

**WAREHOUSE MANAGEMENT AND ECONOMIC SUSTAINABILITY OF POULTRY FIRMS IN RIVERS STATE, NIGERIA****TOBY Idabie Leovincy<sup>1</sup>      NWULU Stella Chinyere<sup>2</sup>**<sup>1,2</sup> Department of Marketing, Faculty of Administration and Management  
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chijoe frank@gmail.com**Abstract**

This study investigated the relationship between warehouse management and economic sustainability of poultry firms in Rivers State. This study adopted a survey research design and a quantitative research approach. The population of the study consisted 134 registered poultry. The Taro Yamane formula for sample size determination was used compute to derive a sample size of 100 poultry firms. The study collected primary data using structured questionnaire whose reliability was ascertained via Cronbach's Alpha test. The data collected was analysed using descriptive statistics, while test of hypotheses was done using Pearson's Product Moment Correlation, relying on Statistical Packages for Social Sciences (SPSS) version 23.0. The results showed that warehouse management has positive and statistically significant relationship with proxies (productivity, resilience and cost reduction) of economic sustainability. The study therefore concluded that warehouse management has significant relationship with economic sustainability of poultry firms in Rivers State; and recommends that managers of poultry firms should adopt warehouse management to boost their productivity and resilience, as well as reduce their costs of operation, hence, improve their economic sustainability.

**Keywords:** Cost reduction, economic sustainability, resilience, productivity, warehouse management

**Introduction**

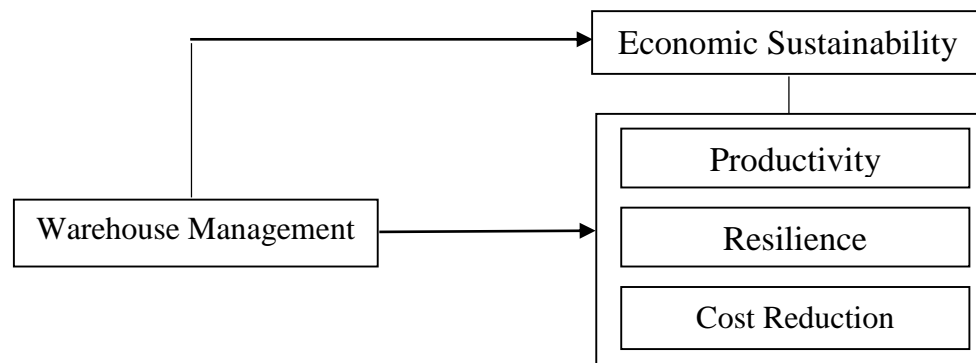
The ever-increasing demand for poultry produce indicate the significance of poultry farming to human existence. In Nigeria, majority of the population consume poultry produce. This makes poultry farming a crucial component of general agriculture and a key contributor to the country's socio-economic wellbeing (Mohammed et al., 2015). Lawan and Mohammed (2020) states that poultry business provide protein for human consumption, employment, food, farm energy, manure, fuel and raw materials for domestic industries.

However, poultry firms in Rivers State face various warehouse related problems such as inadequate storage space, poor temperature control, rodents and pest infestations and inefficient inventory management, which militate against their economic sustainability (Olowa et al., 2020; Hamidu et al., 2015). Warehouse management - the process of planning, organizing and execution, as well as monitoring and optimizing warehouse operations - is critical to maintaining economic sustainability of poultry businesses over the world (Satish, 2023).

Economic sustainability involves conserving resources and understanding their current and future value, using indicators like added value, assets and debts, savings, patents, and intangible assets (Adam, 2016). In the context of poultry farming where various logistics challenges exists, optimizing warehouse management is essential to enhancing economic sustainability and competitiveness. Buzu (2021), Vedaste and Muiruri (2021) and Bendu (2023) argue that warehouse management enhance sustainability and overall performance of organizations.

Despite the important role that warehouse management plays in the sustainability of firms, there exists a scarcity of research focusing specifically on the relationship between warehouse management and sustainability of firms in Rivers State. It is on note that this study examined the

relationship between warehouse management and sustainability of poultry firms in Rivers State. The study was designed to address the gap in literature by providing insights that will improve the economic sustainability of poultry farms in Rivers State.



