**ISA Journal of Business, Economics and Management (ISAJBEM)**

Homepage: https://isapublisher.com/isajbem/
Email: office.isapublisher@gmail.com

Volume 2, Issue 6, Nov-Dec, 2025 ISSN: 3049-1835

# Impact of Infrastructural Deficiencies on the Organizational Performance of Manufacturing Firms in Kano Metropolis

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**Received:** 25.10.2025 | **Accepted:** 22.11.2025 | **Published:** 02.12.2025

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**DOI:** *10.5281/zenodo.17791734*

**Abstract** **Original Research Articles**

This theoretical paper reviews how a lack of infrastructures affects the performance of manufacturing companies in Kano Metropolis, especially power supply, transportation and logistics, digital and communication infrastructure, and urban planning. Using global, African, West African, Nigerian and Kano specific literature, the research points out that these infrastructural gaps influence productivity, their efficiency of operations, decision-making and the sustainability of manufacturing organizations in the long-term. The research synthesizes the past studies making the challenges of the manufacturing sector of Kano to be placed in a wider framework of industrial and economic development. The study follows a conceptual approach to the research since it makes use of the secondary sources of data and the comprehensive literature review to build a strong theoretical and conceptual framework. The research is based on the Systems Theory, Contingency Theory and the Resource-Based View (RBV) that combines the interactions between infrastructural shortcomings and organizational processes and resources to determine the impact on performance. The research problem represents the conceptual framework where the independent variable is multidimensional infrastructural deficiencies and the dependent variable is organizational performance with the key performance indicators of productivity, profitability, operational efficiency, and market share. Two graphs are used to depict the connection between infrastructural factors, organisational processes and the output of the firm. The results of the literature analysis demonstrate that the unreliable power supply, insufficient transportation and logistical networks, insufficient digital infrastructure, and weak urban planning are major restrictions to manufacturing performance in Kano. The paper highlights the significance of specific interventions to be implemented by policy makers and organizational administrators such as having a better power and transportation infrastructure, investments in ICT, city planning, and engaging in agile practice to reduce the constraints in infrastructural constraints. Such insights can serve as the basis of further empirical studies, contribute to the theoretical knowledge in the domain of infrastructure-performance connection, and precondition the construction of practical strategies to make manufacturing companies in the area more competitive and sustainable.

**Keywords:** Infrastructural Deficiencies, Organizational Performance, Manufacturing Firms, Kano Metropolis, Operational Efficiency, Conceptual Framework, Systems Theory, Resource-Based View.



## 1.0 Introduction to the Study

### 1.1 Background of the Study

Manufacturing industries have been known to lead the economic growth and development in the world, create jobs, and invent new technologies to make the nations more competitive. Nevertheless, the infrastructural shortcomings, which are the lack of reliable power source, poor transport systems, and poor waste disposal systems, are limiting the

performance of these industries or, put differently, increasingly limiting their performance (Sik Lee & Anas, 1992; Aliyu Mohammed, 2023). In both developed and developing economies, researchers have highlighted that insufficient infrastructure greatly enhances the cost of production, decreases the efficiency of operations, and makes the firm unable to compete in the global market (Sundararajan and Mohammed, 2023; Aliyu Mohammed, 2023). In Africa, the issue of infrastructure still weakens the industrial productivity and diversification of its economy. Africa has a history of electrical outages, inadequate roads, scarce digital networks and logistical systems that are largely unresponsive to industry growth and make firms less competitive in the global arena (Obokoh & Goldman, 2016; Olalekan Ahmed, 2025). It has been demonstrated that such deficiencies not only hinder large-scale industries, but small- and medium-sized enterprises (SMEs), which comprised the backbone of the industrial sector in Africa, are disproportionately affected (Butu & Mshelia, 2014; Ahmad, Danlami, and Iliyasu, 2023).

With respect to West African region, infrastructural restrictions have been a key challenge to manufacturing performance. Poor road connectivity, unstable power supply, and regulatory inefficiencies in Nigeria and its neighboring nations only reduce the level of production inefficiencies and the cost of operations (Obokoh and Goldman, 2016; Maiyaki, 2013). The manufacturing companies in the region are likely to utilize a major chunk of their earnings on self-produced electricity and logistics, which decrease the profitability and competitiveness (Sik Lee & Anas, 1992; Olalekan Ahmed, 2025). These operational limitations are exacerbated by urbanization pressures, environmental management issues, and lack of proper facilities provided to the citizenry (Koko, Bello, and Sadiq, 2023; Butu and Mshelia, 2014). Nigeria offers a very clear example of the interface between infrastructural drawbacks and the performance of the industry, at both the national and the local level, as well. The manufacturing industry in Kano Metropolis is experiencing severe problems, with unstable power supply, insufficient transport, ineffective housing and industrial infrastructure, and waste disposal (Ahmad, Danlami, and Iliyasu, 2023; Ibrahim and Mai, 2020; Zango, 2012). These studies have pointed out that these shortcomings have an adverse impact on productivity, diminish the efficiency of operations, and constrain the size of firms (Maiyaki, 2013; Koko, Bello, and Sadiq, 2023). As a result, it is essential to comprehend how the lack of infrastructures affects the performance of organizational participants in the manufacturing companies of Kano to inform policy interventions, the planning of industries, and sustainable development of businesses (Sundararajan and Mohammed, 2023; Aliyu Mohammed, 2024).

### 1.2 Problem Statement

The manufacturing companies in Kano Metropolis are working in an unfavorable environment where there has been a consistent inadequacy in infrastructural facilities that affect organizational performances. The empirical evidence shows that the failure of small and medium enterprises (SMEs) in Kano is not only caused by the external environmental conditions such as the insufficient supply of electricity, poor road network, and the lack of sufficient logistical support (Junaidu, 2019; Abubakar et al., 2019). These constraints frequently make firms unable to achieve production goals, provide competitive advantage, or increase operations, which decline operational efficiency and profitability. The lack of infrastructural support is also accompanied by poor managerial capacity and lack of resources. Research indicates that despite a company having a good entrepreneurship strategy and effective management team, the performance of the company can be hindered by the inability of infrastructure to handle the operations of the company (Usman et al., 2019; Iliya and Sule, 2025; Abubakar et al., 2019). An example is that common power failures, poor waste disposal, and availability of water and transport infrastructure raise the cost of production and lower the quality of products, which hurts the competitiveness of the markets (Ahmad, Danlami, and Iliyasu, 2023; Gado and Nmadu, 2012).

In addition, these are compounded by the greater economic and institutional environment in Nigeria.

The policy inconsistencies, bureaucratic bottlenecks, and inadequate investment in the public utilities all restrain the new and existing firms, and the result of urban planning deficits in Kano further restrict the availability of industrial and commercial spaces (Ifatimehin et al., 2010; Mustapha, n.d.; Manjo, 2025). Infrastructural deficiency is one of the key factors that lead to underperformance in organizations, especially SMEs that are extremely sensitive to these limitations, as these firms of all sizes play a crucial role in job creation and local economic growth (Abdullahi et al., 2015; Agu, Isichei, and Olabosinde, 2018). Lastly, due to the fast rate of technological evolution and globalization, firms are under pressure to evolve and innovate. Nevertheless, without proper infrastructural, such as stable power, effective transportation, and digital connections, companies cannot effectively exploit sophisticated technologies and do not scale their operations to a certain extent (Kumar et al., 2024; Mohammed, 2023; Lawal et al., 2023; Mohammed, 2023). This leaves a continuous rift between the potential and actual performance thus the necessity to look into the effects of infrastructural inadequacies in the performance of manufacturing companies in Kano Metropolis.

