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Strategic Inventory Management and Operational Cost Minimisation Efficiency of Contemporary Eateries in South-South Nigeria

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Abstract
Strategic inventory management which is a comprehensive approach that integrates long-term planning, control and optimisation of inventory-related activities with organisational cost objectives plays a vital role in enhancing operational cost optimisation. Despite its important and optimal benefits, considerable number of contemporary food service operators continue to experience rising operational costs driven largely by inefficient inventory practices, including excessive spoilage, poor storage conditions, uncoordinated sourcing, and irregular replenishment decisions. This study examined the effect of strategic inventory management on operational cost minimisation efficiency of contemporary eateries in the South-South, Nigeria. The specific objectives were to ascertain how strategies such as supplier base diversity, inventory source strategy, supplier concentration level, supplier switching flexibility, modern storage infrastructure, inventory level planning policy and systematic replenishment planning levels affect waste cost minimisation attainability. A survey research design was adopted, primary data were obtained through 5-point Likert scale structured questionnaire, administered to 150 respondents from among owners, storekeepers, procurement officers, accountants, and branch managers/supervisors across 34 renowned eateries in the zone, census sampling technique was employed, data were analysed using Ordinary Least Squares (OLS) multiple regression analysis, and SPSS version 21 was employed as the statistical tool. Findings revealed that inventory level planning emerged as the most influential variable with a strong positive and highly significant effect, supplier base diversity, supplier switching flexibility, modern storage infrastructure, and systematic replenishment planning had positive and statistically significant effect, inventory source strategy and supplier concentration level showed positive but statistically insignificant effect The study concluded that strategic inventory management had a positive relationship with operational cost minimisation efficiency, which strongly support Resource-Based View Theory the anchoring theory. This study recommended that management of eateries should institutionalized strategies with positive and statistically significant, reduce excessive dependence on a limited suppliers and re-evaluate and optimize their inventory source strategies.

Keywords: Strategic Inventory Management, Supplier Base Diversity, Inventory Source Strategy, Supplier Concentration Level, Supplier Switching Flexibility, Modern Storage Infrastructure, Inventory Level Planning, Systematic Replenishment Planning, Operational Cost Minimization Efficiency, Waste Cost Minimization Attainability

1. Introduction

1.1 Background to the Study

In recent years, the food service industry had operated within an increasingly complex environment characterized by supply chain disruptions, volatile input prices, intense competition, and evolving consumer preferences. These developments had compelled eateries to adopt structured and cost-oriented approaches in order to boost inventory management operations and remain competitive in the business world. Inventory constitutes a substantial portion of working capital and also represents a major cost driver in food service organizations especially where raw materials are perishable and directly linked to service delivery outcomes (Chopra & Meindl, 2022; Heizer *et al*., 2020).

Currently, inventory decisions have extended beyond physical stock control to include cost measurement, cost optimisation, and waste minimisation. Scholars such as Adegbie & Fakile (2023) and Singh *et al*. (2023) and) had reported that ineffective inventory practices often resulted in excessive spoilage, high procurement costs, and inefficient utilisation of resources.

Consequently, eatery that fails to adopt structured inventory systems experienced increased operational costs and weakened financial performance. The cost implications of inventory decisions therefore become critical to operational sustainability. As noted by Slack *et al*. (2022), organisations that effectively managed inventory-related costs are better positioned to achieve operational efficiency and maintain service quality. Thus, the integration of cost considerations into inventory management becomes essential for improving operational outcomes in the food service sector.

Strategic inventory management had emerged as a comprehensive approach that integrated long-term planning, control, and optimisation of inventory-related activities with organisational cost objectives. Unlike traditional inventory management, which focuses primarily on stock availability, strategic inventory management emphasizes cost efficiency, resource utilisation, and waste reduction across procurement, storage, handling, and replenishment processes (Christopher, 2022 Jacobs & Chase, 2021). This approach enables organisations to align inventory decisions with broader financial and operational goals. Empirical evidence had shown that firms adopting strategic inventory management achieved improved cost control and reduced waste levels (Kim & Park, 2023; Wang *et al*., 2022). In eateries, where profit margins are often thin and input costs volatile, the application of strategic inventory management becomes particularly relevant.

The ability of a firm to optimise procurement quantities, minimise spoilage, and control holding costs contributes significantly to operational cost minimisation efficiency. Furthermore, strategic inventory management facilitates the use of management accounting tools such as variance analysis, cost tracking, and performance monitoring systems, which enhance decision-making and financial discipline (Bowersox *et al*., 2019). These practices collectively improve the efficiency with which resources are utilized for the purpose of reducing avoidable operational costs.

In this study, the concept of operational cost minimisation efficiency reflects the extent to which eateries effectively reduces avoidable costs associated with inventory handling, particularly waste-related costs. It is a concept that extends beyond general operational performance and embodies cost efficiency outcomes derived from inventory management. Scholars such as Parfitt *et al*. (2021) and Akinyemi & Adejumo (2020) had identified food waste as a major contributor to operational costs in food service establishments. Food waste represents not only lost inventory but also embodied costs related to procurement, storage, labour, and energy consumption. Consequently, waste cost minimisation attainability is recognised as a critical indicator of operational efficiency in eateries. Studies by Rahim and Afsar (2024) and Olatunji and Adebayo (2024) had shown that firms implementing structured inventory systems recorded lower waste-related costs and improved financial outcomes. Inefficient inventory practices, on the other hand, results in overstocking, spoilage, and stock obsolescence, thereby increasing operational costs and reducing profitability (Akinyemi & Adejumo, 2020). Therefore, the ability of eateries to minimise waste-related costs had become a key determinant of their operational sustainability and financial viability.

Globally, the food service industry had experienced significant expansion driven by urbanisation, changing consumption patterns, and increasing demand for convenience foods. This growth has intensified competition among food service providers and increased the importance of cost minimization efficiency in business operations (Christopher, 2022; Umo 2022; Bowersox *et al*., 2019). Inventory-related costs were identified as a major component of total operating expenses in food service operations, particularly in establishments dealing with perishable goods. Empirical studies had indicated that firms adopting cost-oriented inventory strategies were better able to manage procurement costs, reduce spoilage, and enhance operational efficiency (Zhang *et al*., 2024; Wang *et al*., 2022). In developed economies, the integration of digital inventory systems and predictive analytics improves cost control and waste reduction. However, such advancements had not been fully realised in developing economies, where infrastructural challenges and resource constraints persisted. As a result, the need for strategic inventory management becomes more pronounced in these contexts.

In a developing economy such as Nigeria, inventory cost management challenges have been exacerbated by infrastructural deficiencies, supply chain disruptions, and price volatility. Food service organisations had frequently encountered irregular supply conditions, fluctuating input costs, and inadequate storage facilities, all of which contributed to inefficiencies in inventory management (Okon & Etim, 2022; Oni & Daniyan, 2021). These challenges had increased the likelihood of overstocking, understocking, and excessive spoilage, thereby raising operational costs. Empirical evidence by Akinyemi & Adejumo (2020) and Nwankwo Okeke (2019) and showed that many Nigerian eateries relied on informal inventory practices which lacked systematic cost control mechanisms. Such practices had resulted in poor procurement decisions, inaccurate inventory records, and increased waste levels. Consequently, there had been a growing need for the adoption of structured inventory systems that will incorporate cost measurement and control. Strategic inventory management provides a viable framework for addressing these challenges because it integrates cost analysis into inventory decision-making processes.

The South-South region of Nigeria represents a dynamic economic zone characterised by rapid urbanisation, population growth, and increased hospitality activities. Cities such as Port Harcourt, Uyo, Benin City, Warri, Yenegoa and Calabar witnesses a proliferation of eateries catering for diverse consumer needs. Inspite of this growth, eateries in the region continue to face significant operational challenges related to inventory management and cost minimization efficiency. Supply instability, transportation inefficiencies, and price fluctuations complicates procurement and inventory planning processes (Okon & Etim, 2022). These conditions increase the risk of waste and elevated operational costs. Empirical findings continued to suggest that eateries adopting structured inventory management practices are better able to control costs and improve operational efficiency (Adegbie & Fakile, 2023). However, many organisations still relied on intuition-based decision-making, and this limited their ability to achieve cost minimisation efficiency. As competition intensifies, the importance of strategic inventory management in achieving operational cost minimisation efficiency becomes increasingly evident.

Furthermore, supplier base diversity, modern strorage

infractructuure, inventory level planning, systematic replenishment planning dimensions of strategic inventory management had played critical roles in influencing waste cost minimisation. From available accounting literature, supplier base diversity enhanced sourcing flexibility and also reduced the risk of supply disruptions, thereby minimising waste caused by delays or poor-quality inputs (Christopher & Peck, 2020; Chelimo & Ndeto, 2023). Inventory source strategy enabled eateries to balance cost and reliability by combining different procurement channels (Eze & Ibe, 2021). Supplier concentration influenced bargaining power and exposure to supply risks, while supplier switching flexibility enhanced responsiveness to changing supply conditions (Afolabi & Uchenna, 2022; Nguyen *et al*., 2021). In addition, modern storage infrastructure played a crucial role in preserving inventory quality and reducing spoilage, particularly in the environments with unstable electricity supply (Buzu, 2021; Gołaś, 2020). Inventory level planning and systematic replenishment planning further contributed to cost efficiency by ensuring optimal stock levels and reducing overstocking (Muchaendepi *et al*., 2019; Rahim & Afsar, 2024). These strategies collectively influenced the extent to which eateries are able to minimise waste-related costs.

Despite the growing recognition of the importance of strategic inventory management, empirical studies focusing on its impact on operational cost minimisation efficiency in the Nigerian food service sector remained limited to the best of the knowledge of the researcher. Most existing studies concentrated on manufacturing and retail sectors, with little attention given to eateries, which possessed unique operational characteristics such as high perishability and demand uncertainty (Parfitt *et al*., 2021). Moreover, previous studies often measured operational cost minimization efficiency using profitability or sales growth, which might not fully capture the cost efficiency implications of inventory management. Therefore, there had been significant need to specifically study strategic inventory management and operational cost minimization efficiency (using waste cost minimization attainability as its measure) This is the gap this study sought to address and the researcher reached a decision to study the operating contemporary eateries in South-South Nigeria.

1.2 Statement of the Problem

The efficient management of inventory costs has remained central to the survival and sustainability of food service establishments, particularly in environments characterized by high perishability and cost sensitivity. In an ideal operational setting, eateries are expected to integrate structured inventory strategies with cost control mechanisms in order to achieve optimal resource utilization and minimize avoidable operational expenses. This involves the systematic coordination of procurement, storage, stock levels, and replenishment activities in a manner that aligns with demand patterns while controlling cost leakages. Contemporary management accounting literature emphasizes that when inventory decisions are guided by cost-oriented strategies, organizations are better positioned to reduce waste-related costs, improve cost efficiency, and enhance operational sustainability (Heizer *et al*., 2020; Slack *et al*., 2022). In the food service industry, where raw materials are highly perishable, the ability to minimize waste cost is particularly critical, as wasted inventory directly translates into financial loss. Empirical evidence has further suggested that structured inventory systems such as demand-based replenishment, optimized stock levels, and effective storage infrastructure contribute significantly to cost minimisation efficiency (Bowersox *et al*., 2019; Jacobs & Chase, 2021). Therefore, an effective linkage between strategic inventory management and operational cost minimisation efficiency is expected to exist, especially in eateries where inventory constitutes a substantial proportion of operating costs.

However, the reality among many eateries in South-South Nigeria reflects a significant deviation from this ideal. A considerable number of food service operators continue to experience rising operational costs driven largely by inefficient inventory practices, including excessive spoilage, poor storage conditions, uncoordinated sourcing, and irregular replenishment decisions (Umo, 2022). These inefficiencies often manifest in the form of avoidable waste costs, which erode profit margins and weaken financial sustainability. Studies had shown that inadequate inventory cost control mechanisms contribute to increased operational expenses, particularly in developing economies where supply chain disruptions, price volatility, and infrastructural limitations are prevalent (Oni & Daniyan, 2021; Akinyemi & Adejumo, 2020). Furthermore, many eateries rely on intuition-based decision-making rather than structured inventory planning systems, resulting in poor cost visibility and ineffective cost management (Goel *et al*., 2022). Although some empirical studies had attempted to address inventory-related inefficiencies, most have focused on general inventory management practices without explicitly linking them to cost minimisation efficiency. Others have concentrated on large-scale firms or manufacturing sectors, thereby overlooking the unique operational and cost challenges faced by small and medium-sized eateries (Nwankwo & Okeke, 2019; Okon & Etim, 2022). Consequently, waste-related costs remain persistently high, indicating that existing approaches have not sufficiently addressed the problem within this specific context.

In addition to these practical challenges, there exists a notable gap in empirical literature regarding the integration of strategic inventory management dimensions with operational cost minimisation efficiency in the eatery sector. Prior studies have predominantly employed performance indicators such as profitability, return on assets, or sales growth, which are indirectly influenced by inventory decisions and may not adequately capture cost inefficiencies arising from waste (Parfitt *et al*., 2021; Goel *et al*., 2022). Moreover, limited attention has been given to critical strategic components such as supplier base diversity, supplier concentration, switching flexibility, inventory source strategy, modern storage infrastructure, inventory level planning, and systematic replenishment planning, all of which have direct implications for cost control and waste reduction. Where such variables have been examined, they have often been studied in isolation rather than within a comprehensive strategic inventory framework. This has resulted in fragmented evidence and limited understanding of how these strategies collectively influence cost minimisation efficiency. The persistence of high waste costs in eateries therefore suggests the need for a more integrated and context-specific investigation. This study seeks to bridge this gap by examining how strategic inventory management, through its key dimensions, influences

operational cost minimisation efficiency proxied by waste cost minimisation attainability among contemporary eateries in South-South Nigeria. By adopting a cost-focused perspective and incorporating multiple strategic variables, the study aims to provide empirical evidence that will support more effective cost control practices and contribute to improved operational efficiency in the sector.

1.3 Objectives of the Study

The main objective of the study is to examine the effect of strategic inventory management on the operational cost minimisation efficiency of contemporary eateries in South-South Nigeria. The specific objectives of the study are to:

1. Examine the effect of supplier base diversity on waste cost minimisation attainability of contemporary eateries in South-South Nigeria.
2. Assess the effect of inventory source strategy on waste cost minimisation attainability of contemporary eateries in South-South Nigeria.
3. Determine the effect of supplier concentration level on waste cost minimisation attainability of contemporary eateries in South-South Nigeria.
4. Evaluate the effect of supplier switching flexibility on waste cost minimisation attainability of contemporary eateries in South-South Nigeria.
5. Examine the effect of modern storage infrastructure on waste cost minimisation attainability of contemporary eateries in South-South Nigeria.
6. Assess the effect of inventory level planning policy on waste cost minimisation attainability of contemporary eateries in South-South Nigeria.
7. Determine the effect of systematic replenishment planning on waste cost minimisation attainability of contemporary eateries in South-South Nigeria.

1.4 Research Hypotheses

The following null hypotheses were formulated to guide the empirical investigation of the study:

H_{01}: Supplier base diversity has no significant effect on waste cost minimisation attainability of contemporary eateries.

H_{02}: Inventory source strategy has no significant effect on waste cost minimisation attainability of contemporary eateries.

H_{03}: Supplier concentration level has no significant effect on waste cost minimisation attainability of contemporary eateries.

H_{04}: Supplier switching flexibility does not have significant effect on waste cost minimisation attainability of contemporary eateries.

H_{05}: Modern storage infrastructure does not have significant effect on waste cost minimisation attainability of contemporary eateries.

H_{06}: Inventory level planning policy has no significant effect on waste cost minimisation attainability of contemporary eateries.

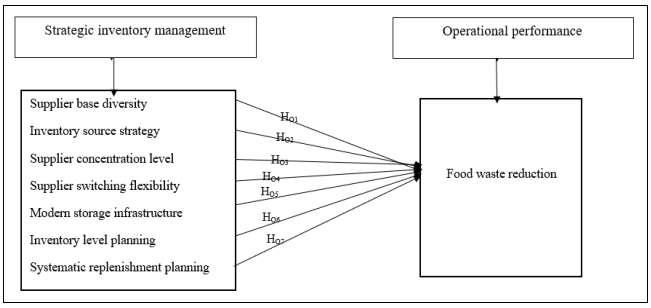
H_{07}: Systematic replenishment planning does not have significant effect on waste cost minimisation attainability of contemporary eateries.

2. Review of Related Literature

This chapter contains review of relevant conceptual, theoretical, and empirical literature relating to strategic inventory management and operational cost minimisation efficiency. The review establishes the conceptual foundations of the study, clarify key constructs, and situate the research within existing scholarly discourse.

2.1 Conceptual Framework

The conceptual relationship between strategic inventory management and operational cost minimization efficiency examined in this study are depicted below:



Source: Researcher's conceptualisation (2026)

Fig 1: Conceptual framework of the variables

2.1.1 Strategic inventory management

Strategic inventory management is conceptualised as a deliberate, long-term managerial approach to planning, sourcing, storing, controlling, and replenishing inventory in a manner that align inventory decisions with organisational strategy and cost efficiency objectives (Heizer *et al*., 2020; Jacobs & Chase, 2021). Unlike traditional inventory control, which focuses primarily on record keeping and stock valuation, strategic inventory management integrate procurement policies, supplier relationships, demand forecasting, and storage optimisation to support operational cost minimisation efficiency (Stevenson, 2021; Slack *et al*., 2022). In this regard, inventory is not merely treated as a cost element but as a strategic resource capable of influencing cost structures, operational efficiency, and organisational sustainability (Christopher, 2016; Bowersox *et al*., 2019). From an accounting perspective, inventories is defined in line with International Accounting Standard (IAS 2) as assets held for sale, in the process of production, or in the form of materials and supplies to be consumed in production or service delivery (IFRS Foundation, 2023). This definition underscores the importance of inventory in service-oriented organisations such as eateries, where raw materials directly determined cost accumulation and service delivery outcomes (Slack *et al*., 2022). Effective strategic inventory management therefore consider essential for ensuring uninterrupted operations and achieving waste cost minimisation attainability (Heizer *et al*., 2020).

Strategic inventory management involves balancing competing cost elements, particularly ordering costs, holding costs, shortage costs, and spoilage-related costs, all of which significantly influenced operational cost efficiency (Jacobs & Chase, 2021; Monczka *et al*., 2022). Scholars had argued that excessive inventory tied down working capital, increased storage and insurance costs, and heightened the risk of spoilage, while insufficient inventory exposed firms to stockouts, emergency procurement costs, and service disruptions (Heizer *et al*., 2020; Slack *et al*., 2022). The strategic role of inventory management therefore lay in achieving an optimal inventory level that minimises total inventory-related costs while maintaining service continuity (Christopher, 2022). Supplier-related decisions also

constitute a critical dimension of strategic inventory management. Empirical studies had shown that supplier base diversity, supplier concentration, and switching flexibility significantly influenced procurement cost efficiency and supply reliability (Monczka *et al*., 2022; Bowersox *et al*., 2019). A diversified supplier base reduced dependency risk and enabled competitive pricing, while excessive supplier concentration increased exposure to price volatility and supply disruptions (Christopher, 2022). Consequently, strategic inventory management requires careful evaluation of supplier structures to enhance cost control and operational stability (Slack *et al*., 2022).

In addition, strategic inventory management encompasses inventory sourcing strategies, storage infrastructure, and replenishment systems, all of which directly affects waste cost minimisation attainability (Jacobs & Chase, 2021; Stevenson, 2021). The selection of inventory sources such as wholesalers, distributors, and local suppliers influences procurement costs, lead times, and product quality consistency (Christopher, 2022). Modern storage infrastructure, including refrigeration and controlled storage systems, plays a crucial role in reducing spoilage and preserving inventory value, thereby minimising waste-related costs (Krajewski *et al*., 2019; Slack *et al*., 2022). Similarly, systematic replenishment planning ensures that inventory inflows align with demand patterns, reducing overstocking and emergency procurement expenses (Silver *et al*., 2017; Jacobs & Chase, 2021). From the researcher's perspective, strategic inventory management is not merely an operational function but a core cost management mechanism that integrates accounting principles with supply chain decisions to achieve waste cost minimisation attainability. It therefore argues that eateries that adopt structured and strategic inventory practices are more likely to achieve superior cost efficiency outcomes compare to those relying on informal and reactive inventory systems.

2.1.1.1 Supplier base diversity

Supplier base diversity is conceptualised as the extent to which an organisation sources its inventory requirements from a broad and heterogeneous set of suppliers rather than relying on a limited or homogeneous group (Monczka *et al*., 2022; Ivanov & Dolgui, 2021). It reflectes deliberate managerial decisions aimed at spreading procurement risks, enhancing supply reliability, and strengthening operational flexibility within dynamic supply environments (Christopher, 2022; Slack *et al*., 2022). In strategic inventory management literature, supplier base diversity is regarded as a core sourcing strategy that enables firms to mitigate supply disruptions, price volatility, and quality inconsistencies, particularly in environments characterised by uncertainty and demand variability (Ivanov *et al*., 2021; Jacobs & Chase, 2021). For service-oriented firms such as eateries, where uninterrupted access to perishable inputs is critical, supplier base diversity is considered central to sustaining daily operations and minimising cost inefficiencies arising from supply interruptions (Heizer *et al*., 2020; Stevenson, 2021). From a strategic perspective, supplier base diversity extends beyond merely increasing the number of suppliers to include the deliberate selection of suppliers with varying capabilities, geographical locations, cost structures, and delivery lead times (Monczka *et al*., 2022; Bowersox *et al*., 2019). Scholars have argued that firms with diversified supplier bases are better positioned to respond to external shocks such as transportation delays, inflationary pressures, and supplier failures compared to firms that depend heavily on a few suppliers (Ivanov & Dolgui, 2021; Wagner & Bode, 2020). Consequently, supplier base diversity is viewed as an embedded risk management mechanism within strategic inventory management that enhances operational stability and cost control (Christopher, 2022; Slack *et al*., 2022).

In the context of inventory management, supplier base diversity also influences procurement efficiency and operational cost minimisation efficiency through improved bargaining power and sourcing flexibility (Monczka *et al*., 2022; Jacobs & Chase, 2021). A diversified supplier base is found to foster competitive pricing, reduce opportunistic behaviour by suppliers, and enhance negotiation leverage, thereby lowering procurement costs and associated waste-related expenses (Christopher, 2022; Bowersox *et al*., 2019). By maintaining multiple sourcing alternatives, firms are able to adjust order quantities and delivery schedules in response to fluctuating demand patterns without accumulating excessive inventory that could lead to spoilage and waste costs (Heizer *et al*., 2020; Stevenson, 2021). This flexibility is particularly relevant to eateries operating under tight margins and facing high perishability risks, where overstocking translated directly into waste cost escalation (Slack *et al*., 2022; Jacobs & Chase, 2021). Furthermore, supplier base diversity enhances inventory availability and continuity of operations by reducing dependency on single suppliers and mitigating the effects of supplier-specific disruptions (Ivanov *et al*., 2021; Monczka *et al*., 2022). Empirical evidence had shown that firms with diversified supplier networks experienced fewer stockouts and improved service delivery outcomes, which in turn reduced emergency procurement costs and waste-related inefficiencies (Wagner & Bode, 2020; Ivanov & Dolgui, 2021). In this regard, supplier base diversity contributed directly to waste cost minimisation attainability by ensuring consistent supply flow and reducing losses associated with supply interruptions and poor-quality inputs (Christopher, 2022; Slack *et al*., 2022).

Measurement of supplier base diversity in this study is operationalised using perceptual and objective indicators captured through structured questionnaires, consistent with contemporary supply chain research methodologies (Eze & Agu, 2022; Ivanov *et al*., 2021). It is measured by the number of active suppliers engaged by the eatery, the degree of variation among suppliers in terms of sourcing channels and geographical spread, and the extent to which alternative suppliers are utilised for critical inventory items (Monczka *et al*., 2022; Jacobs & Chase, 2021). These indicators is assessed using Likert-scale items to capture the intensity of supplier diversification practices, and composite scores are computed to represent the level of supplier base diversity across sampled eateries (Eze & Agu, 2022; Wagner & Bode, 2020). Within the conceptual framework, supplier base diversity is treated as a distinct dimension of strategic inventory management that directly influences operational cost minimisation efficiency, proxied by waste cost minimisation attainability (Slack *et al*., 2022). From the researcher's perspective, supplier base diversity is considered as a practical and contextually relevant strategy for eateries operating in developing economies such as Nigeria, where infrastructural constraints and supply uncertainties were prevalent. It is therefore argued that, compare to technologically intensive inventory systems,

supplier base diversification offers more accessible and cost-effective mechanism for enhancing supply reliability, reducing waste-related costs, and improving overall operational cost efficiency in resource-constrained environments.

2.1.1.2 Inventory source strategy

Inventory source strategy is conceptualized as the structured and deliberate approach through which organizations select, combine, and manage procurement channels for acquiring inventory inputs in alignment with cost efficiency and operational objectives (Monczka *et al*., 2021; Chopra & Meindl, 2022). It explains as a strategic dimension of inventory management that extends beyond routine purchasing decisions to include long-term sourcing configurations involving manufacturers, wholesalers, distributors, and local suppliers (Christopher, 2022; Jacobs & Chase, 2021). Scholars maintain that firms that align their sourcing strategies with operational requirements achieved improved supply continuity, cost control, and responsiveness to demand fluctuations (Ketchen & Hult, 2020; Ivanov, 2021). In the food service sector, where perishability and time sensitivity of inputs are critical, sourcing strategy is considered fundamental to ensuring freshness, minimizing spoilage, and sustaining service delivery (Bowersox *et al*., 2020; Heizer *et al*., 2020). It is further noted that inventory source strategy involves evaluating suppliers based on reliability, pricing, lead time, and quality consistency, thereby influencing overall operational efficiency (Monczka *et al*., 2021; Stevenson, 2021). Empirical studies indicates that firms that adopts structured sourcing strategies experienced fewer disruptions and lower operational losses compared to those relying on informal procurement systems (Mandal, 2021; Ayaburi *et al*., 2020). Consequently, inventory source strategy is regarded as a critical mechanism for achieving supply chain resilience and cost optimization in dynamic environments (Ivanov & Dolgui, 2022; Christopher, 2022).

The strategic relevance of inventory source strategy further reflects in decisions regarding the mix of local, regional, and international sourcing channels adopted by firms (Chopra & Meindl, 2022; Jacobs & Chase, 2021). It is observed that local sourcing enhanced responsiveness, reduced transportation costs, and improved product freshness, particularly for perishable goods (Mangla *et al*., 2021; Adeoye & Elegunde, 2020). Conversely, sourcing from distant or international suppliers is associated with cost advantages in bulk purchasing but exposed firms to risks such as exchange rate volatility, logistics delays, and regulatory constraints (Christopher, 2022; Ivanov, 2021). Studies showed that firms that combined multiple sourcing channels strategically are better able to balance cost efficiency with supply reliability (Mandal, 2021; Ayaburi *et al*., 2020). In addition, inventory source strategy influences inventory holding patterns, as unreliable sources often led to overstocking as a buffer against uncertainty, thereby increasing waste and cost inefficiencies (Heizer *et al*., 2020; Stevenson, 2021). Within the context of eateries, where demand variability and supply uncertainty were prevalent, the adoption of flexible and diversified sourcing strategies was found to significantly reduce spoilage and improve operational cost efficiency (Bowersox *et al*., 2020; Jacobs & Chase, 2021). Measurement of inventory source strategy in empirical studies had been conducted using indicators such as sourcing diversity, supplier type mix, procurement frequency, and perceived reliability of supply channels (Ayaburi *et al*., 2020; Mandal, 2021). These measures were often captured using structured instruments and aggregated into composite indices for analytical purposes.

From the perspective of this study, inventory source strategy is considered a vital proxy of strategic inventory management due to its direct influence on waste cost minimisation attainability and operational cost efficiency. It is argued that poorly structured sourcing decisions often resulted in irregular supply, excessive inventory accumulation, and increased spoilage costs, thereby undermining cost minimisation efforts (Christopher, 2022; Heizer *et al*., 2020). Conversely, well-aligned sourcing strategies are found to support just-in-time availability, reduce holding costs, and enhance inventory turnover efficiency (Chopra & Meindl, 2022; Ivanov & Dolgui, 2022). Empirical evidence further supported the view that strategic sourcing significantly influenced cost outcomes and operational sustainability in service-oriented firms (Mandal, 2021; Adeoye & Elegunde, 2020). In the context of South-South Nigeria, where infrastructural constraints, supply instability, and price fluctuations were prevalent, inventory source strategy is particularly relevant as a practical and adaptable tool for managing inventory-related costs (Oni & Daniyan, 2021). In the opinion of the researcher, inventory source strategy represents one of the most actionable and impactful dimensions of strategic inventory management available to small and medium eateries, as it requires minimal technological sophistication yet offered substantial potential for reducing waste-related costs and enhancing operational efficiency.

2.1.1.3 Supplier concentration level

Supplier concentration level is conceptualized as the extent to which a firm's procurement activities are dependent on a limited number of suppliers as opposed to being distributed across a broader supplier base (Monczka *et al*., 2021; Chopra & Meindl, 2022). It is described as a critical structural attribute of sourcing strategy that shaped supply risk exposure, bargaining power, procurement costs, and operational flexibility within organizations (Christopher, 2022; Ivanov & Dolgui, 2022). Scholars explained that a high level of supplier concentration implied that a significant proportion of inventory requirements is sourced from a few dominant suppliers, thereby increasing vulnerability to disruptions, opportunistic pricing, and delivery uncertainties (Ivanov, 2021; Ketchen & Hult, 2020). Conversely, a lower concentration level indicates a more balanced sourcing structure, which enhances resilience and reduces dependency risks (Bowersox *et al*., 2020; Jacobs & Chase, 2021). In the context of eateries, where inventory consists largely of perishable items requiring timely replenishment, supplier concentration level is considered highly significant for maintaining operational continuity and minimizing waste-related costs (Heizer *et al*., 2020; Stevenson, 2021). Empirical studies had shown that firms operating with excessive supplier concentration often experiences supply bottlenecks and cost inefficiencies, while those maintaining balanced supplier portfolios demonstrate improved operational outcomes (Mandal, 2021; Ayaburi *et al*., 2020). As such, supplier concentration level is regarded as a key determinant of sourcing effectiveness and operational performance in dynamic supply environments (Christopher, 2022; Ivanov & Dolgui, 2022).

From a risk management perspective, supplier concentration

level is closely associated with supply chain resilience and disruption management capabilities (Ivanov, 2021; Ivanov & Dolgui, 2022). It is argued that high supplier concentration amplified systemic risk because disruptions affecting a few key suppliers could significantly impair the entire supply chain, thereby increasing the likelihood of stockouts, overstocking, and spoilage (Ketchen & Hult, 2020; Jacobs & Chase, 2021). In contrast, a more distributed sourcing structure provided redundancy and flexibility, enabling firms to switch between suppliers and maintain continuity of supply under uncertain conditions (Bowersox *et al*., 2020; Chopra & Meindl, 2022). However, scholars also noted that moderate supplier concentration could yield certain advantages, including economies of scale, stronger supplier relationships, and reduced transaction costs (Monczka *et al*., 2021; Christopher, 2022). These benefits are often achieved through bulk purchasing and streamlined communication channels, which could enhance efficiency in stable supply environments (Stevenson, 2021; Heizer *et al*., 2020). Nevertheless, excessive reliance on a few suppliers is found to weaken bargaining power and limit the firm's ability to respond to price and quality variations (Ivanov, 2021; Mandal, 2021). In the eatery sector, where product quality and freshness are directly linked to customer satisfaction, the implications of supplier concentration are particularly pronounced, as delays or inconsistencies in supply could lead to significant food waste and increased operational costs (Bowersox *et al*., 2020; Jacobs & Chase, 2021).

Supplier concentration level is operationalized in empirical research using both objective and perceptual indicators that captured the proportion of inventory sourced from key suppliers and the degree of dependency on those suppliers (Ayaburi *et al*., 2020; Mandal, 2021). In this study, it is measured through structured questionnaire items assessing the share of procurement attributed to top suppliers, perceived reliance on dominant suppliers, and the availability of alternative sourcing options. These measures are aggregated into a composite index representing the level of supplier concentration for each eatery, consistent with contemporary supply chain research methodologies (Monczka *et al*., 2021; Chopra & Meindl, 2022). Within the conceptual framework, supplier concentration level is positioned as a strategic inventory management variable influencing operational cost minimisation efficiency, particularly through its effect on waste cost minimisation attainability. It is argued that excessive concentration would lead to supply inflexibility, increased spoilage, and higher procurement costs, while optimal concentration would support cost efficiency and operational stability (Christopher, 2022; Ivanov & Dolgui, 2022). In the opinion of the researcher, supplier concentration level represents a critical yet often underappreciated dimension of strategic inventory management in the context of small and medium eateries in South-South Nigeria, where supply markets are fragmented and characterized by uncertainty. It is further opined that managing supplier concentration effectively would provide a practical pathway for eateries to reduce waste-related costs, enhance sourcing flexibility, and achieve sustainable operational cost minimisation efficiency without requiring sophisticated technological systems.

