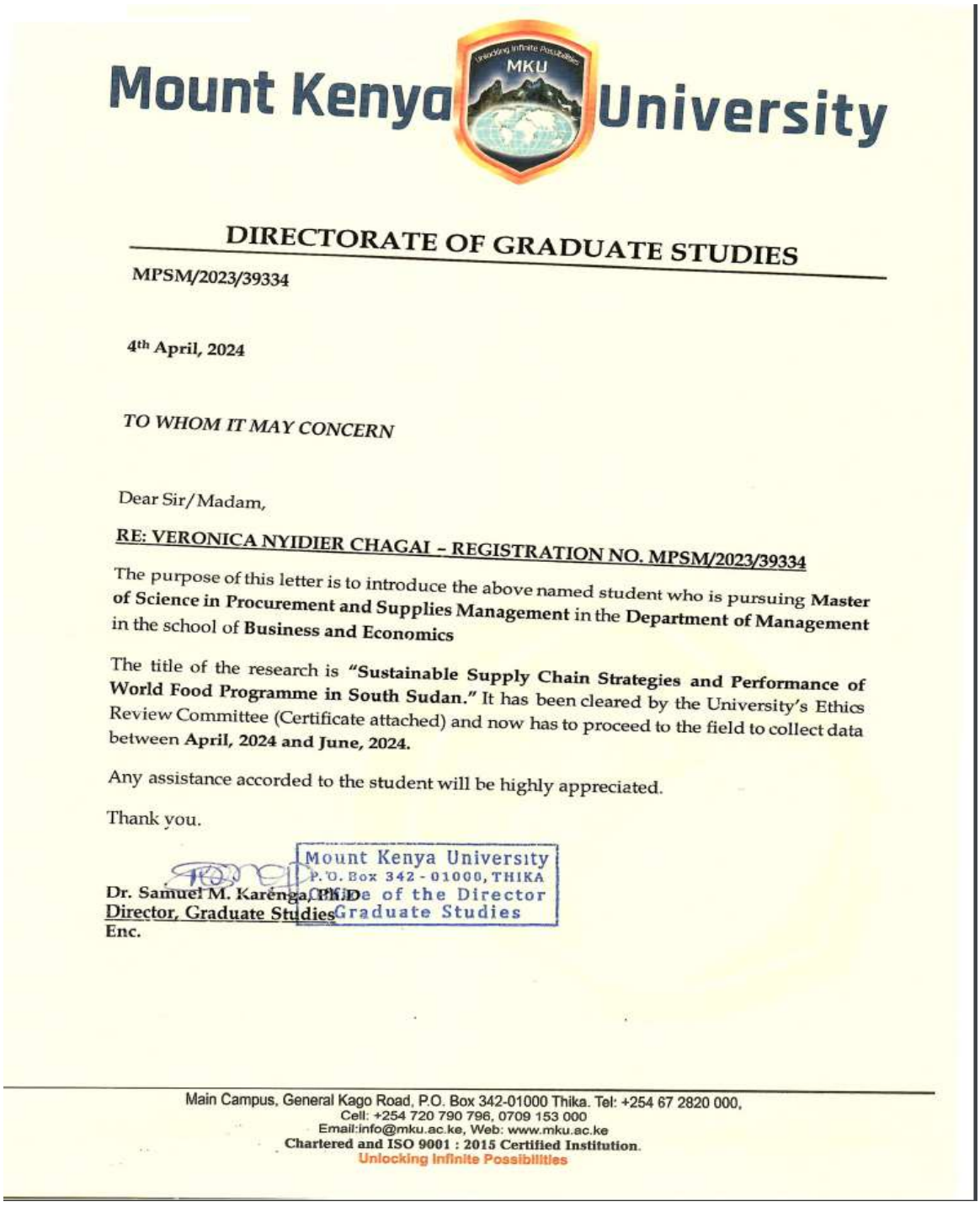
6. Have you observed any correlations between efficient reverse logistics processes and the performance of WFP operations in South Sudan?

Part D: Transportation Optimization

7. What strategies does the World Food Program employ to optimize transportation logistics for delivering goods in South Sudan?

8. Can you discuss the relationship between transportation optimization efforts and the overall performance of WFP operations in South Sudan?

Appendix V: Introduction letter for Data collection



Mount Kenya University

DIRECTORATE OF GRADUATE STUDIES

MPSM/2023/39334

4th April, 2024

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

RE: VERONICA NYIDIER CHAGAI – REGISTRATION NO. MPSM/2023/39334

The purpose of this letter is to introduce the above named student who is pursuing **Master of Science in Procurement and Supplies Management** in the **Department of Management** in the school of **Business and Economics**

The title of the research is **"Sustainable Supply Chain Strategies and Performance of World Food Programme in South Sudan."** It has been cleared by the University's Ethics Review Committee (Certificate attached) and now has to proceed to the field to collect data between **April, 2024 and June, 2024.**

Any assistance accorded to the student will be highly appreciated.

Thank you.

Mount Kenya University
P. O. Box 342 - 01000, THIKA
Office of the Director
Graduate Studies

Dr. Samuel M. Karenga, Ph.D
Director, Graduate Studies
Enc.

