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GREEN ENVIRONMENTAL KNOWLEDGE UTILIZATION AND ORGANIZATIONAL RESILIENCE OF UPSTREAM OIL AND GAS COMPANIES IN NIGERIA

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Abstract

The study investigates the impact of green environmental knowledge utilization on organizational resilience of upstream oil and gas companies in Nigeria, with organizational resilience examined through adaptability, production efficiency, and agility. Guided by dynamic capabilities theory, the research employed a quantitative approach using semi-structured questionnaire administered to key respondents across five (5) upstream oil and gas companies in Nigeria from which 40 respondents provided data for the study. The study employed regression model to analyze the data by testing three null hypotheses. Results of the analysis revealed that green environmental knowledge utilization has a very strong positive and significant effect on adaptability, a strong positive and significant impact on production efficiency, and a strong positive and significant impact on agility. Based on the findings of this study, it was concluded that green environmental knowledge utilization has a positive and significant impact on organizational resilience of upstream oil and gas companies in Nigeria. Therefore, the study recommends that upstream oil and gas companies in Nigeria strategically integrate green environmental knowledge into their operations and decision-making processes to strengthen adaptability, enhance production efficiency, and improve organizational agility for long-term resilience.

Keywords: Green Environmental knowledge Utilization, Organizational Resilience, Adaptability, Production Efficiency, Agility.

1. Introduction

The global energy landscape is undergoing a paradigm shift towards sustainability, driven by increasing environmental concerns, regulatory pressures, and the urgency to combat climate change (Yusliza et al., 2020). Within this transition, the upstream oil and gas sector faces critical challenges in balancing operational efficiency with environmental responsibility. In Nigeria, a country highly dependent on oil revenues, the sustainability of upstream oil and gas companies is imperative for economic stability. However, these companies are susceptible to environmental risks, regulatory uncertainties, and global market fluctuations, necessitating resilient strategies for long-term viability (Akinwale & Osabuohien, 2021).

One emerging factor influencing resilience in the sector is the utilization of green environmental knowledge (GEK). Green environmental knowledge refers to the acquisition, dissemination, and application of ecological and sustainability-oriented information in business processes (Dangelico, 2016). By integrating GEK into corporate strategies, upstream oil and gas companies can enhance their adaptive capacity, mitigate environmental risks, and foster innovation for sustainable growth. Empirical evidence suggests that firms leveraging environmental knowledge demonstrate higher resilience, improved stakeholder confidence, and regulatory compliance, which are

crucial for survival in volatile markets (Zailani et al., 2019).

The Nigerian upstream oil and gas industry operates in a highly dynamic environment characterized by stringent environmental regulations, community-related conflicts, and fluctuating global oil prices. The industry's ability to withstand and recover from environmental and economic shocks depends on the extent to which firms integrate green knowledge into their operations. Companies that proactively invest in environmental management practices, carbon reduction technologies, and sustainable resource utilization exhibit greater resilience against external shocks (Ebohon et al., 2022). Moreover, leveraging green knowledge enhances corporate reputation, facilitates access to green financing, and fosters innovation, further strengthening resilience (Famiyeh et al., 2021).

Despite the potential benefits, the extent to which Nigerian upstream oil and gas companies utilize green environmental knowledge to enhance resilience remains underexplored. This study examines the impact of green environmental knowledge utilization on the resilience of upstream oil and gas firms in Nigeria. It explores the impacts of green environmental knowledge utilization on key resilience determinants such as adaptability, production efficiency, and organizational agility, contributing to a broader discourse on corporate environmental responsibility in the petroleum industry.

Conceptual Framework

The conceptual framework positions green environmental knowledge utilization as a predictor variable impacting resilience – the criterion variable, assessed through adaptability, production efficiency, and organizational agility. Literature is reviewed on all the variables in the conceptual framework.