### 1.3 Significance of the Study

The research on how the infrastructural shortages affect the organizational performance of manufacturing companies in Kano Metropolis is important in a number of ways. To begin with, it gives us understanding of how ineffective infrastructure, such as unstable power supply, bad transportation systems, and poor logistic systems limit manufacturing activities, enhance the cost of production, and decrease competitiveness (Henson, n.d.; Abdullahi, Jakada, and Kabir, 2015, 2016). By pointing out these problems, the study would be able to inform policymakers, and industry players on the key areas which need infrastructural investments to improve the industry productivity and sustainability. Second, the results of the present research can be useful to business managers and entrepreneurs who want to maximize the efficiency of operations. The manufacturing companies, especially SMEs in Kano, are subjected to numerous issues, which hamper their development and existence, including the failure of small-scale plants because of infrastructural constipation (Usman and Imam, 2022; Omotayo, Lawal, and Odeleke, 2019). The appreciation of the relationship between infrastructural shortfalls and organizational performance provides managers with strategic knowledge on how they may implement mitigatory measures such as investing in alternative sources of power, effective resource management, and minimization of risks (Aliyu and Muhammad, n.d.; Mohammed, 2023).

Third, the research will add to scholarly literature and research on the interaction between infrastructures and the performance of firms in emerging economies. Kano has a distinct case study of analyzing the growth of industries in a difficult infrastructural setting by the virtue of its historical dominance in textile and manufacturing industries (Maiyaki, 2013; Muhammad, n.d.; Oni and Okanlawon, 2011). This study is a synthesis of both empirical and conceptual findings that offer the context of future research on the topic of infrastructural investment, regional industrial development, and organizational performance in similar urban centres (Raheem, Oyeleye, Adeniji, and Aladekoyi, 2014; Okonkwo, Ugwu, and Ekwochi, n.d.). Lastly, the research is also important in terms of policy and strategic planning. The findings enable the prioritisation of any infrastructural project by government agencies and development planners that would directly boost the manufacturing productivity, economic growth in the region, and sustainable development (Mohammed & Sundararajan, 2023a, 2023b, 2023c). Also, the findings of this study can be used to inform financial institutions, investors, and industrial associations to offer specific assistance to manufacturing companies, which enhances their resilience in operations, competitiveness in the markets, and economic sustainability in the long term.

### 1.4 Research Objectives

The study seeks to achieve the following objectives:

1. To examine the impact of power supply deficiencies on the operational efficiency of manufacturing firms in Kano Metropolis.

2. To assess the influence of transportation and logistics infrastructure on the productivity and competitiveness of manufacturing firms.

3. To evaluate the effects of inadequate communication and digital infrastructure on decision-making and performance within manufacturing organizations.

4. To explore how poor urban planning and facility provision affect the overall growth and sustainability of manufacturing firms in Kano Metropolis.

### 1.5 Research Questions

In line with the research objectives, the study seeks to answer the following questions:

1. How do deficiencies in power supply affect the operational efficiency of manufacturing firms in Kano Metropolis?
2. What is the influence of transportation and logistics infrastructure on the productivity and competitiveness of manufacturing firms?
3. In what ways do inadequate communication and digital infrastructure impact decision-making and organizational performance?
4. How does poor urban planning and facility provision affect the growth and sustainability of manufacturing firms in Kano Metropolis?

## 2.0 Literature Review

The literature review gives a comprehensive discussion on the effects of infrastructural shortages to the performance of an organization especially in the manufacturing companies of Kano Metropolis. It reviews the existing studies on the global, African, and Nigerian settings to comprehend the impacts of the physical, digital, and environmental infrastructures on productivity, efficiency, and competitiveness. The review notes that infrastructure issues are multidimensional in nature with a deficiency in one dimension of infrastructure usually compounding inefficiency in another, which constrains the growth of organizations and their ongoing sustainability (Sik Lee, Anas, and Oh, 1999; Mohammed, Jakada, and Lawal, 2023).

### 2.1 Conceptual Framework

The conceptual framework gives a systematic way of handling the relationship between infrastructural deficiencies (independent variable) and organizational performance (dependent variable) in manufacturing companies. This framework views infrastructure as a multidimensional aspect in which transportation, energy, water, ICT, and environmental services are taken as a whole that determine the performance of firms. These associations between the variables lead to the analysis of how infrastructure infrastructural gaps restrict operational efficiency, raise the cost of production, and diminish manufacturing competitiveness (Muhktar Bichi, 2010; OKWUDILI, Ngozi, and Henson, 2018).

#### 2.1.1 Overview of Conceptual Framework

A conceptual framework is a hypothetical map, which demonstrates how the independent variables are supposed to affect the dependent outcomes in a hypothetical manner. The postulation in this research is that the infrastructural deficiencies that are multidimensional in nature directly influence the productivity, cost effectiveness, quality output, and competitiveness of the institution in the markets. The framework includes interdependency among other infrastructure dimensions, such as, on the one hand, power outages can aggravate transportation delays, and ICT gaps can negatively impact successful supply chain management (Mohammed, Sundararajan, and Lawal, 2022). The conceptual framework would also help in establishing areas where managerial intervention and policy reformation can alleviate infrastructural predicaments that would ensure continuity of operations and sustainable growth. It combines both the theoretical approaches toward the firm resources as well as empirical data of the infrastructural-performance relationships, therefore, making it a multifaceted way of studying the organizational dynamics in Kano Metropolis.

#### 2.1.2 Independent Variable (IV): Multidimensional Infrastructural Deficiencies

Infrastructural shortcomings include shortcoming in physical, digital and environmental

systems that would facilitate effective business operations. Kano Metropolis has multidimensional infrastructure challenges that pose a bottleneck operational cost, and firm competitiveness. Researchers have singled out transportation, energy, water, ICT, and waste management as important infrastructural dimensions that remedially affect organizational performance (Ibrahim, 2014; Bashir and Hamid Danlami, 2022).

#### 2.1.2.1 Transportation Infrastructure (Roads, Railways, Ports)

The transportation infrastructure is important in the transportation of raw materials and finished products. The lack of proper roads, rail systems, and the development of ports are factors that create logistical slacks, higher operations expenses, and less access to the markets by manufacturing companies (Sik Lee, Anas, and Oh, 1999; Muhktar Bichi, 2010). These shortcomings slow down delivery and supply chain performance and reduce the ability of firms to react to market demands and remain competitive. There is also empirical research that, limited transportation infrastructure also raises the risk of production failures and loss of inventory (Ibrahim, 2014).

#### 2.1.2.2 Power Supply and Energy Infrastructure

The constant supply of energy is critical in continuous production cycles. In Kano Metropolis, common power disconnection and ineffective electricity supply contribute to the increased reliance on the expensive alternative sources of energy, decreased productivity, and the overall performance of the firms (OKWUDILI, Ngozi, and Henson, 2018; Mohammed, Sundararajan, and Lawal, 2022). Production lines and machines also become stagnant in energy deficiencies, which affects the efficiency of the employees, as on many occasions the production targets are not achieved in a timely manner. Furthermore, the lack of the reliability of the energy may prevent the further investments and restrict the use of the modern production technologies.

#### 2.1.2.3 Water and Sanitation Infrastructure

Water and sanitation are paramount to operational effectiveness, particularly in manufacturing industries like textiles, food processing and chemical production. Water supply suspension and lack of sanitation facilities undermine the quality of production, operational risks, and endanger the health of the workforce (Bashir and Hamid Danlami, 2022). Companies also incur extra expenses of treating water or getting other supplies which trim down profitability. Moreover, the lack of sanitation is also one of the sources of health risks in the workplace that may lead to higher levels of absenteeism and reduced productivity in general.