**Fig. 1:** Conceptual framework of relationship between warehouse management and economic sustainability.

### Theoretical Foundation of the Study: System Theory

System theory (Von Batalanfy, 1940) originated in the natural sciences but has since been applied to various fields, including engineering, biology, sociology and organizational studies. A comprehensive analysis of system theory involves understanding its key concepts, principles, applications and implications across different disciplines. System theory place strong emphasis on integrating different components to maximize performance (Bindu et al., 2021).

A system is a set of interconnected and interdependent components that work together to achieve a common purpose. System theory offer a framework for understanding and analyzing the structure, behavior and dynamics of systems across various domains. By recognizing the interconnectedness and complexity of systems, practitioners can develop more holistic and effective solutions to real-world challenges.

System theory is considered an adequate baseline theory for this study because it provides a framework for understanding the interconnection between warehouse management and economic sustainability. By integrating various elements of warehouse management such as inventory management, inventory storage, warehouse design, order processing, fulfillment, etc., firms can reduce cost, remain resilient and increase their productivity, thereby achieving economic sustainability (Furukawa & Tezuka, 2014).

### Concept of Warehouse Management

Warehouse management is a critical aspect of logistics and supply chain operations that impact efficiency, customer satisfaction and overall performance. It involves the strategic planning, organizing, coordination and control of tasks within a distribution center or warehouse in order to ensure efficient functioning and support the facility in reaching its objectives (Gegeleso, 2020). According to Satish (2023), warehouse management refers to efficient material handling processes that impact transit time, resources and service levels.

Warehouse management ensure effective and efficient provision of temporary storage of materials that will be disposed of or recycled; and provide support for a firm's customer service policies (Faber et al., 2013). Effective warehouse management involves structuring material handling

systems for high-level efficiency, optimizing inbound and outbound logistics processes and conducting regular stock audits (Zhilu, 2020). In the context of poultry firms, effective and efficient provision of temporary storage for poultry waste is crucial to proper disposal and recycling, and supports customer service policies.

### **Concept of Economic Sustainability**

Economic sustainability involve conserving resources and understanding their current and future value, using indicators like added value, assets and debts, savings, patents, and intangible assets (Adam, 2016). It requires optimal use, recovery and recycling of resources to create long-term value. Economic sustainability aims to improve living standards and maintain high levels of economic growth while considering the quality of that growth (Rah & Wahid, 2011).

Economic development leads to improved quality of life and ensure that everyone has access to basic necessities of life; and also have the opportunity to make choices (Igwe & Ateke, 2019). It is a growth process that employs systematic and technical knowledge to meet specific economic growth and human development requirements, including health, education, and clean environment (Nwulu & Ateke, 2014).

So, economic development involves not just economic growth, but the quality of growth well. Critics of traditional economic model point out that market prices often fail to include costs of damage to the environmental. However, modern economic approaches incorporate natural and social capital, and argue that continual growth is inherently good if it does not harms ecological and human systems (Benn et al., 2014).

The core principle of sustainability is that current economic activities should not place undue burden on future generations. This suggests various decision rules for preserving environmental assets, including maintaining safe minimum levels of these assets in physical terms rather than merely their monetary value (Rah & Wahid, 2011). Safe minimum standards for environmental assets ensure sustainability of economic systems, with an ecological approach, so that economic considerations do not sacrifice better decision-making regarding environmental assets.

Economic sustainability is viewed differently by different scholars, and is measured using various indices (Benn et al., 2014; Rah & Wahid, 2011). In this study, economic sustainability is compartmentalized into productivity, resilience and cost reduction.

### **Productivity**

Productivity is the ability to produce more with limited inputs (Walter & Walters, 2010). Khan (2003) posit that productivity is a rich blend of efficiency and effectiveness, being a sign of the ability of an organization to achieve objectives efficiently. Productivity involves maximizing the utilization of resources to increase satisfaction of managers and consumers. It involves achieving maximum possible profit from available resources to enhance societal welfare (Darvish, 2008).

Improving productivity is a key issue for most organizations, as it directly affects profits (Gummesson, 1998; Sels et al., 2006). Productivity is typically measured by the output of employees over a specific period. It can also be assessed by number of units of a product an employee handles in a given time frame (Piana, 2001).

**Resilience**

Resilience is the ability to bounce back or recover from adversity, stress or challenge. It includes mental, emotional, social and physical factors. According to Masten (2001), resilience includes not only individual characteristics but also interactions between individuals and their environments. This link highlights the importance of considering both internal factors, such as coping skills and self-efficacy, and external factors, such as social support and access to resources, in understanding resilience of coping (Southwick et al., 2014).