2.1.1.4 Supplier switching flexibility

Supplier switching flexibility is conceptualized as the capability of a firm to change or reconfigure its supplier base with minimal cost, time, and operational disruption in response to variations in price, quality, delivery reliability, or external market conditions (Ivanov, 2021; Christopher, 2022). It is described as a dynamic sourcing capability embedded within strategic inventory management that enhanced a firm's ability to respond to uncertainty and maintain continuity of supply (Chopra & Meindl, 2022; Monczka *et al*., 2021). Scholars explained that supplier switching flexibility differed from switching frequency, as it focused on the readiness and ease of switching rather than the number of times switching occurred (Ketchen & Hult, 2020; Mandal, 2021). In operational contexts characterized by volatility, firms with high switching flexibility are found to be more resilient to supplier disruptions and market shocks, as they could rapidly activate alternative sourcing options (Ivanov & Dolgui, 2022; Jacobs & Chase, 2021). Within the eatery sector, where supply interruptions could immediately translate into spoilage, lost sales, and increased operational costs, supplier switching flexibility is considered critical for ensuring the timely availability of perishable inputs (Heizer *et al*., 2020; Stevenson, 2021). Empirical studies had further shown that organizations with flexible supplier arrangements experienced improved service continuity, reduced lead-time variability, and enhanced operational efficiency (Mandal, 2021; Ayaburi *et al*., 2020). Consequently, supplier switching flexibility is regarded as a core dimension of supply chain agility and an essential determinant of operational cost minimisation efficiency (Christopher, 2022; Ivanov & Dolgui, 2022).

The strategic importance of supplier switching flexibility is also evident in its influence on negotiation power and procurement cost management (Monczka *et al*., 2021; Chopra & Meindl, 2022). It was observed that firms capable of switching suppliers easily were less dependent on specific vendors, thereby strengthening their bargaining position and enabling them to secure more favorable pricing and service conditions (Christopher, 2022; Ketchen & Hult, 2020). In contrast, firms with low switching flexibility often faced supplier dominance, increased procurement costs, and limited ability to respond to unfavorable contract terms (Ivanov, 2021; Mandal, 2021). Studies further indicated that supplier switching flexibility contributed to cost control by allowing firms to shift to lower-cost or higher-quality suppliers when market conditions changed (Bowersox *et al*., 2020; Jacobs & Chase, 2021). In the context of eateries, where profit margins are typically narrow and input costs are subject to frequent fluctuations, this flexibility is particularly valuable for maintaining cost efficiency and minimizing waste-related losses (Heizer *et al*., 2020; Stevenson, 2021). Additionally, switching flexibility reduced the risk of inventory obsolescence and spoilage by ensuring that supply interruptions did not result in prolonged stockouts or emergency overstocking (Ivanov & Dolgui, 2022; Christopher, 2022). Measurement of supplier switching flexibility in empirical studies had been carried out using perceptual indicators such as the ease of switching suppliers, availability of alternative sources, and the cost implications of switching (Ayaburi *et al*., 2020; Mandal, 2021). These measures are typically captured through Likert-scale instruments and aggregated to form composite indices for analysis.

Within the conceptual framework of this study, supplier switching flexibility is positioned as a strategic inventory management variable influencing operational cost

minimisation efficiency, particularly through its impact on waste cost minimisation attainability. It is argued that firms with low switching flexibility were more likely to experience supply rigidities, leading to delayed replenishment, excess inventory accumulation, and increased spoilage costs (Christopher, 2022; Ivanov, 2021). Conversely, firms with high switching flexibility are better able to align procurement decisions with real-time operational needs, thereby reducing waste and improving cost efficiency (Chopra & Meindl, 2022; Monczka *et al*., 2021). Empirical evidence supports the view that flexible sourcing arrangements enhanced supply chain responsiveness and reduced operational disruptions in uncertain environments (Mandal, 2021; Ayaburi *et al*., 2020). In the context of South-South Nigeria, where supply chain challenges such as transportation delays, inconsistent supplier reliability, and market volatility were prevalent, supplier switching flexibility is considered particularly relevant for ensuring operational continuity (Oni & Daniyan, 2021). In the opinion of the researcher, supplier switching flexibility represents a highly practical and impactful dimension of strategic inventory management for eateries, as it provided a direct mechanism for reducing dependency risks, improving sourcing responsiveness, and minimizing waste-related costs without requiring advanced technological infrastructure.

2.1.1.5 Modern storage infrastructure

Modern storage infrastructure is conceptualized as the combination of physical facilities, technological systems, and organizational practices that enable firms to preserve inventory quality, enhance storage efficiency, and minimize losses throughout the inventory lifecycle (Bowersox *et al*., 2020; Christopher, 2022). It is described as a critical component of strategic inventory management that extendes beyond mere storage space to include refrigeration systems, climate-controlled environments, structured shelving, and hygiene-compliant handling processes (Heizer *et al*., 2020; Stevenson, 2021). Scholars emphasized that in food service operations, particularly eateries dealing with perishable items, the effectiveness of storage infrastructure directly determine the rate of spoilage, product quality, and operational cost outcomes (Jacobs & Chase, 2021; Chopra & Meindl, 2022). It is further explained that inadequate storage facilities exposes inventory to temperature fluctuations, contamination, and rapid deterioration, thereby increasing waste levels and reducing profitability (Adebayo & Olatunde, 2023; Oni & Daniyan, 2021). Conversely, the adoption of modern storage systems was found to significantly extend product shelf life, maintain nutritional and aesthetic quality, and reduce waste-related costs (Christopher, 2022; Ivanov & Dolgui, 2022). Empirical studies had shown that firms investing in improved storage infrastructure achieved better inventory preservation, lower disposal rates, and enhanced operational efficiency, particularly in environments characterized by high perishability and supply uncertainty (Melo *et al*., 2021; Mandal, 2021). Thus, modern storage infrastructure is regarded as a strategic resource that supports effective inventory control and cost minimisation in food service operations (Bowersox *et al*., 2020; Jacobs & Chase, 2021).

The relevance of modern storage infrastructure is further underscore by its role in improving operational coordination, inventory visibility, and decision-making efficiency (Chopra & Meindl, 2022; Christopher, 2022). It is noted that technological components such as temperature monitoring systems, barcode scanners, and digital inventory tracking platforms enhanced real-time visibility of stock conditions and quantities (Ivanov, 2021; Jacobs & Chase, 2021). These technologies enable firms to detect early signs of spoilage, optimize stock rotation, and align inventory levels with consumption patterns, thereby reducing overstocking and emergency procurement (Heizer *et al*., 2020; Stevenson, 2021). Scholars also observed that improved storage infrastructure reduced human error in inventory handling, improved compliance with food safety standards, and enhanced accountability in stock management (Oni & Daniyan, 2021; Adebayo & Olatunde, 2023). In small and medium-sized eateries, where manual inventory systems were prevalent, the introduction of modern storage technologies was found to significantly improve operational control and reduce discrepancies between recorded and actual stock levels (Mandal, 2021; Melo *et al*., 2021). Furthermore, effective storage infrastructure supports cost efficiency by reducing the need for excessive safety stock, minimizing losses from expired products, and improving procurement planning (Christopher, 2022; Chopra & Meindl, 2022). Measurement of modern storage infrastructure in empirical studies had been conducted using multi-dimensional indicators capturing the availability, adequacy, and functionality of storage facilities and technologies (Melo *et al*., 2021; Mandal, 2021). This indicator typically includes refrigeration capacity, storage organization, hygiene standards, and the presence of inventory tracking systems, which were aggregated into composite indices for analysis.

Within the conceptual framework of this study, modern storage infrastructure is positioned as a strategic inventory management variable influencing operational cost minimisation efficiency, particularly through its impact on waste cost minimisation attainability. It is argued that inadequate storage systems would lead to higher spoilage rates, increased waste disposal costs, and inefficiencies in inventory utilization, thereby undermining cost control efforts (Christopher, 2022; Ivanov & Dolgui, 2022). In contrast, advanced storage infrastructure enables firms to preserve inventory quality, improve stock rotation, and reduce waste-related costs, thereby enhancing operational efficiency (Heizer *et al*., 2020; Jacobs & Chase, 2021). Empirical evidence supports the assertion that firms with modern storage facilities consistently recorded lower levels of inventory loss and improved service reliability compared to those relying on rudimentary storage systems (Melo *et al*., 2021; Mandal, 2021). In the context of South-South Nigeria, where environmental conditions such as high temperature and humidity accelerated spoilage, the importance of modern storage infrastructure is even more pronounced (Adebayo & Olatunde, 2023). In the opinion of the researcher, modern storage infrastructure represents one of the most practical and impactful dimensions of strategic inventory management for eateries, as it directly addresses the core challenge of perishability and provided a tangible pathway for reducing waste costs and improving operational cost minimisation efficiency without requiring highly sophisticated managerial systems.

2.1.1.6 Inventory level planning

Inventory level planning is conceptualized as the systematic and strategic process through which firms determine the optimal quantity of inventory to be maintained at different

stages of operations in order to meet expected demand while minimizing total inventory-related costs (Chopra & Meindl, 2022; Heizer *et al*., 2020). According to Umo (2023), inventory level planning is a core component of strategic inventory management that guided decisions relating to reorder points, safety stock levels, and inventory review systems. Scholars emphasized that effective inventory level planning enabled firms to balance the trade-off between holding costs and stockout risks, thereby enhancing operational efficiency and cost control (Christopher, 2022; Bowersox *et al*., 2020). In food service operations, particularly eateries dealing with perishable inputs, inventory level planning is considered critical because excessive stock levels often resulted in spoilage and waste, while insufficient stock levels led to service interruptions and lost sales (Ivanov & Dolgui, 2022; Oni & Daniyan, 2021). Empirical evidence suggests that firms adopting structured inventory planning practices achieved better alignment between supply and demand, reduced waste levels, and improved operational cost minimisation efficiency (Mandal, 2021; Zhang & Sharifi, 2021). It is further explained that inventory level planning incorporated forecasting techniques, safety stock determination, and reorder point calculations, all of which contributed to proactive decision-making and operational stability (Chopra & Meindl, 2022; Jacobs & Chase, 2021). Thus, inventory level planning is regarded as a fundamental mechanism for optimizing inventory utilization and minimizing avoidable operational costs (Christopher, 2022; Heizer *et al*., 2020; Jacobs & Chase, 2021; Stevenson, 2021).

The operational relevance of inventory level planning is further reflected in its ability to enhance service continuity and reduce wastage across supply chain activities (Bowersox *et al*., 2020; Stevenson, 2021). It was observed that firms with well-defined inventory thresholds were better positioned to prevent overstocking, which often resulted in spoilage, particularly in perishable goods environments (Ivanov, 2021; Mandal, 2021). Conversely, understocking is found to disrupt service delivery, increase emergency procurement costs, and negatively affect customer satisfaction (Christopher, 2022; Chopra & Meindl, 2022). Scholars also highlighted that safety stock acted as a buffer against uncertainties in demand and supply lead times, thereby ensuring operational continuity even under fluctuating conditions (Jacobs & Chase, 2021; Heizer *et al*., 2020). In addition, the use of demand forecasting methods enabled firms to anticipate consumption patterns and adjust inventory levels accordingly, reducing mismatches between supply and demand (Zhang & Sharifi, 2021; Mandal, 2021; Umo, 2023). In the context of eateries, where demand variability could arise from seasonality, customer preferences, and economic conditions, inventory level planning is particularly essential for minimizing waste and maintaining cost efficiency (Oni & Daniyan, 2021). Measurement of inventory level planning in empirical research had been conducted using perceptual indicators assessing the presence of reorder policies, safety stock practices, and demand forecasting activities (Zhang & Sharifi, 2021; Mandal, 2021). These indicators were typically captured using Likert-scale instruments and aggregated to form composite indices representing the extent of planning practices within firms.

Within the conceptual framework of this study, inventory level planning is positioned as a strategic inventory management variable influencing operational cost minimisation efficiency, particularly through its effect on waste cost minimisation attainability. It is argued that inadequate planning of inventory levels would result in excessive holding costs, high spoilage rates, and inefficient resource utilization, thereby undermining cost efficiency (Christopher, 2022; Ivanov & Dolgui, 2022). Conversely, effective inventory level planning would enable firms to maintain optimal stock levels, reduce waste-related costs, and improve service reliability, thereby enhancing overall operational efficiency (Heizer *et al*., 2020; Jacobs & Chase, 2021). Empirical studies had supported the view that structured inventory planning systems were associated with lower levels of waste and improved operational outcomes in both manufacturing and service sectors (Mandal, 2021; Zhang & Sharifi, 2021). In the context of South-South Nigeria, where supply uncertainties and demand fluctuations are prevalent, inventory level planning is considered a practical and necessary strategy for improving operational cost control (Oni & Daniyan, 2021). In the opinion of the researcher, inventory level planning represents a highly relevant and actionable dimension of strategic inventory management for eateries, as it provided a structured approach to balancing inventory availability with cost efficiency, thereby directly contributing to waste cost minimisation without requiring sophisticated technological systems.

2.1.1.7 Systematic replenishment planning

Systematic replenishment planning is conceptualized as a structured and coordinated process through which firms scheduled, monitored, and executed inventory restocking activities based on demand forecasts, lead times, and predetermined inventory thresholds (Chopra & Meindl, 2022; Jacobs & Chase, 2021). It is described as a critical dimension of strategic inventory management that ensured alignment between inventory inflows and consumption patterns, thereby reducing uncertainty and minimizing both stockouts and excess inventory (Christopher, 2022; Stevenson, 2021). Scholars emphasized that unlike ad hoc ordering practices, systematic replenishment planning involved clearly defined procedures, periodic review systems, and data-driven decision-making processes that enhanced operational efficiency and cost control (Heizer *et al*., 2020; Ivanov, 2021). In the context of eateries, where demand fluctuations are frequent and inventory items are highly perishable, systematic replenishment planning is considered essential for maintaining service continuity and reducing waste-related costs (Oni & Daniyan, 2021; Mandal, 2021). Empirical studies had shown that firms adopting structured replenishment systems achieved better synchronization between supply and demand, resulting in lower spoilage rates and improved operational cost minimisation efficiency (Zhang & Sharifi, 2021; Ivanov & Dolgui, 2022). It is further explained that systematic replenishment planning incorporated forecasting techniques, safety stock considerations, and reorder point mechanisms, all of which contributed to proactive inventory control and operational stability (Chopra & Meindl, 2022; Jacobs & Chase, 2021).

The operational importance of systematic replenishment planning is further reflected in its ability to enhance supply chain responsiveness, reduce emergency procurement, and improve inventory utilization (Christopher, 2022; Stevenson, 2021). It is observed that firms with structured

replenishment schedules are better positioned to anticipate demand variability and adjust order quantities accordingly, thereby avoiding excessive inventory accumulation and reducing waste (Heizer *et al*., 2020; Mandal, 2021). Conversely, the absence of systematic planning often led to reactive ordering, which increased the likelihood of overstocking, stockouts, and higher procurement costs (Ivanov, 2021; Oni & Daniyan, 2021). Scholars also noted that periodic and continuous review systems enabled firms to monitor inventory levels effectively and trigger replenishment actions at appropriate times, thereby improving operational coordination and service reliability (Jacobs & Chase, 2021; Chopra & Meindl, 2022). In addition, systematic replenishment planning enhanced transparency and accountability in inventory management by establishing clear procedures and documentation for restocking decisions (Christopher, 2022; Ivanov & Dolgui, 2022). In the eatery sector, where consumption patterns could vary due to customer preferences, seasonality, and economic conditions, the adoption of structured replenishment practices was found to significantly reduce waste and improve cost efficiency (Zhang & Sharifi, 2021; Mandal, 2021). Measurement of systematic replenishment planning in empirical research had been conducted using multi-item perceptual indicators assessing the presence of replenishment schedules, use of forecasting data, and frequency of planned versus emergency orders (Mandal, 2021; Zhang & Sharifi, 2021).

Within the conceptual framework of this study, systematic replenishment planning is positioned as a strategic inventory management variable influencing operational cost minimisation efficiency, particularly through its effect on waste cost minimisation attainability. It is argued that poorly structured replenishment processes would lead to mismatches between supply and demand, resulting in increased spoilage, higher holding costs, and inefficient resource utilization (Christopher, 2022; Ivanov & Dolgui, 2022). Conversely, systematic replenishment planning would enable firms to maintain optimal inventory levels, reduce waste-related costs, and enhance service reliability, thereby improving overall operational efficiency (Heizer *et al*., 2020; Jacobs & Chase, 2021). Empirical evidence supported the assertion that firms with structured replenishment systems consistently recorded lower levels of inventory loss and improved operational outcomes compared to those relying on reactive ordering practices (Mandal, 2021; Zhang & Sharifi, 2021). In the context of South-South Nigeria, where supply uncertainties and infrastructural constraints affected inventory flows, systematic replenishment planning is considered a practical and impactful strategy for improving cost control and operational efficiency (Oni & Daniyan, 2021). In the opinion of the researcher, systematic replenishment planning represents a highly feasible and strategically significant practice for eateries, as it emphasized procedural discipline and informed decision-making, which could be implemented without sophisticated technological systems while still delivering substantial improvements in waste cost minimisation efficiency.

2.1.2 Operational cost minimisation efficiency

Operational cost minimisation efficiency is conceptualized as the extent to which an organization effectively reduces operational costs through optimal utilization of resources, efficient process coordination, and minimization of avoidable losses arising from operational activities (Heizer *et al*., 2020; Christopher, 2022). It is described as a critical dimension of management accounting and operations management that reflected how well firms controlled costs associated with procurement, storage, handling, and service delivery (Bowersox *et al*., 2020; Jacobs & Chase, 2021). Scholars emphasized that operational cost minimisation efficiency focused on internal cost discipline rather than revenue generation, thereby aligning more closely with accounting-oriented performance evaluation (Stevenson, 2021; Drury, 2021). In service-oriented firms such as eateries, this concept is particularly relevant because cost inefficiencies often arose from poor inventory handling, excessive waste, and uncoordinated replenishment practices (Oni & Daniyan, 2021; Ivanov & Dolgui, 2022). Empirical evidence suggested that firms that implemented structured cost control mechanisms and efficient inventory management systems are more likely to achieve lower operating costs and improved sustainability (Mandal, 2021; Zhang & Sharifi, 2021). It is further explained that operational cost minimisation efficiency incorporated elements such as cost control, waste reduction, process optimization, and resource utilization, all of which contributed to improved financial discipline and organizational performance (Christopher, 2022; Heizer *et al*., 2020).

The importance of operational cost minimisation efficiency is further reflected in its role as a driver of organizational sustainability and competitiveness (Bowersox *et al*., 2020; Stevenson, 2021). It is observed that firms operating in highly competitive and cost-sensitive environments are required to continuously optimize their cost structures in order to remain viable and profitable (Christopher, 2022; Jacobs & Chase, 2021). In inventory-intensive operations, cost inefficiencies are often manifested through excessive holding costs, spoilage, stock obsolescence, and emergency procurement expenses (Ivanov, 2021; Oni & Daniyan, 2021). Scholars noted that effective cost minimisation practices required the integration of planning, monitoring, and control mechanisms that ensured alignment between resource usage and operational objectives (Drury, 2021; Mandal, 2021). In addition, the adoption of structured inventory systems, accurate demand forecasting, and efficient replenishment strategies had been associated with significant reductions in operational costs and improvements in efficiency (Zhang & Sharifi, 2021; Ivanov & Dolgui, 2022). In the context of eateries, where margins were often thin and cost pressures were high, operational cost minimisation efficiency is considered a key determinant of business survival and long-term performance (Oni & Daniyan, 2021). Measurement of this construct in empirical research had been conducted using indicators such as cost reduction levels, waste minimisation, efficiency of resource utilization, and control over operational expenses (Drury, 2021; Mandal, 2021).

In this study, operational cost minimisation efficiency is proxied by waste cost minimisation attainability, which is defined as the extent to which eateries effectively reduced costs associated with food waste arising from spoilage, overproduction, and inefficient inventory practices. It is argued that waste-related costs represented a significant portion of operational expenses in food service operations and therefore provided a direct measure of cost inefficiency (Christopher, 2022; Ivanov & Dolgui, 2022). Empirical

studies had shown that effective inventory management practices significantly reduced waste levels and associated costs, thereby improving overall operational efficiency (Mandal, 2021; Zhang & Sharifi, 2021). The adoption of waste cost minimisation attainability as a proxy was justified on the grounds that it directly captured the financial implications of operational inefficiencies, particularly in environments characterized by perishable inventory (Oni & Daniyan, 2021). Unlike broader financial indicators such as profitability or revenue growth, waste cost minimisation attainability provided a more precise and internally driven measure of performance that was less influenced by external market factors (Drury, 2021; Christopher, 2022). In the opinion of the researcher, operational cost minimisation efficiency, as measured through waste cost minimisation attainability, represented the most appropriate and contextually relevant dependent variable for this study, as it directly linked strategic inventory management practices to measurable cost outcomes and reflected the core accounting focus of cost control and efficiency improvement within eateries.

2.1.2.1 Waste cost minimisation attainability

Waste cost minimisation attainability is conceptualized as the extent to which an organization effectively reduced the financial losses associated with food waste arising from spoilage, overstocking, improper storage, and inefficient inventory handling practices (FAO, 2022; UNEP, 2023). It is described as a cost-oriented operational outcome that reflects the ability of firms to control and minimize avoidable expenses linked to discarded or unusable inventory (Christopher, 2022; Drury, 2021). Scholars emphasized that in food service operations, waste-related costs constituted a significant proportion of total operating expenses due to the perishable nature of inputs and the sensitivity of demand patterns (Heizer *et al*., 2020; Oni & Daniyan, 2021). Waste cost minimisation attainability is therefore regarded as a critical indicator of operational cost efficiency, capturing the financial implications of ineffective inventory planning, poor storage systems, and weak replenishment practices (Ivanov & Dolgui, 2022; Mandal, 2021). Empirical evidence suggested that firms that adopted structured inventory management systems and cost control mechanisms were able to significantly reduce waste-related costs and improve overall operational efficiency (Zhang & Sharifi, 2021; Christopher, 2022). It was further explained that waste cost minimisation attainability integrated both operational and accounting perspectives by linking physical waste reduction to measurable cost savings, thereby aligning with the principles of management accounting (Drury, 2021; Bowersox *et al*., 2020).

The operational significance of waste cost minimisation attainability is further reflected in its relationship with resource utilization, cost control, and sustainability performance (UNEP, 2023; FAO, 2022). It is observed that ineffective inventory practices such as over-purchasing, delayed usage, and inadequate storage conditions often resulted in spoilage, which translated directly into financial losses for firms (Heizer *et al*., 2020; Ivanov, 2021). Conversely, effective cost minimisation practices required the integration of demand forecasting, inventory planning, and monitoring systems that ensured alignment between supply and consumption patterns (Christopher, 2022; Jacobs & Chase, 2021). Scholars also noted that waste cost minimisation is enhanced when firms adopted systematic replenishment strategies and maintained appropriate inventory levels, thereby reducing the likelihood of excess stock and associated spoilage costs (Mandal, 2021; Zhang & Sharifi, 2021). In the context of eateries, where operational margins are often narrow and input costs were volatile, the ability to minimise waste-related costs is considered essential for sustaining profitability and operational efficiency (Oni & Daniyan, 2021). Measurement of waste cost minimisation attainability in empirical research had been conducted using perceptual indicators assessing the extent of cost savings from reduced spoilage, efficiency of inventory utilization, and control over waste-related expenses (Drury, 2021; Mandal, 2021). These indicators are typically captured using Likert-scale instruments and aggregated to form composite indices representing cost minimisation performance.

Within the conceptual framework of this study, waste cost minimisation attainability is positioned as the dependent variable reflecting operational cost minimisation efficiency outcomes. It is influenced by strategic inventory management dimensions such as supplier base diversity, inventory source strategy, supplier concentration level, supplier switching flexibility, modern storage infrastructure, inventory level planning, and systematic replenishment planning (Christopher, 2022; Ivanov & Dolgui, 2022). It is argued that effective implementation of these strategic practices would lead to improved coordination of inventory flows, reduced spoilage, and lower operational costs (Heizer *et al*., 2020; Jacobs & Chase, 2021). Conversely, weak inventory management practices would result in increased waste, higher holding costs, and inefficient resource utilization, thereby undermining cost efficiency (Oni & Daniyan, 2021; Ivanov, 2021). The adoption of waste cost minimisation attainability as a proxy is justified on the grounds that it provided a direct and measurable link between operational practices and financial outcomes, making it a more precise indicator than general performance measures such as profitability or revenue growth (Drury, 2021; Christopher, 2022). In the opinion of the researcher, waste cost minimisation attainability represented the most appropriate and contextually relevant dependent variable for this study, as it captured the core objective of cost control within eateries and directly reflected the effectiveness of strategic inventory management practices in reducing avoidable operational losses.

2.1.3 Strategic inventory management and operational cost minimisation efficiency

Strategic inventory management is examined as a deliberate and integrated managerial approach that coordinated procurement, storage, replenishment, and supplier relationships in order to achieve operational cost minimisation efficiency within organizations (Chopra & Meindl, 2022; Heizer *et al*., 2020). It is explained that unlike routine inventory control practices, strategic inventory management incorporated forecasting, sourcing decisions, warehousing systems, and replenishment policies into a unified framework aligned with cost control objectives and operational efficiency (Christopher, 2022; Jacobs & Chase, 2021). Scholars emphasized that in food service operations, where perishability and demand uncertainty are prevalent, inventory decisions directly influenced cost outcomes because excess stock often resulted in spoilage, while inadequate stock led to emergency procurement costs (Ivanov & Dolgui, 2022; Oni & Daniyan, 2021). Empirical

evidence had demonstrated that firms implementing structured inventory management systems achieved significant reductions in operational costs and improved efficiency compared to those relying on informal practices (Mandal, 2021; Zhang & Sharifi, 2021). It is further noted that strategic inventory management enabled firms to align supply with actual consumption patterns, thereby reducing waste-related costs and enhancing operational cost discipline (Christopher, 2022; Stevenson, 2021). From a theoretical perspective, the resource-based view supported the argument that effective inventory coordination constituted a valuable organizational capability that improved efficiency and reduced operational costs when properly managed (Barney, 1991; Ivanov, 2021).

Beyond cost efficiency, strategic inventory management is also found to strengthen operational resilience and sustainability by minimizing waste-related costs and improving resource utilization (FAO, 2022; UNEP, 2023). It is observed that firms adopting integrated inventory systems are better positioned to manage demand variability, supplier disruptions, and quality inconsistencies, all of which had direct implications for operational costs (Christopher, 2022; Ivanov & Dolgui, 2022). In food service enterprises, operational cost minimisation efficiency is closely linked to waste cost minimisation attainability because food waste represented a direct financial loss arising from inefficient inventory practices (Heizer *et al*., 2020; Oni & Daniyan, 2021). Empirical studies had shown that structured inventory planning, supplier diversification, and systematic replenishment significantly reduced spoilage costs and improved overall cost efficiency (Mandal, 2021; Zhang & Sharifi, 2021). Similarly, the adoption of inventory monitoring technologies and improved storage infrastructure had been associated with reduced deterioration losses and enhanced cost control (Jacobs & Chase, 2021; Christopher, 2022). These findings suggested that strategic inventory management influenced not only physical inventory outcomes but also financial performance through its impact on cost minimisation and operational discipline (Drury, 2021; Stevenson, 2021).

Furthermore, the relationship between strategic inventory management and operational cost minimisation efficiency became more critical in volatile economic environments characterized by price fluctuations, supply chain disruptions, and infrastructural challenges (Ivanov, 2021; Oni & Daniyan, 2021). Studies conducted in developing economies indicated that firms lacking structured inventory strategies often experienced high levels of waste, increased procurement costs, and inefficient resource allocation, all of which undermined cost efficiency (Mandal, 2021; FAO, 2022). Conversely, organizations that integrated forecasting accuracy, supplier coordination, and systematic replenishment into their inventory systems demonstrated improved cost control, reduced waste-related expenses, and enhanced operational stability (Zhang & Sharifi, 2021; Christopher, 2022). In the context of eateries in South-South Nigeria, where supply uncertainties and perishability challenges were prevalent, strategic inventory management is considered a critical driver of waste cost minimisation attainability and overall operational efficiency (Oni & Daniyan, 2021). In the opinion of the researcher, strategic inventory management represents a fundamental managerial capability that directly influenced operational cost minimisation efficiency by ensuring that inventory-related decisions are aligned with cost control objectives, thereby reducing avoidable losses and improving the financial sustainability of eateries.

2.1.3.1 Supplier base diversity and waste cost minimisation attainability

Supplier base diversity is examined as the strategic engagement of multiple suppliers across different locations, capacities, and sourcing channels in order to reduce procurement risk and enhance supply flexibility within inventory systems (Christopher, 2022; Chopra & Meindl, 2022). It is explained that in food service operations, where perishability and delivery timing were critical, reliance on a limited number of suppliers increased exposure to disruptions that often resulted in overstocking, emergency purchases, and ultimately higher waste-related costs (Heizer *et al*., 2020; Ivanov & Dolgui, 2022). Scholars emphasized that diversified sourcing improved supply responsiveness, negotiation power, and procurement efficiency, thereby enabling firms to better align inventory inflows with actual consumption patterns (Jacobs & Chase, 2021; Stevenson, 2021). Empirical evidence had indicated that firms with diversified supplier bases experienced lower operational costs due to reduced spoilage and improved inventory control compared to firms operating with concentrated supplier structures (Mandal, 2021; Zhang & Sharifi, 2021). From the perspective of supply chain risk management, supplier base diversity is found to mitigate vulnerabilities associated with delivery delays, price volatility, and supply shortages, all of which had direct implications for waste cost minimisation (Ivanov, 2021; Christopher, 2022). It is further noted that when firms distributed procurement across multiple reliable suppliers, they are able to adjust order quantities more effectively, thereby reducing excess inventory and minimizing waste-related financial losses (Oni & Daniyan, 2021; Mandal, 2021).

Beyond risk mitigation, supplier base diversity is found to enhance quality control and inventory freshness, which were critical determinants of waste cost minimisation attainability (Christopher, 2022; Heizer *et al*., 2020). It is observed that variations in supplier reliability and product quality often contributed to spoilage and rejection costs, particularly in perishable goods environments (Ivanov & Dolgui, 2022; Jacobs & Chase, 2021). Empirical studies had shown that firms maintaining diversified supplier relationships are better able to compare supplier performance, enforce quality standards, and reduce deterioration-related costs (Zhang & Sharifi, 2021; Mandal, 2021). In addition, diversified sourcing arrangements are associated with improved stock rotation practices and reduced incidence of expired inventory, thereby lowering waste-related expenses (Oni & Daniyan, 2021; Stevenson, 2021). Theoretical support for this relationship is provided by resource dependence theory, which suggests that firms relying heavily on a single supplier are more likely to experience power imbalances that limited their ability to negotiate favorable delivery schedules and batch sizes (Pfeffer & Salancik, 1978; Christopher, 2022). Conversely, supplier diversification enhanced bargaining power, enabling firms to request smaller, more frequent deliveries aligned with demand patterns, thereby reducing the likelihood of overstocking and spoilage costs (Heizer *et al*., 2020; Jacobs & Chase, 2021).

Furthermore, the relationship between supplier base diversity and waste cost minimisation attainability is found

to be particularly significant in volatile economic environments characterized by supply disruptions and demand uncertainty (Ivanov, 2021; Oni & Daniyan, 2021). Studies in emerging economies had shown that firms with diversified sourcing structures are better able to maintain operational continuity and avoid the cycle of stockouts followed by excessive replenishment, which often led to increased waste costs (Mandal, 2021; FAO, 2022). Empirical findings had also demonstrated that sourcing flexibility significantly reduced spoilage rates and improved cost efficiency in food service operations facing fluctuating demand conditions (Zhang & Sharifi, 2021; Christopher, 2022). It was further observed that diversified local sourcing reduced lead times and enhanced inventory freshness, thereby minimizing deterioration losses and improving overall cost performance (Oni & Daniyan, 2021; Ivanov & Dolgui, 2022). These findings collectively suggested that supplier base diversity functioned as a strategic capability that influenced operational cost outcomes by reducing uncertainty and enhancing procurement adaptability. In the opinion of the researcher, supplier base diversity represented a critical driver of waste cost minimisation attainability, as it enabled eateries to balance supply flexibility with cost control, thereby reducing avoidable losses and improving the efficiency of inventory-related decision-making processes.

2.1.3.2 Inventory source strategy and waste cost minimisation attainability

Inventory source strategy is examined as the deliberate and systematic selection of procurement channels, including local sourcing, regional distribution networks, direct supplier linkages, and import-based supply systems, in order to align inventory acquisition with operational cost minimisation objectives (Chopra & Meindl, 2022; Christopher, 2022). It is explained that in food service operations, sourcing decisions significantly influenced product freshness, lead time variability, transportation exposure, and ultimately the level of waste-related costs incurred by firms (Heizer *et al*., 2020; Ivanov & Dolgui, 2022). Scholars emphasized that sourcing configuration determined the speed, reliability, and quality of inventory inflows, thereby directly affecting spoilage rates and cost efficiency (Jacobs & Chase, 2021; Stevenson, 2021). Empirical evidence had indicated that firms adopting localized and strategically aligned sourcing strategies experienced lower operational costs due to reduced spoilage and improved inventory turnover compared to firms dependent on distant or inconsistent supply channels (Mandal, 2021; Zhang & Sharifi, 2021). It is further noted that sourcing strategies that minimized logistical complexity reduced handling time, transportation delays, and exposure to deterioration, thereby enhancing waste cost minimisation attainability (Christopher, 2022; Ivanov, 2021). Consequently, inventory source strategy is regarded as a critical determinant of operational cost efficiency, as it enables firms to synchronise procurement timing, product quality, and demand patterns, thereby reducing avoidable financial losses associated with waste (Oni & Daniyan, 2021; Mandal, 2021).