#### 2.1.2.4 ICT and Digital Infrastructure

Modern manufacturing operations, such as logistics management, enterprise resource planning, and market intelligence, are based on information and communication technology (ICT) infrastructure. The restricted access to the high-quality digital infrastructure inhibits the efficiency of operations, hampers the adoption of innovation, and decreases the global competitiveness (Garba, 2023; Mohammed, Shanmugam, Subramani, and Pal, 2024). Companies that have poor ICTs have a hard time making decisions in real time, monitoring remotely and optimization of supply chains. As a result, poor ICT infrastructure has a direct impact on organizational agility, customer responsiveness and profitability.

#### 2.1.2.5 Waste Management and Environmental Infrastructure

Sustainable manufacturing operations require proper waste management as well as environmental infrastructure. Inefficient waste disposal facilities pose environmental risks, become costly in compliance with regulations, and pose a threat to the image of an organization (Jajere, Baballo, and Bello, 2025; Mohammed, Jakada, and Lawal, 2023). Manufacturing companies that encounter environmental difficulties might have to pay extra costs to manage their wastes, financial fines on violating the environment, and health consequences of their workforce. All these factors decrease the efficiency and performance outcomes.

### 2.1.3 Dependent Variable (DV): Organizational Performance of Manufacturing Firms

The dependent variable in this research is organizational performance which, as the study demonstrates, shows how manufacturing firms in Kano Metropolis have attained their operational, financial, and strategic objectives. Organizational performance is a multidimensional construct that involves productivity, profitability, efficiency in operations and market share. Productivity is the capacity to make the most out of the existing facilities and profitability is the monetary gains compared to investment and operational expenses. Operational efficiency focuses on reducing costs, making good use of resources, and streamlining processes, whereas market share shows the competitive status of the firm and its capacity to attract and retain customers in the market (Abubakar, 2016; Omisore, Madichie, Qingan, and Nwankwo, 2017).

Empirical evidence shows that infrastructural conditions are very sensitive to the performance in the organization. The manufacturing companies located in the places with low transportation systems, low power supply reliability, low water and sanitation facilities, low ICT infrastructure and low waste management systems have low operational attainments and high costs (Muhammad & Bichi, 2014). Also, environmental and regulatory pressures exacerbate the performance issues, and to remain competitive, firms have to engage in adaptive strategies, innovative practices, and managerial interventions. Performance measurement consequently is not only about financial measures but also operational and strategic aspects, bringing out the integrative role of infrastructure on firm sustainability (Shanmugam Sundararajan et al., 2024).

#### 2.1.3.1 Indicators of Performance

In the case of Kano Metropolis manufacturing companies, the study defines four indicators that play a crucial role in the measurement of the performance of the organization:

**1. Productivity:** It is the amount of output produced per unit of input. The availability and reliability of infrastructure also affect productivity because production processes require appropriate accessibility of raw materials, energy, and operational facilities on time. Poor transport or power outages are infrastructural gaps that can drastically lower the productivity of the workforce and machines.

**2. Profitability:** Measures the financial well-being of companies such as profitability and returns on investment. The poor infrastructure raises the operational expenses in terms of fuel, maintenance, and alternative power supplies which eventually reduces profitability. Companies that have effective infrastructure access would be at a better position to reduce costs and maximize profits.

**3. Operational Efficiency:** Refers to the capacity to undertake processes in the best way possible with minimum wastage. The ineffective operational efficiency is also caused by the infrastructural inadequacies that interfere with the workflow, supply chain operations, or production plans. A well-coordinated infrastructure means smooth operations, quick turnaround time as well as better allocation of resources.

**4. Market Share:** This is a reflection of the competitive position and customers base of a firm in comparison with that of its competitors. Poor infrastructure may slow down the delivery of products in time, poor quality of products, and poor customer satisfaction, thus lowering market share. Companies that utilize sound infrastructure are able to increase their radius of operation and have a good market base.

All these indicators are factors that give a complete perspective in the evaluation of the performance of firms in terms of operational and strategic results, and enable the consideration of infrastructure as a key determinant.

### 2.1.4 Interrelationships between IVs and DV

Multidimensional infrastructural deficiencies are interrelated in connection to organizational performance. The infrastructure of transportation, power, water, ICT, and waste management all determine the operation capacity, cost structure, and competitive ability in the market. As an example, the

logistics, as well as energy use patterns, availability of raw materials, and the general production schedule are impacted by the delays in the transportation infrastructure (Muhammad and Bichi, 2014). The lack of power and energy directly affects the production lines and decreases the productivity and costs of operations. The problem of water and sanitation impacts the efficiency of the process and the health of the workforce, whereas the issue of ICT constraints prevents the decision-making process, real-time monitoring, and use of advanced technologies in manufacturing. The level of compliance issues, environmental risks, and unfavorable corporate image are also associated with poor waste management and environmental infrastructure, and consequently, the profitability and market share may decline (Shanmugam Sundararajan et al., 2024). The interdependencies indicate that any enhancement in any of the infrastructural dimensions can enhance benefits in performance in various areas of operations. On the other hand, failure in critical infrastructure may create systemic impacts on performance of the entire organization. Knowledge of such linkages would be important to policy makers and managers in order to focus on interventions and mobilizing resources efficiently to promote the performance of firms in unfavorable infrastructural conditions.

### 2.1.5 Conceptual Framework Diagram

Figure 2.1 demonstrates the Model of the Study that conceptualizes the connection between multidimensional infrastructural deficiencies and organizational performance. The model confines five key infrastructural elements transportation, power supply and energy, water and sanitation, ICT and digital and waste management and environmental infrastructure as the key determinants of business operations. All these infrastructural factors determine the effectiveness of organizations in their main outcome dimensions namely productivity, profitability, operational efficiency and market share.

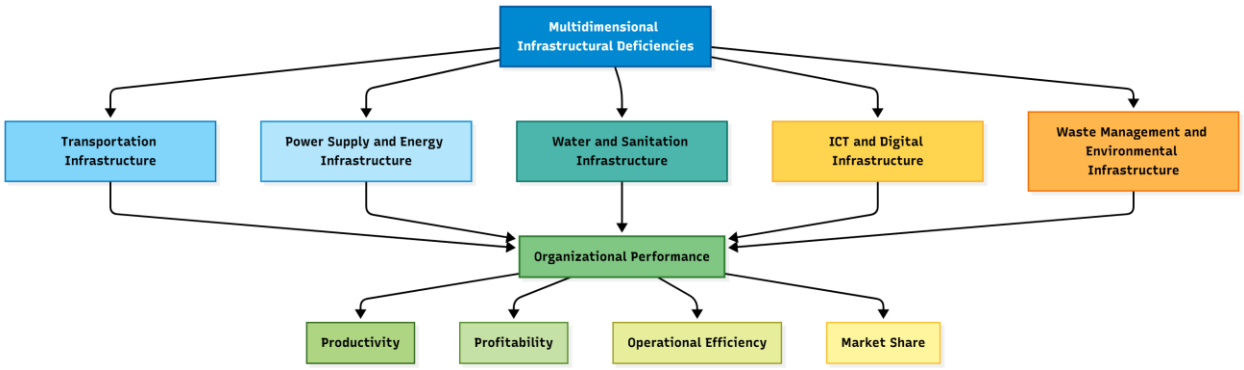


**Figure 2.1:** ***Model of the Study on Multidimensional Infrastructural Deficiencies and Organizational Performance***

**Source: Researcher's Design (2025)**

The diagram shows how the various dimensions of infrastructural deficiencies interact each other to impact performance ultimately of an organization, putting emphasis on the direct routes of the independent variables to the dependent variable and performance indicators. Individual and synergistic effects on the productivity, profitability, operational efficiency, and market share of manufacturing companies are brought by each infrastructural component, which demonstrates a graphic articulation of the conceptualization of the framework of this study.