Research suggests that resilience is not a fixed trait but a dynamic process that can be developed and strengthened over time through positive relationships, adaptive strategies and creating value and meaning in life (Bonanno, 2004; Masten & Obradović, 2006). Resilience is the ability to adapt to change positively, recover from difficulties and persist in the face of challenges.

**Cost reduction**

Cost reduction is a process that uses new and better methods and techniques to lower the unit cost of manufactured goods or service delivered, without compromising quality (Robert, 2016). It determines ways to lower costs. Cost reduction guarantees savings in cost per unit and the organization's attempt to maximize revenues. The goal of cost reduction is to eliminate needless expenditures that arise from manufacturing, storage, sale, and distribution (Macêdo et al., 2023).

Groves et al. (2014) define cost reduction as the achievement of significant and stable decrease in unit costs of manufactured items without compromising their fitness for intended applications. Since low production costs are now one of the main ways that businesses compete in the global economy, managers need to constantly think about methods to cut costs (McWatters et al., 2001, as cited in Groves et al., 2014). According to Gong (2008), cost reduction is a corrective function; it is an ongoing process of closely analyzing every facet of the business and all cost components in an effort to increase business efficiency.

**Warehouse Management and Economic Sustainability**

Hura and de-Dieu (2024) examined the effect of warehouse management on performance manufacturing companies. The study showed that variation in organizational performance can be explained by the combined influence of warehouse automation and optimization, inventory control and material handling. In specifics, Hura and de-Dieu (2024) established that inventory control, material handling, and automation and optimization contributes significantly to performance of manufacturing firms.

On their part, Christian et al. (2024) studied the effect of warehousing on logistics performance of shipping firms in Nigeria. The findings from the study suggests that shipping firms will experience improved logistics performance if they successfully implement warehousing management practices. Similarly, Bendu (2023) investigated effects of warehousing management on organisational performance logistics firms in Rwanda. The study revealed the existence of intricate relationships between warehousing management and organizational performance.

Also, Vedaste and Muiruri (2021) investigated effects of warehouse management on operational performance of clearing and forwarding companies in Rwanda. The study found that warehouse management have strong positive effects on operational performance; while Buzu (2021) in another study, showed that lack of space for loading and unloading items, lack of shelves, pallets and racks; poor well established put away process for received items, poor tight control the storage

areas, high warehousing cost, and high inventory cost are challenges faced by firms; and that receiving, storage, put away, order picking and shipping significantly influence warehouse performance of the organization.

The foregoing literature review shows that a relationship exists between warehouse management and different aspect of performance. Thus, it is likely that economic sustainability of firms can also achieved through proper inventory management practices. Thus, the following alternate hypotheses were formulated and was tested in the study:

**H<sub>A1</sub>:** There is a significant relationship between warehouse management and productivity of poultry firms in Rivers State

**H<sub>A2</sub>:** There is a significant relationship between warehouse management and resilience of poultry firms in Rivers State.

**H<sub>A3</sub>:** There is a significant relationship warehouse management and cost reduction of poultry firms in Rivers State.

### Methodology

The study adopted a survey research design and a quantitative research approach. The population for the study consisted 134 registered poultry firms that operate in Rives State, according to Agricultural Development Programme. The Taro Yamane formula for sample determination was used to derive a sample size of 100 poultry firms. The study collected primary data using structured questionnaire. The questionnaire was designed in the 5-point Likert, ranging from Very High Extent, High Extent, Moderate Extent, Low Extent and Very Low Extent, and measured warehouse management and components of economic sustainability.

Academic and industry experts validated the research instrument. To determine the reliability of the instrument, Cronbach's alpha test with a threshold of 0.70 set by Nunally (1978) was carried out which showed that the research instrument. Table 1 shows the result of the reliability test. The data generated was analyzed at two levels. At the primary level, the study employed descriptive statistics tool such as mean, standard deviation, frequency tables, to present the data; while inferential statistic - Pearson Product Moment Correlation was used at the secondary level of analysis, to test for the direction and degree of relationships between warehouse management and measures of economic sustainability. All the statistical analyses was performed using the Statistical Package for Social Sciences (SPSS) version 23.0.