Beyond geographical proximity, the structure of inventory source strategy is also found to influence coordination intensity, information sharing, and demand integration between firms and suppliers, which were essential for minimizing waste-related costs (Christopher, 2022; Jacobs & Chase, 2021). It is observed that integrated sourcing arrangements, such as long-term supplier partnerships and coordinated delivery systems, enhanced forecasting accuracy and improved stock rotation practices, thereby reducing spoilage costs (Heizer *et al*., 2020; Stevenson, 2021). Empirical studies had shown that firms utilizing collaborative sourcing mechanisms achieved lower levels of inventory deterioration because suppliers adjusted delivery quantities and timing based on consumption patterns (Mandal, 2021; Zhang & Sharifi, 2021). In contrast, fragmented and opportunistic sourcing strategies were associated with inconsistent supply quality, irregular batch sizes, and increased likelihood of overstocking, all of which contributed to higher waste-related expenses (Ivanov & Dolgui, 2022; Oni & Daniyan, 2021). The resource-based view further supported this relationship by suggesting that firms capable of configuring adaptive and well-coordinated sourcing networks developed superior operational capabilities that enhanced cost efficiency and reduced waste (Barney, 1991; Christopher, 2022). Thus, inventory source strategy contributed to waste cost minimisation attainability not only through proximity advantages but also through improved supplier coordination, demand alignment, and quality assurance mechanisms embedded within sourcing relationships (Jacobs & Chase, 2021; Heizer *et al*., 2020).

Furthermore, the role of inventory source strategy in waste cost minimisation attainability became more pronounced in volatile economic environments characterized by supply disruptions, price instability, and infrastructural constraints (Ivanov, 2021; FAO, 2022). Empirical findings had indicated that firms relying heavily on distant or import-based sourcing channels experienced higher spoilage rates and increased costs due to delays, currency fluctuations, and logistical inefficiencies (Oni & Daniyan, 2021; Mandal, 2021). Conversely, firms adopting hybrid sourcing strategies that combined local and regional suppliers demonstrated improved cost efficiency, reduced spoilage, and enhanced operational stability (Zhang & Sharifi, 2021; Christopher, 2022). It is further observed that flexible sourcing configurations enabled firms to adjust procurement volumes and delivery schedules in response to demand fluctuations, thereby minimizing excess inventory and associated waste costs (Ivanov & Dolgui, 2022; Jacobs & Chase, 2021). These findings collectively suggested that inventory source strategy shaped both the temporal and qualitative characteristics of inventory inflows, which directly influenced deterioration rates and cost outcomes. In the opinion of the researcher, inventory source strategy represents a fundamental dimension of strategic inventory management that significantly influenced waste cost minimisation attainability, as it provided a practical mechanism through which eateries could align sourcing decisions with cost control objectives, thereby reducing avoidable losses and enhancing overall operational efficiency.

2.1.3.3 Supplier concentration level and waste cost minimisation attainability

Supplier concentration level examines the degree to which a firm depended on a limited number of suppliers for its inventory requirements, thereby shaping procurement flexibility, risk exposure, and operational cost outcomes (Christopher, 2022; Chopra & Meindl, 2022). It explaines that in food service enterprises, high supplier concentration increased dependency risk and reduced the firm's ability to

respond to supply disruptions, which often resulted in delays, emergency purchases, and increased waste-related costs (Heizer *et al*., 2020; Ivanov & Dolgui, 2022). Scholars emphasized that excessive concentration constrained adaptive procurement decisions, particularly in environments where perishability required frequent and smaller deliveries aligned with demand patterns (Jacobs & Chase, 2021; Stevenson, 2021). Empirical evidence had shown that firms with highly concentrated supplier bases experienced higher spoilage costs during supply interruptions compared to firms operating with more distributed sourcing structures (Mandal, 2021; Zhang & Sharifi, 2021). It is further noted that when disruptions occurred under concentrated sourcing arrangements, firms often resorted to bulk purchasing once supply resumed, leading to excess inventory that deteriorated before use, thereby increasing waste costs (Ivanov, 2021; Christopher, 2022). From a supply chain risk perspective, supplier concentration reduced operational agility and heightened uncertainty, both of which contributed to inefficiencies in inventory utilisation and elevated waste-related expenses (Ivanov & Dolgui, 2022; Oni & Daniyan, 2021).

Beyond disruption risks, high supplier concentration is found also to affect quality control, delivery frequency, and negotiation power, all of which had direct implications for waste cost minimisation attainability (Christopher, 2022; Heizer *et al*., 2020). It is observed that concentrated sourcing structures reduced competitive pressure among suppliers, thereby weakening incentives for maintaining strict quality standards and delivery precision (Jacobs & Chase, 2021; Stevenson, 2021). Empirical studies had indicated that firms relying on a few suppliers experienced higher rates of substandard or delayed deliveries, which contributed to increased spoilage and operational losses (Mandal, 2021; Zhang & Sharifi, 2021). In addition, firms with high supplier concentration faced challenges in negotiating staggered delivery schedules, resulting in bulk inventory inflows that exceeded short-term demand and increased holding time, thereby raising the likelihood of deterioration (Ivanov & Dolgui, 2022; Oni & Daniyan, 2021). Theoretical support for this relationship is provided by resource dependence theory, which suggested that reliance on a limited number of suppliers created power imbalances that reduced the firm's ability to demand favourable delivery terms and flexible procurement arrangements (Pfeffer & Salancik, 1978; Christopher, 2022). Consequently, high supplier concentration constrained inventory optimisation efforts and undermined waste cost minimisation by increasing dependency risks and limiting procurement adaptability (Heizer *et al*., 2020; Jacobs & Chase, 2021).

Conversely, a moderate or reduced level of supplier concentration is found to enhance waste cost minimisation attainability by improving flexibility, competition, and coordination within the supply network (Christopher, 2022; Ivanov, 2021). It is observed that firms with lower supplier concentration are better able to align procurement volumes with consumption patterns, thereby reducing excess inventory and minimizing spoilage costs (Mandal, 2021; Zhang & Sharifi, 2021). Empirical findings had also indicated that diversified procurement structures enabled smaller and more frequent deliveries, improved responsiveness to demand fluctuations, and enhanced inventory freshness, all of which contributed to reduced waste-related expenses (Ivanov & Dolgui, 2022; Oni & Daniyan, 2021). Furthermore, reduced supplier concentration enhances bargaining leverage, facilitated quality benchmarking, and improved delivery reliability, thereby strengthening operational efficiency and cost control (Jacobs & Chase, 2021; Stevenson, 2021). These findings collectively suggested that supplier concentration level functioned as a structural determinant of inventory performance, influencing cost outcomes through its impact on flexibility, coordination, and risk exposure. In the opinion of the researcher, maintaining an optimal level of supplier concentration rather than excessive dependence on a few suppliers represented a critical strategy for achieving waste cost minimisation attainability, as it enables eateries to balance supplier reliability with procurement flexibility, thereby reducing avoidable losses and improving overall operational efficiency.

2.1.3.4 Supplier switching flexibility and waste cost minimisation attainability

Supplier switching flexibility is examined as the capacity of a firm to change suppliers with minimal cost, delay, or operational disruption when existing suppliers failed to meet expectations regarding price, quality, or delivery performance (Christopher, 2022; Chopra & Meindl, 2022). It is explained that in food service enterprises, where inventory items are highly perishable and time-sensitive, limited switching flexibility often resulted in delayed replenishment, emergency overstocking, or acceptance of substandard deliveries, all of which contributed to increased waste-related costs (Ivanov & Dolgui, 2022; Heizer *et al*., 2020). Scholars emphasized that switching flexibility represented a critical dimension of strategic sourcing because it enhanced responsiveness to uncertainty and enabled firms to maintain continuity of supply under volatile conditions (Jacobs & Chase, 2021; Stevenson, 2021). Empirical evidence had shown that firms with higher supplier switching capability experienced lower spoilage costs and improved inventory utilisation, particularly during periods of demand fluctuation and supply disruption (Mandal, 2021; Zhang & Sharifi, 2021). From the perspective of supply chain resilience, switching flexibility reduced vulnerability to supplier failure and allowed firms to reconfigure sourcing arrangements quickly, thereby minimizing delays and reducing waste-related financial losses (Christopher, 2022; Ivanov, 2021). It is further noted that when firms arre able to disengage from unreliable suppliers without procedural rigidity, they avoided bottlenecks and excessive holding periods, which are major contributors to inventory deterioration (Ivanov & Dolgui, 2022; Oni & Daniyan, 2021).

Beyond responsiveness, supplier switching flexibility is found to enhance quality control, supplier discipline, and cost efficiency within the supply network, all of which are critical for waste cost minimisation attainability (Christopher, 2022; Heizer *et al*., 2020). It is observed that the availability of credible alternative suppliers created competitive pressure, encouraging incumbent suppliers to maintain high standards of product quality, delivery reliability, and pricing efficiency (Jacobs & Chase, 2021; Stevenson, 2021). Empirical studies had indicated that firms capable of replacing underperforming suppliers experienced lower rejection rates, improved stock turnover, and reduced spoilage costs (Mandal, 2021; Zhang & Sharifi, 2021). In addition, firms with flexible supplier arrangements are better

positioned to negotiate smaller and more frequent delivery batches aligned with consumption patterns, thereby minimizing excess inventory and reducing deterioration risks (Ivanov & Dolgui, 2022; Oni & Daniyan, 2021). Theoretical support for this relationship is provided by resource dependence theory, which suggested that firms locked into rigid supplier relationships experienced power imbalances that limited their ability to renegotiate delivery terms or exit unfavorable contracts (Christopher, 2022; Pfeffer & Salancik, 1978). Consequently, supplier switching flexibility restored bargaining balance and enabled firms to optimise procurement timing and quantity decisions, thereby reducing waste-related expenses (Jacobs & Chase, 2021; Heizer *et al*., 2020).

Furthermore, supplier switching flexibility played a significant role in stabilising inventory performance and enhancing waste cost minimisation attainability in volatile economic and logistical environments (FAO, 2022; Ivanov, 2021). Empirical findings had shown that firms facing supply delays, price fluctuations, or supplier non-compliance experienced higher spoilage costs when contractual rigidity prevented rapid supplier substitution (Oni & Daniyan, 2021; Mandal, 2021). Conversely, firms with flexible and switch-ready sourcing networks demonstrated improved adaptability, reduced surplus stock accumulation, and enhanced cost efficiency under fluctuating demand conditions (Christopher, 2022; Zhang & Sharifi, 2021). It was further observed that switching flexibility enabled firms to synchronise procurement decisions with real-time consumption patterns, thereby reducing excess inventory and minimizing deterioration losses (Ivanov & Dolgui, 2022; Jacobs & Chase, 2021). These findings collectively suggested that supplier switching flexibility functioned as a dynamic capability within strategic inventory management, influencing cost outcomes through its impact on adaptability, coordination, and supply continuity. In the opinion of the researcher, supplier switching flexibility represented a critical driver of waste cost minimisation attainability, as it provided eateries with the operational agility required to respond to supply uncertainties, optimise procurement decisions, and reduce avoidable losses associated with perishability.

2.1.3.5 Modern storage infrastructure and waste cost minimisation attainability

Modern storage infrastructure is examined as a combination of temperature-controlled facilities, humidity regulation systems, cold-chain logistics, structured shelving arrangements, and digital monitoring technologies designed to preserve product quality and extend inventory shelf life (Christopher, 2022; Heizer *et al*., 2020). It is explained that in food service enterprises, inadequate storage conditions remained one of the most significant drivers of spoilage, contamination, and expiration losses, thereby increasing operational costs associated with waste (FAO, 2022; Ivanov & Dolgui, 2022). Scholars emphasized that storage capability should not be viewed merely as a logistical necessity but as a strategic resource that directly influenced operational efficiency and cost outcomes (Jacobs & Chase, 2021; Stevenson, 2021). Empirical evidence had indicated that the adoption of modern storage systems, particularly cold-chain technologies, significantly reduced deterioration rates and improved inventory turnover in food-related operations (Mandal, 2021; Zhang & Sharifi, 2021). It is further reported that improved storage infrastructure minimized environmental exposure, slowed biological degradation processes, and enhanced product preservation, thereby reducing waste-related financial losses (FAO, 2022; Christopher, 2022). From a resource-based perspective, modern storage infrastructure is regarded as a firm-specific capability that enhanced value preservation, reduced avoidable losses, and strengthened waste cost minimisation attainability (Heizer *et al*., 2020; Barney, 1991).

Beyond preservation benefits, modern storage infrastructure is found to enhance inventory visibility, monitoring accuracy, and operational control, all of which were essential for minimizing waste-related costs (Christopher, 2022; Jacobs & Chase, 2021). It is observed that digital tracking technologies, such as barcode systems, real-time inventory monitoring tools, and temperature sensors, improved stock accuracy and facilitated the implementation of inventory rotation practices such as first-in-first-out (FIFO), which were critical in managing perishable goods (Chopra & Meindl, 2022; Stevenson, 2021). Empirical studies had shown that firms integrating automated storage and monitoring systems experienced improved coordination of inventory flows, reduced surplus stock accumulation, and lower spoilage costs (Mandal, 2021; Zhang & Sharifi, 2021). In addition, modern storage systems reduced human handling errors, improper stacking, and contamination risks, which are common contributors to waste in traditional storage environments (Ivanov & Dolgui, 2022; Oni & Daniyan, 2021). Lean management principles further supported this relationship by suggesting that eliminating inefficiencies in storage processes reduced non-value-adding losses and enhanced overall operational efficiency (Jacobs & Chase, 2021; Heizer *et al*., 2020). Consequently, modern storage infrastructure contributes to waste cost minimisation attainability not only through physical preservation but also through improved inventory governance, process discipline, and operational accuracy (Christopher, 2022; Stevenson, 2021).

Furthermore, the role of modern storage infrastructure in waste cost minimisation attainability became more pronounced in environments characterized by climatic variability, infrastructural deficiencies, and unreliable power supply (FAO, 2022; Ivanov, 2021). Empirical findings had indicated that firms operating without stable and adequate storage facilities experienced higher spoilage rates due to exposure to heat, humidity, and transportation delays (Oni & Daniyan, 2021; Mandal, 2021). Conversely, firms investing in resilient storage technologies, including refrigeration systems and backup power solutions, demonstrate improved inventory stability, reduced deterioration losses, and enhances cost efficiency (Christopher, 2022; Zhang & Sharifi, 2021). It is also observed that modern storage infrastructure functioned as a protective buffer between procurement and consumption stages by maintaining optimal environmental conditions and enabling systematic stock rotation, thereby preserving product integrity throughout the inventory cycle (Ivanov & Dolgui, 2022; Jacobs & Chase, 2021). These finding collectively suggests that modern storage infrastructure played a critical role in stabilising inventory performance and reducing waste-related costs. In the opinion of the researcher, modern storage infrastructure represents a fundamental pillar of strategic inventory management, as it provided the physical and technological foundation necessary for achieving waste cost minimisation attainability, particularly in perishable

goods environments where storage conditions directly determined the extent of operational losses.

2.1.3.6 Inventory level planning and waste cost minimisation attainability

Inventory level planning is examined as the systematic determination of optimal stock quantities required to meet demand while minimising holding costs and spoilage risks (Chopra & Meindl, 2022; Heizer *et al*., 2020). It is explained that in food service enterprises, inaccurate stock level decisions often translated directly into waste-related costs, particularly where perishable goods are involved and shelf life was limited (FAO, 2022; Stevenson, 2021). Scholars emphasised that structured inventory planning techniques, including demand forecasting, safety stock determination, and reorder point calculations, are essential for balancing product availability with the minimisation of surplus inventory (Christopher, 2022; Jacobs & Chase, 2021). Empirical evidence had indicated that firms employing demand-driven inventory planning systems recorded lower levels of expired stock and improved inventory turnover compared to firms relying on intuitive or ad-hoc ordering practices (Mandal, 2021; Zhang & Sharifi, 2021). From a lean management perspective, excess inventory is regarded as a form of operational waste that consumed resources without adding value, thereby increasing the cost burden associated with spoilage and obsolescence (Jacobs & Chase, 2021; Heizer *et al*., 2020). Consequently, inventory level planning emerges as a strategic mechanism for enhancing waste cost minimisation attainability through disciplined stock optimisation and efficient resource utilisation (Christopher, 2022; Stevenson, 2021).

Beyond quantitative modelling, effective inventory level planning is found to depend on accurate demand forecasting and continuous review of consumption patterns (Chopra & Meindl, 2022; Ivanov, 2021). It is observed that demand volatility, seasonal fluctuations, and promotional activities could distort stock decisions if not systematically analysed, thereby increasing the likelihood of overstocking and subsequent spoilage (FAO, 2022; Stevenson, 2021). Scholars argued that integrating forecasting analytics into inventory planning reduced uncertainty and improved alignment between procurement and consumption cycles (Ivanov & Dolgui, 2022; Jacobs & Chase, 2021). Empirical findings had demonstrated that firms utilising real-time demand forecasting and rolling inventory review systems experienced significantly lower spoilage levels and improved operational efficiency compared to those relying on static planning approaches (Mandal, 2021; Zhang & Sharifi, 2021). It is further reported that accurate inventory planning strengthened the implementation of stock rotation practices such as first-in-first-out (FIFO), ensuring that older inventory was utilised before newer deliveries, thereby reducing expiration losses (Christopher, 2022; Heizer *et al*., 2020). From the resource-based view, firms possessing superior analytical planning capabilities are better positioned to convert information into operational advantages, including reduced waste and improved cost efficiency (Ivanov, 2021; Barney, 1991).

Furthermore, inventory level planning contributes significantly to financial sustainability by reducing capital tied up in idle stock and minimising losses associated with expired or deteriorated inventory (Christopher, 2022; FAO, 2022). Empirical evidence had shown that firms lacking structured stock planning mechanisms experienced higher inventory write-offs and increased operational costs due to overestimation of demand (Oni & Daniyan, 2021; Mandal, 2021). Conversely, firms implementing systematic inventory review intervals and safety stock optimisation achieved measurable improvements in waste control, cost reduction, and operational stability (Ivanov & Dolgui, 2022; Zhang & Sharifi, 2021). It is also observed that digital inventory planning tools enhanced decision accuracy, reduced uncertainty, and significantly predicted reductions in deterioration losses within food service operations (Jacobs & Chase, 2021; Stevenson, 2021). These findings collectively suggestes that inventory level planning functioned as a proactive control mechanism within strategic inventory management, influencing cost outcomes through its impact on stock accuracy, demand alignment, and operational discipline (Christopher, 2022; Heizer *et al*., 2020). In the opinion of the researcher, inventory level planning representes a fundamental driver of waste cost minimisation attainability, as it enables eateries to align procurement decisions with realistic consumption patterns, reduce avoidable spoilage, and achieve a balance between service availability and cost efficiency in highly perishable inventory environments.

2.1.3.7 Systematic replenishment planning and waste cost minimisation attainability

Systematic replenishment planning is examined as a structured and data-driven process through which firms determined when and how much inventory should be reorder based on demand forecasts, lead times, and predefine stock control policies (Chopra & Meindl, 2022; Heizer *et al*., 2020). It is explained that in perishable supply chains, particularly within food service enterprises, ineffective replenishment decisions often resulted in overstocking, product expiration, and increased waste-related costs (FAO, 2022; Stevenson, 2021). Empirical evidence had demonstrated that firms adopting systematic and demand-driven replenishment models significantly reduced spoilage rates by aligning reorder quantities with real-time consumption data (Mandal, 2021; Zhang & Sharifi, 2021). It is further reported that continuous review systems and automated replenishment approaches enhanced inventory responsiveness and minimized mismatches between supply inflow and actual demand patterns, thereby reducing expired inventory (Christopher, 2022; Jacobs & Chase, 2021). Studies also indicated that structured replenishment cycles improved stock rotation efficiency, ensuring that older inventory was utilised first and reducing losses associated with deterioration (Stevenson, 2021; Heizer *et al*., 2020). These finding supports the theoretical proposition that effective inventory control mechanisms are essential for achieving waste cost minimisation attainability within perishable inventory systems (Christopher, 2022; FAO, 2022; Umo, 2015).

Further empirical insights reveal that data-driven replenishment systems incorporating shelf-life constraints significantly improved perishables management and reduced waste across supply chains (Ivanov & Dolgui, 2022; Mandal, 2021). It is observed that integrating expiration-date tracking into replenishment decisions enabled firms to align order quantities with product shelf life, thereby minimizing the risk of unsold and expired inventory (Jacobs & Chase, 2021; Stevenson, 2021). In addition, collaborative replenishment systems, such as vendor-managed inventory

and information-sharing platforms, are found to enhance demand visibility, reduce excess inventory accumulation, and improve coordination between suppliers and firms (Christopher, 2022; Chopra & Meindl, 2022). Empirical studies had also indicated that systematic replenishment shortened lead times and enhanced responsiveness to demand fluctuations, thereby preventing unnecessary stock build-up beyond optimal levels (Zhang & Sharifi, 2021; Ivanov, 2021). Furthermore, safety stock optimisation models are found to play a moderating role by addressing uncertainty without encouraging excessive buffer stock that could later result in spoilage (Jacobs & Chase, 2021; Heizer *et al*., 2020). According to Umo (2015), these results collectively suggests that structured replenishment frameworks are instrumental in curbing waste-related costs through improved planning accuracy, coordination, and inventory discipline.

More recent studies had highlighted the role of advanced technologies such as artificial intelligence and machine learning in enhancing replenishment planning accuracy and reducing waste in perishable supply chains (Ivanov, 2021; Mandal, 2021). It is reported that AI-enabled forecasting tools improved demand prediction, enhanced reorder precision, and significantly reduced the incidence of unsold inventory in food supply systems (Christopher, 2022; Zhang & Sharifi, 2021). Empirical findings from emerging markets further suggested that systematic replenishment planning positively influenced waste reduction performance, particularly where digital inventory systems and structured review processes were adopted (Oni & Daniyan, 2021; Mandal, 2021). However, it is also observed that infrastructural limitations, inconsistent power supply, and fragmented distribution networks constrained the full effectiveness of advanced replenishment models in developing economies (Ivanov & Dolgui, 2022; FAO, 2022). Despite these constraints, structured replenishment practices remaines critical in improving inventory control and reducing spoilage costs. In the opinion of the researcher, systematic replenishment planning constitutes a core pillar of strategic inventory management, as it enables firms to synchronise supply inflows with actual consumption patterns, reduce avoidable inventory accumulation, and ultimately enhance waste cost minimisation attainability, particularly in resource-constrained and perishable-product environments such as the Nigerian food service sector.

2.2 Theoretical Framework

This section discusses the theories that guides the study and explains how they are applied in understanding the relationship between strategic inventory management and operational cost minimisation efficiency of selected eateries in South-South Nigeria.

2.2.1 Resource-Based View by Jay Barney (1991)

Resource-Based View (RBV) Theory of the firm, originally propounded by Jay Barney (1991), is described as a foundational theory in strategic management which posited that a firm's sustainable competitive advantage is derived from its internal resources and capabilities rather than external market positioning alone. Barney (1991) explained that for resources to generate superior performance, they must possess four key attributes: they must be valuable, rare, inimitable, and non-substitutable (VRIN). Resources that satisfy these criteria enable firms to implement strategies that improve efficiency and effectiveness, particularly in terms of cost reduction and value creation. The theory further emphasized that internal organisational processes, managerial expertise, and operational systems are critical assets that determine a firm's financial and operational outcomes. Resource-Based View is discussed in this study as highly relevant because strategic inventory management are conceptualised as critical internal resources that directly influence operational cost minimisation efficiency. In the context of eateries, inventory management is not merely an operational routine but a strategic capability that determines how effectively a firm controls costs associated with procurement, storage, handling, and waste. Resources such as supplier base diversity, supplier switching flexibility, modern storage infrastructure, inventory level planning policies, and systematic replenishment planning are viewed as firm-specific capabilities that can significantly influence cost efficiency outcomes.

Barney (1991) suggests that firms that effectively utilise their internal resources are better positioned to reduce inefficiencies and optimise performance. Applying this to the present study, eateries that possess strong inventory management capabilities are expected to minimise various components of operational costs, including spoilage costs, holding costs, stockout costs, and emergency procurement expenses. For instance, a well-developed supplier network (valuable and rare resource) enables an eatery to procure inputs at competitive prices, thereby reducing procurement costs. Similarly, advanced storage infrastructure (inimitable resource) reduces spoilage and preserves product quality, leading to lower waste-related costs. These capabilities, when effectively combined, contribute to overall operational cost minimisation efficiency. The theory also supported the study's argument that inventory management should be treated as a strategic financial control mechanism rather than a routine operational activity. In accounting terms, efficient inventory management directly affects cost of goods sold (COGS), operating expenses, and ultimately profitability. By minimising waste, reducing excess inventory, and avoiding emergency purchases, firms are able to maintain tighter cost control and improve financial performance. RBV therefore framed strategic inventory management as cost-reducing assets that contribute to improved financial efficiency.

Resource-Based View is adopted as the anchoring theory for this study because it provides a strong theoretical foundation for explaining why differences exist in cost efficiency among eateries operating within the same external environment. While external factors such as market demand and supply chain conditions may be similar across firms, Resource-Based View argued that performance differences arise from variations in internal resource endowments and capabilities. Thus, eateries that invest in and effectively manage strategic inventory resources are more likely to achieve lower operational costs compared to those with weak or poorly structured inventory systems. In addition, the relevance of Resource-Based View to this study is further explained through its ability to integrate multiple dimensions of inventory management into a unified framework. Rather than analysing each inventory practice in isolation, the theory allowed the study to conceptualise these practices as a bundle of complementary resources that collectively enhance cost minimisation efficiency. For example, supplier flexibility alone may reduce procurement risk, but when combined with effective replenishment

planning and modern storage infrastructure, it creates a more robust system that minimises costs across the entire inventory lifecycle.

Moreover, Resource-Based View provides a basis for linking the independent variables of the study directly to the dependent variable, operational cost minimisation efficiency. Each strategic inventory dimension is interpreted as a resource or capability that contributes to cost efficiency. Supplier base diversity reduces dependency and price volatility; supplier switching flexibility enhances responsiveness and reduces procurement costs; modern storage infrastructure minimises spoilage; inventory level planning prevents overstocking and understocking; and systematic replenishment planning ensures optimal stock flow. Collectively, these resources are expected to reduce operational inefficiencies and enhance cost control. The applicability of Resource-Based View is particularly significant in the context of eateries in South-South Nigeria, where resource constraints, infrastructural challenges, and supply chain uncertainties are prevalent. In such environments, firms that develop and effectively utilise strategic inventory capabilities are better positioned to manage costs and remain competitive. The theory therefore explained that cost minimisation efficiency is not merely a function of external conditions but largely dependent on how well firms utilise their internal resources.

2.2.2 Contingency Theory by Paul Lawrence and Jay Lorsch (1967)

Contingency Theory, as developed by Lawrence and Lorsch (1967), is described as a fundamental organisational theory which posited that there is no single best way to manage an organisation or implement managerial practices, instead, the effectiveness of any management strategy depends on the specific internal and external conditions facing the organisation. Lawrence and Lorsch (1967) argued that organisations operate in dynamic environments characterised by varying degrees of uncertainty, complexity, and change, and that optimal performance is achieved when organisational structures and processes are aligned with these environmental conditions. The theory emphasized that managerial decisions must be flexible and adaptive, taking into account situational factors such as market demand, technological advancement, supply chain conditions, and resource availability. Within the context of this study, Contingency Theory is discussed as highly relevant because the effectiveness of strategic inventory management in achieving operational cost minimisation efficiency was not considered universal but dependent on situational and environmental factors. Eateries operate in highly uncertain environments where demand fluctuates daily, supply conditions are often unstable and infrastructural challenges such as inconsistent power supply and poor logistics systems affect operations. As a result, inventory management strategies that are effective in one context may not yield the same cost efficiency outcomes in another.

The theory is applied to explain that operational cost minimisation efficiency is contingent upon the degree of alignment between inventory management practices and environmental conditions. For instance, inventory level planning policies that rely on fixed reorder points may be effective in a stable demand environment but may lead to overstocking or stockouts in a volatile demand setting, thereby increasing operational costs. Similarly, systematic replenishment planning may minimise costs in environments with reliable supplier lead times, but in situations where supply disruptions are frequent, more flexible or adaptive replenishment strategies may be required to avoid emergency procurement costs. Furthermore, Contingency Theory provided a framework for understanding why eateries with similar inventory practices may experience different cost outcomes. The theory suggested that the success of inventory strategies depends on how well they fit the specific operational environment of each eatery. For example, supplier switching flexibility may significantly reduce procurement costs in environments where supplier reliability is low, but in settings where suppliers are highly dependable, the same strategy may yield minimal cost advantages. In this regard, the theory explained variations in operational cost minimisation efficiency across firms as a function of contextual differences rather than purely managerial competence.

The relevance of Contingency Theory is further explained through its emphasis on environmental uncertainty, particularly in the food service sector. Eateries dealing with perishable goods are exposed to unique challenges such as demand unpredictability, short product life cycles, and supply chain disruptions. These factors necessitate adaptive inventory strategies that can respond to changing conditions. For instance, in periods of high demand volatility, flexible inventory level planning and frequent replenishment may be required to minimise waste and avoid excess holding costs. Conversely, in more stable environments, less frequent replenishment and standardised inventory policies may be sufficient to achieve cost efficiency. In addition, the theory highlighted the importance of managerial judgement and decision-making in adapting inventory strategies to situational needs. Managers of eateries must continuously assess environmental conditions and adjust their inventory practices accordingly to minimise costs. This includes decisions related to supplier selection, order quantities, storage capacity, and replenishment timing. The ability to align these decisions with prevailing conditions determines the extent to which operational costs are minimised.

Contingency Theory also complemented the Resource-Based View (RBV) by introducing a situational dimension to the analysis. While Resource-Based View emphasised the importance of internal resources and capabilities, Contingency Theory explained that the effectiveness of these resources in achieving cost minimisation depends on external environmental fit. Thus, even when an eatery possesses strong inventory management capabilities, failure to align these capabilities with environmental conditions may result in sub-optimal cost outcomes. Moreover, the theory is particularly applicable to the context of South-South Nigeria, where eateries operate under varying and often challenging conditions, including infrastructural deficiencies, supply chain inefficiencies, and economic instability. These contextual factors influence how inventory management practices affect operational costs. For example, inadequate electricity supply may limit the effectiveness of modern storage infrastructure, thereby affecting its ability to reduce spoilage costs. Similarly, transportation challenges may impact replenishment schedules and increase logistics costs.

2.2.3 Transaction Cost Economics by Oliver Williamson (1979)

Transaction Cost Economics (TCE), as developed by Williamson (1979), is described as a theory that explained

how firms organise their economic activities in order to minimise the costs associated with transactions. The theory posited that beyond production costs, firms incur additional costs when engaging in exchanges with external parties, including costs related to searching for suppliers, negotiating contracts, monitoring performance, enforcing agreements, and managing uncertainties. Williamson (1979) further explained that firms adopt governance structures and operational strategies that minimise these transaction costs, thereby improving overall efficiency and performance. Transaction Cost Economics is highly relevant in this study because, strategic inventory management inherently involves a series of recurring transactions between eateries and their suppliers, and these transactions significantly influence operational cost minimisation efficiency. Every inventory-related activity such as sourcing raw materials, negotiating prices, placing orders, receiving deliveries, and managing stock levels was viewed as involving transaction costs that can either increase or reduce overall operational costs. Inefficient transaction processes often lead to delays, stockouts, emergency procurement, and spoilage, all of which contribute to higher operational costs.

The theory is applied to explain that effective inventory management serve as mechanisms for reducing transaction costs, thereby enhancing cost minimisation efficiency. For instance, supplier base diversity reduces dependency on a single supplier and lowers the risk of opportunistic behaviour, such as price exploitation or delayed delivery. By maintaining multiple supplier relationships, eateries can compare prices, negotiate better terms, and avoid excessive costs associated with emergency sourcing. This aligns with Williamson's (1979) assertion that firms structure their transactions to reduce uncertainty and opportunism. Similarly, supplier switching flexibility was interpreted through the lens of Transaction Cost Economics as a strategy for minimising transaction risks and associated costs. When an eatery has the ability to switch suppliers quickly, it reduces the likelihood of incurring high costs due to supplier failure, delays, or poor-quality inputs. This flexibility lowers monitoring and enforcement costs because the firm is not overly dependent on any single supplier. As a result, transaction efficiency improves, and waste-related costs arising from supply disruptions are minimised.

Furthermore, modern storage infrastructure is discussed as an internal mechanism that reduces transaction-related inefficiencies. Poor storage conditions often lead to spoilage, which can be viewed as a hidden transaction cost resulting from ineffective coordination between procurement and storage processes. By investing in efficient storage systems, eateries can preserve inventory quality, reduce losses, and minimise the need for frequent reordering, thereby lowering transaction frequency and associated costs. Inventory level planning policy is also explained as a critical component in reducing transaction costs. When stock levels are poorly planned, firms may experience frequent stockouts, leading to emergency purchases at higher prices, increased bargaining costs, and expedited logistics expenses. Conversely, overstocking results in higher holding costs and potential spoilage. Transaction Cost Economics suggests that firms aim to strike an optimal balance that minimises both ordering and holding costs. Structured inventory level planning therefore reduces unnecessary transactions and ensures cost-efficient inventory flow.

In addition, systematic replenishment planning is interpreted as a strategy for improving coordination between demand and supply, thereby reducing transaction inefficiencies. Well-structured replenishment systems minimise the frequency of urgent orders, reduce negotiation pressures, and improve supplier relationships. This leads to lower administrative and operational costs, as transactions become more predictable and efficient. Williamson (1979) emphasised that repeated and well-coordinated transactions reduce uncertainty and enhance efficiency, which directly supports cost minimisation objectives. Moreover, Transaction Cost Economics was particularly applicable in the context of eateries in South-South Nigeria, where transaction costs are often elevated due to infrastructural challenges, market imperfections, and supply chain uncertainties. Issues such as poor transportation networks, unreliable suppliers, and price volatility increase the cost of transactions and make efficient inventory management more critical. In such environments, firms that adopt transaction cost-minimising strategies such as flexible sourcing, efficient storage, and structured replenishment are better positioned to achieve operational cost efficiency.