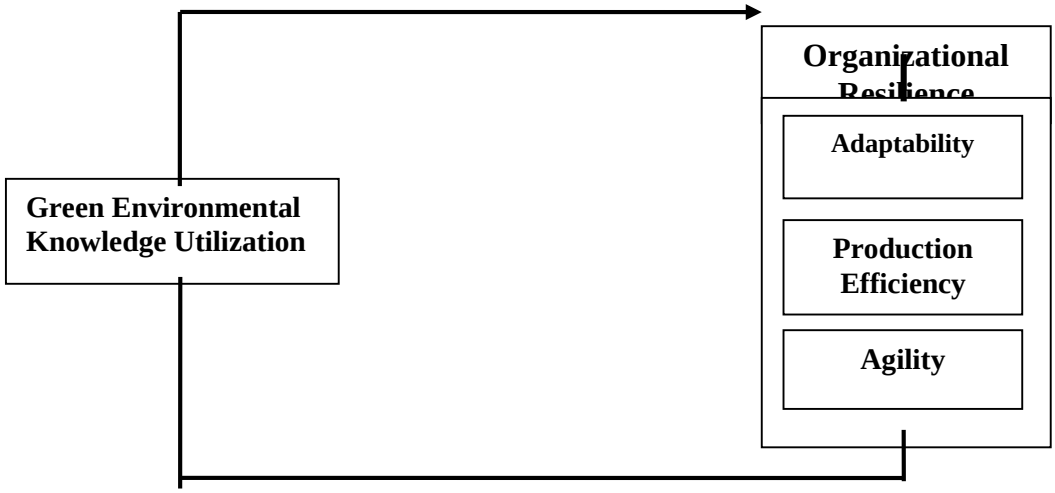

Figure 1: Conceptual framework of the Impact of Green Environmental Knowledge Utilization on Organizational Resilience of Upstream Oil and Gas Companies in Nigeria.
Source: Adapted from Taha and Abdel-Aal (2021); Adams and Turner (2022).

The purpose of this study was to investigate the impact of green environmental knowledge utilization on organizational resilience of upstream oil and gas companies in Nigeria. The specific objectives were to:

i. explore the impact of green environmental knowledge utilization on adaptability of upstream oil and gas companies in Nigeria.
ii. explore the impact of green environmental knowledge utilization on production efficiency of upstream oil and gas companies in Nigeria.
iii. explore the impact of green environmental knowledge utilization on agility of upstream oil and gas companies in Nigeria.

In order to achieve the purpose and objectives of this study, the following null hypotheses were tested:

$H_0$1: Green environmental knowledge utilization does not significant impact adaptability of upstream oil and gas companies in Nigeria.

$H_0$2: Green environmental knowledge utilization does not significant impact production efficiency of upstream oil and gas companies in Nigeria.

$H_0$3: Green environmental knowledge utilization does not significant impact agility of upstream oil and gas companies in Nigeria.

2. Literature Review

2.1 Conceptual Review

This literature review examines existing research on the interplay between green environmental knowledge utilization, organizational resilience, adaptability, production efficiency, and agility. By analyzing these interconnected concepts, the review highlights the strategic importance of green technological knowledge utilization, in achieving organizational resilience.

Green Environmental Knowledge Utilization

Green environmental knowledge utilization refers to the process by which firms acquire, assimilate, and apply sustainability-related knowledge to improve environmental performance and achieve competitive advantage (Chen et al., 2015). This concept is increasingly recognized as a critical factor in corporate sustainability, particularly in industries that are highly resource-intensive and subject to environmental regulations (Jabbour et al., 2020). By integrating green knowledge into their operations, firms can reduce waste, improve energy efficiency, and comply with environmental policies, thereby enhancing both economic and environmental outcomes (Zhang et al., 2019).

The utilization of green environmental knowledge is rooted in the absorptive capacity framework, which emphasizes a firm's ability to recognize, assimilate, and apply external knowledge for strategic benefits (Cohen & Levinthal, 1990). This capacity enables firms to leverage technological advancements and regulatory insights to develop eco-friendly products and sustainable operational practices (Weng & Lin, 2011). Companies that actively invest in green knowledge utilization can mitigate environmental risks, reduce costs through resource efficiency, and improve brand reputation among stakeholders (González-Benito & González-Benito, 2006).

In the context of industries such as oil and gas, where environmental concerns are paramount, green environmental knowledge utilization plays a pivotal role in enhancing resilience and long-term sustainability (Linnenluecke & Griffiths, 2010). Firms that effectively integrate environmental knowledge can respond more proactively to climate change regulations, transition towards renewable energy solutions, and adopt cleaner production technologies (Aragón-Correa & Sharma, 2003). This strategic approach not only ensures compliance with evolving environmental policies but also fosters innovation and competitiveness in a rapidly shifting global market (Hart & Dowell, 2011).

Empirical studies suggest that firms that leverage green knowledge perform better in terms of environmental and financial performance (Russo & Fouts, 1997). For example, companies that invest in green research and development (R&D) are more likely to develop innovative solutions that enhance operational efficiency and sustainability (Porter & Van der Linde, 1995). Additionally, firms with strong environmental knowledge capabilities can establish industry leadership by setting sustainability benchmarks and influencing regulatory frameworks (Bansal & Roth, 2000).