## 2.2 Theoretical Framework

The theoretical framework gives the basis of explaining the effects of the multidimensional infrastructural deficits on the performance of manufacturing companies in Kano Metropolis. The research is based on the three major theories, i.e. the Systems Theory, Contingency Theory, and the Resource-Based View (RBV) to provide the dynamic relationships between the infrastructural variables and the firm performance outcomes. A combination of these theories enables the understanding of the way in which the environment internal and external factors interact to influence the organizational effectiveness and competitiveness (Dansuleka & Kure, 2025; Uba, 2017).

### 2.2.1 Relevant Theories

#### 2.2.1.1 Systems Theory

Systems Theory assumes that organizations are complex systems which are interdependent, consisting of interconnected subsystems that need to work in harmony in order to realize wanted results. In the manufacturing industry, infrastructure elements include transport, electricity, water, information technology, and garbage disposal are essential subsystems, the performance of which directly affects the performance of the whole organization. According to the theory, the inadequacy of a single subsystem (e.g. power supply) can lead to the subsequent impact on productivity, operational efficiency, and competitiveness in the market (Sundararajan and Mohammed, 2022). Systems Theory therefore emphasizes the comprehensive role played by infrastructural sufficiency in manufacturing performance thus stressing the need to plan and manage infrastructures in a coordinated manner.

#### 2.2.1.2 Contingency Theory

Contingency Theory holds that the performance of an organization is based on the compatibility of organizational structures, processes, and externality. Weaknesses in infrastructural terms are severe environmental contingencies in which firms plan their resources and processes. Due to erratic power supply, inadequate transportation systems, and a low level of the ICT infrastructure, the manufacturing companies in Kano Metropolis will have to alter operational strategies, production schedules and human resources deployment in order to curb the performance losses (Badaru & Moses, 2025). The theory proposes that there is no optimal solution which is universal; instead, it is dependent on the ability of the firms to match their internal capacities with the existing infrastructural realities.

#### 2.2.1.3 Resource-Based View (RBV)

The Resource-Based View (RBV) is concerned with the relationship between firm-specific resources and capabilities and competitive advantage. Although infrastructural deficiencies are mostly external to firms, the RBV is a prism through which it is possible to consider how firms use their internal capabilities, including managerial skills, human resources, technological skills, and strategic thinking, in response to infrastructural problems to improve performance (Sundararajan, Mohammed, and Lawal, 2023). When firms have developed unique adaptive capabilities, they are able to be operationally efficient, profitable and retain a market share even in suboptimal infrastructural conditions. RBV thus connects the challenges of external infrastructures and internal strategies of an organization, to the mobilization of resources and the development of capability as a means to long term performance.

### 2.2.2 Application of Theories to the Study

The Systems Theory used in this paper describes the relationship of infrastructural aspects and how they influence the collective organizational performance. The Contingency Theory can shed light on the adjustment of internal operations and management practices of firms to infrastructural deficits and the situational nature of the performance outcomes. RBV presents an internal strategic approach, as it is said that firms that have better internal resources and flexibility will be able to reduce the negative impact of infrastructural shortcomings (Dansuleka & Kure, 2025; Nabegu, 2010). These theories, combined, will offer a powerful construct to discuss and explain the effects of external infrastructural issues on productive,

profit, operational performance, and market share of manufacturing companies in Kano Metropolis.

### 2.2.3 Theoretical Framework Diagram

Figure 2.2 shows the Model of the Study, including the influence of multidimensional infrastructural deficiencies on organizational performance in five significant dimensions, namely transportation, power and energy, water and sanitation, ICT and digital, and waste management infrastructure. All these infrastructural aspects have an effect on the organizational results in terms of productivity, profitability, efficiency of operations, and market share. The theoretical basis of the model is Systems Theory, Contingency Theory, and Resource-Based View (RBV), which offer an explanatory support of how organizations can adjust, exploit resources and sustain performance within infrastructural conditions.

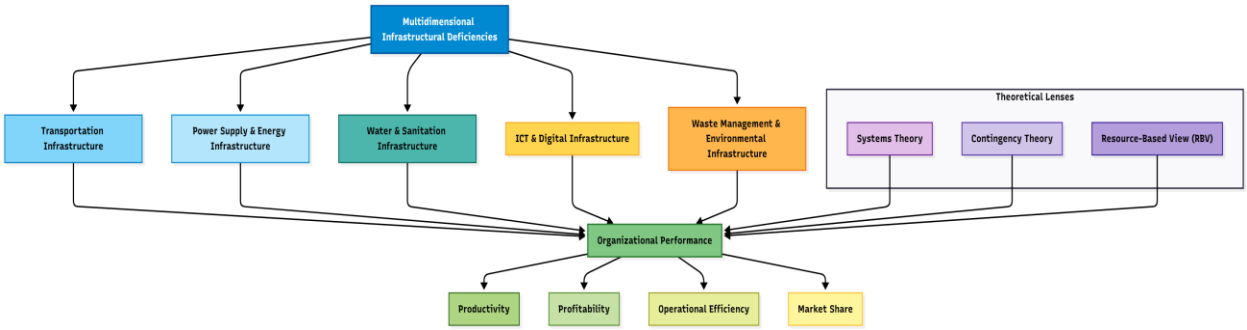


**Figure 9.3:** ***Model of the Study on Infrastructural Deficiencies and Organizational Performance***

**Source: Researcher's Design (2025)**

It is also depicted in the diagram that the infrastructural deficiencies are multidimensional and the performance indicators of an organization are impacted by the deficiencies in addition to incorporating the theoretical viewpoints of Systems Theory, Contingency Theory, and RBV. Every infrastructural element will influence the performance of firms directly and indirectly and the theoretical perspectives offer the mechanisms to comprehend the adaptive strategies, interdependencies, and resource usage in tackling the infrastructural challenges. The study was conceptualized to aid in analyzing and interpreting the findings.

## 2.3 Empirical Review

The critical empirical review will involve reviewing the existing literature on the effects of infrastructural inadequacies on organizational performance especially in the manufacturing industry of Kano Metropolis. This part summarizes the knowledge on transport, power, ICT and environmental infrastructures with focus on practical implications of infrastructural gaps in terms of productivity, efficiency and competitiveness. A number of studies report that poor infrastructure is a significant challenge to the development of firms, innovation and operational efficiency in the global and Nigerian environment (Obokoh and Goldman, 2016; Olalekan Ahmed, 2025). The transport network such as roads, railways, and portals are a major factor in the performance of the supply chain of a manufacturing company. Inadequately developed road networks and accessibility to rail transportation in Kano Metropolis add to the time of delivery, raise costs of production, and interfere with the supply of raw materials (Maiyaki, 2013; Sik Lee and Anas, 1992). Based on empirical research, companies that are forced to work in this situation have low market competitiveness and profitability because of delays and logistical bottlenecks (Olalekan Ahmed, 2025; Mustapha, 2025). Moreover, the availability of transport infrastructure at the national and regional level is limited, which