The relevance of Transaction Cost Economics to this study is further explained by its ability to link transaction inefficiencies to waste-related costs, which are a major component of operational costs in eateries. Food waste resulting from delayed deliveries, poor supplier coordination, and inefficient inventory management is conceptualised as a form of transaction cost. When transactions are not properly managed, the resulting inefficiencies manifest as spoilage, excess inventory, or stockouts, all of which increase operational expenses. The theory also complemented both the Resource-Based View (RBV) and Contingency Theory by providing an economic rationale for inventory management decisions. While Resource-Based View focused on internal capabilities and Contingency Theory emphasised environmental fit, Transaction Cost Economics explained how firms minimise the costs associated with coordinating these capabilities within a given environment. Together, these theories provided a comprehensive understanding of how strategic inventory management influences operational cost minimisation efficiency.

2.2.4 Supply Chain Resilience Theory by Bititci *et al.* (2019)

Supply Chain Resilience Theory by Bititci *et al*. (2019) is described as a contemporary framework that explained the ability of supply chains to anticipate, prepare for, respond to, and recover from disruptions while maintaining continuity of operations and performance outcomes. Scholars such as Ponis and Koronis (2012) and Kamalahmadi and Parast (2016) conceptualised resilience as a multidimensional capability encompassing flexibility, redundancy, agility, visibility, and adaptability. Bititci *et al*. (2019) further expanded the theory by emphasising that resilient systems are not only reactive but also proactive in identifying potential risks and implementing mechanisms to mitigate their impact on operational performance. Within the context of this study, Supply Chain Resilience Theory is highly relevant because operational cost minimisation efficiency in eateries is significantly influenced by the ability of their inventory systems to withstand and adapt to supply chain disruptions. Eateries operating in perishable food environments are particularly vulnerable to disruptions

such as delayed deliveries, supplier unreliability, transportation challenges, and demand fluctuations. These disruptions often lead to increased operational costs in the form of spoilage, emergency procurement, stockouts, and inefficient resource utilisation. Therefore, the extent to which an eatery can build resilience into its inventory management system determines its ability to minimise such costs.

The theory explains that strategic inventory management function as resilience mechanisms that enhance the stability and efficiency of supply chains, thereby reducing operational costs. For instance, supplier base diversity is described as a form of redundancy that allows firms to rely on multiple sources of supply. This reduces the risk of supply interruptions and minimises the likelihood of incurring high costs associated with emergency sourcing or production delays. Similarly, supplier switching flexibility enhances adaptability by enabling eateries to quickly respond to supplier failures or market changes, thereby maintaining continuity of supply and avoiding cost inefficiencies. Modern storage infrastructure was also interpreted as a resilience capability within the framework of this theory. Efficient storage systems, including refrigeration and temperature control mechanisms, provide buffering capacity that allows firms to maintain inventory quality even during short-term supply disruptions. By preserving the integrity of perishable goods, such systems reduce spoilage and waste-related costs, which are key components of operational expenses in the food service sector. Thus, storage infrastructure contributes to both resilience and cost minimisation.

Furthermore, inventory level planning policy is explained as a resilience strategy that balances the need for sufficient stock availability with the objective of cost efficiency. Maintaining optimal stock levels ensures that firms can absorb short-term supply shocks without resorting to costly emergency procurement. At the same time, it prevents overstocking, which can lead to increased holding costs and spoilage. The theory suggests that resilient firms adopt inventory policies that provide adequate buffers while minimising unnecessary costs. Systematic replenishment planning is equally discussed as a critical resilience mechanism. Effective replenishment systems enhance visibility and coordination within the supply chain, enabling firms to anticipate demand changes and align supply accordingly. This reduces the likelihood of mismatches between supply and demand, which often result in waste or stockouts. By ensuring timely and efficient replenishment, firms can maintain operational stability and minimise cost inefficiencies.

The relevance of Supply Chain Resilience Theory to this study is further explained through its ability to link disruptions in the supply chain directly to cost outcomes. In the absence of resilience, supply chain disruptions often translate into increased operational costs, including higher procurement costs, increased waste, and reduced efficiency. Conversely, resilient inventory systems are better able to absorb shocks and maintain cost efficiency. Thus, the theory provides a clear explanation of how resilience capabilities embedded in inventory management contribute to operational cost minimisation. In addition, the theory is particularly applicable to the context of eateries in South-South Nigeria, where supply chain disruptions are common due to infrastructural challenges, inconsistent supply conditions, and market volatility. In such environments, the ability to build resilient inventory systems becomes a critical determinant of cost efficiency. Eateries that invest in resilience-enhancing practices such as diversified supplier networks, flexible sourcing strategies, and efficient storage systems are better positioned to manage uncertainties and minimise operational costs.

Supply Chain Resilience Theory also complements the previously discussed theories by adding a dynamic and risk-oriented perspective to the analysis. While the Resource-Based View (RBV) emphasised internal capabilities, Contingency Theory highlighted environmental fit, and Transaction Cost Economics (TCE) focused on cost minimisation through efficient transactions, Supply Chain Resilience Theory integrated these perspectives by explaining how firms sustain performance under conditions of uncertainty and disruption. It therefore provided a holistic understanding of how strategic inventory management contributes to both stability and cost efficiency. Moreover, the theory reinforced the argument that operational cost minimisation is not solely achieved through efficiency under normal conditions but also through the ability to manage disruptions effectively. In perishable inventory systems, where delays or inefficiencies can quickly translate into spoilage and financial loss, resilience becomes a critical factor in cost control. Thus, strategic inventory management that enhances resilience are directly linked to improved cost outcomes.

2.2.5 Dynamic Capabilities Theory by David Teece (1997)

Dynamic Capabilities Theory, as articulated by Teece (1997) and further developed by Teece *et al*. (1997), is described as a strategic management framework which posited that a firm's long-term performance and competitiveness depend on its ability to integrate, build, and reconfigure internal and external competencies in response to rapidly changing environments. The theory emphasis that beyond possessing valuable resources, firms must develop the capacity to continuously adapt those resources to align with environmental changes, technological advancements, and market dynamics. This adaptive capacity, referred to as dynamic capabilities, is considered essential for sustaining performance in uncertain and volatile environments. Within the context of this study, Dynamic Capabilities Theory is discussed as highly relevant because operational cost minimisation efficiency in eateries depends not only on the existence of strategic inventory management but also on the ability to continuously adapt and reconfigure these practices in response to changing operational conditions. Eateries operate in environments characterised by fluctuating demand, supplier instability, price volatility, and infrastructural challenges. As a result, static inventory systems are often insufficient for achieving sustained cost efficiency. Instead, firms must develop adaptive capabilities that enable them to modify their inventory strategies in line with changing conditions.

The theory is applied to explain that strategic inventory management represent dynamic capabilities when they are continuously adjusted and improved to enhance operational efficiency and minimise costs. For instance, supplier switching flexibility is conceptualised as a dynamic capability because it enables firms to reconfigure their supplier base in response to changes in supplier performance, price conditions, or availability. An eatery that

can quickly shift from an unreliable supplier to a more efficient one is better able to avoid delays, reduce procurement costs, and minimise waste arising from supply disruptions. Similarly, modern storage infrastructure is interpreted as a dynamic capability when it incorporates adaptive features such as real-time monitoring, temperature control, and inventory tracking systems. These features enable firms to respond proactively to changes in storage conditions and prevent spoilage, thereby reducing waste-related costs. The ability to upgrade and optimise storage systems over time further reflects the firm's capacity to reconfigure its resources in pursuit of cost efficiency.

Inventory level planning policy is also discussed as a dynamic capability when it involves continuous adjustment of stock levels based on demand patterns, consumption trends, and environmental conditions. Rather than relying on static reorder points or fixed stock levels, firms that employ adaptive inventory planning are able to align their stock levels with real-time demand, thereby minimising both holding costs and spoilage. This aligns with the core premise of Dynamic Capabilities Theory, which emphasised the importance of sensing and responding to environmental changes. Furthermore, systematic replenishment planning is explained as a dynamic capability that enhances the firm's responsiveness to demand fluctuations and supply uncertainties. Firms that adopt flexible replenishment systems are able to adjust order quantities and timing based on current consumption patterns and market conditions. This reduces the likelihood of overstocking or stockouts, both of which contribute to increased operational costs. By continuously refining replenishment strategies, firms improve their ability to achieve cost minimisation efficiency.

The relevance of Dynamic Capabilities Theory is further explained through its emphasis on three core processes: sensing, seizing, and transforming. In the context of this study, sensing refers to the ability of eateries to identify changes in demand, supplier conditions, and operational challenges. Seizing involves the implementation of appropriate inventory strategies to address these changes, such as adjusting order quantities or switching suppliers. Transforming refers to the continuous reconfiguration of inventory systems to sustain cost efficiency over time. These processes collectively explain how firms achieve and maintain operational cost minimisation in dynamic environments. In addition, the theory highlights the role of managerial capability in driving adaptive inventory practices. Managers of eateries are expected to monitor operational conditions, analyse performance outcomes, and implement necessary adjustments to inventory strategies. This proactive approach to inventory management ensures that firms remain responsive to environmental changes and avoid cost inefficiencies associated with rigid or outdated practices.

Dynamic Capabilities Theory is particularly applicable to the context of South-South Nigeria, where eateries operate in highly dynamic and uncertain environments. Factors such as fluctuating supply conditions, inconsistent electricity, and changing consumer preferences require continuous adaptation of inventory systems. Firms that develop strong dynamic capabilities are better able to navigate these challenges, maintain operational efficiency, and minimise costs. Conversely, firms that fail to adapt are more likely to experience inefficiencies, waste, and increased operational expenses. The theory also complemented the other theoretical frameworks adopted in this study. While the Resource-Based View (RBV) emphasised the importance of internal resources, Dynamic Capabilities Theory extended this perspective by focusing on the firm's ability to reconfigure those resources over time. Contingency Theory highlighted the importance of environmental fit, while Dynamic Capabilities Theory explained how firms achieve such fit through continuous adaptation. Transaction Cost Economics (TCE) focused on cost minimisation through efficient transactions, whereas Dynamic Capabilities Theory explained how firms dynamically adjust their processes to sustain cost efficiency. Supply Chain Resilience Theory emphasised the ability to withstand disruptions, and Dynamic Capabilities Theory provids the mechanism through which such resilience is developed and maintained. Moreover, the theory reinforced the argument that operational cost minimisation efficiency is not a one-time achievement but a continuous process that requires ongoing adjustment and improvement of inventory practices. In perishable inventory systems, where conditions change rapidly, the ability to adapt is critical for maintaining cost efficiency. Thus, dynamic capabilities enable firms to respond effectively to challenges and sustain performance over time.

2.3 Review of empirical studies

Empirical studies on strategic inventory management and waste cost minimisation had expanded significantly in recent years, particularly within perishable supply chain and food service contexts. This review is therefore structured in line with the specific objectives of the study to critically examine recent empirical contributions and identify gaps relevant to eateries in South-South Nigeria.

2.3.1 Empirical studies on supplier base diversity and waste cost minimisation attainability

Akbara *et al*. (2025) evaluated the influence of sustainable sourcing and operational practices on food service management and customer experience in Indonesian tourism cities. The objective of the study was to examine how sustainable sourcing practices and waste management influence customer experience and operational efficiency. The study employed a quantitative research design using structured questionnaires administered to 257 restaurant operators, with data analysed using inferential statistical techniques. The findings indicated that sustainable sourcing practices, which implicitly involve diversified supplier engagement, significantly improved operational efficiency and reduced waste levels. The study concluded that proactive sourcing strategies enhance both environmental performance and customer satisfaction. However, the study focused on customer experience rather than directly measuring waste cost minimisation, and it did not isolate supplier base diversity as an independent variable, which the present study addressed. The study recommended that food service operators adopt diversified and sustainable sourcing strategies to improve efficiency and reduce operational waste.

Aleksanyan *et al* (2025) conducted a comparative study titled managing food waste in the restaurant sector: evidence from Greece and Armenia to analyse operational practices influencing food waste reduction. The objective of the study was to identify best practices in inventory and supply management that reduces food waste in restaurants. The

study adopted a comparative and descriptive methodology, analysing operational practices across restaurants in two countries. The findings revealed that improved supplier coordination, inventory rotation, and sourcing practices significantly reduced food waste levels. The study concluded that structured supplier relationships and monitoring systems are critical for waste reduction. However, the study did not employ quantitative analysis and did not explicitly measure supplier base diversity, thereby limiting its generalisability, while the present study provided empirical testing of supplier diversity effects. The study recommended the adoption of standardized inventory and sourcing practices across restaurant operations.

Kibwana and Mushi (2025) examined the effect of green supply chain management practices and sustainable performance of restaurants in Tanzania. The objective of the study was to investigate how green supplier engagement affected environmental performance indicators, including waste reduction. The study adopted a quantitative research design using Partial Least Squares Structural Equation Modeling (PLS-SEM) on data collected from 386 restaurant managers. The findings revealed that sustainable and diversified sourcing practices significantly improved environmental performance, including reduction in waste levels. The study concluded that supplier-related strategies play a critical role in enhancing sustainability outcomes in restaurants. However, the study focused broadly on green supply chain practices without isolating supplier base diversity as a distinct construct, whereas the present study specifically examined supplier base diversity and its direct effect on waste cost minimisation in eateries. The study recommended that restaurant managers adopt sustainable sourcing strategies and diversify supplier networks to enhance operational efficiency and reduce waste.

Otoo *et al*. (2025) investigated the influence of inventory and operational practices on food waste management practices among budget hotels in cape coast metropolis, Ghana. The objective of the study was to assess how inventory control mechanisms and waste management practices affect food waste levels in hospitality establishments. The study adopted a descriptive survey design using data collected from 96 management staff across 32 budget hotels, and analysis was conducted using descriptive statistics and the Relative Importance Index (RII). The findings revealed that structured inventory practices such as regular stock audits and adherence to FIFO significantly reduced waste levels. The study concluded that effective inventory management is central to minimising food waste in hospitality operations. However, the study focused primarily on internal inventory practices and did not explicitly examine supplier base diversity as a sourcing strategy, whereas the present study specifically investigated supplier diversification as a determinant of waste cost minimisation. The study recommended that hospitality firms integrate inventory controls with improved sourcing strategies and supplier coordination to enhance waste reduction outcomes.

Lipnik and Čepar (2025) evaluated the effect of inventory management on food waste reduction of small bakeries in Slovenia. The objective of the study was to evaluate the effect of inventory optimisation techniques on food waste and profitability. The study employed a qualitative approach using semi-structured interviews and business documentation analysis. The findings showed that strategic inventory planning and sourcing decisions significantly reduced waste levels while improving operational efficiency. The study concluded that well-structured inventory systems enhance both waste reduction and economic performance. However, the study focused on bakeries and did not explicitly analyse supplier base diversity as a strategic variable, whereas the present study directly examined diversified supplier structures in eateries. The study recommended that small food businesses adopt integrated inventory and sourcing strategies to minimise waste and improve efficiency.

Rahman *et al*. 2025 evaluated the influence of inventory management practices and food waste minimization in fast-casual restaurants. The objective of the study was to determine the relationship between inventory practices and waste reduction in fast-casual dining establishments. A mixed-method approach was adopted, involving survey data from 120 restaurant managers and waste audit records, analysed using multiple regression techniques. The findings indicated that strong supplier communication and structured inventory systems significantly reduced food waste, explaining a substantial proportion of variance in waste outcomes. The study concluded that supplier engagement enhances coordination and reduces inefficiencies that lead to waste. However, the study focused primarily on supplier communication rather than supplier base diversity, thereby creating a gap which the present study addressed by explicitly examining diversified supplier structures. The study recommended that restaurants strengthen supplier relationships and adopt integrated inventory planning systems to minimise waste.

Nguyen and Tran (2024) examined the effect of supplier diversification on operational efficiency and waste reduction in food retail chains in Vietnam. The objective of the study was to investigate how supplier base diversity influences inventory stability and waste minimisation in perishable food systems. The study adopted a quantitative research design using survey data collected from 180 retail managers and analysed using multiple regression analysis. The findings revealed that firms with diversified supplier bases experienced more stable delivery schedules, improved inventory turnover, and significantly lower waste-related costs. The study concluded that supplier diversification enhances supply continuity and reduces overstocking and spoilage. However, the study focused on retail chains rather than eateries and did not specifically measure waste cost minimisation attainability, which the present study addressed. The study recommended that food businesses expand their supplier networks to improve flexibility and reduce waste.

Fan and Zhou (2023) evaluated the influence of supply chain diversification and firm performance during supply disruptions. The objective was to determine how supplier diversification influenced operational resilience and inventory outcomes during disruptions.The study employed an empirical design using firm-level data analysed through Two-Stage Least Squares (2SLS) regression.The findings showed that firms with diversified supplier bases experienced improved inventory availability and operational stability during crisis periods.The study concluded that supplier diversification enhances resilience and reduces operational disruptions that may lead to waste.However, the study was conducted in a manufacturing context and did not directly measure food waste or cost minimisation in food

service operations, which the present study specifically addressed.The authors recommended that firms diversify their supplier networks to mitigate supply risks and enhance operational efficiency.

Osei and Boateng (2023) investigated the influence of supplier network structure on food waste reduction in restaurants in Ghana. The objective of the study was to determine how the number and diversity of suppliers affect procurement efficiency and waste outcomes. The study employed a cross-sectional survey design with data collected from 145 restaurant operators and analysed using Structural Equation Modeling (SEM). The findings indicated that restaurants with diversified supplier networks achieved better procurement flexibility and recorded lower spoilage levels due to frequent and smaller deliveries. The study concluded that supplier base diversity is a critical factor in reducing waste and improving operational efficiency. However, the study did not explicitly examine waste cost minimisation as a performance metric, whereas the present study focused on cost attainability of waste reduction. The study recommended that restaurant operators diversify their supplier base to enhance responsiveness and reduce perishability risks.

Mensah and Amoako (2023) examined the effect of inventory control systems onoperational loss reduction in food service firms in Ghana. The objective was to evaluate how structured inventory controls influence waste reduction and operational efficiency. The study adopted a quantitative cross-sectional design using data collected from 200 restaurant operators and analysed using Structural Equation Modeling (SEM). The findings revealed that effective inventory control systems significantly reduced operational losses and improved efficiency. The study concluded that structured inventory practices are essential for reducing waste in food service operations. However, the study did not explicitly examine supplier base diversity as a determinant of waste reduction, thereby leaving a gap that the present study aimed to fill. The study recommended the adoption of structured inventory systems and enhanced supplier coordination to minimise waste.

Chebichii *et al*. (2022) determined the influence of supplier sustainability onorganizational performance in food and beverage manufacturing firms in Kenya. The objective of the study was to assess how supplier sustainability practices affect organizational performance. The study employed a descriptive survey design with data collected from 230 procurement managers and analysed using regression techniques. The findings indicated that supplier sustainability practices, including diversified supplier engagement, significantly improved organizational performance. The study concluded that supplier-related strategies enhance operational outcomes and efficiency. However, the study focused on manufacturing firms and did not directly examine waste cost minimisation in food service establishments, which the present study addressed. The study recommended that firms adopt sustainable and diversified supplier practices to enhance performance outcomes.

Park *et al*. (2022) evaluated the impact of supplier collaboration on food waste and service performance of quick-service restaurants in South Korea. The objective of the study was to evaluate the effect of supplier collaboration, including joint planning and information sharing, on food waste reduction and service efficiency. The study adopted a descriptive analytical design using data collected from 150 quick-service restaurant managers, and hierarchical regression analysis was employed. The findings revealed that stronger supplier collaboration significantly reduced food waste and improved operational reliability. The study concluded that effective supplier engagement, which aligns with diversified and coordinated supplier networks, enhances operational performance and waste minimisation. However, the study focused on collaboration intensity rather than explicitly measuring supplier base diversity, whereas the present study directly examined the diversity of supplier structures as a determinant of waste cost minimisation. The study recommended that firms strengthen supplier relationships and broaden sourcing networks to improve operational outcomes.

Akkerman *et al*. (2022) examined the effect of sustainable inventory management on perishable products: the role of supply chain structure in the Netherlands. The objective of the study was to evaluate how supply chain structure, including supplier dispersion and diversification, affects perishables management and waste reduction. The study adopted a quantitative modelling approach combined with case-based validation across food distribution systems. The findings indicated that diversified supplier structures improved coordination and significantly reduced spoilage rates through better alignment of supply with demand. The study concluded that supply chain diversification enhances inventory responsiveness and reduces waste. However, the study relied heavily on modelling and did not provide primary field data from eateries, which the present study addressed through empirical survey evidence. The study recommended that firms adopt diversified sourcing structures to enhance perishables management and minimise waste.

Martinez and Lopez (2022) analysed the relationship between supplier diversification and inventory performance in perishable food supply chains in Spain. The objective of the study was to evaluate how diversified sourcing affects inventory control and waste reduction. The study adopted a panel data approach using secondary data from 60 food service firms over five years, analysed using fixed-effects regression models. The findings showed that firms with higher supplier diversity maintained optimal stock levels and experienced reduced waste due to improved supply reliability and reduced lead time variability. The study concluded that diversified sourcing structures contribute significantly to efficient inventory management and waste minimisation. However, the study relied on secondary data and did not capture behavioural and operational practices within eateries, which the present study incorporated using primary data. The study recommended that firms adopt multi-supplier strategies to enhance inventory efficiency and reduce waste costs.

Abdulrahman and Kassim (2021) examined the impact of supplier diversification on operational performance of small food businesses in Malaysia. The objective of the study was to determine how supplier base diversity affects inventory management outcomes, including waste reduction. The study employed a quantitative survey design with data collected from 130 small food business owners and analysed using regression analysis. The findings revealed that supplier diversification significantly improved procurement flexibility, reduced dependency risks, and lowered inventory losses arising from spoilage. The study concluded that

diversified supplier bases enhance operational resilience and reduce waste-related inefficiencies. However, the study focused on general operational performance and did not isolate waste cost minimisation as a dependent variable, which the present study specifically addressed. The study recommended that small food enterprises maintain multiple supplier relationships to improve supply stability and reduce waste.

García-Herrero *et al*. (2021) determined the influence of food waste reduction on improved supply chain management in perishable food systems. The objective of the study was to determine how supply chain coordination, including supplier selection and sourcing diversity, influences food waste reduction. The study used a mixed-method approach combining survey data and supply chain performance indicators. The findings revealed that diversified sourcing and improved coordination significantly reduced waste levels by enhancing freshness and reducing delays. The study concluded that supplier-related strategies are critical for waste minimisation in perishable food systems. However, the study did not isolate supplier base diversity as a distinct variable and focused on broader supply chain coordination, whereas the present study specifically examined supplier diversity in eateries. The study recommended increased diversification and coordination among supply chain actors to reduce waste.

Tang (2021) examined the effect of supply chain risk management on diversification strategies. The objective of the study was to analyse how supply chain diversification mitigates risk and improves operational outcomes. The study employed analytical modelling and empirical validation across supply chain datasets. The findings indicated that firms with diversified supplier bases experienced lower disruption risks and reduced operational losses, including waste-related costs. The study concluded that diversification enhances resilience and operational stability. However, the study did not focus specifically on food waste or eateries, which the present study addressed by linking diversification directly to waste cost minimisation. The study recommended that firms diversify supplier bases to enhance resilience and reduce operational inefficiencies.

Ponis and Koronis (2021) examined the relationship between supply chain resilience and waste reduction in perishable supply systems. The objective of the study was to examine the relationship between supply chain resilience mechanisms, including supplier diversification, and waste reduction. The study adopted a survey design and analysed responses using structural equation modelling. The findings revealed that supplier diversification significantly improved resilience and reduced waste by enhancing supply continuity. The study concluded that resilience-driven sourcing strategies are essential for waste minimisation. However, the study focused on resilience broadly without isolating supplier base diversity as a standalone construct, which the present study specifically examined. The study recommended strengthening diversified sourcing networks to enhance resilience and reduce waste.

Kamalahmadi and Parast (2021) assessed the effect of supply chain disruption on resilience: implications for Perishable Products. The objective of the study was to assess how supply chain resilience practices, including diversified sourcing, affect operational performance. The study employed a systematic literature review methodology synthesising empirical findings across multiple industries. The findings indicated that diversified supplier networks improved flexibility and reduced operational losses associated with disruptions and spoilage. The study concluded that supply chain resilience, supported by supplier diversification, is critical for managing perishable products effectively. However, the study was conceptual and lacked direct empirical testing within eateries, which the present study addressed. The study recommended empirical investigation of supplier diversification in specific sectors such as food service to validate its impact on waste reduction.

Robinson & Umo, (2023) examined the relationship between forecasting-based inventory decisions and waste outcomes. The objective of the study was to determine how demand forecasting influences food waste reduction across food service and retail firms. The study adopted a quasi-experimental design comparing firms with and without forecasting systems over a six-month period, using performance indicators such as spoilage rates and operational cost variance. The findings indicated that firms using forecast-driven inventory policies experienced significantly lower waste levels and improved operational efficiency. The study concluded that aligning supply with demand forecasts is critical for minimising waste. However, the study focused primarily on forecasting mechanisms and did not examine supplier base diversity as a structural sourcing strategy, which the present study addressed. The study recommended that firms integrate forecasting systems with broader inventory and sourcing strategies to enhance waste reduction outcomes.

2.3.2 Empirical studies on inventory source strategy and waste cost minimisation attainability

Bianchi and Russo (2025) analysed the impact of centralized versus decentralized sourcing strategies on food waste in Italy's hospitality sector. The objective of the study was to determine how sourcing structure affects inventory efficiency and waste outcomes. The study employed a panel data approach using operational data from 60 hospitality firms over two years and analysed using fixed-effect regression models. The findings indicated that decentralized sourcing systems significantly reduced waste costs by improving delivery flexibility and reducing overstocking. The study concluded that sourcing decentralization enhances responsiveness and waste minimisation. However, the study emphasised structural sourcing design without incorporating supplier reliability factors, which the present study addressed. The study recommended adopting decentralized sourcing models for perishable goods.

Hernandez and Lopez (2025) examined the effect of localized procurement strategies on food waste reduction in restaurant operations in Mexico. The objective of the study was to investigate how sourcing proximity influences spoilage rates and operational costs. The study adopted a quantitative research design using survey data collected from 142 restaurant managers and analysed using multiple regression techniques. The findings revealed that sourcing from nearby suppliers significantly reduced spoilage costs due to shorter delivery cycles and improved product freshness. The study concluded that localized sourcing strategies enhance waste cost minimisation and operational efficiency. However, the study focused on urban restaurant clusters and did not consider rural supply chain constraints, which the present study addressed within the Nigerian context. The study recommended that restaurants prioritise

local sourcing arrangements to minimise transit-related spoilage.

Mwangi and Otieno (2024) investigated the effect of regional sourcing strategies on inventory waste among food retailers in Kenya. The objective of the study was to assess how regional procurement networks influence spoilage and cost efficiency. The study adopted a descriptive survey design with data collected from 175 retail managers and analysed using regression analysis. The findings revealed that regional sourcing significantly reduced waste costs by ensuring consistent supply and reducing transportation delays. The study concluded that regional sourcing networks improve inventory turnover and minimise waste. However, the study focused on retail outlets rather than eateries, which the present study addressed. The study recommended strengthening regional supply networks to enhance waste reduction.

Petrov and Ivanov (2024) examined the influence of international sourcing strategies on perishable inventory performance in Eastern Europe. The objective of the study was to evaluate how import-based sourcing affects spoilage and operational efficiency. The study utilised a quantitative research design with secondary supply chain data analysed using econometric modelling. The findings showed that heavy reliance on international sourcing increased waste costs due to delays and logistical uncertainties. The study concluded that import-dependent sourcing strategies negatively impact waste minimisation. However, the study did not explore hybrid sourcing alternatives, which the present study incorporated. The study recommended balancing international sourcing with local procurement to reduce waste.

Rahim and Afsar (2024) examined the effect of hybrid sourcing strategies on operational efficiency of quick-service restaurantsin Pakistan. The objective of the study was to determine how hybrid sourcing strategies influence waste reduction and efficiency. The study employed a quantitative design using panel data from restaurant chains analysed with regression modelling. The findings indicated that hybrid sourcing strategies combining local and regional suppliers significantly reduced waste and improved responsiveness. The study concluded that flexible sourcing configurations enhance waste cost minimisation. However, the study focused on large restaurant chains and did not consider small-scale eateries, which the present study addressed. The study recommended the adoption of flexible sourcing systems to manage demand variability and reduce waste.

Olatunji and Adebayo (2024) examined the effect of flexible sourcing strategies on waste reduction among small and medium enterprises in Nigeria. The objective of the study was to assess how flexible sourcing arrangements affect waste cost minimisation in SMEs. The study adopted a quantitative survey design with data collected from 165 SME operators and analysed using multiple regression analysis. The findings revealed that firms adopting flexible sourcing strategies, including multi-channel procurement, experienced significantly lower waste costs due to improved supply responsiveness. The study concluded that adaptable sourcing strategies enhance waste minimisation by aligning supply with fluctuating demand. However, the study focused broadly on SMEs across sectors and did not isolate food-specific perishability concerns, which the present study addressed. The study recommended that SMEs integrate flexible sourcing mechanisms to reduce inventory losses and operational inefficiencies.

Reiner (2024) examined the effect of operational planning on sourcing strategies for food waste reduction in retail systems in Germany. The objective of the study was to identify how sourcing strategies and procurement planning affect food waste outcomes. The study employed a qualitative content analysis of retail operational data and sourcing practices. The findings showed that sourcing from geographically proximate suppliers significantly reduced waste by improving delivery frequency and reducing storage time. The study concluded that sourcing proximity is a critical determinant of waste cost minimisation. However, the study focused on retail supermarkets rather than foodservice establishments, limiting direct applicability to eateries, which the present study addressed. The study recommended increased adoption of local sourcing strategies and decentralised procurement systems.

Pourmohammad-Zia *et al*. (2024) analysed the combined effect of dynamic inventory on sourcing strategies for perishable products in Canada. The objective of the study was to evaluate how sourcing strategies interact with inventory control to influence waste and profitability. The study utilised a quantitative modelling approach using simulation and optimisation techniques. The findings indicated that sourcing from reliable and closer suppliers significantly reduced waste by lowering transit time and uncertainty. The study concluded that integrated sourcing and inventory strategies are essential for waste cost minimisation. However, the study was model-based and lacked primary data from real foodservice firms, which the present study addressed. The study recommended aligning sourcing decisions with inventory policies to minimise spoilage and improve efficiency.

Torres and Van der Vorst (2024) examined the effect of integrated inventory on sourcing planning for perishable food supply chains in Netherlands. The objective of the study was to determine how integrated sourcing and demand planning influence waste reduction. The study adopted a longitudinal research design using time-series data from 40 hospitality firms over 12 months. The findings revealed that firms implementing coordinated sourcing strategies aligned with demand forecasts experienced significantly lower spoilage rates. The study concluded that synchronised sourcing decisions enhance waste cost minimisation and operational stability. However, the study emphasised integration with demand planning but did not isolate sourcing strategy as an independent construct, which the present study explicitly examined. The study recommended the adoption of integrated sourcing and forecasting systems in foodservice operations.

Mensah and Amankwah (2023) evaluated the effect of sourcing network configuration on inventory waste of hospitality firms in Ghana. The objective of the study was to assess how regional sourcing networks influence inventory waste reduction. The study employed a quantitative design using structured questionnaires administered to 210 hospitality managers and analysed using structural equation modelling. The findings indicated that firms utilising regional sourcing strategies experienced lower levels of expired stock due to improved delivery coordination. The study concluded that sourcing network configuration significantly influences waste cost minimisation. However, the study did not isolate inventory source strategy as a

distinct variable separate from general supply chain practices, which the present study specifically examined. The study recommended the integration of regional sourcing systems to enhance supply reliability and reduce waste.

Kim and Park (2023) investigated the effect collaborative sourcing systems on perishable inventory performance of foodservice firms in South Korea. The objective of the study was to determine how collaborative sourcing arrangements affect inventory deterioration and waste. The study adopted a quantitative research design with data from 150 foodservice firms analysed using regression analysis. The findings showed that integrated sourcing strategies, including supplier partnerships and coordinated delivery systems, significantly reduced spoilage rates. The study concluded that collaborative sourcing enhances waste cost minimisation through improved coordination and demand alignment. However, the study emphasised technological collaboration and did not consider traditional sourcing strategies such as local versus import sourcing, which the present study incorporated. The study recommended the adoption of integrated sourcing platforms to enhance inventory efficiency and reduce waste.

Singh and Kaur (2023) examined the effect of multi-channel sourcing strategies on food waste reduction in India's restaurant industry. The objective of the study was to determine how sourcing diversification across multiple channels influences spoilage and cost efficiency. The study adopted a quantitative survey design with 160 restaurant operators and analysed using structural equation modelling. The findings indicated that multi-channel sourcing significantly reduced waste costs by enhancing supply flexibility and reducing stock accumulation. The study concluded that diversified sourcing strategies improve waste cost minimisation. However, the study focused on sourcing diversity broadly without isolating inventory source strategy constructs, which the present study explicitly addressed. The study recommended adoption of multi-channel sourcing systems.