**Table 1: Reliability Test - Cronbach's Alpha Analysis**

S/N	Variables	Number of Items	Cronbach's Alpha Coefficients
2	Warehouse Management	3	0.939
4	Productivity	3	0.781
5	Resilience	3	0.761
6	Cost Reduction	3	0.720

Source: SPSS Output form field data

**Data Analysis and Results****Table 2: Descriptive Statistics of Warehouse Management**

	N	Sum	Mean	Std. Dev.	Variance
To what extent does your organization implement warehouse automation technologies to improve efficiency and accuracy in operations?	87	347	3.99	1.360	1.849
To what extent does your organization utilize warehouse management systems (WMS) to optimize inventory control and order fulfillment processes?	87	396	4.55	.846	.715
To what extent does your organization design and manage warehouse layouts to enhance space utilization and operational flow?	87	390	4.48	.847	.718
To what extent does your organization conduct regular audits and assessments to maintain and improve warehouse performance?	87	375	4.31	1.341	1.798
Valid N (listwise)	87				

Source: SPSS Output, 2024.

Table 2 depicts high mean scores of the questionnaire items ranging over 3.00, this means that greater number of the respondents expressed very high and high extents of acceptance to the research question with respect to warehouse management. However, it can be seen that item 2 which sought to determine the extent to which managers of poultry firms in Rivers State utilize warehouse management systems to optimize inventory control and order fulfillment processes, has the highest mean score of 4.55. This shows that item 2 has the strongest influence on the variables.

**Table 3: Descriptive Statistics of Productivity**

	N	Sum	Mean	Std. Dev.	Variance
To what extent have you been able to establish clear performance metrics and goals to track and improve productivity levels?	87	386	4.44	.859	.737
To what extent have you been able to streamline and optimize your operational processes to enhance overall productivity?	87	418	4.80	.679	.461
To what extent has your organization reduced lead times and improved delivery accuracy to boost productivity?	87	406	4.67	.710	.504
To what extent have you been able to foster a culture of continuous improvement to drive productivity enhancements?	87	431	4.95	.211	.044
Valid N (listwise)	87				

Source: SPSS Output, 2024.

Table 3 depicts high mean scores of the questionnaire items ranging over 3.00, this means that greater number of the respondents expressed very high and high extents of acceptance to the item with respect to productivity. However, it can be seen that item 4 which sought to determine the extent to which poultry firms in Rivers State have been able to foster a culture of continuous improvement to drive productivity enhancements, has the highest mean score of 4.95. This shows that item 4 has the strongest influence on the variables.

**Table 4: Descriptive Statistics of Resilience**

	N	Sum	Mean	Std. Dev.	Variance
To what extent have you been able to develop and implement strategies to enhance the resilience of your supply chain?	87	375	4.31	1.103	1.217
To what extent have you been able to diversify your supplier base to reduce dependency and increase operational resilience?	87	403	4.63	.891	.793
To what extent have you been able to create contingency plans for potential disruptions to ensure business continuity?	87	385	4.43	1.168	1.364
To what extent have you been able to build a flexible and adaptable organizational culture to respond to unforeseen challenges?	87	354	4.07	1.328	1.763
Valid N (listwise)	87				

Source: SPSS Output, 2024.

Table 4 depicts high mean scores of the questionnaire items ranging over 3.00, this means that greater number of the respondents expressed very high and high extents of acceptance to the item with respect to resilience. However, it can be seen that question 2 which sought to determine the extent to which new products of poultry firms in Rivers State have been able to diversify supplier base to reduce dependency and increase operational resilience, has the highest mean score of 4.63. This shows that item 2 has the strongest influence on the variables.

**Table 5: Descriptive Statistics of Cost Reduction**

	N	Sum	Mean	Std. Dev.	Variance
To what extent have you been able to identify and eliminate inefficiencies in your processes?	87	405	4.66	.847	.717
To what extent have you been able to negotiate better terms with suppliers to reduce procurement costs?	87	427	4.91	.291	.084
To what extent have you been able to implement energy-saving measures to lower utility costs?	87	421	4.84	.370	.137
To what extent have you been able to implement sustainable practices to reduce environmental costs?	87	412	4.74	.869	.755
Valid N (listwise)	87				

Source: SPSS Output, 2024.

Table 5 depicts high mean scores of the questionnaire items ranging over 3.00, this means that greater number of the respondents expressed very high and high extents of acceptance to the item on cost reduction. However, it can be seen that item 2 which sought to determine the extent to which poultry firms in Rivers State have been able to negotiate better terms with suppliers to reduce procurement costs, has the highest mean score of 4.91. This shows that item 2 has the strongest influence on the variables.