limits the potential of expansion and limits the possibility of belonging to larger supply chains (Agu, Isichei, and Olabosinde, 2018). Consistent power energy is essential in keeping manufacturing going. The impact of electricity disruptions, fluctuating voltage, and the high price of alternative sources of power are high in Kano Metropolis, as they influence the effectiveness of Small and Medium Enterprises (SMEs) (Ahmad, Danlami, and Iliyasu, 2023; Okafor, 2008). The companies also tend to spend extra money on generators and fuel, which is not spent on the main production process (Obokoh and Goldman, 2016). Research also indicates irregular energy supply is among the causes of machine stoppage, slow production timetable, and a drop in overall productivity, which adversely affect profitability and performance in the market (Olise, 2025; Abdullahi et al., 2015). The Information and Communication Technology (ICT) infrastructure is becoming crucial in the modern manufacturing, such as inventory management, manufacturing monitoring, and online marketing. Limited broadband connectivity, poor ICT infrastructure, and digital illiteracy in Kano Metropolis do not allow firms to implement automated systems and online markets (Bashir and Danlami, 2022; Garba, 2023). There is empirical evidence that companies that have ineffective ICT infrastructure have difficulty streamlining their business operations, retaining their customers, and growing their business operations (Olalekan Ahmed, 2025). The untrustworthy ICT also makes a firm less competitive in the regional and global market where digitizing is essential in efficiency and innovativeness. The environmental infrastructure such as waste management and sanitation systems has direct implications on the performance of manufacturing and business sustainability. The lack of proper waste disposal in Kano Metropolis is one of the causes of environmental risks, non-compliance with regulations, and higher operational costs of manufacturing companies (Butu and Mshelia, 2014; Jajere, Baballo, and Bello, 2025). Companies are at a greater risk of disruptions at the production stage as a result of health and safety concerns, complaints by the neighbors, and penalties imposed on them by the regulatory bodies. It has been pointed out by research that proper waste management facilities can improve the productivity of firms by providing them with cleaner operations, less down time, healthy and motivated staff (Olalekan Ahmed, 2025). The empirical data is always used to prove that infrastructural shortcomings, such as transportation, energy, ICT, and environmental systems, are major limitations to the operational performance of manufacturing companies in Kano Metropolis (Maiyaki, 2013; Ahmad, Danlami, and Iliyasu, 2023; Olalekan Ahmed, 2025). Companies that conduct business in such circumstances have low productivity, high operational expenses, and little prospects of growth in the market. The literature patterns highlight that infrastructural inadequacies are also multidimensional and interdependent; the lack of one aspect frequently complicates the situation in another, which further intensifies their effects on the performance of firms (Obokoh and Goldman, 2016; Agu, Isichei, and Olabosinde, 2018).

### 2.4 Research Gap

Although there are many studies on individual issues of infrastructure, there still exists a great deal of gaps on the integrated effects of infrastructure in terms of its influence on manufacturing performance in Kano Metropolis. There are few studies that focused on transportation, power, ICT, and environmental infrastructure simultaneously and considered them within an overall conceptual framework. Also, little research studies the interaction effect among infrastructural shortages and adaptive strategies at the firm level, including managerial intervention and investment in technology (Olalekan Ahmed, 2025; Abdullahi et al., 2015). It is important that these gaps are addressed to come up with comprehensive interventions that can be used to enhance the operational efficiency, productivity, and competitiveness in the manufacturing sector of Kano.

### 2.5 Model of the Study

The conceptual model of this paper offers a systematic model through which one can comprehend the effect multidimensional infrastructural shortfalls have on organizational performance of manufacturing companies in Kano

Metropolis. It is based on the previous empirical studies and theoretical frameworks, emphasizing the mechanisms by which transportation, energy, ICT, and environmental infrastructure deficits affect the performance of firms in terms of output, profitability, efficiency in its operations, and market share (Olise, 2025; Okafor, 2008). The visualization of these associations allows the model to provide researchers and practitioners with an instrument of determining the key points of intervention and evaluating the systemic impact of infrastructure on the performance of manufacturing.

### 2.5.1 Justification of Conceptual Model

The rationale behind the suggested conceptual framework is that the issue of infrastructures in Kano Metropolis are multidimensional, and the problem has far-reaching consequences on the manufacturing activities. The previous research has indicated that the impact of the lack of one infrastructural area tends to compound the effects of the lack of another area, resulting in a multiplied influence on organisational performance (Yusuf et al., 2023; Olise, 2025). As such, the model combines these dimensions transportation, energy, ICT and environmental infrastructure as independent variables (IVs) and places organizational performance as the dependent variable (DV). By integrating this, it is easy to come up with a holistic analysis which can aid in identifying the leverage points on which the policy intervention, managerial behavior and strategic planning can be done.

### 2.5.2 Operationalization of IVs and DV

The independent variables are operationalized around measurable variables within each of the dimensions of infrastructures:

**a. Transportation Infrastructure:** The quality of infrastructure, access and connectedness of roads, railway, and ports that impact on the supply of raw materials and distribution of products.

**b. Power Supply and Energy Infrastructure:** Availability, reliability and cost of electricity and other energy sources affecting continuity of production.

**c. ICT and Digital Infrastructure:** Broadband network, computer software, and electronic literacy that facilitates automated operation, data administration, and use of e-commerce.

**d. Waste Management and Environmental Infrastructure:** Productiveness of waste collection, disposal mechanisms and sanitation infrastructure that are equal to sustainable and compliant operational conditions.

The dependent variable of interest is organizational performance and it is operationalized using the measure of productivity, profitability, and operational efficiency and market share, an indicator of both quantitative and qualitative aspects of firm performance. These can be used to determine the direct or indirect impact of infrastructural constrained on the manufacturing output, cost control, and competitive positioning (Sundararajan, Mohammed, & Senthil Kumar, 2023).

### 2.5.3 Table of Model of the Study

| Independent Variables (IVs) | Dimensions/Indicators | Dependent Variable (DV) | Performance Indicators |
|---|---|---|---|
| Transportation Infrastructure | Road quality, rail connectivity, port accessibility | Organizational Performance | Productivity, Profitability, Operational Efficiency, Market Share |
| Power Supply & Energy Infrastructure | Electricity reliability, alternative energy availability, energy cost | Organizational Performance | Productivity, Profitability, Operational Efficiency, Market Share |

| | | | |
|---|---|---|---|
| ICT & Digital Infrastructure | Broadband connectivity, digital tools adoption, IT literacy | Organizational Performance | Productivity, Profitability, Operational Efficiency, Market Share |
| Waste Management & Environmental Infrastructure | Waste collection efficiency, disposal systems, sanitation facilities | Organizational Performance | Productivity, Profitability, Operational Efficiency, Market Share |

This table briefly shows the multidimensional nature of the IVs and how they are likely to affect the single dimensional DV. It offers an effective guide to the empirical test or conceptual research enabling a systematic investigation of how the infrastructural shortcomings limit manufacturing performance and what areas need to be targeted (Olise, 2025; Okafor, 2008; Yusuf et al., 2023).

## 3.0 Research Methodology

This research will use a conceptual research approach, which will offer a systematic knowledge about the effect of infrastructural shortcomings on the organizational performance of manufacturing companies in Kano Metropolis. As a conceptual study, it is based on the strict synthesis of the existing literature, theoretical frameworks, and empirical results to develop the harmonious understanding of how various aspects of infrastructure influence the firm-level results. In this way, it is possible to combine various perspectives such as global, national, and local, and come up with insights that are both broad and contextual. The tangible benefit of prior research is that, by concentrating on conceptual investigation, the study does not need to collect primary data but uses the abundance of the existing literature to make significant conclusions about the correlation between infrastructural factors and manufacturing performance (Sundararajan, Mohammed, and Senthil Kumar, 2022).

### 3.1 Research Design

The adopted research design is purely conceptual as it focuses on a literature-based framework focusing on a systematic study of the multi-dimensional aspect of infrastructural deficiencies and its impact on manufacturing firms. The study aims to analyze the complex relationships without the necessity of the primary quantitative data, therefore this design is suitable. It includes detailing, categorizing and generalizing information about past research, governmental reports, and scholarly books to chart the routes in which the shortages in transportation, energy, ICT, and environmental infrastructure affect the organizational performance (Hamidu, Agboola, Faruq, and Falade, 2024). The conceptual approach also makes it possible to develop a model that connects the independent variables (multidimensional infrastructural deficiencies) with the dependent variable (organizational performance), which gives a clear theoretical and practical perspective of the manufacturing issue in Kano.