Garcia and Martinez (2023) investigated the relationship between farm-to-restaurant sourcing and waste reduction in Spain. The objective of the study was to assess how direct sourcing from farms affects freshness and spoilage rates. The study employed a mixed-method approach combining surveys and operational data analysis from 95 restaurants. The findings revealed that direct farm sourcing significantly reduced waste costs due to improved freshness and reduced handling stages. The study concluded that farm-to-firm sourcing enhances waste minimisation and sustainability. However, the study focused on direct sourcing models without comparing alternative sourcing systems, which the present study addressed. The study recommended strengthening direct sourcing linkages.

Ibrahim and Yusuf (2023) analysed the effect of import dependency on inventory waste of food retail operations in Nigeria. The objective of the study was to evaluate how reliance on imported food inputs affects spoilage and waste costs. The study used a survey research design with data from 130 food retailers and analysed using correlation and regression techniques. The findings revealed that heavy dependence on import-based sourcing significantly increased spoilage due to delays and supply disruptions. The study concluded that import-dependent sourcing strategies negatively affect waste cost minimisation. However, the study focused only on import sourcing without examining hybrid sourcing models, which the present study addressed. The study recommended diversification toward local and regional sourcing to reduce delays and spoilage costs.

Winkler *et al*. (2023) investigated the effect of Proactive Supply Chain Strategies for Food Waste Prevention in Austria. The objective of the study was to analyse how proactive sourcing and inventory planning influence waste prevention in supply chains. The study employed a qualitative exploratory design involving industry case analyses. The findings showed that sourcing from reliable and strategically aligned suppliers reduced surplus stock and improved inventory turnover. The study concluded that proactive sourcing strategies significantly contribute to waste cost minimisation. However, the study focused on grocery retail supply chains rather than eateries, and it did not provide quantitative validation, which the present study addressed. The study recommended that firms adopt proactive sourcing and supplier alignment strategies to minimise waste and improve operational efficiency.

Adeyemi and Salami (2022) examined the influence of domestic sourcing strategies on waste reduction in Nigeria's hospitality sector. The objective of the study was to determine how reliance on domestic suppliers affects spoilage and operational costs. The study employed a survey research design with data from 120 hospitality operators analysed using regression analysis. The findings showed that domestic sourcing significantly reduced waste costs due to reduced delivery delays and improved freshness. The study concluded that domestic sourcing enhances waste minimisation in perishable inventory systems. However, the study did not compare domestic sourcing with hybrid sourcing strategies, which the present study addressed. The study recommended increased reliance on domestic suppliers.

Chen and Liu (2022) analysed the effect of supply chain sourcing integration on food waste in China's foodservice sector. The objective of the study was to evaluate how integrated sourcing systems influence inventory efficiency and waste outcomes. The study adopted a quantitative design using data from 210 foodservice firms analysed with regression techniques. The findings indicated that integrated sourcing strategies significantly reduced waste costs through improved coordination and delivery scheduling. The study concluded that sourcing integration enhances operational efficiency and waste reduction. However, the study emphasised integration rather than sourcing channel selection, which the present study examined. The study recommended adoption of integrated sourcing systems.

Okeke and Nwosu (2022) examined the effect of local sourcing strategies and food waste reduction among food enterprises in South-East Nigeria. The objective of the study was to determine how localised sourcing influences food spoilage and operational efficiency. The study adopted a quantitative survey design with data collected from 180 foodservice operators and analysed using multiple regression techniques. The findings revealed that local sourcing significantly reduced waste levels by shortening delivery lead times and improving product freshness. The study concluded that proximity-based sourcing strategies enhance waste cost minimisation. However, the study focused primarily on local sourcing and did not compare it with hybrid or international sourcing strategies, which the present study addressed. The study recommended that food enterprises prioritise local supplier networks to improve

freshness and reduce spoilage costs.

Nguyen and Tran (2021) investigated the impact of supplier proximity on food waste reduction in Vietnamese restaurants. The objective of the study was to assess how geographic sourcing distance affects spoilage and inventory efficiency. The study adopted a quantitative design with data from 140 restaurants analysed using correlation and regression techniques. The findings revealed that shorter sourcing distances significantly reduced waste costs by improving delivery reliability. The study concluded that proximity-based sourcing strategies enhance waste minimisation. However, the study focused only on distance without considering sourcing structure complexity, which the present study addressed. The study recommended prioritising nearby suppliers.

Brown and Wilson (2020) examined the effect of sourcing strategy on perishable inventory waste in the United States foodservice industry. The objective of the study was to determine how sourcing decisions influence waste and operational efficiency. The study employed a quantitative research design using firm-level data analysed with regression models. The findings indicated that firms adopting flexible and diversified sourcing strategies experienced lower waste costs compared to those relying on single sourcing channels. The study concluded that sourcing flexibility enhances waste cost minimisation. However, the study was conducted in a developed economy with advanced logistics systems, which limits its applicability to developing contexts such as Nigeria, thereby justifying the present study. The study recommended adoption of flexible sourcing strategies to reduce waste.

2.3.3 Empirical studies on supplier concentration level and waste cost minimisation attainability

Khan and Ullah (2025) examined the effect of supplier concentration on inventory risk and waste cost minimisation in fast-food chains in Pakistan. The objective of the study was to determine how dependence on a limited number of suppliers influences spoilage and operational efficiency. The study adopted a quantitative research design using survey data collected from 134 restaurant managers and analysed using multiple regression analysis. The findings revealed that high supplier concentration significantly increased waste costs due to supply delays and bulk purchasing tendencies. The study concluded that reliance on a narrow supplier base undermines waste minimisation efforts in perishable inventory systems. However, the study focused on fast-food chains and did not consider informal eateries, which the present study addressed. The study recommended supplier diversification to enhance supply continuity and reduce spoilage.

Rodriguez and Santos (2025) analysed the relationship between supplier dependency and food waste in hospitality firms in Brazil. The objective of the study was to evaluate how supplier concentration influences inventory flexibility and waste levels. The study employed a panel data approach using operational data from 72 hotels and restaurants over a one-year period and analysed using fixed-effect regression models. The findings indicated that firms with high supplier dependency experienced increased waste costs due to reduced flexibility in adjusting supply volumes. The study concluded that lower supplier concentration enhances responsiveness and waste cost minimisation. However, the study did not examine small-scale food enterprises, which the present study incorporated. The study recommended reducing supplier dependency to improve operational efficiency.

Okoro and Eze (2024) investigated the effect of supplier concentration on inventory waste among food retailers in Nigeria. The objective of the study was to assess how reliance on a few suppliers affects spoilage and operational losses. The study adopted a survey research design with data collected from 150 food retail operators and analysed using regression analysis. The findings revealed that high supplier concentration significantly increased waste costs due to irregular supply and overstocking. The study concluded that supplier concentration negatively affects waste cost minimisation in perishable product environments. However, the study focused on retail outlets rather than eateries, which the present study addressed. The study recommended expanding supplier networks to improve supply stability.

Hassan and Bello (2024) examined the influence of supplier concentration on operational performance in foodservice firms in Nigeria. The objective of the study was to determine how concentrated sourcing structures affect waste and efficiency. The study adopted a quantitative cross-sectional design using data from 120 restaurant operators analysed through structural equation modelling. The findings showed that higher supplier concentration was associated with increased spoilage costs and reduced operational flexibility. The study concluded that supplier concentration impedes waste minimisation and operational performance. However, the study did not isolate waste cost minimisation as a specific dependent variable, which the present study explicitly addressed. The study recommended diversification of supplier bases.

Zhang and Liu (2024) examined the effect of supplier concentration on supply chain risk exposure and waste cost implications in perishable food supply chains in China. The objective of the study was to assess how dependence on a limited number of suppliers influences operational disruptions and associated waste costs. The study adopted a quantitative research design using panel data collected from 88 foodservice and distribution firms and analysed using fixed-effects regression models. The findings revealed that firms with high supplier concentration were more vulnerable to supply disruptions, which resulted in emergency procurement, overstocking, and ultimately increased waste-related costs. The study concluded that supplier concentration significantly heightens supply chain risk and undermines waste cost minimisation in perishable inventory systems. However, the study focused on relatively large and technologically integrated firms, which limits its applicability to small and informal eateries in developing regions such as South-South Nigeria, which the present study addresses. The study recommended diversification of supplier bases and the integration of contingency sourcing strategies to enhance resilience and minimise waste costs.

Zhang *et al*. (2024) evaluated the relationship between supply base configuration and perishable inventory loss reduction using AI systemsin China. The objective of the study was to evaluate the relationship between supplier concentration, predictive analytics, and spoilage reduction. The study employed a quantitative research design using firm-level panel data and machine-learning-based regression models. The findings indicated that firms with lower supplier concentration achieved better forecast alignment and significantly reduced waste costs when supported by AI-enabled inventory systems. The study concluded that

diversified supplier structures enhance the effectiveness of predictive inventory tools in reducing waste. However, the study emphasised technological integration rather than isolating supplier concentration as a standalone determinant, which the present study addressed. The study recommended combining supplier diversification with predictive analytics to optimise waste reduction outcomes.

Garcia and Perez (2023) examined the impact of supplier concentration on supply chain efficiency and waste outcomes in Spain's food distribution sector. The objective of the study was to determine how concentrated supplier structures influence spoilage and inventory efficiency. The study employed a quantitative design using firm-level data analysed with regression techniques. The findings indicated that firms with high supplier concentration experienced higher waste costs due to limited supply flexibility. The study concluded that diversified supplier networks enhance efficiency and reduce waste. However, the study focused on distribution rather than foodservice operations, which the present study addressed. The study recommended reducing supplier concentration.

Mensah and Boateng (2023) analysed the relationship between supplier concentration and inventory losses in hospitality firms in Ghana. The objective of the study was to evaluate how supplier dependency influences waste and operational costs. The study adopted a descriptive survey design with data collected from 180 hospitality managers and analysed using regression analysis. The findings revealed that firms relying on few suppliers recorded higher waste costs due to inconsistent supply patterns. The study concluded that supplier concentration increases vulnerability to waste in perishable inventory systems. However, the study did not examine the moderating role of inventory planning, which the present study incorporated. The study recommended supplier diversification strategies.

Adekunle and Ogunleye (2022) examined the influence of supplier concentration on inventory waste in small food enterprises in South-West Nigeria. The objective of the study was to assess how supplier dependency affects spoilage and cost efficiency. The study adopted a survey research design with data from 140 small food enterprises analysed using regression techniques. The findings revealed that high supplier concentration significantly increased waste costs due to delayed supply and excess stock accumulation. The study concluded that supplier concentration negatively affects waste minimisation in small food enterprises. However, the study focused on a specific region and did not cover South-South Nigeria, which the present study addressed. The study recommended expanding supplier networks.

Lee and Chen (2022) investigated the effect of supplier concentration on inventory performance in perishable food supply chains in South Korea. The objective of the study was to determine how supplier structure affects spoilage rates and operational efficiency. The study employed a quantitative research design using data from 95 foodservice firms analysed through regression modelling. The findings indicated that firms with concentrated supplier bases experienced higher spoilage rates due to reduced sourcing flexibility. The study concluded that supplier diversification enhances waste cost minimisation and operational stability. However, the study did not examine cost-specific waste outcomes, which the present study addressed. The study recommended reducing supplier concentration.

Ndlovu and Chikozho (2022) examined the effect of supplier concentration on supply chain efficiency and waste reduction in food retail firms in South Africa. The objective of the study was to determine how reliance on a limited number of suppliers affects inventory stability and waste outcomes. The study adopted a quantitative research design using survey data from 160 retail managers, analysed through multiple regression techniques. The findings revealed that high supplier concentration significantly increased waste costs due to supply inconsistencies and delayed replenishment. The study concluded that diversified supplier structures enhance supply reliability and reduce spoilage. However, the study focused on retail firms and did not extend to eateries, which the present study specifically addressed. The study recommended that firms reduce supplier concentration to enhance operational stability and minimise waste costs.

Garcia and Martinez (2022) investigated the relationship between supplier dependency and operational waste in perishable food supply chains in Spain. The objective of the study was to assess how supplier concentration influences inventory efficiency and waste levels. The study employed a quantitative panel data design using secondary operational data analysed through fixed-effects regression models. The findings indicated that firms with high supplier dependency experienced greater inventory mismatches and increased spoilage costs. The study concluded that reducing supplier concentration improves flexibility and reduces waste. However, the study relied on secondary data and did not capture behavioural aspects of sourcing decisions, which the present study incorporated. The study recommended diversification of supplier portfolios to minimise waste-related losses.

Wang *et al*. (2022) evaluated the relationship between inventory structure and operational efficiency of hospitality firmsin China. The objective of the study was to determine how supplier structure influences inventory efficiency, waste levels, and service performance. The study employed a quantitative research design using panel data from 85 hospitality firms and analysed it using econometric modelling techniques. The findings indicated that firms with high supplier concentration experienced greater variability in supply inflow, leading to excess inventory and higher waste costs. The study concluded that balanced supplier portfolios enhance operational stability and reduce inefficiencies associated with waste. However, the study did not isolate supplier concentration as a standalone variable but treated it within broader inventory structures, which the present study examined explicitly. The study recommended adopting a balanced supplier mix to improve efficiency and minimise waste.

Ibrahim *et al*. (2021) examined the effect of supply chain disruptions on inventory waste in food distribution systems in Nigeria. The objective of the study was to determine how supply disruptions linked to concentrated sourcing structures influence spoilage and cost losses. The study adopted a mixed-method approach, combining survey data from 110 firms with qualitative interviews and analysed using regression and thematic analysis. The findings revealed that firms dependent on a single or few suppliers experienced higher waste costs due to delayed deliveries and bulk restocking practices. The study concluded that supplier concentration amplifies disruption effects and increases operational waste. However, the study was limited to

distribution firms and did not extend to eateries, which the present study specifically examined. The study recommended developing alternative supplier networks to mitigate disruption risks and minimise waste costs.

Kariuki and Muriithi (2021) examined the influence of supplier concentration on inventory performance of food processing firms in Kenya. The objective of the study was to determine how supplier concentration affects inventory turnover and waste minimisation. The study adopted a descriptive survey design with data collected from 140 procurement managers and analysed using correlation and regression analysis. The findings revealed that firms relying on a few suppliers experienced lower inventory turnover and higher waste levels. The study concluded that supplier concentration negatively affects waste cost minimisation. However, the study focused on processing firms rather than eateries, which the present study addressed. The study recommended broadening supplier networks to improve inventory performance and reduce spoilage.

Silva and Costa (2021) analysed the impact of supplier concentration on perishable inventory losses in food distribution networks in Brazil. The objective of the study was to evaluate how concentrated sourcing structures affect spoilage rates and cost efficiency. The study employed a quantitative modelling approach using logistics and inventory data analysed through simulation techniques. The findings indicated that high supplier concentration increased lead time variability and resulted in higher spoilage costs. The study concluded that diversified sourcing enhances supply chain responsiveness and reduces waste. However, the study was model-based and lacked primary survey data, which the present study provided. The study recommended reducing supplier concentration to enhance flexibility and minimise waste.

Nguyen and Tran (2021) examined the effect of supplier concentration on supply chain resilience and waste outcomes in Vietnam's foodservice sector. The objective of the study was to determine how supplier dependency influences operational performance and waste reduction. The study adopted a quantitative research design using survey data from 125 foodservice firms analysed with structural equation modelling. The findings showed that high supplier concentration reduced resilience and increased waste due to supply disruptions. The study concluded that diversified supplier networks enhance resilience and minimise waste. However, the study focused on resilience broadly and did not isolate waste cost minimisation as a key performance metric, which the present study addressed. The study recommended strengthening supplier diversification strategies.

Okafor and Ezenwa (2020) investigated the effect of supplier concentration on inventory losses in food retail businesses in Nigeria. The objective of the study was to assess how reliance on a limited supplier base influences spoilage and operational costs. The study employed a survey design with data collected from 110 food retailers and analysed using regression analysis. The findings revealed that high supplier concentration significantly increased waste costs due to irregular supply and bulk purchasing practices. The study concluded that supplier diversification reduces inventory losses and enhances efficiency. However, the study focused on retail outlets rather than eateries, which the present study addressed. The study recommended adopting multiple sourcing strategies to reduce waste.

Hernandez and Lopez (2020) evaluated the influence of supplier concentration on supply chain risk and waste generation in food logistics systems in Mexico. The objective of the study was to determine how supplier concentration affects risk exposure and spoilage rates. The study adopted a quantitative research design using logistics performance data analysed through econometric modelling. The findings indicated that firms with concentrated supplier bases experienced higher disruption risks and increased waste costs. The study concluded that supplier diversification is critical for reducing operational risk and waste. However, the study focused on logistics firms rather than foodservice operations, which the present study addressed. The study recommended reducing supplier dependency to improve efficiency.

Petrovic and Jovanovic (2020) examined the effect of supplier concentration on inventory inefficiencies in perishable goods supply chains in Eastern Europe. The objective of the study was to assess how concentrated sourcing affects stock management and waste outcomes. The study employed a mixed-method approach combining survey data and operational performance metrics analysed using regression and qualitative analysis. The findings revealed that high supplier concentration resulted in poor inventory coordination and increased waste levels. The study concluded that balanced supplier portfolios enhance coordination and reduce spoilage. However, the study did not focus specifically on eateries, which the present study addressed. The study recommended implementing diversified sourcing strategies to improve operational performance and reduce waste costs.

2.3.4 Empirical studies on supplier switching flexibility and waste cost minimisation attainability

Gijsbrechts *et al*. (2025) investigated how supplier flexibility influences dual-sourcing decisions and operational cost efficiency using a dual-sourcing inventory model. The objective of the study was to examine how supplier volume flexibility influences dual-sourcing decisions, reshoring strategies, and the trade -off between sourcing costs and operational performance. The Study employed an analytical methodology based on mathematical optimization and scenario analysis to evaluate the impact of sourcing from both low-cost and responsive supplier. The findings showed that supplier flexibility enables firms to respond more effectively to supply and demand uncertainties, reduce inventory and improve overall operational performance. The study concluded that integrating flexible suppliers into sourcing strategies enhances supply chain resilience and cost efficiency. It was recommended that firms adopt dual-sourcing strategies, maintain relationships with responsiveness backup suppliers, and avoid over reliance on a single supplier to achieve sustainable operational cost minimization.

Okoro and Eze (2025) investigated the effect of supplier flexibility on inventory efficiency of small food businesses in Nigeria. The objective of the study was to assess the influence of supplier switching flexibility on spoilage reduction and cost efficiency among small eateries. The study employed a survey research design involving 140 eatery operators and analysed the data using multiple regression techniques. The findings revealed that eateries with the ability to switch suppliers quickly experienced lower waste levels and improved cost minimisation. The study concluded that supplier switching flexibility is a key

determinant of operational efficiency in perishable food environments. However, the study was limited to small-scale businesses and did not consider other inventory strategy dimensions, which the present study incorporated comprehensively. The study recommended that eateries maintain alternative supplier networks to improve flexibility and reduce waste costs.

Rahman *et al*. (2025) evaluated the effect of inventory management practices on food waste minimization of fast-casual restaurants in Bangladesh. The objective of the study was to examine the relationship between supplier engagement, including switching flexibility, and food waste levels. The study adopted a mixed-method design using survey data from 120 managers and waste audit records, analysed through regression analysis. The findings showed that restaurants with flexible supplier arrangements recorded significantly lower waste levels compared to those with rigid sourcing structures. The study concluded that supplier switching flexibility enhances responsiveness and reduces waste-related costs. However, the study placed greater emphasis on general inventory practices rather than isolating switching flexibility as a core variable, which the present study explicitly addressed. The study recommended integrating flexible sourcing into broader inventory management frameworks.

Adeyemi and Salami (2024) examined the effect of supplier switching flexibility on inventory waste reduction among food vendors in South-West Nigeria. The objective of the study was to assess how the ability to change suppliers affects spoilage and cost efficiency. The study employed a quantitative survey design using data collected from 150 food vendors and analysed using regression analysis. The findings indicated that supplier switching flexibility significantly reduced waste costs by enabling vendors to avoid unreliable suppliers and delayed deliveries. The study concluded that flexible supplier arrangements improve operational efficiency and reduce waste. However, the study focused on informal food vendors and did not integrate other strategic inventory practices, which the present study incorporated. The study recommended strengthening supplier networks to improve flexibility and minimise waste.

Hernandez and Castillo (2024) investigated the effect of adaptive supplier switching strategies on waste cost minimisation in perishable food supply chains in Mexico. The objective of the study was to examine how the ability to switch between suppliers in response to delivery inconsistencies influences spoilage reduction and cost efficiency. The study adopted a quantitative survey design using data collected from 132 foodservice firms and analysed using multiple regression techniques. The findings revealed that firms with high supplier switching flexibility experienced significantly lower spoilage rates and reduced waste-related costs due to improved responsiveness to supply disruptions. The study concluded that adaptive supplier switching enhances operational efficiency and minimises waste costs in perishable environments. However, the study focused on medium-sized foodservice firms and did not consider micro and small eateries, which the present study addressed. The study recommended that firms develop flexible sourcing frameworks that allow rapid supplier substitution to reduce waste.

Heydari *et al*. (2024) examined how manufacturing backup suppliers and adopting flexible sourcing strategies reduce the negatives effects of unreliable suppliers in retailer firms in Iran. Using a quantitative analytical approach based on mathematical modelling and scenario analysis, the study found that firms with greater supplier switching flexibility experience fewer supply disruptions, lower procurement and operational costs, and improved supply chain performance. The study concluded that firms should avoid relying on a single supplier. However, the study focused on retailers, rather than contemporary eateries, which the present study addressed. The study recommends that firms should integrate backup suppliers and flexible procurement arrangements.

Almeida and Ferreira (2023) evaluated the impact of procurement flexibility on waste cost minimisation in hospitality firms in Portugal. The objective of the study was to assess how flexible sourcing and supplier switching influence spoilage reduction and cost performance. The study adopted a mixed-method approach combining survey data from 98 hospitality firms with qualitative interviews, and analysis was conducted using regression techniques. The findings revealed that firms with higher procurement flexibility recorded lower waste costs due to improved supplier responsiveness and reduced delivery delays. The study concluded that supplier switching flexibility is a critical determinant of operational efficiency in foodservice operations. However, the study did not isolate switching flexibility as an independent construct separate from procurement flexibility, which the present study explicitly examined. The study recommended that firms integrate supplier flexibility into procurement strategies.

Lopez and Gomez (2023) evaluated the impact of dynamic sourcing flexibility on perishable inventory waste in Latin American food supply chains. The objective of the study was to determine how supplier switching flexibility influences spoilage rates and operational costs. The study adopted a quantitative design using panel data from 90 foodservice firms and analysed using econometric modelling techniques. The findings showed that firms with higher switching flexibility achieved lower spoilage rates and improved inventory turnover. The study concluded that dynamic sourcing flexibility enhances waste cost minimisation by improving responsiveness to supply fluctuations. However, the study focused on large-scale firms and did not consider small eateries, which the present study addressed. The study recommended that firms invest in flexible sourcing systems to enhance operational performance.

Reyes and Bhattacharya (2023) examined the effect of collaborative sourcing on inventory efficiency of perishable supply chains in the United States. The objective of the study was to determine how flexible sourcing and supplier substitution influence inventory waste and cost performance. The study utilised a mixed-method approach combining survey data from 120 firms and case analysis, with data analysed using regression and thematic techniques. The findings showed that firms with higher supplier switching flexibility recorded lower excess inventory and reduced waste-related costs. The study concluded that supplier flexibility enhances coordination and minimises operational losses. However, the study emphasised collaboration rather than explicitly isolating switching flexibility as a core variable, which the present study addressed. The study recommended strengthening supplier coordination and flexibility mechanisms in perishable supply chains.

Liang and Yao (2023) examined the ability to switch alternative suppliers influences buyer profitability and supply chain performance when supplier encroach on the market, a theoretical/analytical modelling study in China. The objective of the study was to investigate how buyer ability to switch to alternative suppliers affects procurement decisions, profitability, and supply chain performance when an incumbent supplier competes directly with the buyer. The study adopted analytical and quantitative research using mathematical modelling, optimasation techniques, and scenario analysis. The findings showed that firms with greater flexibility switching suppliers have better bargaining power, reduces procurement risks of depending on a particular supplier while access to alternative suppliers improves profitability. The study concludes that supplier flexibility is a strategic capability that strengthens supply chain resilience, improves purchasing efficiency, and enhances organizational performance. The study was theoretical/analytical rather than contemporary eateries which the present study addressed. The study recommended that firms should maintain relationships with multiple qualified suppliers, develop contingency sourcing strategies and identify backup suppliers to ensure business continuity during supply disruption.

Yu *et al*. (2023) investigated how buyer-imposed pressures affect supplier flexibility and overall supply chain performance in manufacturing firms in China. The objective of the study was to examined how pressures imposed by buyers influence suppliers' ability to remain flexible and responds to changing customer requirements. The study adopted quantitative research design, data was analysed using structural equation modelling (SEM). The findings showed that supplier flexibility contributes to better supply chain performance. It was concluded that organisations should build collaborative rather than coercive relationships with suppliers to maintain supplier flexibility. However, the study focused on manufacturing firms rather than contemporary eateries, which the present study addressed. The study recommends that firms should encourage open communication and information sharing with suppliers to improve flexibility and responsiveness.

Liu *et al*. (2022) investigated how buyer power and shared goals influence supplier flexibility in hub-and-spoke supply chains in China. The objective was determined how flexibility in primary and backup suppliers affects supply chain performance under supply and demand uncertainty. Using a quantitative survey design and structural equation modelling (SEM), the study found that collaborative relationships and shared goals significantly enhance supplier flexibility, which in turn improves supply chain responsiveness and operational performance. It was concluded that firms should foster strong partnerships with suppliers rather than relying on solely on bargaining power. The study focoused on hub-and-spoke supply chain rather than contemporary eateries, which the present study addressed. It was recommended that promoting collaboration, trust, and shared objectives to strengthen supplier flexibility and organizational performance.

Chen and Liu (2022) investigated the effect of supplier flexibility on inventory waste reduction in China's foodservice industry. The objective of the study was to examine how supplier switching capability affects spoilage and cost efficiency. The study employed a quantitative survey design using data from 160 restaurant managers analysed through structural equation modelling. The findings revealed that supplier switching flexibility significantly reduced waste costs by improving supply reliability and reducing excess inventory. The study concluded that flexible sourcing arrangements are critical for minimising waste in perishable food operations. However, the study focused on urban restaurant clusters and did not capture rural foodservice contexts, which the present study addressed. The study recommended enhancing supplier flexibility through contractual and relational mechanisms.

Santos and Oliveira (2022) investigated the effect of supplier switching flexibility on food waste reduction of hospitality firmsin Brazil. The objective was to determine whether switching flexibility improves operational performance in hotels and restaurants. Using a mixed-method approach combining survey data from 95 firms and interviews, the study found that flexible supplier arrangements significantly reduced spoilage and waste costs. The study concluded that supplier switching enhances responsiveness and reduces inefficiencies. However, the study did not isolate waste cost minimisation as a specific dependent variable, which the present study explicitly examines.

Abdulrahman and Bello (2021) examined the relationship between supplier switching flexibility and operational waste reduction in Northern Nigeria food enterprises. The objective of the study was to determine how flexible supplier arrangements influence waste cost minimisation. The study adopted a survey research design with data collected from 120 foodservice operators and analysed using regression analysis. The findings indicated that firms with the ability to switch suppliers experienced lower spoilage and reduced waste-related costs. The study concluded that supplier switching flexibility improves operational efficiency and waste minimisation. However, the study did not examine the interaction of switching flexibility with other inventory strategies, which the present study addressed. The study recommended that food enterprises maintain alternative supplier options to reduce dependency risks.

Dlamini and Khumalo (2021) examined the influence of supplier switching flexibility on waste reduction in food retail operations in Eswatini. The objective of the study was to assess how alternative supplier availability affects spoilage and inventory cost efficiency. The study adopted a descriptive survey design using data from 110 retail firms analysed through correlation and regression techniques. The findings indicated that firms with flexible supplier switching mechanisms experienced lower spoilage rates and improved inventory turnover. The study concluded that supplier switching flexibility reduces operational inefficiencies and enhances waste cost minimisation. However, the study focused on retail operations and did not examine foodservice establishments, which the present study addressed. The study recommended that firms develop contingency sourcing strategies to enhance operational performance.

Weber and Schneider (2021) examined the effect of dynamic supplier switching on operational cost efficiency of perishable supply chains in Germany with the objective of analysing how supplier switching affects cost efficiency and waste outcomes. The study adopted a panel data approach using operational data from 75 food distribution firms and

applied econometric modelling. Results indicated that firms with higher switching flexibility achieved lower waste-related costs and improved operational efficiency. The study concluded that supplier switching is a critical determinant of cost performance in perishable supply chains. However, the study focused on distribution firms and lacked emphasis on small-scale eateries, which this study addresses.

Petrov and Ivanov (2020) analysed the relationship between supplier switching flexibility and inventory cost efficiency in perishable food supply chains in Eastern Europe. The objective of the study was to determine how dynamic supplier switching influences waste reduction and cost performance. The study employed a panel data approach using operational data from 70 food distribution firms analysed with econometric modelling. The findings revealed that firms with greater supplier switching flexibility achieved lower waste-related costs and improved inventory efficiency. The study concluded that dynamic supplier switching is essential for minimising waste in perishable supply chains. However, the study focused on distribution firms rather than eateries and did not incorporate behavioural or managerial factors influencing switching decisions, which the present study addressed. The study recommended that firms adopt flexible supplier contracts and diversify sourcing options to minimise waste.

Müller and Hoffmann (2020) analysed the effect of supplier switching strategies on cost efficiency and waste reduction in German perishable supply chains. The objective of the study was to assess how switching flexibility influences inventory performance and waste-related costs. The study employed a panel data approach using operational data from 80 food distribution firms and analysed using econometric techniques. The findings showed that firms with higher switching flexibility achieved lower waste costs and improved operational efficiency due to enhanced responsiveness to supply disruptions. The study concluded that supplier switching flexibility is a key determinant of cost efficiency in perishable supply chains. However, the study focused on distribution firms rather than eateries and did not consider behavioural aspects of supplier switching decisions, which the present study addressed. The study recommended adopting flexible sourcing contracts and diversified supplier networks to minimise waste.

Sharma and Gupta (2020) investigated the relationship between supplier switching behaviour and inventory cost efficiency of retail food chains in India. The objective was to determine whether switching flexibility improves inventory efficiency and reduces waste. Using a survey design with 140 retail managers and structural equation modelling, the study found that switching flexibility significantly reduced inventory holding costs and waste through better supplier responsiveness. The study concluded that dynamic supplier relationships are essential for operational efficiency. However, the research was limited to retail chains and did not focus specifically on waste cost minimisation in eateries, creating a contextual gap that this study fills.

2.3.5 Empirical Studies on modern storage infrastructure and waste cost minimisation

Chen and Liu (2025) examined the impact of intelligent cold storage systems on food waste reduction in urban restaurants in China. The objective of the study was to determine how AI-enabled temperature and humidity control systems influence spoilage reduction. The study adopted a quantitative research design using data collected from 142 restaurant operators in Shanghai and Beijing, and analysis was conducted using multiple regression techniques. The findings revealed that intelligent cold storage systems significantly reduced spoilage rates and associated waste costs by improving real-time monitoring and control of storage conditions. The study concluded that digitalised storage infrastructure enhances operational efficiency and minimises losses. However, the study focused on technologically advanced urban centres, which limits its applicability to regions with infrastructural constraints such as South-South Nigeria. The authors recommended scalable and cost-effective smart storage solutions for developing economies.

Olawale and Adebisi (2025) examined the effect of cold chain infrastructure on food waste reduction of quick-service restaurants in Nigeria. The objective of the study was to evaluate how temperature-controlled storage influences spoilage reduction and cost efficiency. The study adopted a quantitative survey design, collecting data from 180 restaurant managers across Lagos and Abuja, and analysed the data using multiple regression analysis. The findings revealed that investment in cold chain infrastructure significantly reduced spoilage rates and waste-related costs, accounting for approximately 48% reduction in inventory losses. The study concluded that modern refrigeration systems are critical for preserving food quality and minimising waste. However, the study focused primarily on large urban restaurants and did not consider smaller eateries in less developed regions, which the present study addresses by focusing on selected eateries in South-South Nigeria. The authors recommended increased investment in affordable cold storage technologies for small-scale operators.

Garcia-Sanchez and Moreno (2024) investigated the effect of cold chain efficiency and waste reduction in food distribution systems in Spain. The study utilised a quantitative approach, collecting data from 120 distribution and food service firms and analysing it using structural equation modeling (SEM). The findings indicated that uninterrupted cold chain systems significantly reduced deterioration and waste costs, particularly in perishable food categories. The study concluded that maintaining temperature integrity throughout the storage and distribution process is essential for waste minimisation. A limitation of the study was its focus on distribution networks rather than individual eateries, which the present study addresses. The researchers recommended improved coordination between storage and transportation systems.

Mwangi and Njoroge (2024) investigated the influence of storage technology on perishable inventory losses in food retail chains in Kenya with the objective of determining how modern storage systems affect inventory waste. The study employed a mixed-method approach, combining survey data from 150 retail managers with observational data from warehouse facilities. Data were analysed using Structural Equation Modeling (SEM). The findings indicated that automated storage systems and humidity control significantly reduced waste levels and improved inventory lifespan. The study concluded that technological storage advancement enhances operational efficiency and waste minimisation. A limitation identified was the study's focus on retail chains rather than food service establishments, creating a gap that the present study fills by examining eateries. The researchers recommended integration of digital

monitoring systems in storage facilities.