Organizational Resilience

Resilience in the upstream oil and gas sector refers to the capacity of firms to adapt, recover, and thrive in the face of market fluctuations, geopolitical uncertainties, and regulatory pressures (Gupta & Hall, 2023). Given the industry's exposure to volatile oil prices, environmental risks, and shifting energy policies, resilience is crucial for ensuring long-term sustainability and competitive advantage (Liu et al., 2020).

Key resilience strategies in this sector include diversification, technological innovation, and strategic agility. Companies that invest in renewable energy integration, digital transformation, and sustainability-driven operational improvements are better positioned to withstand external shocks (Xie et al., 2022). Furthermore, firms that cultivate strong stakeholder relationships, including government agencies and environmental organizations, can more effectively navigate regulatory changes and industry disruptions (Chen et al., 2021).

Despite these advantages, challenges such as capital-intensive investments and market uncertainties continue to pose barriers to resilience-building efforts. Overcoming these hurdles requires proactive policy engagement, investment in dynamic capabilities, and a long-term commitment to sustainability and innovation (Wang et al., 2022).

Measures of Organizational Resilience

Several measures have been put forward as measures of resilience in the oil and gas sector. For instance, Adams and Turner (2022) identify financial strength and stability, operational efficiency, technological innovation, environmental and regulatory compliance, diversification of energy portfolio, stakeholder engagement and transparency, workforce adaptability and safety, and market and strategic agility. Similarly, Taha et al. (2021) outline risk management, operational efficiency, regulatory compliance and competitive advantage, technological adaptation and innovation, financial stability, strengthened stakeholder trust and corporate reputation, and adaptation to market changes. In this study however, adaptability, production efficiency, and agility are examined.

Adaptability

Adaptability refers to the ability of individuals and organizations to respond effectively to changing environments, challenges, and uncertainties (Pulakos et al., 2000). It is a crucial determinant of success in dynamic and competitive landscapes, allowing entities to modify their behaviors, strategies, and operations to remain relevant and resilient (Chan, 2014). Adaptability is particularly important in times of crisis, technological disruption, and market volatility, where rigid structures and outdated processes can hinder performance and innovation (Walker et al., 2004).

From an organizational perspective, adaptability is linked to agility, resilience, and dynamic capabilities. Firms that demonstrate high adaptability are more likely to anticipate changes, embrace innovation, and seize emerging opportunities (Teece et al., 2016). Organizations with strong adaptability can restructure operations, implement new technologies, and realign workforce capabilities to address external and internal challenges (Gibson & Birkinshaw, 2004). Companies such as Amazon and Google exemplify adaptability by continuously evolving their business models in response to technological advancements and customer preferences (Dyer & Ericksen, 2009).

At the individual level, adaptability involves cognitive, emotional, and behavioral flexibility, enabling people to navigate changing job roles, industries, and societal expectations (Martin et al., 2013). Employees who demonstrate adaptability tend to exhibit higher problem-solving skills, openness to learning, and resilience under pressure (O'Connell et al., 2008). Organizations increasingly value adaptable employees, as they can drive innovation, foster collaboration, and sustain performance in uncertain work environments (Griffin et al., 2007).

Adaptability is closely related to learning and development. Individuals and firms that invest in continuous learning and knowledge acquisition are better equipped to handle disruptions and take advantage of emerging trends (Kolb, 1984). This learning mindset is essential for fostering a culture of adaptability, where employees are encouraged to experiment, take calculated risks, and develop new skills (Van Velsor & McCauley, 2004).

Adaptability is a fundamental attribute for both individuals and organizations striving to succeed in rapidly changing environments. It enhances resilience,

fosters innovation, and ensures long-term sustainability. Developing adaptability through continuous learning, strategic foresight, and proactive decision-making is essential for thriving in the modern world.

Production Efficiency

Production efficiency refers to the ability of a firm to maximize output while minimizing waste, costs, and resource utilization (Farrell, 1957). It is a key determinant of competitiveness and profitability in both manufacturing and service industries. A firm achieves production efficiency when it operates at the lowest possible cost without compromising quality, meaning that no additional output can be produced without increasing input consumption (Battese & Coelli, 1995).