Main Campus, General Kago Road, P.O. Box 342-01000 Thika. Tel: +254 67 2820 000,
Cell: +254 720 790 796, 0709 153 000
Email:info@mku.ac.ke, Web: www.mku.ac.ke
Chartered and ISO 9001 : 2015 Certified Institution.
Unlocking Infinite Possibilities

Appendix VI: Approved ERC Protocol

Mount Kenya University

REF: MKU/ISERC/3572
TO: VERONICA NYIDIER CHAGAI

Date: 04 April 2024

REG: MPSM/2023/39334

Dear Sir/Madam,

RE: SUSTAINABLE SUPPLY CHAIN STRATEGIES AND PERFORMANCE OF WORLD FOOD PROGRAMME IN SOUTH SUDAN

This is to inform you that **Mount Kenya University** has reviewed and approved your above research proposal. Your application approval number is **2616.** The approval period is **04/04/2024 - 03/04/2025.**

This approval is subject to compliance with the following requirements:

i. Only approved documents including informed consents, study instruments, MTA will be used
ii. All changes including amendments, deviations and violations are submitted for review and approval by **Mount Kenya University**
iii. Death and life threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to **Mount Kenya University** within 72 hours of notification
iv. Any changes, anticipated or otherwise that may increase the risks or affect the safety or welfare of study participants and others or affect the integrity of the research must be reported to **Mount Kenya University** within 72 hours
v. Clearance for export of biological specimens must be obtained from relevant Institutions
vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal
vii. Submission of an executive summary report within 90 days upon completion of the study to **Mount Kenya University**

Prior to commencing your study, you will be expected to comply with any additional requirements from the relevant authorities in the country where this study will be conducted.

Yours sincerely,

Dr. Alfred Owino, PhD
Chairman, Mount Kenya University ISERC

Appendix VII: Turnitin Report

SUSTAINABLE SUPPLY CHAIN STRATEGIES AND PERFORMANCE OF WORLD FOOD PROGRAMME IN SOUTH SUDAN

ORIGINALITY REPORT

13%	%	13%	0%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	Naomi Pendle. "Law and Famine: Learning from the Hunger Courts in South Sudan", Development and Change, 2023 Publication	1%
2	Jinfeng Wang, Lei Zhu, Lijie Feng, Jian Feng. "A meta-analysis of sustainable supply chain management and firm performance: Some new findings on sustainable supply chain management", Sustainable Production and Consumption, 2023 Publication	1%
3	Pravin Kumar, Rajesh Kr Singh. "Application of Industry 4.0 technologies for effective coordination in humanitarian supply chains: a strategic approach", Annals of Operations Research, 2021 Publication	1%
4	Guangqian Peng. "Inter-organizational information exchange, supply chain	<1%

Appendix VIII: List of Suppliers and Vendors

Food Suppliers
1. Cargill
2. ADM (Archer Daniels Midland Company)
3. Olam International
4. Louis Dreyfus Company
5. Wilmar International

Agricultural and Local Produce Suppliers
6. Sosoma Industries Ltd.
7. Africa Improved Foods
8. Mukwano Group
9. Equator Seeds Limited
10. AfriNut Ltd.

Logistics and Transportation Providers
11. DHL Global Forwarding
12. Maersk Line
13. Bolloré Logistics
14. Agility Logistics
15. Kuehne + Nagel

Packaging and Warehousing Solutions
16. Tetra Pak
17. Smurfit Kappa
18. International Paper
19. Crown Holdings
20. CHEP

Medical Supplies and Equipment
21. GlaxoSmithKline (GSK)
22. Pfizer
23. Medtronic
24. MSD (Merck & Co., Inc.)
25. Sanofi

Non-Food Items (NFIs)
26. Procter & Gamble
27. Unilever

28. Kimberly-Clark
29. Johnson & Johnson
30. Colgate-Palmolive

Water, Sanitation, and Hygiene (WASH) Supplies
31. Grundfos
32. LIXIL Group
33. Tata Chemicals
34. Ecolab
35. Xylem Inc.

IT and Telecommunications
36. Huawei Technologies
37. Ericsson
38. Nokia Networks
39. Cisco Systems
40. Oracle Corporation

Fuel and Energy Providers
41. Total Energies
42. Shell
43. BP
44. Vivo Energy
45. Engen Petroleum

Construction and Shelter
46. LafargeHolcim
47. CEMEX
48. Dangote Cement
49. BAM International
50. Mabati Rolling Mills

Financial Services
51. Standard Chartered Bank
52. Equity Bank
53. KCB Group
54. Ecobank
55. Western Union

Local Suppliers and Vendors

56. South Sudan Breweries Limited
57. Juba Supermarket
58. Gulf Catering Company
59. Equator Catering Services
60. Fattouch Group

Educational Supplies
61. Cambridge University Press
62. Pearson Education
63. Macmillan Education
64. Hachette Education
65. Oxford University Press

Security Services
66. G4S
67. Securitas AB
68. Allied Universal
69. Control Risks
70. Red24

Environmental and Waste Management
71. Veolia Environment
72. SUEZ
73. Waste Management, Inc.
74. Clean Harbors
75. Republic Services

Professional Services
76. PricewaterhouseCoopers (PwC)
77. KPMG
78. Ernst & Young (EY)
79. Deloitte
80. McKinsey & Company

Health and Nutrition
81. DSM Nutritional Products
82. BASF Nutrition & Health
83. Nestlé
84. Arla Foods
85. Danone

Clothing and Textiles
86. Patagonia
87. Hanesbrands Inc.
88. VF Corporation
89. Inditex (Zara)
90. H&M Group

Renewable Energy Providers
91. SunPower Corporation
92. First Solar
93. SolarWorld
94. Trina Solar
95. Vestas Wind Systems

Communication and Media
96. BBC Media Action
97. Al Jazeera Media Network
98. Reuters
99. Thomson Reuters Foundation
100. Associated Press (AP)

Humanitarian Aid and NGOs
101. Save the Children
102. CARE International
103. Oxfam
104. International Rescue Committee (IRC)