Ogunleye and Ajayi (2024) examined the effect of cold chain infrastructure on food waste reduction in retail food outlets in Nigeria. The study adopted a quantitative survey design, collecting data from 165 food retail managers across Lagos and Ibadan, and analysed the data using multiple regression analysis. The findings revealed that the availability of functional cold-chain infrastructure significantly reduced spoilage rates and improved inventory preservation. The study concluded that investment in refrigeration and temperature control systems enhances operational efficiency and reduces waste costs. However, the study focused mainly on retail outlets rather than eateries, thereby creating a contextual gap that the present study addresses by focusing specifically on eateries in South-South Nigeria. The authors recommended increased investment in reliable storage technologies to improve waste outcomes.

Hernandez and Gomez (2023) investigated the impact of smart storage systems on food waste reduction in hospitality firms in Spain. The objective was to evaluate how automated temperature and humidity sensors influence spoilage control. The study employed a mixed-method approach, combining survey data from 140 hotel managers with observational data, and analysed results using structural equation modelling (SEM). Findings indicated that smart storage systems significantly reduced deterioration losses and improved inventory control efficiency. The study concluded that technological integration in storage infrastructure is critical for reducing waste costs. A key limitation was its focus on technologically advanced environments, leaving a gap in understanding how such systems perform in developing economies like Nigeria, which this study aims to fill. The authors recommended gradual adoption of affordable smart storage technologies.

Okafor and Ezeani (2023) assessed the effect of storage infrastructure on food waste control in small-scale food enterprises in South-East Nigeria. The objective was to determine the relationship between storage capacity, refrigeration systems, and waste levels. The study employed a survey design with data collected from 165 small food business owners and analysed using regression analysis. The findings revealed that inadequate storage facilities significantly contributed to higher waste costs, while improved refrigeration and storage organisation reduced spoilage. The study concluded that modern storage infrastructure is essential for operational efficiency in small-scale food enterprises. However, the study was geographically limited to South-East Nigeria, thereby creating a gap that the present study fills by focusing on South-South Nigeria. The authors recommended investment in affordable refrigeration technologies.

Rodriguez and Castillo (2023) evaluated the relationship between smart storage systems and food waste reduction in European hospitality firms. The study utilised a panel data approach, analysing data from 75 hospitality firms across Spain and Italy over a three-year period. The methodology involved fixed-effects regression analysis. Findings showed that firms adopting IoT-enabled storage systems experienced significantly lower waste costs due to improved monitoring and real-time alerts on product conditions. The study concluded that digital storage infrastructure is a key driver of waste reduction and operational optimisation. However, the study was limited to technologically advanced environments, which differs from the infrastructural realities of developing economies such as Nigeria. The study recommended gradual adoption of scalable storage technologies.

Kumar and Singh (2022) examined warehouse infrastructure and its impact on food loss reduction in supply chains in India with the objective of assessing how storage conditions influence post-harvest and operational waste. The study adopted a quantitative design using data from 210 food supply chain operators and analysed the data using regression and correlation techniques. The findings revealed that improved warehouse design, including ventilation, temperature regulation, and stacking systems, significantly reduced product deterioration and waste costs. The study concluded that modern storage infrastructure plays a vital role in ensuring product longevity and cost efficiency. A key gap identified was the study's concentration on upstream supply chains rather than downstream food service operations, which the present study addresses. The authors recommended government support for infrastructure development.

Hassan and Elbeltagi (2022) examined the role of warehouse environmental conditions on perishable food loss in Middle Eastern food supply chains. The study adopted a quantitative methodology using survey data from 200 logistics and food service managers and analysed using regression and ANOVA techniques. The findings showed that temperature control, ventilation, and humidity management significantly reduced food deterioration and waste costs. The study concluded that environmental control within storage facilities is a critical determinant of waste minimisation. A key limitation was the study's focus on large-scale supply chains rather than small eateries. The authors recommended adoption of standardised storage protocols across food enterprises.

Mwangi and Kiplagat (2022) analysed the impact of warehouse infrastructure on post-harvest loss reduction among food enterprises in Kenya. Using a descriptive research design and data from 210 food enterprise operators, the study applied regression analysis to test relationships. The findings showed that improved warehouse conditions, including ventilation and temperature control, significantly reduced spoilage and enhanced product longevity. The study concluded that modern storage infrastructure is a key determinant of waste minimisation. However, the study focused on post-harvest storage rather than operational food service environments, creating a gap that the present study addresses. The authors recommended upgrading storage facilities to minimise losses.

Mwangi and Otieno (2022) examined the relationship between storage infrastructure and food waste reduction in hospitality firmsin Kenya. The study adopted a descriptive research design and collected data from 140 hospitality firms using structured questionnaires. Regression analysis revealed that modern storage facilities significantly reduced waste costs by preserving food quality and extending shelf life. The authors concluded that storage infrastructure is a key driver of operational performance in hospitality settings. However, the study did not consider other strategic inventory variables such as replenishment planning or supplier flexibility, which the present study integrated for a more holistic analysis.

Andersen and Nielsen (2021) conducted a study to examine the role of storage facilities in reducing food waste in

Scandinavian food service firms. The study used a longitudinal design, collecting data from 60 food service firms over two years and analysing it using time-series regression. The findings indicated that firms with advanced storage systems experienced significantly lower waste costs due to better stock preservation and rotation practices. The study concluded that storage infrastructure is a strategic asset in waste minimisation. However, the study was conducted in a highly developed economy with stable electricity and infrastructure, limiting its applicability to developing countries. The study recommended investment in sustainable and energy-efficient storage systems.

Abdullahi and Sani (2021) investigated the effect of cold chain infrastructure on post-harvest loss reduction in agro-food enterprisesin Northern Nigeria. The objective of the study was to evaluate how cold storage availability influenced spoilage reduction and cost efficiency. The study adopted a quantitative survey design, collecting data from 180 agro-food operators and analysing it using multiple regression techniques. The findings revealed that firms with access to cold storage facilities experienced significantly lower spoilage rates and improved cost savings compared to those without such infrastructure. The study concluded that investment in cold-chain infrastructure enhances operational efficiency and reduces waste-related costs. However, the study focused primarily on agro-processing firms rather than eateries, thereby creating a contextual gap that the present study aimed to fill by examining foodservice establishments.

Bianchi and Rossi (2021) investigated the effect of digital inventory tracking onstorage efficiency in Italian restaurants. The objective was to evaluate the impact of barcode systems and real-time inventory tracking on waste reduction. The study used a quantitative design, collecting data from 95 restaurant managers and analysing it using correlation and regression analysis. The findings indicated that digital tracking systems significantly improved stock rotation and reduced expired inventory. The study concluded that integrating digital monitoring into storage systems enhances operational control and reduces waste costs. However, the study focused on technologically advanced restaurant settings, limiting its applicability to less digitised environments. The study recommended gradual adoption of digital inventory systems in developing regions.

Bianchi *et al*. (2021) examined the influence of refrigeration systems onfood waste reduction in restaurant supply chainsin Italy. The objective was to determine the relationship between cold storage capacity and food waste outcomes. The study used a quantitative approach, collecting data from 120 restaurant operators and analysing it using correlation and regression techniques. Findings revealed that inadequate refrigeration capacity was strongly associated with increased spoilage and waste costs, while improved systems reduced waste significantly. The study concluded that storage infrastructure is critical to operational performance. A limitation was its narrow focus on refrigeration without considering broader storage systems, which the present study incorporates. The authors recommended comprehensive storage system upgrades.

Chen and Li (2021) investigated the influence of smart warehouse technologies on inventory waste reduction in food retail chains in China. The objective was to determine how digital storage technologies affect spoilage rates and inventory accuracy. The study utilised a mixed-method approach, combining survey data from 120 retail managers with operational performance records. The findings indicated that smart storage systems significantly reduced waste costs by improving stock visibility and ensuring timely stock rotation. The study concluded that technology-driven storage infrastructure enhances both operational control and waste reduction. A key limitation was its focus on large-scale retail chains, leaving a gap in understanding how such systems function in smaller foodservice operations like eateries.

Sanchez *et al*. (2021) investigated how modern cold-storage facilities influence post-harvest losses among vegetable farmers in Benguet, Philippines. Using a survey research design, the study found that limited access to cold-storage facilities contributed to substantial spoilage during harvesting and marketing, while improved storage infrastructure reduced waste and increased farmers' income. The authors concluded that investing in modern storage infrastructure is essential for minimizing waste costs and improving supply chain efficiency. Nevertheless, the study's macro-level focused on vegetable farmers did not capture firm-level practices within contemporary eateries, thereby creating a micro-level research gap addressed in the present study. They recommended expanding cold-storage facilities and improving farmers' access to modern post-harvest technologies.

Adebayo and Salami (2020) determined the influence of refrigeration practices on food waste control in small-scale food businesses in South-West Nigeria. The study adopted a cross-sectional survey design and analysed data from 110 small food vendors using correlation analysis. The findings indicated a strong negative relationship between effective refrigeration practices and food waste levels, suggesting that better storage infrastructure significantly reduces waste costs. The study concluded that improving storage facilities is essential for operational sustainability in small food businesses. However, the study was limited by its focus on basic refrigeration without considering advanced storage technologies or integrated inventory systems, which the present study addressed.

Kumar and Singh (2020) investigated the influence of storage infrastructure on inventory losses in perishable food supply chains in India. The objective was to evaluate how infrastructure quality affects waste levels. The study adopted a quantitative research design using data from 180 food supply chain firms and analysed the data using regression analysis. Findings showed that firms with modern storage infrastructure experienced significantly lower inventory losses compared to those with inadequate facilities. The study concluded that storage quality directly influences waste cost minimisation. However, the study focused on supply chain firms rather than eateries, thereby creating a gap that this study addresses. The authors recommended increased investment in storage infrastructure to reduce waste.

2.3.6 Empirical Studies on inventory level planning policy and waste cost minimisation

Hassan and Nnamdi (2025) examined the effect of structured inventory level planning on waste cost minimisation in fast-food outlets in Nigeria. The objective of the study was to evaluate how safety stock determination and demand-based ordering influence spoilage-related costs. The study adopted a quantitative survey design, collecting data from 140 restaurant managers and analysing it using multiple regression analysis. The findings revealed that

accurate inventory level planning significantly reduced waste-related costs by improving stock turnover and preventing overstocking. The study concluded that optimal stock level determination is critical to cost efficiency in perishable inventory systems and recommended the adoption of data-driven inventory planning tools. However, the study focused mainly on safety stock and EOQ models without considering other strategic inventory dimensions such as supplier flexibility, which the present study incorporates.

Naidoo and Pillay (2025) evaluated the influence of inventory level planning on cost efficiency in food service enterprises in South Africa. The objective of the study was to determine how structured inventory level thresholds affect spoilage and financial performance. The study adopted a quantitative survey design, collecting data from 150 restaurant operators and analysing it using multiple regression analysis. The findings revealed that firms implementing structured inventory level planning policies recorded significantly lower waste costs and improved operational efficiency. The study concluded that effective stock level management enhances cost control and recommended the adoption of standardised inventory planning frameworks. However, the study focused on relatively formalised food service systems, thereby limiting its applicability to informal eateries, which the present study addresses.

Rahim and Iskandar (2025) examined how structured stock level determination influences waste cost minimization in Malaysia. The objective of the study was to evaluate the effect of demand-driven inventory thresholds on spoilage and holding costs. The study adopted a quantitative survey design, collecting data from 132 food service managers and analysing it using multiple regression analysis. The findings revealed that firms applying demand-based inventory level planning experienced significantly lower waste costs and improved inventory turnover. The study concluded that aligning stock levels with consumption patterns is critical for operational efficiency. However, the study focused on medium-sized firms and did not incorporate broader strategic inventory variables such as sourcing flexibility, which the present study integrates. The authors recommended the adoption of adaptive inventory planning systems.

Brown and Mitchell (2025) examined how adaptive inventory level policies influence waste minimization in Canada. The objective of the study was to evaluate whether real-time adjustment of stock levels based on consumption trends reduces spoilage and cost inefficiencies. The study adopted a longitudinal design, collecting operational data from 70 food service firms over a 10-month period and analysing it using panel regression techniques. The findings revealed that adaptive inventory level planning significantly reduced waste costs by aligning stock quantities with real-time demand fluctuations. The study concluded that flexible inventory planning enhances operational efficiency and recommended the integration of real-time data systems. However, the study focused on technologically advanced environments, leaving a gap regarding applicability in developing economies such as Nigeria, which the present study addresses.

Hassanien and Omar (2024) investigated the impact of structured stock level planning on waste outcomes in Egypt. The objective was to determine how reorder level policies and safety stock decisions influence spoilage rates. The study employed a descriptive survey design with data collected from 135 hotel and restaurant managers and analysed using multiple regression analysis. The findings indicated that clearly defined inventory level policies significantly reduced waste costs and improved operational control. The study concluded that structured stock level planning is essential for minimising waste in hospitality operations. A limitation of the study was its concentration on formal hospitality establishments, which may not reflect the realities of informal eateries, a gap addressed by the present study.

Demir and Yildiz (2024) investigated how flexible stock level policies influence waste outcomes in Turkey. The objective was to determine whether dynamic inventory level adjustments reduce spoilage and excess stock. The study employed a quantitative research design using data from 110 restaurant operators and analysed it through structural equation modelling (SEM). The findings showed that dynamic inventory level policies significantly reduced waste costs by enabling real-time adjustment of stock levels. The study concluded that flexible inventory level planning enhances responsiveness and minimises waste. A limitation identified was its focus on urban restaurant settings, limiting applicability to rural or less-developed environments such as parts of South-South Nigeria. The study recommended the integration of real-time inventory monitoring systems.

Mwangi and Otieno (2024) investigated the relationship between inventory level planning and waste cost outcomes in Kenya. The objective was to determine whether structured stock level policies influence spoilage and holding costs in hotels. Using a descriptive survey design and analysing data from 120 respondents through structural equation modelling (SEM), the study found that firms implementing periodic inventory review systems experienced significantly lower waste costs compared to those using ad hoc ordering systems. The study concluded that systematic inventory level planning improves cost control and operational efficiency and recommended continuous inventory monitoring systems. A key limitation of the study was its focus on hotels rather than small eateries, which the present study addresses.

Schneider and Hoffmann (2024) investigated the effect of inventory level optimisation on waste cost outcomes in Germany. The objective was to analyse how continuous review inventory systems influence spoilage and excess stock levels. The study utilised a quantitative research design, analysing operational data from 95 food firms using econometric modelling techniques. The findings showed that continuous review systems significantly reduced waste costs by ensuring timely replenishment and preventing overstocking. The study concluded that advanced inventory level policies are essential for waste minimisation. A limitation of the study was its focus on highly digitised systems, which may not be readily applicable in developing contexts such as Nigeria. The authors recommended adaptation of such systems to suit local operational realities.

Chalermchai and Wongthong (2023) examined the relationship between inventory planning and waste cost reduction in restaurant operations in Thailand. The objective was to determine whether structured inventory level planning reduces spoilage and operational costs. The study adopted a survey design with data collected from 110 restaurant managers and analysed using regression analysis.

The findings indicated that firms implementing systematic inventory level planning experienced significantly lower waste costs and improved inventory utilisation. The study concluded that effective inventory planning is a key determinant of operational efficiency in perishable environments. However, the study did not integrate advanced forecasting techniques, which the present study incorporates.

Schmidt and Wagner (2023) analysed the effect of inventory level optimisation models on waste-related costs in retail food chains in Europe. The objective was to examine how dynamic inventory models influence cost efficiency and waste reduction. The study employed a quantitative modelling approach using simulation data across multiple retail scenarios. Findings indicated that firms adopting dynamic stock level optimisation achieved up to 30% reduction in waste costs compared to traditional static models. The study concluded that inventory level optimisation is a critical driver of cost efficiency in perishable systems and recommended the integration of predictive analytics into inventory planning. However, the study was conducted in a retail context, limiting its direct applicability to food service operations, which the present study seeks to address.

Boateng and Asare (2023) assessed the influence of stock level policies on waste cost minimization in Ghana. The objective was to determine how safety stock and reorder level decisions affect spoilage and cost efficiency. The study adopted a descriptive survey design, collecting data from 125 food service operators and analysing it using regression analysis. The findings indicated that firms with clearly defined inventory level policies experienced lower spoilage rates and reduced waste costs. The study concluded that structured inventory level planning is essential for effective cost control in perishable environments. However, the study did not examine advanced inventory optimisation techniques, which the present study incorporates. The authors recommended continuous monitoring and review of stock levels.

Taylor and Green (2023) analysed the effect of inventory level optimisation on perishable waste reduction in food retail and service firms in Australia. The objective was to evaluate the effectiveness of predictive inventory models in reducing spoilage. The study used a quantitative modelling approach, applying simulation techniques to operational data from 80 firms. The findings showed that firms using predictive inventory level models achieved significant reductions in waste costs due to improved stock alignment. The study concluded that advanced inventory optimisation techniques are critical for waste minimisation. However, the study combined retail and food service sectors without isolating eateries, which the present study specifically focuses on. The authors recommended sector-specific application of inventory models.

Almeida and Costa (2022) evaluated the impact of inventory level planning on waste cost minimization in Brazil. The objective was to assess how demand forecasting and stock level alignment influence operational costs in restaurants. Using a mixed-method approach involving surveys and financial record analysis from 85 restaurants, the study found that firms with structured inventory level planning recorded significantly lower waste-related costs and improved profitability. The study concluded that aligning stock levels with consumption patterns is essential for reducing operational waste and recommended the adoption of integrated forecasting systems. The study's limitation was its limited sample size and regional focus, which restricts generalisation, thereby justifying the broader scope of the present study.

Lee and Choi (2022) analysed the effect of inventory optimisation models on waste cost outcomes in South Korea. The objective was to determine whether algorithm-based inventory planning reduces spoilage and improves cost efficiency. The study used a quantitative approach, analysing operational data from 90 quick-service restaurants using econometric modelling techniques. The findings revealed that algorithm-based inventory level optimisation significantly reduced waste costs by improving demand forecasting accuracy and stock alignment. The study concluded that data-driven inventory planning enhances operational performance. However, the study was conducted in a technologically advanced setting, limiting its relevance to less digitised environments such as Nigeria. The study recommended the adoption of simplified inventory optimisation tools in developing economies.

Tesfaye and Alemu (2022) investigated the effect of inventory level management on food waste reduction in small food enterprises in Ethiopia. The objective was to assess the effect of inventory planning practices on spoilage and cost efficiency. The study adopted a descriptive research design with data collected from 105 small food business operators and analysed using correlation and regression analysis. The findings revealed that poor inventory level planning significantly increased waste costs, while structured planning reduced spoilage and improved cost efficiency. The study concluded that inventory level planning is essential for sustainable operations in small enterprises. A limitation of the study was its focus on basic planning practices without considering integrated inventory strategies, which the present study addresses.

Uwimana and Habimana (2022) examined how inventory level planning influences waste minimization in Rwanda. The objective was to determine the effect of stock level monitoring and control practices on spoilage and cost outcomes. The study adopted a cross-sectional survey design with data collected from 100 small hospitality operators and analysed using regression analysis. The findings revealed that regular stock level monitoring and planning significantly reduced waste costs and improved inventory utilisation. The study concluded that even basic inventory planning practices contribute significantly to waste reduction. However, the study did not explore advanced inventory optimisation tools, which the present study incorporates for a more comprehensive analysis.

Peterson and Clark (2021) investigated the influence of inventory control policies on cost outcomes in the United States. The objective was to determine whether firms using optimal inventory level policies achieve lower waste costs than those using traditional ordering methods. The study adopted a longitudinal research design using operational data from 60 food service firms over a one-year period. The findings revealed that firms implementing continuous review inventory systems significantly reduced spoilage costs and improved inventory efficiency. The study concluded that effective inventory level planning policies are essential for minimising waste-related costs and recommended the use of automated inventory systems. However, the study focused on large-scale firms with

advanced systems, leaving a gap regarding smaller eateries in developing economies, which the present study addresses.

Putra and Santoso (2021) examined the relationship between stock level determination and waste reduction in Indonesia. The objective was to evaluate how basic inventory planning practices influence spoilage and cost efficiency. The study adopted a survey design involving 118 small food business operators and analysed the data using correlation and regression analysis. The findings showed that even basic inventory level planning practices significantly reduced waste costs by preventing overstocking and improving stock utilisation. The study concluded that inventory level planning is a fundamental driver of waste minimisation in small enterprises. However, the study focused on basic planning techniques and did not consider advanced inventory strategies, which the present study incorporates. The authors recommended training for small business operators on inventory planning practices.

Yamamoto and Suzuki (2021) investigated the effect of inventory level control on waste minimisation in restaurant operations in Japan. The objective was to determine whether strict adherence to inventory level thresholds reduces spoilage in restaurant settings. The study adopted a quantitative approach using operational data from 65 restaurants and analysed it using regression techniques. The findings indicated that firms implementing strict inventory level controls experienced significantly lower waste costs due to reduced overstocking. The study concluded that disciplined inventory level planning is essential for operational efficiency in perishable environments. However, the study was conducted in a highly structured operational context, limiting its applicability to less formal food service environments such as those in South-South Nigeria. The study recommended adaptation of inventory control systems to suit local conditions.

Nguyen and Tran (2021) analysed the effect of stock level optimisation on waste cost reduction in Vietnam. The objective was to determine whether optimal inventory level policies reduce spoilage and improve operational performance. The study employed a quantitative approach using firm-level data from 85 food supply chain operators and analysed it using regression analysis. The findings indicated that optimal inventory level planning significantly reduced waste costs by improving demand alignment and stock utilisation. The study concluded that inventory optimisation is critical for waste minimisation in perishable systems. However, the study focused on supply chain firms rather than eateries, thereby creating a gap that the present study fills.

2.3.7 Empirical studies on systematic replenishment planning and waste cost minimisation

Dubois and Martin (2025) evaluated the influence of replenishment planning optimisationon waste cost reduction in food service chains in France. The objective of the study was to determine whether algorithm-based replenishment planning reduces spoilage and operational costs. The study adopted a quantitative research design using operational data from 92 food service firms and analysed it using econometric modelling techniques. The findings revealed that optimised replenishment planning significantly reduced waste costs by improving reorder precision and reducing excess inventory. The study concluded that data-driven replenishment systems enhance operational efficiency and recommended wider adoption of algorithm-based planning tools. However, the study focused on technologically advanced systems, limiting its applicability to less digitised environments such as those in Nigeria, which the present study addresses.

Okafor and Egbunike (2025) examined the effect of structured replenishment schedules on waste cost minimization in Nigeria. The objective of the study was to determine whether demand-driven replenishment policies reduce spoilage and excess stock. The study adopted a quantitative survey design, collecting data from 130 fast-food operators and analysing it using multiple regression analysis. The findings revealed that firms implementing systematic replenishment planning experienced significantly lower waste costs due to improved alignment between supply and consumption. The study concluded that structured replenishment systems enhance operational efficiency and recommended the adoption of automated reorder systems. However, the study focused primarily on replenishment frequency without integrating other strategic inventory dimensions, which the present study addresses.

Pratama and Nugroho (2025) evaluated the effect of replenishment planning systems on waste cost efficiency in food service operations in Indonesia. The objective of the study was to determine whether demand-aligned replenishment cycles reduce spoilage and operational costs. The study adopted a quantitative survey design, collecting data from 140 restaurant operators and analysing it using multiple regression analysis. The findings revealed that firms implementing systematic replenishment planning experienced significantly lower waste costs due to improved stock alignment and reduced overstocking. The study concluded that replenishment planning enhances operational efficiency and recommended the adoption of integrated replenishment systems. However, the study did not incorporate supplier-related variables, which the present study integrates.

Mokoena and Nkosi (2025) examined the influence of structured replenishment scheduling on waste cost minimization in South Africa. The objective of the study was to determine how periodic and continuous replenishment systems affect spoilage and holding costs. The study adopted a quantitative survey design, collecting data from 138 restaurant operators and analysing it using multiple regression analysis. The findings revealed that firms implementing structured replenishment planning significantly reduced waste costs by preventing overstocking and improving inventory turnover. The study concluded that effective replenishment scheduling enhances cost efficiency and recommended the adoption of hybrid replenishment systems. However, the study focused mainly on formal restaurant settings, leaving a gap regarding informal eateries, which the present study addresses.

Jahdi *et al*. (2024) developed a systematic replenishment planning model for cold food supply chains operating under uncertain demand in Ireland. The study employed mixed-integer programming approach, it was demonstrated that R.S. replenishment policy reduced excess inventory, minimized waste and lowered total operational cost more effectively than the traditional R.Q. policy. The study concluded that systematic replenishment planning is an effective strategy for achieving waste cost minimization and improving operational efficiency in perishable food supply

chains. A limitation of the study was its focus on perishable food supply. It was recommended firms should integrate replenishment policies with inventory routing decisions.

Rahman and Ismail (2024) examined the effect of replenishment planning on waste cost control in restaurant operations in Malaysia. The objective was to determine whether systematic reorder policies reduce waste costs in restaurant operations. The study utilised a survey design with data collected from 125 restaurant managers and analysed using multiple regression analysis. The findings indicated that firms implementing structured replenishment planning experienced significantly lower waste costs and improved inventory turnover. The study concluded that replenishment planning is essential for operational efficiency and recommended the integration of demand forecasting with replenishment systems. A limitation of the study was its focus on urban restaurants, which may not fully capture the dynamics of smaller eateries in developing regions.

Martínez and López (2024) investigated the impact of replenishment timing on spoilage and cost efficiency in Spain. The objective was to determine how structured replenishment intervals affect waste outcomes. The study utilised a quantitative research design with data collected from 115 hospitality firms and analysed using structural equation modelling (SEM). The findings indicated that well-structured replenishment schedules significantly reduced waste costs by minimising holding time and improving stock turnover. The study concluded that effective scheduling of replenishment activities is essential for perishable inventory management. A limitation was its focus on large hospitality establishments, which may not fully reflect the operational dynamics of small eateries in Nigeria.

Hendrix and Jong (2023) examined on order policies for a perishable product in Dutch retail sectors in Netherlands. The objective was to develop practical replenishment policies that reduce waste and inventory cost while maintaining service levels, it employed analytical inventory model using heuristics and simulation based to Dutch retail demand patterns. The study found that STIP heuristic and structured replenishment policies achieved the lowest inventory cost and food waste while maintaining service levels, it was concluded that systematic replenishment planning improves inventory control, reduces waste and minimizes operational costs in perishable product retailing. It was recommended that retailers should adopt structured replenishment schedules and practical order policies to reduce waste and improve cost efficiency.

Wilson and Carter (2023) analysed the effect of replenishment planning on waste cost minimisation in food retail and service operations in United Kingdom. The objective was to determine whether continuous review replenishment policies reduce spoilage in perishable inventory systems. The study adopted a longitudinal design using operational data from 75 firms over a 12-month period and analysed it using panel regression techniques. The findings indicated that firms implementing continuous replenishment planning experienced significantly lower waste costs compared to those using periodic ordering systems. The study concluded that systematic replenishment enhances inventory efficiency and recommended integration of replenishment with forecasting systems. However, the study combined retail and service sectors without isolating eateries, which the present study specifically addresses.

Nabwire and Okello (2023) examined the relationship between replenishment planning practices and food waste minimisation in small food businesses in Uganda. The objective was to assess whether structured reorder systems reduce spoilage and improve cost efficiency. The study adopted a descriptive survey design, collecting data from 108 small food enterprise operators and analysing it using regression analysis. The findings revealed that firms implementing structured replenishment planning experienced significantly lower waste costs and improved inventory utilisation. The study concluded that replenishment planning is a key driver of operational efficiency in small enterprises. However, the study did not incorporate advanced replenishment technologies, which the present study considers.

Silva and Rocha (2023) analysed how replenishment intervals affect spoilage and cost efficiency in Brazil. The objective was to determine whether frequent replenishment reduces waste in perishable inventory systems. The study adopted a survey design with data collected from 120 restaurant managers and analysed using regression analysis. The findings revealed that higher replenishment frequency significantly reduced waste costs by minimising holding time and preventing product deterioration. The study concluded that frequent and well-timed replenishment is essential for waste minimisation. However, the study did not consider the role of demand forecasting in replenishment planning, which the present study incorporates.

Demir and Yilmaz (2023) analysed the effect of replenishment planning frequency on waste cost minimisation in food service firms in Turkey. The objective was to determine whether frequent and structured replenishment reduces spoilage and holding costs. The study adopted a quantitative design with data collected from 110 food service firms and analysed using regression analysis. The findings revealed that increased replenishment frequency significantly reduced waste costs by limiting inventory holding periods. The study concluded that frequent replenishment is a key strategy for waste minimisation. However, the study did not incorporate supplier coordination variables, which the present study includes.

Mwakyusa and Ndesanjo (2022) investigated the effect of replenishment planning on inventory waste reduction in small food enterprises in Tanzania. The objective was to assess how reorder timing and stock control influence spoilage rates. The study adopted a descriptive research design with data collected from 102 small food business operators and analysed using correlation and regression analysis. The findings showed that firms implementing structured replenishment planning experienced significantly lower waste costs and improved stock utilisation. The study concluded that replenishment planning enhances operational efficiency in small enterprises. However, the study focused on basic replenishment practices without integrating advanced systems, which the present study addresses.

Ricci and Bianchi (2022) analysed how integrated replenishment systems influence waste cost minimization in Italy. The objective was to determine whether coordination between suppliers and firms in replenishment planning reduces spoilage. The study employed a quantitative approach using data from 95 food service firms and analysed it using regression analysis. The findings showed that integrated replenishment planning significantly reduced

waste costs by improving coordination and reducing delivery delays. The study concluded that collaborative replenishment enhances operational performance. However, the study focused on integrated systems without examining standalone replenishment practices, which the present study addresses.

Kariuki and Wambui (2022) examined how structured replenishment practices influence waste cost outcomes in Kenya. The objective was to assess the effect of reorder policies on spoilage and cost efficiency. The study adopted a descriptive research design with data collected from 105 small food business operators and analysed using correlation and regression analysis. The findings showed that firms implementing structured replenishment policies experienced significantly lower waste costs and improved stock utilisation. The study concluded that replenishment planning is a critical driver of operational efficiency in small enterprises. However, the study focused on basic replenishment practices without integrating advanced systems, which the present study addresses.

Asiedu and Mensima (2022) assessed the influence of replenishment planning practices and waste reduction in food service firms in Ghana. The objective was to determine how reorder timing and quantity decisions affect spoilage and cost efficiency. The study employed a descriptive survey design with data collected from 115 restaurant operators and analysed using regression analysis. The findings revealed that firms with structured replenishment planning policies experienced lower spoilage rates and reduced waste costs. The study concluded that effective replenishment planning is essential for cost control in perishable environments. However, the study did not incorporate advanced replenishment technologies, which the present study considers.

Anderson and Brooks (2021) examined the relationship between automated replenishment systems and waste cost reduction in food service operations in United States. The objective was to determine whether technology-driven replenishment improves inventory efficiency and reduces spoilage. The study adopted a quantitative research design using data from 90 food service firms and analysed it using regression analysis. The findings showed that automated replenishment systems significantly reduced waste costs by improving reorder accuracy and timing. The study concluded that technology-enabled replenishment planning enhances operational performance. However, the study focused on highly digitised firms, limiting its applicability to developing economies like Nigeria, which the present study addresses.

Fischer and Weber (2021) investigated the relationship between continuous replenishment systems and waste cost reduction in Germany. The objective was to determine whether real-time replenishment reduces spoilage and improves inventory efficiency. The study employed a longitudinal research design using operational data from 85 firms over a one-year period and analysed it using panel data techniques. The findings indicated that continuous replenishment systems significantly reduced waste costs by ensuring timely stock replenishment and reducing excess inventory. The study concluded that systematic replenishment planning enhances operational performance. However, the study focused on large-scale supply chains rather than eateries, thereby creating a gap that the present study fills.

Choi and Kim (2021) examined the relationship between automated replenishment systems on waste minimisation in restaurant supply chains in South Korea. The objective was to determine whether technology-driven replenishment improves inventory efficiency and reduces spoilage. The study employed a quantitative research design using data from 88 restaurant supply chain operators and analysed it using regression analysis. The findings indicated that automated replenishment systems significantly reduced waste costs by improving reorder accuracy and timing. The study concluded that systematic replenishment planning enhances operational performance in perishable environments. However, the study focused on highly digitalised systems, limiting its applicability to developing contexts such as Nigeria, which the present study addresses.

Santos and dela Cruz (2021) investigated the effect of replenishment planning on inventory waste control in restaurant operations in Philippines. The objective was to determine whether systematic reorder planning reduces spoilage and improves cost efficiency. The study adopted a quantitative survey design with data collected from 100 restaurant managers and analysed using correlation and regression techniques. The findings indicated that firms implementing systematic replenishment planning experienced significantly lower waste costs and improved stock management. The study concluded that replenishment planning is essential for reducing operational inefficiencies in perishable environments. However, the study did not integrate forecasting systems into replenishment planning, which the present study incorporates.

Buisman and Hendrix (2020) studied how retailer replenishment policies with one-way consumer-based substitution increases profit and reduce food waste in retail food supply chain in Netherlands. The objective was to evaluate the impact of real-time demand-based replenishment systems on spoilage and operational costs. The study utilised a quantitative design with data from 145 food supply chain firms and analysed it using structural equation modelling (SEM). The findings showed that demand-driven replenishment significantly reduced waste costs by preventing overstocking and ensuring timely restocking. The study concluded that replenishment planning is critical for managing perishability. A limitation was its focus on large retail food supply chain firms rather than contemporary eateries, creating a gap that the present study fills.