Production efficiency is commonly analyzed through two perspectives: technical efficiency and allocative efficiency. Technical efficiency refers to the optimal use of resources in the production process, ensuring that maximum output is achieved from given inputs (Kumbhakar & Lovell, 2000). Allocative efficiency, on the other hand, involves the optimal distribution of resources to produce goods and services that align with market demand at the lowest cost (Coelli et al., 2005). Firms that achieve both technical and allocative efficiency operate at an optimal level, known as economic efficiency (Lovell, 1993).

Several factors influence production efficiency, including technology adoption, workforce skills, and process optimization. The implementation of advanced technologies such as automation, artificial intelligence, and lean manufacturing can significantly enhance efficiency by reducing waste and improving precision (Schmenner & Swink, 1998). Additionally, continuous employee training and skill development ensure that human resources are effectively utilized, thereby reducing errors and inefficiencies (Beamon, 1999). Moreover, effective supply chain management and just-in-time (JIT) production methods help firms minimize inventory costs and streamline production flows (Womack & Jones, 1996).

In highly competitive markets, firms that prioritize production efficiency can achieve cost leadership, allowing them to offer lower prices while maintaining profit margins (Porter, 1985). Efficiency also contributes to sustainability by reducing energy consumption, material waste, and environmental impact, aligning with modern corporate social responsibility (CSR) initiatives (Hart & Dowell, 2011). Furthermore, production efficiency enhances a company's ability to respond swiftly to market fluctuations and customer demands, improving overall operational resilience (Simchi-Levi et al., 2008).

Production efficiency is a crucial aspect of modern business strategy. By optimizing resource use, adopting advanced technologies, and focusing on continuous improvement, firms can enhance competitiveness, reduce costs, and contribute to sustainable economic growth.

Agility

Agility refers to a company’s ability to rapidly sense and respond to changes in its environment with flexibility, speed, and efficiency (Teece et al., 2016). It is increasingly recognized as a critical factor in sustaining competitiveness, especially in fast-changing industries such as technology, healthcare, and finance (Doz & Kosonen, 2010). Agility enables organizations to adapt to market shifts, technological advancements, and evolving consumer preferences, ensuring long-term resilience and success (Sambamurthy et al., 2003).

The concept of organizational agility is grounded in three main dimensions: strategic agility, operational agility, and leadership agility (Doz & Kosonen, 2010). Strategic agility involves the ability to anticipate and respond to market disruptions, reconfigure business models, and seize new opportunities before competitors (Weber & Tarba, 2014). Operational agility refers to the capability of optimizing processes, leveraging technology, and enhancing supply chain responsiveness to meet customer demands efficiently (Braunscheidel & Suresh, 2009). Leadership agility, on the other hand, focuses on fostering a culture of innovation,

adaptability, and continuous learning within the organization (Joiner & Josephs, 2007).

Organizations that successfully implement agility practices often experience improved performance, innovation, and customer satisfaction (Overby et al., 2006). For instance, companies like Amazon and Tesla exemplify organizational agility by continuously adjusting their strategies, developing cutting-edge technologies, and rapidly responding to market trends (Teece, 2007). Agile firms leverage digital transformation, data analytics, and artificial intelligence to enhance decision-making, streamline operations, and improve responsiveness (Bharadwaj et al., 2013).

Agility is closely linked to dynamic capabilities, as both emphasize the importance of sensing, seizing, and transforming resources to maintain a competitive edge (Eisenhardt & Martin, 2000). Firms that cultivate an agile mindset prioritize collaboration, decentralized decision-making, and cross-functional teams to foster innovation and responsiveness (Felipe et al., 2017). Additionally, agile organizations embrace experimentation, fail-fast approaches, and iterative development, as seen in methodologies like Agile and Scrum in software development (Highsmith, 2009). Organizational agility is a vital capability that enables firms to thrive in volatile and uncertain environments. By fostering strategic foresight, operational flexibility, and adaptive leadership, businesses can maintain a competitive advantage and drive long-term success.

2.2 Empirical Review

Green Environmental Knowledge Utilization and Organizational Resilience of Upstream Oil and Gas Companies

Several scholars and researchers have conducted studies similar to the study on the impact of green environmental knowledge utilization on organizational resilience of upstream oil and gas companies. Some of these studies are examined in this study. For example, Abdulameer and Ibrahim (2024) investigated the effect of green training on individual environmental performance: evidence from oil and gas industry in Iraq. The purpose of the study was to investigate the relationship between green training (GT) and individual environmental performance (IEP) among employees in the Iraqi oil and gas industry. Quantitative analysis using Partial Least Square-Structural Equation Modeling (PLS-SEM) was employed with data collected from 170 employees. Findings indicated that a strong positive and significant relationship was found between green training and individual environmental performance, indicating that green training enhances employees' environmental performance. It was concluded that implementing green training programs is crucial for improving environmental performance in the oil and gas industry.