### 3.2 Justification for Conceptual Methodology

The conceptual approach is supported by the fact that the study is primarily concerned with knowing about systemic and multidimensional impacts that cannot be empirically measured. By so doing, the researcher is able to use existing theories, frameworks and empirical studies to give strong accounts on the cause and effect relationships. In the framework of Kano Metropolis, where the infrastructural issues that manufacturing companies encounter are complicated and interdependent, the conceptual framework allows analyzing the direct and indirect implications on productivity, profitability, the efficiency of operations, and market share (Oni, Ojekunle, and Ohida, 2023). In addition, conceptual analysis is useful in establishing the gaps in the literature, synthesizing disparate knowledge, and developing a systematic model that could guide subsequent empirical study or policy intervention.

### 3.3 Data Sources (Literature, Secondary Data)

The research is based solely on the secondary sources of data, such as peer-reviewed journal articles, books, conference proceedings, government

reports, and institutional publications. These sources are very informative on the issues of infrastructural challenges, manufacturing performance as well as policy frameworks at the global as well as local levels. The most important literature is related to the studies of transportation, energy, ICT, and environmental infrastructure with the focus on the Kano Metropolis environment (Winter and Ujoh). The secondary sources enable the study to have a triangulation of findings of other studies, and hence reliable validity in the concept development. Moreover, the benefit of the approach is the possibility to analyze past and current data, learn long-term trends, new trends, and best practices that can be implemented in manufacturing companies in Nigeria and similar situations.

### 3.4 Data Analysis Method (Conceptual Synthesis and Comparative Analysis)

The systematic synthesis and comparative analysis of the existing literature are the methods of data analysis of this conceptual study. Conceptual synthesis entails deriving important themes, patterns and relationship on the basis of previous studies, which are grouped based on the infrastructural deficiencies in multi dimensions and their influence to manufacturing performance. The similarities and differences between the studies are analyzed using comparative analysis based on findings, methods, and contextual aspects (Sundararajan, Mohammed, and Senthil Kumar, 2022; Hamidu, Agboola, Faruq, and Falade, 2024). Through synthesis and comparison, the study determines recurrent trends, unresolved issues, and gaps in the current research permitting the formulation of an integrated conceptual framework that presents how infrastructural shortcomings affect organizational performance and offer a framework on which future empirical studies could be conducted.

## 4.0 Findings of the Study

**1. Impact of Power Supply Deficiencies on Operational Efficiency:** In line with the earlier literature, volatile power supply is a major challenge encountered by manufacturing companies in Kano, which raises the cost of production, causes instances of downtime, as well as inefficiency in production (Okafor, 2008; Ahmad, Danlami, and Iliyasu, 2023). The unpredictability of power compels companies to use the other sources of energy that are more expensive and inefficient.

**2. Influence of Transportation and Logistics Infrastructure on Productivity:** The issue of transportation and logistics has been reported to be a problem such as poor road systems, inadequate urban roads and limited accessibility to rail and port services has been proven to cause delays in transportation of raw materials and finished products. Such shortcomings directly lower productivity and have adverse effects on the competitiveness of companies in Kano Metropolis (Sik Lee & Anas, 1992; Olalekan Ahmed, 2025).

**3. Effects of Inadequate ICT and Communication Infrastructure on Decision-Making:** Effective organizational coordination and decision-making is inhibited by limited access to modern ICT infrastructure, poor digital connection, and unstable communication networks. Companies cannot effectively gather, process, and transfer data, making them less responsive to the changes in the market and their performance (Sundararajan, Mohammed, and Senthil Kumar, 2023; Mohammed, 2023).

**4. Impact of Poor Urban Planning and Facility Provision on Growth and Sustainability:** Poor urban planning, inaccessibility to water, sanitation and waste collection and disposal systems, and poor distribution of zoning and facilities allocation are the detrimental factors to the growth of firms, environmental compliance, and sustainability (Muhammad and Bichi, 2014; Butu and Mshelia, 2014). These infrastructural gaps limit the operations of manufacturing organizations, and raise their operating expenses.

## 5.0 Recommendations of the Study

### 5.1 Policy Recommendations

**1. Improving Power Supply Infrastructure:** To serve manufacturing cluster in Kano Metropolis, the government and energy agencies should focus on stable and affordable supply of electricity to maximize its efficiency and limit its dependence on costly alternative sources.

**2. Upgrading Transportation and Logistics Networks:** The rehabilitation of roads, the growth of rail systems and efficient logistics activities should be invested in to ensure that the supply chains of raw materials as well as the competitiveness of manufacturing companies are enhanced.

**3. Enhancing ICT and Digital Infrastructure:** The policymakers are encouraged to ensure that there is the expansion of broadband, digital connectivity and the support systems that are supported by ICT within manufacturing organizations in order to enable them to make efficient decisions and coordinate and communicate.

**4. Strengthening Urban Planning and Facility Provision:** The development authorities of urban areas should be able to provide good zoning, water and sanitation systems and waste disposal system in the industrial areas promoting sustainable development as well as environmental compliance.

### 5.2 Managerial Recommendations

**1. Adoption of Alternative Energy and Energy-Efficient Technologies:** The manufacturing companies ought to invest strategically on backup power, renewable energy, and the introduction of energy efficient machines to reduce the consequences of the unstable power supply.

**2. Optimizing Internal Logistics and Distribution Planning:** Managers must ensure the internal logistic management practices are strong such as inventory planning, route optimization and coordination with vendors in order to maneuver through infrastructural limitations.

**3. Leveraging ICT Tools for Enhanced Decision-Making:** Enterprise resource planning (ERP) systems, cloud-based systems, and other digital tools can be implemented in the organization to enhance information flow, monitoring, and real-time decision making.

**4. Proactive Facility and Environmental Management:** To reduce the impact of disruptions in the functioning of manufacturing firms, the introduction of general waste management, water conservation, and optimization of the facilities are necessary to enhance sustainability.

### 5.3 Recommendations for Future Research

**1. Empirical Assessment of Energy Infrastructure Impact:** The future research should quantitatively examine the specific impacts of deficiencies in power supply on operational areas of efficiency in Kano manufacturing industry.

**2. Evaluation of Transportation Infrastructure on Firm Productivity:** The research ought to aim on quantifying the close relationship between the quality of logistics, transportation networks and performance indicators at the firm level.

**3. Exploring ICT Infrastructure Adoption in Manufacturing:** The research questions in the future should refer to how organizational performance and competitiveness adopt, utilize and are affected by digital and communication technologies.

**4. Investigating Urban Planning and Sustainability Practices:** Future studies need to investigate the effects of urban planning, facilities provision and environmental management on long-term growth and sustainability of manufacturing companies in the Nigerian cities.

## 6.0 Conclusion

The paper analyzed how organizational performance of manufacturing companies in Kano Metropolis has been affected by the infrastructural deficiencies through a conceptual approach. It emphasized the multidimensionality of infrastructural issues such as unstable electrical power supply, lack of transport and logistics networks, insufficient ICT and digital infrastructure, and poor urban design with poor facilities supply. The results indicate that all of these shortcomings are barriers to working performance, output, decision-making, and sustainability of the manufacturing companies in the area. The conceptual review of the study showed that interruption in power supply has a direct impact on the operating efficiency of the business and the inadequate transport infrastructure slows down the transportation of raw materials and finished goods weakening competitiveness. Equally, lack of adequate digital infrastructure limits proper and timely decision making, and lack of urban planning, water, sanitation and waste management

infrastructure compounds operations cost and environmental hazards. All these together are carriers of a structural dilemma that infrastructural loopholes restrict the ability of manufacturing companies to perform optimally and grow sustainably.