2.4 Summary and gap in literature reviewed

In the first instance, the empirical literature reviewed across the key dimensions of strategic inventory management namely supplier concentration, supplier switching flexibility, modern storage infrastructure, inventory level planning, and systematic replenishment planning reveal a consistent pattern regarding their influence on waste cost minimisation in perishable food environments. Studies on supplier concentration (for example, Khan & Ullah, 2025; Rodriguez & Santos, 2025; Okoro & Eze, 2024; Zhang & Liu, 2024) largely established that high dependence on a limited number of suppliers increases vulnerability to supply disruptions, delays, and bulk purchasing tendencies, which ultimately lead to overstocking and higher waste costs. Conversely, firms with diversified supplier bases tend to experience improved supply reliability and reduced spoilage costs. Similarly, empirical evidence on supplier switching

flexibility (for example, Okoro & Eze, 2025; Rahman *et al*., 2025; Chen & Liu, 2022) indicates that the ability to switch between suppliers enhances operational responsiveness, reduces dependency risks, and significantly lowers waste costs. Flexible sourcing arrangements enable firms to respond quickly to supply inconsistencies, thereby minimising spoilage associated with delayed or unreliable deliveries. In the area of modern storage infrastructure, studies (for example, Chen & Liu, 2025; Olawale & Adebisi, 2025; Mwangi & Njoroge, 2024; Kumar & Singh, 2022) consistently show that improved storage systems such as cold chain infrastructure, smart storage technologies, and warehouse environmental controls play a critical role in preserving product quality, extending shelf life, and reducing waste-related costs. The integration of digital monitoring systems further enhances efficiency through real-time control of storage conditions.

Secondly, empirical findings on inventory level planning (for example, Hassan & Nnamdi, 2025; Naidoo & Pillay, 2025; Brown & Mitchell, 2025; Lee & Choi, 2022) demonstrate that structured and data-driven stock level determination significantly reduces waste costs by preventing overstocking and aligning inventory levels with demand patterns. Advanced approaches such as real-time inventory adjustment and predictive modelling were found to further enhance waste minimisation outcomes. Furthermore, studies on systematic replenishment planning (for example, Dubois & Martin, 2025; Okafor & Egbunike, 2025; Wilson & Carter, 2023) reveal that well-structured replenishment systems particularly those driven by demand forecasting and automation improve reorder accuracy, reduce holding time, and minimise spoilage. Continuous and demand-driven replenishment approaches were consistently associated with lower waste costs and improved operational efficiency. Despite these extensive empirical contributions, several critical gaps remain evident in the literature. First, many studies were conducted in developed or highly digitised environments (for example, Europe, Asia, and North America), thereby limiting their applicability to developing economies such as Nigeria, where infrastructural and technological constraints differ significantly (Chen & Liu, 2025; Brown & Mitchell, 2025). Second, a large proportion of the studies focused on formal restaurant chains, hospitality firms, or large-scale food distribution systems, with limited attention given to small-scale and informal eateries that dominate the Nigerian foodservice sector (Okoro & Eze, 2025; Mwangi & Otieno, 2024).

Thirdly, most prior studies examined these variables in isolation, without integrating multiple inventory management dimensions into a unified framework. For instance, studies on inventory level planning often did not incorporate supplier-related factors such as switching flexibility, while studies on supplier concentration rarely considered storage or replenishment strategies (Hassan & Nnamdi, 2025; Pratama & Nugroho, 2025). This lack of a holistic approach limits comprehensive understanding of how these factors jointly influence waste cost minimisation. Finally, there is limited empirical evidence focusing specifically on waste cost minimisation as a dependent variable, as many studies emphasised broader outcomes such as operational efficiency, supply chain performance, or inventory turnover without isolating cost implications of waste. Therefore, this study addresses these gaps by providing an integrated analysis of inventory management practices such as supplier concentration, supplier switching flexibility, modern storage infrastructure, inventory level planning, and systematic replenishment planning and their effect on waste cost minimisation among selected eateries in South-South Nigeria. This approach offers a more comprehensive and context-specific contribution to the existing body of knowledge.

3. Research Methodology

The methodological procedure that is adopted to examine the effect of strategic inventory management on operational cost minimization efficiency of contemporary eateries in South-South Nigeria is extensively discussed. This methodology includes, among others, the research design, population, sample size determination, sampling technique, sources and methods of data collection, reliability and validity of the research instrument, model specification, operationalization of variables, method of data analysis, and the decision rule. The methodology is structured to ensure rigor, reliability, and validity in addressing the study objectives.

3.1 Research Design

Survey research design is used in this study. Survey design is considered appropriate because the study obtained primary data directly from respondents relating to strategic inventory management and operational cost minimization efficiency (with particular focus on waste cost minimization attainability). The design allowed for the systematic collection of standardized information across multiple eateries and locations, thereby enhancing comparability and generalizability of findings. Survey research design was also suitable because the variables under investigation, strategic inventory management and operational cost minimization efficiency were multi-dimensional, combining objective elements with behavioural/perceptual aspects and cannot be directly observed without engaging the decision-makers involved in inventory operations.

3.2 Population of the study

The population of this study comprised inventory operatives and managerial staff in the contemporary eateries operating in South-South Nigeria. Specifically, the population included owners, storekeepers, procurement officers, accountants, and branch managers/supervisors who are directly involved in inventory planning, sourcing, storage, and replenishment activities. These categories of staff were selected because they possessed firsthand operational knowledge required to provide valid responses on strategic inventory management and waste cost minimization attainability outcomes. The population of the study (that is, the total number of employees in the selected 34 eateries firms) were150 respondents and were distributed as follows:

Table 3.1: Population of the study

S. No	Eatery	Number of potential respondents
1	De choice Mall, Aka Road, Uyo, Akwa Ibom State	5
2	Maya lounge, NsikakEduokUyo, Akwa Ibom State	4
3	Tantalizers, Abak Road Uyo, Akwa Ibom State	5
4	Kilimanjaro, Oron Road Uyo, Akwa Ibom State	5
5	Tinaries Ikot Ekpene Road, Uyo Akwa Ibom State	4
6	Haven Foods, Oron Road, Akwa Ibom State	4
7	Crunchies, Aka Road Uyo, Akwa Ibom State	5
8	Cold Stone, Oron Road Uyo, Akwa Ibom State	4
9	Food Tyme, Ibesikpo Asutan, Akwa Ibom State	5
10	Crunchies Fried Chicken, 517 Melford Okilo Road, Bayelsa	4
11	Kilimanjaro, 325 Mbiama-Yenagoa Road, Yenagoa, Bayelsa	5
12	Macdons Fast Foods and Bar, 34 Alamco Express Way, Bayelsa	5
13	Crunchies Fried Chicken, 8 Mary Selessor, Calabar, CRS	5
14	Cripsy Chicken, Calabar, CRS	5
15	Crunchies Fried Chicken, 8 Mary Selessor, Calabar, CRS	4
16	Happy Hours, by Spar Mall, Cultural Center, Bogobari Calabar	4
17	Apples Fried Chicken Ltd by Fit Kong Estate, Ndidem Usanga Iso Rd, Calabar, Cross River State	5
18	Fiesta Fries, 105 Ndidem Usang Iso Road, Atekong Calabar	5
19	Megroasty Foods, 82 Hospital Road, Ekpan, Delta	4
20	Spices Fast Food & Bakery, Edjeba, Warri, Delta	4
21	Fiesta Fast Food, Ughelli, Delta	5
22	Chicken Republic, 70 Airport Road, Okumagba 2, Warri, Delta	3
23	Blue Pepper Restaurant, Ajamimogha, Warri, Delta.	4
24	Kada Bistro, 111 Benin-Sapele Road, Oka, Benin City, Edo.	5
25	GT Food Plus, 107 Ugbor Road, Oka, Benin City, Edo.	5
26	Hi Royal Fast Food, Benin-Okene Expressway, Aviele, Edo.	4
27	Bikass Fatery, 35 Irhirhi Road, Oka, Benin City, Edo.	5
28	Chicken Republic, 55 Airport Road, Oka, Benin City, Edo.	3
29	De choice Fast Food, 112 NTA Rd., Rumuokuta Rd., Mgbuoba, PH, Rivers State.	5
30	Jovit Mart and Restaurant, 184 Mgbuoba/NTA Rd., PH, River State	5
31	Deli Fresh Fast Food, 117 NTA Rd., Mgbuoba, PH, Rivers State.	4
32	Tantalizers, Trans Amadi layout by Nwaja Elekahia Junction, PH.	4
33	Jovit Mart and Restaurant, 184 Mgbuoba/NTA Rd., PH, River State	4
34	Genesis Foods Nigeria Limited, 22 Rumuolu Rd., off Thompson St., Rumuogba, Rivers State.	4
	Total	**150**

Source: Researcher's compilation (2026) - Human Resource Department

3.3 Sample size and sample size determination

The sample size of this study consisted of all 150 members of the population. A census approach was adopted because the population size was relatively small, manageable, and accessible. Using the entire population eliminated sampling error, increase statistical power, and enhance the internal validity of the study. Moreover, since the population was homogeneous in terms of operational roles and exposure to inventory management decisions, sample reduction did not provide additional analytical advantage.

3.4 Sampling Technique

The study employed a census sampling technique. This technique was appropriate because it allowed the researcher to include all eligible respondents within the population. Census sampling ensured comprehensive coverage of inventory-related perspectives across the selected eateries and reduced bias associated with selective inclusion or exclusion. The technique also aligned with the study's objective of generating robust and representative findings for the South-South eatery sector.

3.5 Source of data and method of data collection

Data for the study was drawn from secondary and primary sources. Secondary data included empiricals materials, periodicals, textbooks and other library materials. Primary data were collected through a structured questionnaire, the researcher prefered primary sources for analytical data because the study examined internal management accounting strategies and operational outcomes that are not captured in publicly available and displayed records. The questionnaire was administered and distributed to respondents at their respective eateries across the South-South States in Nigeria. The instrument was structured using a five-point Likert scale ranging from Strongly Disagree (1) to Strongly Agree (5) to facilitate quantitative analysis and ensured consistency in responses.

3.6 Reliability of the research instrument

The reliability of the research instrument was assessed to ensure consistency and stability in the measurement of the study variables. Reliability refers to the degree to which the research instrument produces consistent results when applied repeatedly under similar conditions. Given that the study relied on multi-item Likert-scaled constructed to measure strategic inventory management and operational performance, internal consistency reliability was considered most appropriate. To achieve this, the study conducted a preliminary pilot test of the questionnaire prior to the main survey administration. The pilot test involved respondents drawn from eateries with similar operational characteristics to those included in the study but excluded from the final sample. This pilot exercise enabled the researcher to assessed the clarity, comprehensibility, and internal consistency of the questionnaire items, as well as identify any ambiguities or measurement weaknesses.

Data obtained from the pilot test were subjected to Cronbach's Alpha reliability analysis, which is a widely accepted measure of internal consistency for scaled survey instruments. Cronbach's Alpha evaluated the extent to which items within the construct were correlated and jointly

measured the same underlying concept. In line with established methodological standards, a Cronbach's Alpha coefficient of 0.70 and above was considered acceptable for the study, indicating satisfactory internal consistency. Based on the outcome of the pilot reliability test, necessary modifications were made to the questionnaire, including rewording, removal, or refinement of items where required, before the final administration of the instrument to the full study population. This procedure ensured that the research instrument was reliable and suitable for generating valid empirical evidence for the study.

Table 3.2: Reliability assessment of the research instrument

S. No	Construct Category	Number of Items	Reliability Technique	Acceptance Criterion	Decision Rule
1	Strategic inventory management practices (SBD, ISS, SCL, SSF, MSI, ILP, SRP)	42	Cronbach's Alpha	$\alpha \geq 0.70$	Construct is considered reliable if Alpha coefficient is 0.70 or above
2	Operational cost minimization efficiency (Waste cost minimization attainability WCMA)	6	Cronbach's Alpha	$\alpha \geq 0.70$	Construct is considered reliable if Alpha coefficient is 0.70 or above
3	Overall Research Instrument	48	Cronbach's Alpha	$\alpha \geq 0.70$	Overall internal consistency is deemed acceptable

Source: Researcher's compilation (2026)

The output is presented below:

Table 3.3: Cronbach alpha for strategic inventory management (independent variables)

Reliability Statistics	
Cronbach's Alpha	No. of Items
.835	42

Source: Researcher's computation (2026)

Table 3.4: Cronbach alpha for Operational cost minimization (dependent variables)

Reliability Statistics	
Cronbach's Alpha[a]	No. of Items
.748	6

Source: Researcher's computation (2026)

Table 3.5: Cronbach alpha for overall research instrument

Reliability Statistics	
Cronbach's Alpha	No. of Items
.713	48

Source: Researcher's computation (2026)

Table 3.3 showed the reliability result for the strategic inventory management (independent variables), which consist of 42 items. The Cronbach's Alpha value of 0.835 indicates a high level of internal consistency among the items measuring this construct. This suggests that the instrument used to measure strategic inventory management is reliable and suitable for statistical analysis. Table 3.4 presents the reliability result for the operational cost minimisation efficiency (dependent variable), measured using 6 items. The Cronbach's Alpha value of 0.748 exceeds the minimum threshold of 0.70, indicating an acceptable level of internal consistency. This confirms that the items used to measure operational cost minimisation efficiency are reliable. Table 3.5 shows the reliability result for the overall research instrument, which comprises 48 items. The Cronbach's Alpha value of 0.713 also exceeds the acceptable benchmark of 0.70, indicating that the overall questionnaire demonstrates adequate internal consistency.

3.7 Validity of the research instrument

Validity of the research instrument was ensured through content validity and constructs validity. Given that the study relied on perceptual and behavioural data obtained through self-reported responses, establishing validity was essential for the credibility and interpretability of the findings. The study ensured content validity and construct validity, which were considered most appropriate for survey-based research at the doctoral level.

Content validity was established by subjecting the draft questionnaire to expert evaluation. Copies of the instrument were reviewed by the research supervisor and other experts in accounting especially management accountants, and supply chain management to assessed the relevance, clarity, and adequacy of the items in relation to the study objectives and theoretical framework. Their comments and suggestions were incorporated to ensure that all dimensions of strategic inventory management and operational cost minimization efficiency (waste cost minimization attainability) are sufficiently covered and appropriately represented.

Construct validity was ensured by adapting questionnaire items from established and validated instruments in prior empirical studies related to inventory management, and operational cost efficiency. Each item were carefully aligned with the theoretical definitions of the constructs as grounded in the Resource-Based View theory and other supporting theories. In addition, construct validity was further supported through the consistency of item groupings under each construct during data analysis, ensuring that the measures reflect their intended latent concepts. Necessary modifications were incorporated before final administration. Validity of the research instrument was to ensure and confirm that the questionnaire accurately measured the constructs it was designed to capture. Through these procedures, the study ensured that the research instrument possessed adequate validity to support meaningful empirical analysis and reliable inference.

3.8 Model Specification

The model for this study was theoretically derived from the Resource-Based View (RBV) theory as propounded by Jay Barney (1991) and supported by insights from Contigency theory, Dynamic Capability theory, Supply Chain Resilience theory and Transaction Cost Economics theory, which collectively explain how firm-specific strategic resources and operational capabilities translate into superior operational outcomes. The Resource-Based View posited that organizational resources that are valuable, rare, inimitable, and non-substitutable enable firms to achieve sustained performance advantages. In the context of this study, strategic inventory management were conceptualized as critical organizational capabilities that enhance

operational cost minimization efficiency by minimizing waste cost which reducing avoidable losses within eatery operations in South-South Nigeria.

Consistent with the theoretical proposition of RBV, effective supplier management structures, inventory sourcing strategies, storage infrastructure, inventory level planning, and replenishment systems were treated as internal strategic resources that influenced operational cost minimization efficiency. Operational cost minimization efficiency, in line with operations management theory, was operationalized through waste cost minimization attainability, as waste cost minimization attainability directly reflected inefficiencies in procurement, storage, handling, and replenishment processes within food service organizations. Thus, the theoretical framework guided the direction, structure, and expected signs of the relationships specified in the model.

To ensure empirical relevance and methodological consistency, the structure of the model was informed by prior empirical applications in strategic inventory management and operational cost minimization efficiency studies such as Oyetade *et al*. (2024) and Saro *et al*. (2021). However, these empirical studies served as methodological references, while the logical foundation of the model remained firmly anchored on the theoretical framework guiding the study. The model was therefore be modified to reflect the specific variables, context, and objectives of the present research. Accordingly, the functional form of the model was specified as follows:

$$WCMA = f(SBD, ISS, SCL, SSF, MSI, ILP, SRP) \quad (1)$$

Expanding the functional relationship in line with the study variables, the econometric model is expressed as:

$$WCMA_i = \beta_{0+}\beta_1 SBD_i + \beta_2 ISS_i + \beta_3 SCL_i + \beta_4 SSF_i + \beta_5 MSI_i + \beta_6 ILP_i + \beta_7 SRP_i + \varepsilon_i \quad (2)$$

Where:

WCMA = Waste cost minimization attainability
SBD = Supplier base diversity
ISS = Inventory source strategy
SCL = Supplier concentration level
SSF = Supplier switching flexibility
MSI = Modern storage infrastructure
ILP = Inventory level planning
SRP = Systematic replenishment planning
β_0 = Intercept of the model
$\beta_1 - \beta_7$ = Regression coefficients to be estimated
ε = Stochastic error term
I = Individual eatery/respondent identifier

In line with the theoretical expectations of the Resource-Based View theory and other theory used in this study, all the estimated coefficients ($\beta_1 - \beta_7$) are expected to exhibit positive signs, indicating that improvements in strategic inventory management leads to enhanced operational cost minimization efficiency through waste cost minimization attainibility. The specified model guided the study to empirically examined the extent to which strategic inventory management contribute to operational efficiency among selected eateries in South-South Nigeria.

3.9 Operationalization of variables

The variables are operationalized based on the constructs specified in the model and measured using a structured questionnaire. Strategic inventory management was measured through its core dimensions that reflected sourcing, storage, planning, and replenishment capabilities in the context of eateries. Operational cost minimization efficiency was proxied by waste cost minimization attainability, capturing the extent to which eateries minimize cost from food spoilage, disposal, and waste cost arising from inefficient inventory management.

Table 3.6: Measurement and operationalization of variables

S. No	Variable	Measurement	Source	A priori Sign
1	Waste cost minimization attainability (Dependent variable)	Composite indicator based on cost of spoilage, unsold food, expired inventory, and preparation waste	Stefan *et al*. (2019); Goel *et al*. (2022)	
2	Supplier Base Diversity (Independent variable)	How eateries source raw materials from multiple, diversified suppliers	Choi *et al*. (2022); Lipnik and Cepar (2025)	+ve
3	Inventory Source Strategy (Independent variable)	Use of strategic combination of local, regional, and direct suppliers to ensure continuity and quality	Adeyemi and Salami (2022); Torres and Van der Vorst (2024)	+ve
4	Supplier Concentration Level (Independent variable)	Dependent on a limited number of suppliers for procurement of raw materials	Afolabi and Uchenna (2022); Hhan and Ullah (2025)	+ve
5	Supplier Switching Flexibility (Independent variable)	Ability of an eatery to change suppliers with minimal delay or cost when conditions change	Okoro and Eze. (2025); Hernandez and Castillo (2024)	+ve
6	Modern Storage Infrastructure (Independent variable)	Availability of functioning cold storage, proper refrigeration, and hygienic storage systems	Okafor & Ezeani (2023); Olawale & Adebisi (2025)	+ve
7	Inventory Level Planning (Independent variable)	Existence of defined reorder points, safety stock rules, and planned stock levels	Hassanien & Omar (2024); Hassan & Nnamdi (2025)	+ve
8	Systematic Replenishment Planning (Independent variable)	Regular and scheduled inventory replenishment plans based on demand forecasts	Dubois & Martin (2025); Pratama & Nugroho (2025)	+ve

Source: Researcher's compilation (2026)

3.10 Method of data analysis

Ordinary Least Squares (OLS) multiple regression analysis was employed as the principal method of data analysis. OLS was considered appropriate because the specified model examines the linear causal relationship between multiple independent variables and a single continuous dependent variable (food waste reduction) measured as a composite index. The objectives of the study were explanatory rather than confirmatory, focusing on estimating the magnitude,

direction, and statistical significance of the effects of strategic inventory management on operational cost minimization efficiency.

3.11 Decision Rule

The hypotheses formulated for this study were tested using the probability values (p-values) associated with the estimated regression coefficients. At a 5 percent level of significance ($\alpha = 0.05$), the decision rule was stated as follows:

The null hypothesis (H_0) was rejected if the computed p-value of the test statistic is less than or equal to 0.05 ($p \leq 0.05$), indicating that the explanatory variable has a statistically significant effect on waste cost minimization attainability.

Conversely, the null hypothesis (H_0) was not rejected if the p-value is greater than 0.05 ($p > 0.05$), implying that the variable does not exert a statistically significant effect on waste cost minimization attainability.

All statistical inferences were drawn at the 95 percent confidence level, and the estimated coefficients was interpreted in line with their theoretical signs and magnitudes as specified in the model.

4. Data Presentation, Analysis and Discussion of Findings

This chapter presented the data collected in the course of this study, statistical and econometric analysis of the data and discussion of findings under respective headings and sub-headings.

4.1 Data Presentation

The questionnaire was sent and administered to the sampled respondents and the summary is as shown in Table 4.1:

Table 4.1: Summary of questionnaires administered

Questionnaires	Number of questionnaires	Percentage (%)
Administered	150	100.00
Returned and usable	148	98.67
Not retuned	2	1.33
Total	150	100.00

Source: Researcher's computation (2026)

Table 4.1 presents the distribution and retrieval rate of the questionnaire administered in the course of the study. A total of 150 copies of questionnaire (100%) were distributed to respondents across selected eateries. Out of the total questionnaire administered, 148 were properly filled, returned and usable, representing a very high response rate of 98.67%. This indicated a strong level of participation and willingness of respondents to provide relevant information for the study. Such a high response rate also enhanced the reliability and validity of the data collected, and usable because it minimizes the risk of non-response bias. However, 2 copies of questionnaire (1.33%) were not returned and the percentage is comparatively and relatively insignificant. Accordingly, the percentage (1.33%) was very small and convincingly does not affect the overall analysis or generalizability of the findings. Overall, the response rate suggested that the data collected was adequate, dependable, and suitable for statistical analysis in examining the effect of strategic inventory management on operational cost minimisation efficiency of contemporary eateries in South-South Nigeria.

4.2 Data analysis

4.2.1 Analysis of respondents' demographics

The demographic data of the study included the position respondents hold and the year of service. For confidentiality reasons, the researcher could not ask for too much demographics. The data for position held by respondents is presented in Table 4.2:

Table 4.2: Position held by respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Owners	34	23.0	23.0	23.0
	Accountants	17	11.5	11.5	34.5
	Procurement officer	23	15.5	15.5	50.0
	Branch manager/Supervisor	34	23.0	23.0	73.0
	Storekeeper	40	27.0	27.0	100.0
	Total	148	100.0	100.0	

Source: Researcher's computation (2026)

Table 4.2 presents the distribution of respondents based on their positions within the selected contemporary eateries in South-South Nigeria. The results showed that the respondents were fairly distributed across key operational and managerial roles relevant to inventory management and cost efficiency. The largest proportion of respondents were storekeepers, accounting for 40 respondents (27.0%). This reflected their central role in inventory handling, stock control, and day-to-day material management within eateries. Their dominance in the sample was appropriate, given the study's focused on strategic inventory management. Both owners and branch managers/supervisors each accounted for 34 respondents (23.0%), indicating that top-level and operational management perspectives were adequately captured. This balance was important because owners provide strategic decisions, while managers supervise implementation at the outlet level. Further, procurement officers made up 23 respondents (15.5%), representing personnel directly involved in sourcing and purchasing decisions, which are key components of inventory management systems. Lastly, accountants constituted the smallest group with 17 respondents (11.5%), reflecting the fact that not all eateries maintain dedicated accounting personnel, as some financial functions may be outsourced or integrated into managerial duties.

Table 4.3: Years of service

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1-5 years	72	48.6	48.6	48.6
	6-10 years	40	7.0	27.0	75.7
	11-15 years	22	14.9	14.9	90.5
	Above 15 years	14	9.5	9.5	100.0
	Total	**148**	**100.0**	**100.0**	

Source: Researcher's computation (2026)

Table 4.3 presents the distribution of respondents based on their years of service in the selected contemporary eateries in South-South Nigeria. The result showed that a significant proportion of the respondents were relatively new in their respective establishments. The highest proportion of respondents, 72 (48.6%), had between 1-5 years of work

experience, this suggested that the industry is characterized by frequent labour turnover or recent employment growth, which is typical in the food service sector. Respondents with 6–10 years of experience accounted for 40 (27.0%), showing a moderate level of experienced personnel who are likely familiar with operational and inventory management practices. Those with 11-15 years of experience represented 22 respondents (14.9%), while the least proportion, 14 respondents (9.5%), had above 15 years of experience. This implied that only a small fraction of employees had long-term experience within the eateries, which may reflect limited long-term retention in the industry.

4.2.2 Normality test

To assess whether a dataset aligns with a normal distribution and to estimate the probability that the underlying random variable is normally distributed, statisticians often use normality tests. In SPSS, several tests can evaluate normality, but this study focused on the Shapiro-Wilk test, widely regarded as having the highest power for a given significance level based on Monte Carlo simulations. According to this test, a variable is considered normally distributed if the p-value is not statistically significant at the 1% or 5% level; otherwise, normality is rejected. The results are presented in Table 4.4 below:

Table 4.4: Tests of Normality for the Study Variables

Variable	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
WCMA	.177	148	.001	.937	148	.000
SBD	.250	148	.001	.887	148	.000
ISS	.186	148	.001	.934	148	.007
SCL	.114	148	.001	.973	148	.005
SSF	.197	148	.001	.913	148	.000
MSI	.139	148	.001	.936	148	.000
ILP	.188	148	.001	.899	148	.000
SRP	.217	148	.001	.861	148	.000

a. Lilliefors Significance Correction

Source: Researcher's computation (2026) SPSS version 21

Table 4.4 presents the results of the normality test conducted on the study variables using the Shapiro-Wilk test, which was appropriate for samples below 200 and is widely regarded as a reliable test of data normality. The decision rule for the Shapiro–Wilk test stated that a significance value (Sig.) greater than 0.05 indicates that the data is normally distributed, while a value less than 0.05 suggested a departure from normality. From the results, most of the variables, including WCMA (p = 0.000), SBD (p = 0.000), ISS (p = 0.001), SCL (p = 0.005), SSF (p = 0.000), ILP (p = 0.000), and SRP (p = 0.000); recorded significance values below 0.05. This indicated that these variables deviate from perfect normality.

However, despite the observed deviations from normality in the variables, the study proceeded with the use of pooled Ordinary Least Squares (OLS) estimation technique. This was because OLS estimators remain Best Linear Unbiased Estimators (BLUE) under the Gauss–Markov assumptions, and were robust to mild violations of normality, particularly in studies with relatively large sample sizes such as this (n = 148). Furthermore, the Central Limit Theorem supported the reliability of OLS estimates in large samples, as the sampling distribution of the estimators tends toward normality. Therefore, the use of pooled OLS is considered appropriate for this analysis.

4.2.3 Multicollinearity test

The regression model assumes the inexistence of multicollinearity between the predictor variables. It is a situation where one or more independent variable can be expressed as a combination of other independent variables. This can be detected by observing the Variance Inflation Factor (VIF). The VIF should be lower than 10 for this assumption to hold.

Table 4.5: Multicollinearity test for the independent variables

Independent Variable	Tolerance	VIF
SBD	.924	1.082
ISS	.948	1.055
SCL	.964	1.037
SSF	.908	1.102
MSI	.946	1.057
ILP	.985	1.015
SRP	.920	1.087

Source: Researcher's computation (2026)

Table 4.5 presents the results of the multicollinearity test for the independent variables using Tolerance and Variance Inflation Factor (VIF) values. The test was conducted to determine whether there exists a high degree of correlation among the explanatory variables that could bias the regression estimates. The decision rule for multicollinearity indicates that a Tolerance value below 0.10 and a VIF value above 10 suggest the presence of serious multicollinearity, while values within acceptable ranges indicate the absence of multicollinearity problems. From the results, all the independent variables; SBD, ISS, SCL, SSF, MSI, ILP, and SRP, recorded Tolerance values ranging from 0.908 to 0.985, which were well above the 0.10 threshold. Similarly, the VIF values range from 1.015 to 1.102, which were far below the benchmark of 10. Specifically, ILP recorded the lowest VIF value of 1.015, while SSF recorded the highest VIF value of 1.102, yet both remain significantly within the acceptable limit. This indicated that none of the variables exhibits harmful multicollinearity.

4.2.4 Correlation Analysis

Correlation analysis examined the associations between the independent and dependent variables without capturing cause and effects. Based on normality test findings in 4.2.2, it was evident that most variables did not follow normal distribution. Addressing this issue can involve various approaches, such as data transformation, employing robust techniques, or using non-parametric tests (Box & Watson, 1962). As a result, the Spearman rank correlation was applied instead of Pearson's correlation. Spearman's method is non-parametric, robust, and mitigates the effect of outliers by pulling extreme values closer to the centre.

Table 4.6: Spearman rank correlation matrix

Variables	WCMA	SBD	ISS	SCL	SSF	MSI	ILP	SRP
WCMA	1.000	.873	**.407**	,088	.837	.872	.842	.750
SBD	.873	1.000	.404	.086	.857	.919	.838	.807
ISS	.407	.404	1.000	-.042	.391	.416	.450	.259
SCL	.088	.086	-.042	1.000	.230	.077	.064	.069
SSF	.837	.857	.391	.230	1.000	.861	.836	.705
MSI	.872	.919	.416	.077	.861	1.000	.907	.792
ILP	.842	.838	.450	.064	.836	.907	1.000	.708
SRP	.750	.807	.259	.069	.705	.792	.708	1.000

SPSS version 21

Source: Researcher's computation (2026)

Table 4.7: Correlation with WCMA

Independent variable	Spearman's p	Sig. (2-tailed)	Decision
SBD	.873	<.001	Significant
ISS	.407	<.001	Significant
SCL	.088	.286	Not significant
SSF	.837	<.001	Significant
MSI	.872	<.001	Significant
ILP	.842	<.001	Significant
SRP	.750	<.001	Significant

SPSS version 21
Source: Researcher's computation (2026)

Table 4.6 and Table 4.7 presents the Spearman rank correlation results examining the relationship between strategic inventory management (independent variables) and waste cost minimization attainability (WCMA), which served as a proxy for operational cost minimization efficiency. Overall, the results showed that the relationships between WCMA and most of the strategic inventory management variables were strong, indicating that these strategies exhibit strong individual linear associations with operational cost minimization efficiency at the bivariate level. However, a most of the variables showed statistically significant relationships, suggesting strong influence of inventory management strategies on waste cost minimization outcomes.

Supplier base diversity (SBD) showed a very strong and statistically significant positive relationship with WCMA (r = .873, p = < 0.001). This suggested that diversifying suppliers necessarily translate into improved waste cost minimization efficiency in the sampled eateries. Although diversification is generally expected to improve flexibility, the result indicated that its effect on cost efficiency may depend on how it is managed and its presence.

Similarly, inventory source strategy (ISS) recorded strong and significant positive relationship with WCMA (r = .407, p = <0.001). This implied that the method through which inventory is sourced had a meaningful direct relation with waste cost minimization efficiency at the bivariate level. Specifically, supplier concentration level (SCL) had a weak but statistically insignificant positive relationship with WCMA (r = 0.088, p = 0.286). This implied that as supplier concentration increases, the ability of eateries to achieve waste cost minimization efficiency decreases. In practical terms, a high dependence on a limited number of suppliers may reduce bargaining power, limit flexibility in sourcing, and increase vulnerability to supply disruptions, thereby negatively affecting cost efficiency.

Furthermore, supplier switching flexibility (SSF) showed a strong and significant positive relationship with WCMA (r = 0.837 p = <0.001). This indicated that the ability to switch suppliers significantly translate into improved waste cost minimization efficiency, suggesting that switching decisions frequently or effectively utilized in practice within the sampled eateries.

Also, modern storage infrastructure (MSI) exhibited a strong and significant positive relationship with WCMA (r = 0.872, p = <0.001). This suggested that storage infrastructure enhanced inventory preservation and reduce waste, its isolated effect on cost minimization efficiency was statistically evident at the correlation level.

In addition, inventory level planning (ILP) showed a strong and significant positive relationship with WCMA (r = 0.542, p = <0.001). This indicated that planning inventory levels significantly influence waste cost minimization efficiency in the sampled eateries, possibly due to consistencies in implementation and accurate forecasting systems.

Lastly, systematic replenishment planning (SRP) also recorded a strong and significant positive relationship with WCMA (r = 0.750, p = <0.001), suggesting that replenishment planning practices contributed to improve waste cost minimization efficiency.