**Table 6: Relationship between Warehouse Management and Productivity**

		Warehouse Management	Productivity
Warehouse Management	Pearson Correlation	1	.711**
	Sig. (2-tailed)		.000
	N	87	87
Productivity	Pearson Correlation	.711**	1
	Sig. (2-tailed)	.000	
	N	87	87

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

Source: SPSS Output, 2024.

From the SPSS output on Table 6, it can be observed that there is a correlation coefficient of 0.711\*\* between warehouse management and productivity, indicating a strong significant relationship between warehouse management and productivity. More so, the probability value (0.000) is less than the critical value (0.05), this shows the existence of a statistically significant relationship between warehouse management and productivity. This implies that warehouse management is responsible for improvements in productivity of poultry firms Rivers State. Based on this, we accept the alternate hypothesis that there is a significant relationship between warehouse management and productivity of poultry firms in Rivers State.

**Table 7: Relationship between Warehouse Management and Resilience**

		Warehouse Management	Resilience
Warehouse Management	Pearson Correlation	1	.831**
	Sig. (2-tailed)		.000
	N	87	87
Resilience	Pearson Correlation	.831**	1
	Sig. (2-tailed)	.000	
	N	87	87

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

Source: SPSS Output, 2024.

From the SPSS output on Table 7, it can be observed that there is a correlation coefficient of 0.831\*\* between warehouse management and productivity, indicating a very strong significant relationship between warehouse management and resilience. More so, the probability value (0.000) is less than the critical value (0.05), this shows that there is a statistically significant relationship between warehouse management and resilience. This implies that warehouse management is responsible for changes in the resilience capacity of poultry firms Rivers State. Based on this, accept the alternate hypothesis that there is a significant relationship between warehouse management and resilience of poultry firms in Rivers State.



**Table 8: Relationship between Warehouse Management and Cost Reduction**

		Warehouse Management	Cost Reduction
Warehouse Management	Pearson Correlation	1	.691**
	Sig. (2-tailed)		.000
	N	87	87
Cost Reduction	Pearson Correlation	.691**	1
	Sig. (2-tailed)	.000	
	N	87	87

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

Source: SPSS Output, 2024.

From the SPSS output on Table 8, it can be observed that there is a correlation coefficient of 0.691\*\* between warehouse management and cost reduction, indicating a strong positive relationship between warehouse management and cost reduction. The probability value (0.000) is less than the critical value (0.05), this shows that there a statistically significant relationship exists between warehouse management and cost reduction. This implies that warehouse management is responsible for changes in cost reduction among poultry firms Rivers State. Thus, we accept the alternate hypothesis that there is significant relationship between warehouse management and cost reduction of poultry firms in Rivers State.

### Discussion of Findings

The analysis of the study revealed that warehouse management has positive and significant relationship with economic sustainability in terms of productivity, resilience and cost reduction. These findings agree with Hura and de-Dieu (2024) who studied effect of warehouse management on organizational performance and revealed that a positive link exists between warehouse management and organizational performance. The findings also align with Christian et al. (2024) who examined effect of warehousing on logistics performance of shipping firms in Nigeria; and revealed that successfully implemented of warehousing management practices companies rapidly improve logistics performance of in shipping companies.

The current findings also agree with the reports that warehousing management relates to organizational performance of manufacturing firms (Bendu, 2023) and operational performance (Vedaste & Muiruri, 2021) of clearing and forwarding companies. In addition, the findings support Buzu (2021) who investigated effect of warehousing management on warehouse performance and found that receiving, storage, put away, order picking and shipping significantly influence warehouse performance of organizations.

Further, our findings validate the position of Gegeleso (2020) who examined effect of warehousing operations on inbound logistics practices of consumer goods industries performance in Nigeria and found that warehouse operations increase efficient allocation of resources, improves delivery of goods and overall improve performance. The findings also support Salahudeen and Abraham (2018) whose study established that a significant relationship exists between inventory management system and organizational performance.

### Conclusion and Recommendations

Based on the results of the statistical analyses and their level of consistency with results of previous studies, this study concludes that warehouse management significantly relate with economic sustainability of poultry firms in Rivers State. Based on the conclusion of the study and to the extent of its consistency with the result of similar studies we managers of poultry firms should implement warehouse management in new markets to boost productivity and resilience.

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