In theory, the paper combined Systems Theory, Contingency Theory and the Resource-Based View to determine how the lack of infrastructures interferes with the interaction between resources, processes and performance outcomes. The framework offers a paradigm based on which policy makers, administrators and researchers can appropriately comprehend the direct and indirect routes by which infrastructural failures impact firm performance. Simply put, the problem of infrastructural inadequacy is not only necessary in the pursuit of operational efficiency but also the competitiveness, sustainability and development of manufacturing firms within Kano Metropolis. The government agencies, industrial managers and urban planners must work together to provide an enabling environment which promotes industrial productivity and innovation and long-term economic development in the region.

## REFERENCES

1. Abdullahi, M. S., Ghazali, P. L., Awang, Z., Tahir, I. M., & Ali, N. (2015). *The effect of finance, infrastructure and training on the performance of SMEs in Nigeria.* International Journal of Business and Technopreneurship, 5(3), 421-452.

2. Abdullahi, M. S., Jakada, B. A., & Kabir, S. (2015). *Challenges affecting the performance of small and medium scale enterprises (SMEs) in Nigeria.* Journal of Technology Management and Technopreneurship (JTMT), 3(1), 51-74.

3. Abdullahi, M. S., Jakada, B. A., & Kabir, S. (2016). *Challenges affecting the performance of small and medium scale enterprises (SMEs) in Nigeria.* Journal of Human Capital Development (JHCD), 9(2), 21-46.

4. Abubakar, A., Abubakar, M., Mukhtar, J. I., Abdullahi, H., Ahmed, A. A., Adamu, S. I., & Ibrahim, S. G. *The Effects of Managerial Skills on the Growth of Small and Medium Scales Enterprises in Kano State (A Study of Kano Technology Incubation Center, Kano).* SUSTAINABLE TRANSFORMATION OF PUBLIC AND CORPORATE MANAGEMENT IN DIGITAL AGE: PERSPECTIVES, CHALLENGES & PROSPECTS, 497.

5. Abubakar, R. A. (2016). *Entrepreneurial orientation, total quality management, organisational learning and performance of SMEs in Nigeria: the moderating role of competitive intensity.* Universiti Utara Malaysia, 1-147.

6. Agu, M., Isichei, E. E., & Olabosinde, T. M. (2018). *Infrastructural development and growth of micro, small and medium scale enterprises (MSME).* Academic Journal of Economic Studies, 4(4), 71-77.

7. Ahmad, A. K., Danlami, A. H., & Iliyasu, A. (2023). *Impact of power supply on the productivity of Small-Scale Industries (SSI) in Kano Metropolis, Kano State.* Journal of Arid Zone Economy, 1(3), 153-164.

8. Aliyu Mohammed. (2023). *A study on HR strategies for managing talents in global perspective.* Paper submitted to University of Belgrade (IMCSM23).

9. Aliyu Mohammed. (2023, May 11). *An agile performance management system for achieving sustainable Industry 4.0.* (Conference paper, MSNIM / Limkokwing).

10. Aliyu Mohammed. (2024). *Investigating reskilling and up-skilling efforts in IT and software development: Case study of Kano State.* (Conference paper).

11. Aliyu, M. S., & Muhammad, A. B. *The Effects of Corporate Social Responsibility on Firms Performance in Nigeria.*

12. Badaru, I. M., & Moses, I. K. (2025). *Effect of marketing strategies on the performance of small and medium scale enterprises in Kano State.* ISA Journal of Business, Economics and Management (ISAJBEM), 2(4), 316-326.

13. Bashir, R., & Hamid Danlami, A. (2022). *Gender accessibility to credit among entrepreneurs: Empirical evidence from women entrepreneurs in Kano Metropolis.*

14. Butu, A. W., & Mshelia, S. S. (2014). *Municipal solid waste disposal and environmental issues in Kano metropolis, Nigeria.* British Journal of Environmental Sciences, 2(2), 10-26.

15. Dansuleka, S. U., & Kure, S. M. (2025). *Technological innovation, management information systems, and entrepreneurship innovation as drivers of sustainable business performance in SMEs in Kano Metropolis.* ISA Journal of Business, Economics and Management (ISAJBEM), 2(3), 240-247.

16. Gado, N. D., & Nmadu, T. M. (2012). *The performance of textile companies in the North west zone of Nigeria: The role of infrastructure as a resource.* International Journal of Human Resource Studies, 2(1), 89.

17. Garba, H. A. (2023). *Moderating Role of Firm Size on the Relationship between Entrepreneurship Education and SMBs Development in Kano Metropolis.* African Journal of Management and Business Research, 10(1), 14-25.

18. Hamidu, M. Z., Agboola, S. A., Faruq, M. Y., & Falade, A. A. (2024). *Determinants of poor planning in public sector construction projects in Nigeria.* Interdisciplinary Journal of Management Sciences, 1, 1-16.

19. Henson, A. *Impact of deficient electricity supply to small and medium scale enterprises in Kano-Nigeria.*

20. Ibrahim, A. M. (2014). *Evolutionary trend, spatial distribution of, and issues associated with markets in Kano metropolis.* Journal of Research on Humanities and Social Sciences, 3(28), 4-7.

21. Ibrahim, S. K., & Mai, M. M. (2020). *Effect of contravention of building regulations on the quality of built environment in Nigeria's urban centres: Case study of Kano metropolis.* LAUTECH Journal of Civil and Environmental Studies, 4(1), 143-151.

22. Ifatimehin, O. O., Ogbonna, D. O., Musa, S. D., & Ogidiolu, A. (2010). *Contemporary issues in infrastructural development and management in Nigeria.*

23. Iliya, S., & Sule, H. A. S. (2025). *Effect of multidimensional human resource strategies on organizational competitiveness in the global business environment: A conceptual study.* ISAJBEM, 2(3), 200-208.

24. Jajere, A. M., Baballo, A. I., & Bello, L. J. (2025). *Public Perception of Waste Management Effectiveness in Saminaka: Assessing Institutional Performance and Alternative Disposal Methods.* Int. Journal of African Research Sustainability Studies.

25. Junaidu, A. S. (2019). *External environmental factors and failure of small and medium enterprises in Kano Metropolis.* Asian Journal of Economics and Empirical Research.

26. Koko, A. F., Bello, M., & Sadiq, M. A. (2023). *Understanding the Challenges of 21st Century Urbanization in Northern Nigeria's Largest City, Kano.* In Integrative Approaches in Urban Sustainability. IntechOpen.

27. Kumar, M. A., Mohammed, A., Raj, P., & Sundaravadivazhagan, B. (2024). *Entrepreneurial strategies for mitigating risks in smart manufacturing environments.* In Artificial Intelligence Solutions for Cyber-Physical Systems (pp. 165–179). Auerbach.

28. Lawal, T. O., Abdulsalam, M., Mohammed, A., & Sundararajan, S. (2023). *Economic and environmental implications of sustainable agricultural practices in arid regions.* Int. Journal of Membrane Science and Technology, 10(3), 3100–3114. https://doi.org/10.15379/ijmst.v10i3.3027

29. Maiyaki, A. A. (2013). *The challenges of textile and manufacturing industries in Kano Metropolis.* Business Review, 8(2), 116-123.

30. Malam, A. A. (2025). *Assessing the multidimensional effect of supervisor support on job satisfaction among nurses in government hospitals in Kano Metropolis.* ISAJBEM, 2(3), 288-299.

31. Manjo, Y. G. (2025). *Interrogating the Contending Issues and Challenges Confronting Investment Opportunities and Ease of Doing Business in Nigeria (2015-2025).* Ecobankers, 6(2), 114-127.

32. Mohammed, A. (2023). *Analyzing global impacts and challenges in trade management: A multidisciplinary study.* ECTU, 3.