4.2.5 Regression Analysis

The study adopted the pooled Ordinary Least Squares (OLS) regression technique to examined the effect of strategic inventory management on operational cost minimisation efficiency of selected contemporary eateries in South-South Nigeria. This method was appropriate because it allowed for the estimation of the linear relationship between multiple independent variables and a single dependent variable, thereby capturing the combined and individual effects of the explanatory variables. The outputs were presented below:

Table 4.8: Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.907[a]	0.822	0.813	.745	1.203

Predictors: (Constant), SRP, ILP, SCL, SBD, ISS, MSI, SSF
Dependent variable: WCMA
Source: Researcher's computation (2026) SPSS

Table 4.9: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	358.761	7	51.252	92.291	.000[b]
	Residual	77.7746	140	0.555		
	Total	436.507	147			

a. Dependent variable: WCMA
b. Predictors: (Constant), SRP, ILP, SCL, SBD, ISS, MSI, SSF

Source: Researcher's computation (2026) SPSS

Table 4.10: Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-10.016	2.407		-4.160	.000		
	SBD	0.488	.142	.349	3.448	.001	.924	1.082
	ISS	.030	.039	.032	.780	.437	.948	1.055
	SCL	.026	.033	.028	.772	.442	.964	1.037
	SSF	.413	.113	.324	3.646	.001	.908	1.102
	MSI	.361	.103	.383	3.516	.001	.946	1.057
	ILP	.490	.115	.406	4.261	.000	.985	1.015
	SRP	.259	.086	.199	3.011	.003	.920	1.087
a. Dependent Variable: WCMA								

Source: Researcher's computation (2026) SPSS version 21

Tables 4.8, 4.9 and 4.10 present the results of the pooled Ordinary Least Squares (OLS) regression analysis examining the effect of strategic inventory management on waste cost minimization attainability (WCMA), which served as a proxy for operational cost minimization efficiency of selected contemporary eateries in South-South Nigeria. The result in Table 4.8 showed that the model had an R-squared value of 0.822, indicating that approximately 82.2% of the systematic variation in WCMA is explained by the combined effect of strategic inventory management practices (SBD, ISS, SCL, SSF, MSI, ILP, and SRP). This implies that a significant proportion of changes in operational cost minimization efficiency among the sampled eateries is influenced by the inventory management variables included in the model. However, the remaining 17.8% of the variation is explained by other factors not captured in the model but represented in the error term.

The Adjusted R-squared value of 0.813 further confirmed the robustness of the model after adjusting for the number of predictors. This indicated that about 81.3% of the variation in WCMA was still explained by the explanatory variables, confirming that the model has good explanatory power. Furthermore, the result of the F-statistic (92.291) with an associated probability value of <0.001 presented in Table 4.9 indicated that the overall model is statistically significant at the 5% level. This implies that the independent variables, as a group, have a significant effect on waste cost minimization attainability of the sampled eateries. Therefore, the model is appropriate for making statistical inference.

4.3 Test of Hypotheses

4.3.1 Hypothesis one

H_{01}: Supplier base diversity has no significant effect on waste cost minimisation attainability of contemporary eateries.

From the regression results in Table 4.10, supplier base diversity (SBD) had a coefficient of 0.488 with a p-value of 0.001. Since the p-value is less than 0.05, the effect was statistically significant. Therefore, the null hypothesis was rejected. This indicated that supplier base diversity has a significant positive effect on waste cost minimisation attainability of contemporary eateries in South-South Nigeria.

4.3.2 Hypothesis two

H_{02}: Inventory source strategy has no significant effect on waste cost minimisation attainability of contemporary eateries.

Inventory source strategy (ISS) had a coefficient of 0.030 with a p-value of 0.437. Since the p-value is greater than 0.05, the effect was not statistically significant. Therefore, the null hypothesis is not rejected. This implies that inventory source strategy has no significant effect on waste cost minimisation attainability of contemporary eateries.

4.3.3 Hypothesis three

H_{03}: Supplier concentration level has no significant effect on waste cost minimisation attainability of contemporary eateries.

Supplier concentration level (SCL) had a coefficient of 0.026 with a p-value of 0.442. Since the p-value is greater than 0.05, the effect was statistically insignificant. Therefore, the null hypothesis was accepted. This indicated that supplier concentration level had no significant effect on waste cost minimisation attainability of contemporary eateries.

4.3.4 Hypothesis four

H_{04}: Supplier switching flexibility does not have significant effect on waste cost minimisation attainability of contemporary eateries.

Supplier switching flexibility (SSF) had a coefficient of 0.413 with a p-value of 0.001. Since the p-value is less than 0.05, the effect is statistically significant. Therefore, the null hypothesis is rejected. This implied that supplier switching flexibility had a significant positive effect on waste cost minimisation attainability of contemporary eateries.

4.3.5 Hypothesis five

H_{05}: Modern storage infrastructure does not have significant effect on waste cost minimisation attainability of contemporary eateries.

Modern storage infrastructure (MSI) had a coefficient of 0.361 with a p-value of 0.001. Since the p-value is less than 0.05, the effect is statistically significant. Therefore, the null hypothesis is rejected. This indicated that modern storage infrastructure had a significant positive effect on waste cost minimisation attainability of contemporary eateries.

4.3.6 Hypothesis six

H_{06}: Inventory level planning policy has no significant effect on waste cost minimisation attainability of contemporary eateries.

Inventory level planning (ILP) has a coefficient of 0.490 with a p-value of 0.000. Since the p-value is less than 0.05, the effect is statistically significant. Therefore, the null hypothesis is rejected. This implied that inventory level planning has a significant positive effect on waste cost minimisation attainability of contemporary eateries.

4.3.7 Hypothesis seven

H_{07}: Systematic replenishment planning does not have significant effect on waste cost minimisation attainability of contemporary eateries.

Systematic replenishment planning (SRP) had a coefficient of 0.259 with a p-value of 0.003. Since the p-value is less than 0.05, the effect is statistically significant. Therefore, the null hypothesis is rejected. This indicated that systematic replenishment planning had a significant positive effect on waste cost minimisation attainability of contemporary eateries.

4.4 Discussion of Findings

4.4.1 Supplier base diversity and waste cost minimization attainability

Results from the pooled OLS regression in Table 4.10 indicated that supplier base diversity (SBD) exerted a positive and statistically significant effect on waste cost minimisation attainability (WCMA) of selected eateries in South-South Nigeria (coefficient = 0.488, p = 0.001). This suggested that eateries that engaged more diversified pool of suppliers are better able to minimise waste-related costs, thereby improving operational cost efficiency. The positive and significant coefficient implies that supplier diversification enhances procurement flexibility, allowing firms to better align inventory inflows with actual consumption patterns and reduce losses associated with spoilage, overstocking, and emergency purchases.

This finding supported the argument that reliance on multiple suppliers reduces supply chain vulnerabilities and enhances responsiveness, particularly in food service

operations where perishability and delivery timing are critical (Christopher, 2022; Chopra & Meindl, 2022). By spreading procurement across different suppliers, eateries are able to mitigate risks associated with delivery delays, price fluctuations, and supply shortages, which often lead to inefficient inventory decisions and increased waste costs (Ivanov, 2021; Heizer *et al*., 2020). The result therefore suggested that supplier base diversity functions as a strategic mechanism for improving inventory coordination and reducing operational inefficiencies.

The finding was also consistent with Resource Base-View theory, which posits that when firms effectively developed and managed diverse supplier network it establishes a rare and non-substitutable supply chain capability that support superior performance and better positioned to manage external uncertainties and negotiate favorable procurement terms (Barney, 1991). In this context, diversified supplier relationships enhance bargaining power, enabling eateries to request smaller and more frequent deliveries that align with demand patterns, thereby reducing excess inventory and spoilage (Jacobs & Chase, 2021). This improved flexibility directly contributes to waste cost minimisation by limiting the accumulation of perishable goods beyond their useful life.

Furthermore, the positive relationship observed in this study aligned with empirical evidence which suggests that firms with diversified supplier bases experience lower operational costs due to improved inventory control and reduced spoilage rates (Mandal, 2021; Zhang & Sharifi, 2021). Diversified sourcing also enhances quality monitoring and supplier performance comparison, thereby reducing deterioration-related losses and improving overall cost efficiency (Oni & Daniyan, 2021; Stevenson, 2021). In volatile environments, particularly in emerging economies, supplier base diversity has been shown to support operational continuity and prevent the cycle of stockouts followed by excessive replenishment, which often increases waste costs (FAO, 2022; Ivanov & Dolgui, 2022).

4.4.2 Inventory source strategy and waste cost minimization attainability

Results from the pooled OLS regression in Table 4.10 indicated that inventory source strategy (ISS) exerted a positive but statistically insignificant effect on waste cost minimisation attainability (WCMA) of selected contemporary eateries in South-South Nigeria (coeff. = 0.030, p = 0.437). This suggested that although improvements in inventory sourcing approaches may contribute positively to operational cost efficiency, the effect is not strong enough to be statistically meaningful within the context of this study. In practical terms, this implies that the way eateries source their inventory does not significantly influence their ability to minimise waste-related costs when considered in isolation.

The positive coefficient, however, indicated that better-aligned sourcing strategies—such as local sourcing, coordinated supply channels, and efficient procurement structures—may still contribute to reduced spoilage and improved inventory turnover, as suggested in the literature (Chopra & Meindi, 2022; Christopher, 2022). Inventory source strategy influences lead time, product freshness, and supply reliability, all of which are critical determinants of waste generation in food service operations (Ivanov & Dolgui, 2022; Heizer *et al*., 2020). Nevertheless, the lack of statistical significance suggested that these benefits may not be consistently realized across the sampled eateries, possibly due to variations in implementation, infrastructural constraints, or weak coordination between suppliers and firms.

This finding partially aligned with the resource-based view, which posited that sourcing strategy contributes to operational efficiency only when it is effectively integrated with other firm capabilities such as demand forecasting, inventory planning, and supplier coordination (Barney, 1991). In this context, the insignificant result may indicate that while eateries adopt certain sourcing strategies, they may lack the complementary capabilities required to fully translate these strategies into measurable cost savings. For instance, fragmented sourcing arrangements or weak supplier relationships may limit the effectiveness of otherwise sound sourcing decisions (Jacobs & Chase, 2021; Stevenson, 2021).

Furthermore, the result contrasted with empirical studies which reported that firms adopting well-structured and localized sourcing strategies experienced lower spoilage rates and improved cost efficiency (Mandal, 2021; Zhang & Sharifi, 2021). The divergence may be attributed to the operational realities of eateries in South-South Nigeria, where infrastructural challenges, supply inconsistencies, and market volatility may weaken the effectiveness of sourcing strategies. For example, even when sourcing decisions are optimized, external factors such as transportation delays, power supply issues, and demand fluctuations may still lead to inventory deterioration and waste (Ivanov, 2021; FAO, 2022).

Additionally, the finding suggested that inventory source strategy may not operate independently in influencing waste cost minimisation but rather works in conjunction with other inventory management practices such as inventory level planning, storage infrastructure, and replenishment systems. This reinforces the idea that sourcing decisions alone are insufficient to guarantee cost efficiency unless supported by integrated inventory management systems (Christopher, 2022; Oni & Daniyan, 2021).

4.4.3 Supplier concentration level and waste cost minimization attainability

Results from the pooled OLS regression in Table 4.10 indicated that supplier concentration level (SCL) exerted a positive but statistically insignificant effect on waste cost minimisation attainability (WCMA) of selected contemporary eateries in South-South Nigeria (coeff. = 0.026, p = 0.442). This suggested that although higher supplier concentration tends to reduce waste cost minimisation efficiency, the effect is not strong enough to be statistically significant within the context of this study. In practical terms, this implies that dependence on a limited number of suppliers may contribute to increased waste-related costs, but such influence is not consistently pronounced across the sampled eateries.

The coefficient aligned with theoretical expectations and existing literature which argue that high supplier concentration increases dependency risk, reduces procurement flexibility, and exposes firms to supply disruptions that often lead to spoilage and operational inefficiencies (Christopher, 2022; Chopra & Meindl, 2022). In food service operations where perishability is critical, reliance on a few suppliers can result in delayed deliveries, irregular supply schedules, and emergency bulk purchases, all of which increase the likelihood of excess inventory and

deterioration (Ivanov & Dolgui, 2022; Heizer *et al*., 2020). Thus, the direction of the relationship observed in this study supported the view that excessive supplier concentration undermines effective waste cost management.

The finding is also consistent with resource based-view theory and supply chain resilience theory which posited that firms that heavily capitalised on a limited number of suppliers are subject to power imbalances that constrain their ability to negotiate favorable delivery terms, batch sizes, and quality standards (Bititci *et al*. 2019; Barney, 1991). This lack of bargaining power may lead to larger, less frequent deliveries and reduced control over supply conditions, thereby increasing holding time and spoilage risks (Jacobs & Chase, 2021). Consequently, higher supplier concentration can limit the firm's ability to optimize inventory flows and minimise waste-related costs.

However, the lack of statistical significance suggests that the negative impact of supplier concentration may not be uniformly experienced across all eateries. This may be attributed to contextual factors such as the presence of reliable long-term supplier relationships, informal sourcing arrangements, or adaptive operational practices that partially offset the risks associated with supplier concentration. In some cases, firms may benefit from stable supply relationships with a few trusted suppliers, thereby reducing uncertainty and ensuring consistent quality, which may weaken the overall negative effect on waste cost outcomes.

Furthermore, the finding contrasts with empirical studies that reported a significant relationship between supplier concentration and operational cost performance, where firms with highly concentrated supplier bases experienced higher spoilage and inventory-related losses (Mandal, 2021; Zhang & Sharifi, 2021). The divergence may reflect the operational realities of eateries in South-South Nigeria, where supply chain structures are often informal and flexible, allowing firms to adjust procurement practices even within relatively concentrated supplier networks.

Also, the result suggests that supplier concentration level may interact with other inventory management practices in influencing waste cost minimisation. For instance, effective inventory level planning, storage infrastructure and replenishment systems may mitigate the adverse effects of supplier concentration by improving inventory control and reducing spoilage. This reinforces the idea that supplier concentration alone does not determine cost efficiency but operates within a broader system of interrelated inventory management practices (Oni & Daniyan, 2021; Ivanov, 2021).

4.4.4 Supplier switching flexibility and waste cost minimization attainability

Results from the pooled OLS regression in Table 4.10 indicated that supplier switching flexibility (SSF) exerted a positive and statistically significant effect on waste cost minimisation attainability (WCMA) of selected contemporary eateries in South-South Nigeria (coeff. = 0.413, p = 0.001). This suggested that eateries with a higher capacity to switch between suppliers are better able to minimise waste-related costs, thereby improving operational cost efficiency. The positive and significant coefficient implies that the ability to disengage from underperforming suppliers and quickly source alternatives enhance supply continuity, reduces delays, and prevents inventory deterioration.

This finding supported the argument that supplier switching flexibility enhances responsiveness and operational agility, particularly in food service environments where perishability and timing are critical (Christopher, 2022; Chopra & Meindl, 2022). When firms are able to switch suppliers with minimal disruption, they are less likely to experience stockouts, delayed deliveries, or forced acceptance of low-quality goods, all of which contribute to spoilage and increased waste costs (Ivanov & Dolgui, 2022; Heizer *et al*., 2020). Thus, switching flexibility serves as a strategic tool for maintaining inventory flow efficiency and reducing avoidable losses.

The result is also consistent with resource dependence theory, which posits that firms that are not locked into rigid supplier relationships are better able to manage external dependencies and negotiate favourable procurement terms (Pfeffer & Salancik, 1978). Supplier switching flexibility reduces power imbalances by introducing credible alternatives, thereby compelling suppliers to maintain high standards of quality, pricing, and delivery performance (Jacobs & Chase, 2021). This competitive pressure improves overall supply chain efficiency and reduces the likelihood of waste arising from substandard or delayed deliveries.

The finding in turn aligned with empirical evidence indicating that firms with greater supplier switching capability experience lower spoilage costs, improved inventory turnover, and enhanced cost efficiency, especially in uncertain and volatile environments (Mandal, 2021; Zhang & Sharifi, 2021). Switching flexibility enables firms to respond quickly to supply disruptions, adjust procurement volumes, and maintain optimal stock levels, thereby preventing the accumulation of excess inventory that leads to deterioration (Ivanov, 2021; Oni & Daniyan, 2021). In addition, supplier switching flexibility enhances procurement coordination and demand alignment, as firms can synchronise supply decisions with real-time consumption patterns. This reduces the risk of overstocking and ensures that inventory inflows remain consistent with operational needs, thereby improving waste cost minimisation attainability (Ivanov & Dolgui, 2022; Stevenson, 2021). It also allows firms to replace unreliable suppliers promptly, thereby avoiding prolonged holding periods that increase spoilage risks.

4.4.5 Modern storage infrastructure and waste cost minimization attainability

Results from the pooled OLS regression in Table 4.10 indicated that modern storage infrastructure (MSI) exerted a positive and statistically significant effect on waste cost minimisation attainability (WCMA) of selected contemporary eateries in South-South Nigeria (coeff. = 0.361, p = 0.001). This suggested that eateries with improved storage facilities are significantly more effective in minimising waste-related costs, thereby enhancing operational cost efficiency. The positive and significant coefficient implied that investments in modern storage systems contribute directly to preserving inventory quality, reducing spoilage, and improving overall cost performance.

This finding supported the argument that storage infrastructure plays a critical role in determining inventory outcomes, particularly in food service operations where perishability is a major concern (Christopher, 2022; Heizer *et al*., 2020). Modern storage systems such as refrigeration, temperature control, and structured shelving help maintain product integrity by reducing exposure to environmental factors that accelerate deterioration (FAO, 2022; Ivanov &

Dolgui, 2022). As a result, firms are able to extend shelf life, reduce contamination risks, and minimise expiration losses, all of which contribute to improve waste cost minimisation attainability.

The result is also consistent with the resource-based view, which posits that firm-specific capabilities such as advanced storage infrastructure provide a competitive advantage by enhancing operational efficiency and reducing avoidable losses (Barney, 1991). In this context, modern storage infrastructure represents a strategic asset that enables firms to preserve value throughout the inventory cycle, thereby improving cost outcomes. By maintaining optimal storage conditions, eateries can ensure that inventory remains usable for longer periods, reducing the financial burden associated with spoilage and waste.

The finding aligned with empirical studies which reported that the adoption of modern storage technologies significantly reduces deterioration rates and improves inventory turnover in food-related operations (Mandal, 2021; Zhang & Sharifi, 2021). The integration of digital monitoring systems, such as real-time tracking and temperature sensors, enhances inventory visibility and facilitates effective stock rotation practices like FIFO, thereby minimizing waste (Chopra & Meindl, 2022; Stevenson, 2021). Additionally, improved storage systems reduce handling errors, improper stacking, and contamination risks, which are common sources of waste in traditional storage environments (Ivanov & Dolgui, 2022; Oni & Daniyan, 2021).

In environments characterized by infrastructural challenges and climatic variability, the importance of modern storage infrastructure becomes even more pronounced. Firms that invest in resilient storage solutions, including cold-chain systems and backup power supply, are better able to maintain inventory stability and reduce spoilage despite external constraints (FAO, 2022; Ivanov, 2021). This highlights the role of storage infrastructure as a protective buffer that preserves product quality between procurement and consumption stages, thereby enhancing operational efficiency.

4.4.6 Inventory level planning policy and waste cost minimization attainability

Results from the pooled OLS regression in Table 4.10 indicated that inventory level planning (ILP) exerted a positive and highly statistically significant effect on waste cost minimisation attainability (WCMA) of selected contemporary eateries in South-South Nigeria (coeff. = 0.490, p 0.000). This suggested that effective inventory level planning substantially enhances the ability of eateries to minimise waste-related costs. The magnitude of the coefficient further indicates that ILP is one of the strongest predictors of waste cost minimisation among the variables examined, highlighting its critical role in operational cost efficiency.

This finding is in tandem with the argument that systematic determination of optimal stock levels is essential for balancing product availability with the minimisation of spoilage and holding costs (Chopra & Meindl, 2022; Heizer *et al*., 2020). In food service operations where inventory items are highly perishable, poor stock planning often leads to overstocking, expiration, and increased waste-related expenses (FAO, 2022; Stevenson, 2021). The significant positive relationship observed in this study implied that eateries that adopt structured inventory planning techniques, such as demand forecasting, safety stock optimisation, and reorder point systems—are better able to align inventory inflows with consumption patterns, thereby reducing avoidable losses.

The result is also consistent with supply chain resilence theory, contingency theory and transaction cost economics, which explained the ability of eateries to anticipate, prepare for, respond to and recover from disruptions while maintaining continuity of operations and also assessing it environmental uncertainity especially procurement cost (Bititci *et al*., 2019; Lawrence & Lorsch 1967; Williamson 1979). By maintaining optimal inventory levels, firms are able to minimise surplus stock, reduce deterioration risks, and improve resource utilisation. This disciplined approach to inventory control enhances overall efficiency and directly contributes to waste cost minimisation attainability. The finding aligned with the resource-based view, which posits that firms possessing superior planning and analytical capabilities are better positioned to convert information into operational advantages (Barney, 1991). In this context, effective inventory level planning represents a strategic capability that enables firms to anticipate demand fluctuations, adjust procurement decisions accordingly, and maintain inventory accuracy. The integration of forecasting tools and continuous inventory review systems enhances decision-making precision, thereby reducing uncertainty and limiting spoilage (Ivanov, 2021; Jacobs & Chase, 2021).

Empirically, the result is consistent with studies which reported that firms implementing demand-driven inventory planning systems experienced lower levels of expired stock, improved inventory turnover, and reduced operational costs (Mandal, 2021; Zhang & Sharifi, 2021). Accurate planning also supports the effective implementation of stock rotation practices such as FIFO, ensuring that older inventory is utilised before newer stock, thereby minimising expiration losses (Christopher, 2022; Stevenson, 2021). In contrast, firms relying on intuitive or ad-hoc ordering practices often face higher spoilage rates and increased financial losses due to misalignment between supply and demand (Oni & Daniyan, 2021). Additionally, inventory level planning contributes to financial sustainability by reducing capital tied up in idle or excess stock and minimising inventory write-offs. Firms that adopt systematic planning approaches are better able to stabilise operations, control costs, and maintain efficient inventory cycles even in the face of demand volatility and supply uncertainties (FAO, 2022; Ivanov & Dolgui, 2022).

4.4.7 Systematic replenishment planning and waste cost minimization attainability

Results from the pooled OLS regression in Table 4.10 indicated that systematic replenishment planning (SRP) exerted a positive and statistically significant effect on waste cost minimisation attainability (WCMA) of selected contemporary eateries in South-South Nigeria (coeff. = 0.259, p = 0.003). This suggested that eateries that adopt structured and data-driven replenishment systems are significantly more effective in minimising waste-related costs. The positive and significant coefficient implied that aligning reorder decisions with demand patterns, lead times, and inventory policies enhances inventory efficiency and reduces losses associated with spoilage and overstocking.

This finding supported the argument that systematic replenishment planning is critical in perishable inventory systems, where poor replenishment decisions often result in

excess stock accumulation and product expiration (Chopra & Meindl, 2022; Heizer *et al*., 2020). By implementing structured replenishment frameworks, such as continuous review systems and automated reorder mechanisms, firms are able to synchronise supply inflows with actual consumption patterns, thereby minimising mismatches that lead to waste (Christopher, 2022; Jacobs & Chase, 2021). This ensures that inventory levels remain optimal and consistent with operational demand, reducing deterioration losses.

The result is also consistent with resource base-view theory and dynamic capabilities theory, which explained systematic replenishment planning as a dynamic capability that enhances the firm's responsiveness to demand fluctuations and supply uncertainties (Teece, 1997; Barney, 1991). Systematic replenishment enhances stock rotation practices, such as FIFO, ensuring that older inventory is utilised before newer stock, thereby reducing expiration risks (Stevenson, 2021; Heizer *et al*., 2020). In addition, the integration of shelf-life considerations into replenishment decisions enables firms to better manage perishable goods and avoid unsold inventory (Ivanov & Dolgui, 2022).

Empirically, the finding aligned with studies which reported that firms adopting demand-driven and data-based replenishment models experienced lower spoilage rates, improved inventory turnover, and enhanced cost efficiency (Mandal, 2021; Zhang & Sharifi, 2021). The use of real-time data and forecasting tools improves reorder accuracy, reduces excess inventory accumulation, and strengthens coordination between procurement and consumption cycles (Oni & Daniyan, 2021; Ivanov, 2021). Furthermore, collaborative replenishment systems, including information sharing with suppliers, enhance demand visibility and reduce inefficiencies within the supply chain (Christopher, 2022; Chopra & Meindl, 2022).

Systematic replenishment planning contributes to operational discipline and cost control by ensuring that inventory decisions are guided by structured policies rather than intuition. This reduces uncertainty, enhances planning accuracy, and prevents the accumulation of unnecessary buffer stock that may later result in spoilage (Heizer *et al*., 2020; Jacobs & Chase, 2021). Even in environments with infrastructural challenges, structured replenishment practices have been shown to significantly improve waste management outcomes by providing a consistent framework for inventory decision-making (FAO, 2022; Ivanov & Dolgui, 2022).

5. Summary, Conclusion and Recommendations

This chapter presents a summary of the major findings of the study, draws conclusions based on the empirical results, provides relevant recommendations, highlights the contributions to knowledge, and suggests areas for further studies.

5.1 Summary of Findings

This study empirically examined the effect of strategic inventory management on operational cost minimisation efficiency proxied by waste cost minimisation attainability (WCMA) among selected eateries in South-South Nigeria. Using pooled Ordinary Least Squares (OLS) regression, the model demonstrated strong explanatory power, with an R^2 of 0.822 and an adjusted R^2 of 0.813, indicating that approximately 81.3% – 82.2% of variations in WCMA are explained by the included inventory management variables. The overall model was statistically significant ($F = 92.291$, $p < 0.001$), confirming the joint relevance of the explanatory variables. The detailed findings and their implications are summarised as follows:

1. Supplier base diversity exhibited a positive and statistically significant effect on waste cost minimization attainability ($\beta = 0.488$, $t = 3.448$, $p = 0.001$). This implies that a unit increase in supplier diversification leads to a corresponding improvement in waste cost minimisation efficiency. Eateries that engage multiple suppliers are better positioned to reduce procurement risks, improve supply flexibility, and minimise spoilage arising from delays or stock inconsistencies. This underscores the need for diversified sourcing strategies as a cost-control mechanism.
2. Inventory source strategy showed a positive but statistically insignificant effect on waste cost minimization attainability ($\beta = 0.030$, $t = 0.780$, $p = 0.437$). While improved sourcing approaches may enhance efficiency, their isolated impact is weak. This suggests that sourcing strategies must be integrated with other inventory systems (example, planning and storage) to yield meaningful cost reductions.
3. Supplier concentration level had a positive and statistically insignificant effect on waste cost minimization attainability ($\beta = 0.026$, $t = 0.772$, $p = 0.442$). Although reliance on few suppliers tends to reduce cost efficiency, the effect is not strong enough to be conclusive. However, this signals potential risks such as supply disruptions and reduced bargaining power, suggesting that excessive supplier concentration should be avoided.
4. Supplier switching flexibility exerted a positive and statistically significant effect on waste cost minimization attainability ($\beta = 0.413$, $t = 3.646$, $p = 0.001$). The ability to switch suppliers enhances operational agility and reduces dependency risks. Eateries with flexible supplier arrangements can respond quickly to supply inefficiencies, thereby minimising waste and improving cost efficiency.
5. Modern storage infrastructure recorded a positive and statistically significant effect on waste cost minimization attainability ($\beta = 0.361$, $t = 43.516$, $p = 0.001$). Investment in modern storage facilities (example, refrigeration, temperature control systems) significantly reduces spoilage and inventory deterioration. This highlights storage infrastructure as a critical driver of cost efficiency in perishable goods management.
6. Inventory level planning emerged as the most influential variable, with a strong positive and highly significant effect on waste cost minimization attainability ($\beta = 0.490$, $t = 4.261$, $p < 0.001$). Effective planning of inventory levels through demand forecasting, safety stock determination, and reorder systems is central to minimising waste. This finding suggests that eateries should prioritise structured inventory planning systems to achieve optimal cost efficiency.
7. Systematic replenishment planning also showed a positive and statistically significant effect on waste cost minimization attainability ($\beta = 0.259$, $t = 3.025$, $p = 0.003$). Structured and data-driven replenishment systems improve alignment between supply and demand, reducing overstocking and expiration losses. This reinforces the importance of adopting automated and policy-driven replenishment frameworks.

5.2 Conclusion

This study examined the effect of strategic inventory management on operational cost minimisation efficiency of selected eateries in South-South Nigeria. The independent variable, strategic inventory management, was proxied by supplier base diversity, inventory source strategy, supplier concentration level, supplier switching flexibility, modern storage infrastructure, inventory level planning, and systematic replenishment planning, while the dependent variable, operational cost minimization efficiency, was proxied by waste cost minimisation attainability. The major theories underpinning the study were the Resource-Based View (Barney, 1991), Contingency Theory (Lawrence & Lorsch, 1967), Transaction Cost Economics (Williamson, 1979), Supply Chain Resilience Theory (Bititci *et al*., 2019), and Dynamic Capabilities Theory (Teece, 1997).

The findings of this study were strongly supported by the Resource-Based View, which posited that firms achieved superior performance when they possess valuable, rare, inimitable, and non-substitutable resources such as effective inventory systems, supplier networks, and storage capabilities. In this context, strategies such as supplier base diversity, modern storage infrastructure, inventory level planning, and systematic replenishment planning function as strategic internal capabilities that enable eateries to reduce waste and improve cost efficiency. Furthermore, Dynamic Capabilities Theory explained that firms must continuously integrate, build, and reconfigure their operational competencies to respond to changing demand and supply conditions. The significant effects observed in switching flexibility, replenishment planning, and storage infrastructure demonstrate that eateries that are more adaptable in managing inventory-related decisions are better able to minimise waste-related costs.

In addition, Contingency Theory provided further explanation for the mixed significance of some variables, suggesting that the effectiveness of strategic inventory management depends on contextual factors such as operational environment, demand variability, and supply chain structure. This explains why inventory source strategy and supplier concentration level, though theoretically relevant, did not show statistically significant effects in this study. Similarly, Transaction Cost Economics supports the importance of reducing procurement and coordination costs through diversified sourcing, flexible switching arrangements, and structured replenishment systems, all of which help to minimise inefficiencies that contribute to waste. Lastly, Supply Chain Resilience Theory reinforces the findings by emphasizing that firms with adaptable and well-coordinated supply chain structures are better able to withstand disruptions, maintain inventory stability, and reduce losses associated with perishability and supply uncertainty.

Based on the empirical findings, it was concluded that strategic inventory management has a significant positive relationship with waste cost minimisation attainability of selected eateries in South-South Nigeria. This is evidenced by the fact that the significant relationships observed in the study were positive, indicating that improvements in strategic inventory management generally enhance operational cost minimization efficiency.

5.3 Recommendations

Based on the empirical findings of this study, the following recommendations were made:

1. Management of eateries in South-South Nigeria should institutionalize supplier base diversity as a core procurement strategy. Since supplier base diversity was found to have a significant positive effect on waste cost minimisation attainability, firms should deliberately engage multiple suppliers across different locations to reduce dependency risk, improve supply flexibility, and minimise spoilage associated with delays and stock disruptions. This will enhance procurement responsiveness and reduce waste-related operational costs.
2. Eateries should re-evaluate and optimize their inventory source strategies by combining local and regional sourcing channels in a more structured and coordinated manner. Although inventory source strategy was not statistically significant, the positive coefficient suggests potential benefits. Therefore, firms should strengthen supply chain coordination, improve supplier collaboration, and reduce reliance on fragmented sourcing arrangements to enhance inventory freshness and reduce avoidable waste.
3. Management should reduce excessive dependence on a limited number of suppliers by maintaining an optimal level of supplier concentration. The observed relationship implies that, high concentration may increase vulnerability to supply disruptions and spoilage risks. Therefore, eateries should balance supplier relationships by introducing moderate diversification to improve procurement flexibility and reduce waste-related losses.
4. Eateries should develop contractual and operational frameworks that enhance their ability to switch suppliers with minimal cost and delay. Since supplier switching flexibility significantly improves waste cost minimisation, firms should avoid rigid supplier agreements and instead promote competitive sourcing environments that allow rapid replacement of underperforming suppliers. This will enhance responsiveness and reduce inventory deterioration.
5. Management should invest in modern storage infrastructure such as refrigeration systems, temperature control units, and digital inventory monitoring tools. Given its significant positive effect, improving storage systems will help preserve inventory quality, reduce spoilage rates, and extend product shelf life, thereby improving overall cost efficiency.
6. Eateries should strengthen their inventory level planning systems by adopting demand forecasting tools, safety stock optimization techniques, and reorder point models. Since inventory level planning had the strongest positive effect among all variables, firms should prioritise accurate stock planning to avoid overstocking and understocking, thereby reducing waste and improving operational efficiency.
7. Management should adopt structured replenishment systems that align inventory orders with real-time consumption data and demand forecasts. Since systematic replenishment planning significantly improves waste cost minimisation, eateries should implement continuous review systems, automated reorder processes, and FIFO-based replenishment schedules to reduce inventory mismatch and spoilage.

6. Contribution to Knowledge

Based on the empirical findings of this study, the following key contributions to knowledge were established:

1. This study provides context-specific empirical evidence that strategic inventory management significantly explains

variations in waste cost minimisation attainability within the Nigerian food service sector. Unlike prior studies that largely focused on manufacturing or developed economies, this study demonstrates that inventory management-performance relationships hold in a perishable, service-oriented environment characterised by infrastructural and supply chain constraints.

2. The study makes a novel empirical contribution by identifying inventory level planning as the most dominant predictor of waste cost minimisation among all examined variables. This shifts the emphasis in existing literature from general inventory practices to data-driven stock optimisation as the most critical driver of cost efficiency in eateries.

3.The study contributes by establishing that systematic replenishment planning is not merely a supporting function but a core determinant of operational cost efficiency in perishable inventory systems. This finding advance prior literature by empirically demonstrating the importance of structured, demand-aligned replenishment systems in reducing spoilage.

4. The study offers new insight by showing that modern storage infrastructure has a direct and significant effect on cost minimisation, thereby empirically validating storage capability as a critical operational resource in environments with high product perishability in an area previously underemphasised in inventory management studies.

5. The study contributes by providing evidence of differential effects among inventory management dimensions, showing that not all practices are equally impactful. Specifically, inventory source strategy and supplier concentration level were found to be statistically insignificant, thereby refining existing models by distinguishing high-impact practices from low-impact ones in the context of eateries.

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