33. Mohammed, A. (2023). *Navigating the digital marketplace: Strategies for entrepreneurship in electronic commerce.* CAIJ, 10(3/4). Retrieved from https://airccse.com/caij/papers/10423caij06.pdf

34. Mohammed, A. (2023). *Strategic utilization of management information systems for efficient organizational management in the age of big data.* CAIJ, 10(3/4). Retrieved from https://airccse.com/caij/papers/10423caij02.pdf

35. Mohammed, A., & Sundararajan, S. (2023). *Analyzing policy challenges in the financial sector: Implications for effective financial management.* In Digitalization of the banking and financial system (pp. 32–43).

36. Mohammed, A., & Sundararajan, S. (2023). *Emerging trends of business transformation.* MSNIM Management Review, 1, 36–44.

37. Mohammed, A., & Sundararajan, S. (2023). *Exploring the dynamic interplay between startups and entrepreneurship: A conceptual analysis.* In Digital Startup (pp. 1–7).

38. Mohammed, A., Jakada, M. B., & Lawal, T. O. (2023). *Examining the impact of managerial attitude on employee performance and organizational outcomes: A conceptual analysis.* IJBRE, 4(1).

39. Mohammed, A., Shanmugam, S., Subramani, S. K., & Pal, S. K. (2024). *Impact of strategic human resource management on mediating the relationship between entrepreneurial ventures and sustainable growth.* Serbian Journal of Management. https://doi.org/10.5937/IMCSM24044M

40. Mohammed, A., Sundararajan, S., & Lawal, T. (2022). *The effect of training on the performance of SMEs in Kano Metropolis.* Seybold Report, 17(6).

41. Muhammad, M. *The Historical Dimension in the Rise and Fall of the Kano Textile Industry (1500-2015).*

42. Muhammad, M., & Bichi, A. M. (2014). *Constraints and challenges on housing provision in Kano city, Nigeria.* International Journal of Advancements in Research & Technology, 3(6), 4-23.

43. Muhktar Bichi, A. (2010). *Land accessibility and implications for housing development in Kano Metropolis, Nigeria* (Doctoral dissertation, University of Sheffield).

44. Mustapha, D. I. *Assessment of Private Property Developer's Involvement in Urban Developmental Decisions in Kano Metropolis, Nigeria.*

45. Nabegu, A. B. (2010). *An analysis of municipal solid waste in Kano metropolis, Nigeria.* Journal of Human Ecology, 31(2), 111-119.

46. Obokoh, L. O., & Goldman, G. (2016). *Infrastructure deficiency and the performance of small-and medium-sized enterprises in Nigeria's Liberalised Economy.* Acta Commercii, 16(1), 1-10.

47. Okafor, E. E. (2008). *Development crisis of power supply and implications for industrial sector in Nigeria.* Studies of Tribes and Tribals, 6(2), 83-92.

48. Okonkwo, A. O. P., Ugwu, K. O., & Ekwochi, E. A. *Theoretical Review of Manufacturing Research and Innovation: Source of a Society with an Uncertain Future.*

49. OKWUDILI, I. V., NGOZI, I. A., & HENSON, A. (2018). *Impact of deficient electricity supply to small and medium scale enterprises in Kano-Nigeria.* Advances in Management, 17(2), 179-204.

50. Olalekan Ahmed, T. (2025). *Exploring the Impact of Infrastructural Deficiencies on Logistics Efficiency in Nigeria.*

51. Olise, F. S. (2025). *Bridging data gaps in Nigerian air pollution: coverage, infrastructural challenges, and public health implications.* Environmental Science and Pollution Research, 1-20.

52. Omisore, S., Madichie, N., Qingan, A. H., & Nwankwo, S. (2017). *Corporate entrepreneurship, environmental influences, and the performance of the Nigerian manufacturing firms* (Doctoral dissertation).

53. Omotayo, L. W., Lawal, S., & Odeleke, O. B. (2019). *An Assessment of the Effectiveness of SMEs as A Tool For Income and Employment Generation in Kano State.* Glob Acad J Econ Buss, 1, 14-20.

54. Oni, B. G., Ojekunle, A. J., & Ohida, M. E. (2023). *Manufacturing Supply Chain: The role of Location as a Key Factor in Driving Efficiency in Port-to-Sites Transportation.*

55. Oni, S. I., & Okanlawon, K. R. (2011). *An Evaluation of Railway Infrastructural Development in Nigeria.*

56. Raheem, W. M., Oyeleye, O. I., Adeniji, M. A., & Aladekoyi, O. C. (2014). *Regional imbalances and inequalities in Nigeria: Causes, consequences and remedies.* Research on Humanities and Social Sciences, 4(18), 163-174.

57. Shanmugam Sundararajan, S., Rajkumar, T., Senthilkumar, T., Mohammed, A., & Prince Martin, V. (2024). *An analytical study on factors influencing individual investors' investment decisions on selecting private commercial banks at Kano City in Nigeria.* European Chemical Bulletin, 12(1), 3706–3717. https://doi.org/10.31838/ecb/2023.12.s1-B.372

58. Sik Lee, K., & Anas, A. (1992). *Costs of deficient infrastructure: The case of Nigerian manufacturing.* Urban Studies, 29(7), 1071-1092.

59. Sik Lee, K., Anas, A., & Oh, G. T. (1999). *Costs of infrastructure deficiencies for manufacturing in Nigerian, Indonesian and Thai Cities.* Urban Studies, 36(12), 2135-2149.

60. Sundararajan, S., & Mohammed, A. (2022). *Entrepreneurial opportunities for women.* In Proceedings of the conference on Gender Equality and Women Empowerment. European Journal of Humanities and Educational Advancements, Special Issue 1, 112–115.

61. Sundararajan, S., & Mohammed, A. (2023). *Evaluation of teachers – History to current era.* Samzodhana – Journal of Management Research, 13(2). Retrieved from http://eecmbajournal.in

62. Sundararajan, S., Mohammed, A., & Lawal, T. (2023). *Role of human resource management in the post COVID-19 era: Experiential study.* Bio Gecko, 12(2).

63. Sundararajan, S., Mohammed, A., & Senthil Kumar, S. (2023). *A perceptual study on the impact of agile performance management system in IT companies.* Scandinavian Journal of Information Systems, 35(1), 3–38. https://doi.org/10.5281/SJIS.77516

64. Sundararajan, S., Mohammed, M. A., & Senthil Kumar, S. (2022). *A perceptual study on impact of agile performance management system in the information technology companies.* Scandinavian Journal of Information Systems, 34(2), 3–38.

65. Uba, Z. (2017). *Business environmental factors and competitiveness among pharmaceutical companies in Kano Metropolis Nigeria* (Doctoral dissertation, Kampala International University (KIU)).

66. Usman, A., & Imam, M. Z. (2022). *A Geographical analysis of the collapsed sachet water factories in Kano Metropolis, Kano, Nigeria.* International Journal of Geography and Geography Education, (46), 104-114.

67. Usman, B. I., Mustapha, Z. U., Dokochi, M., Umar, J., & Maitala, F. (2019). *Investigating the impact of entrepreneurial infrastructure deficit on firm growth.* IJEBD, 3(1), 13-24.

68. Winter, M., & Ujoh, F. *A Review of Institutional Frameworks & Financing Arrangements for Waste Management in Nigerian Cities.*

69. Yusuf, D. A., Zhu, J., Nashe, S. A., Usman, A. M., Sagir, A., Yukubu, A., ... & Ahmed, A. (2023). *A typology for urban landscape progression: Toward a sustainable planning mechanism in Kano Metropolis, Nigeria.* Urban Science, 7(2), 36.

Zango, A. G. (2012). *Problems and Prospects of Personal Income Tax Administration on Achaba Riders in Kano Metropolis.* Available at SSRN 2193961.