Akande (2025) investigated the impact of ESG practices on the risk portfolio of listed oil and gas firms in Nigeria using a multilayered criterion. The purpose of the study was to examine the impact of Environmental, Social, and Governance (ESG) factors on the risk-adjusted returns of Nigerian oil and gas firms over an 11-year period (2012–2022). Correlational research design with Ordinary Least Squares (OLS) and Two-Stage Least Squares (2SLS) regression techniques, were adopted in analyzing data from eight firms. Findings indicated that significant positive relationships were found between ESG factors and risk-adjusted returns, emphasizing the financial viability of sustainable practices in the oil and gas sector. It was concluded that prioritizing robust environmental practices, including emission reduction and waste management, enhances financial and operational resilience in the oil and gas industry.

Olajide et al. (2023) investigated the impact of strategic environmental management capabilities on the competitiveness of oil and gas industry's supply chain in Nigeria. The purpose of the study was to assess how strategic environmental management capabilities (SEMC), such as pollution prevention, product stewardship, and clean technology, impact the economic and environmental competitiveness of firms in the Nigerian oil and gas supply chain. Multiple regression analysis was conducted on responses from 214 managers across the oil and gas supply chain. Findings revealed that all three SEMCs positively

impacted environmental competitiveness. Pollution prevention and product stewardship were positively related to economic competitiveness, while clean technology had no statistically significant impact on economic competitiveness. It was concluded that developing SEMCs is essential for enhancing both economic and environmental competitiveness in the oil and gas industry.

Sarwar and Mustafa (2023) carried out a study, analyzing the impact of green intellectual capital on environmental performance, as well as the mediating role of green training and development. The purpose of the study was to analyze the effect of green intellectual capital on environmental performance and examine the mediating role of green training and development in Pakistani industrial firms in Pakistan. Partial Least Squares (PLS) method was used in analyzing cross-sectional data from 194 workers. Findings indicated that green human capital and green structural capital positively relate to environmental performance. Green training and development significantly mediate this relationship.

Munodawafa and Johl (2022) carried out a study on the "measurement development for eco-innovation capabilities of Malaysian oil and gas firms". The purpose of the study was to develop and validate a scale measuring eco-innovation capabilities in Malaysian oil and gas firms, focusing on product service stewardship, environmental pollution prevention, and sustainable development commitment. Exploratory and confirmatory factor analysis was conducted on data collected from managers of Malaysian Oil and Gas Services and Equipment (OGSE) companies. The analysis revealed that a three-dimensional structure of eco-innovation capabilities with nine items, confirming the reliability and validity of the scale. It concluded that the developed scale is useful for researchers and practitioners in measuring and implementing eco-innovation capabilities in the oil and gas sector. These studies collectively emphasize the impact of green environmental knowledge utilization on organizational resilience in upstream oil and gas firms.

2.3 Theoretical Framework

Dynamic Capabilities Theory

Dynamic Capabilities Theory (DCT) is a strategic management framework that explains how firms can achieve and sustain competitive advantage in rapidly changing environments (Teece, 2007). It posits that organizations can develop, adapt, and reconfigure their internal and external competencies to address evolving challenges and opportunities (Eisenhardt & Martin, 2000). Unlike traditional resource-based views that focus on static resources, DCT emphasizes a firm's ability to continuously renew its capabilities to respond to technological, environmental, and market shifts (Teece et al., 1997).

One of the core tenets of DCT is that firms must possess three fundamental capabilities: sensing, seizing, and transforming (Teece, 2018). Sensing refers to the ability to identify emerging opportunities and threats in the business environment. Seizing involves mobilizing resources to capitalize on those opportunities. Transforming refers to the continuous renewal and reconfiguration of business processes and structures to maintain long-term viability. These capabilities enable firms to remain agile and resilient amidst uncertainties (Augier & Teece, 2009).

The relevance of DCT in studying the impact of green environmental knowledge utilization on the resilience of upstream oil and gas companies lies in the sector's exposure to environmental regulations, technological disruptions, and market volatility (Linnenluecke, 2017). Green environmental knowledge utilization—defined as the ability of firms to acquire, assimilate, and apply sustainability-related knowledge—aligns with the three dimensions of DCT. Companies in the upstream oil and gas industry must **sense** emerging environmental policies and technological advancements, seize opportunities through investments in cleaner technologies and sustainable practices, and transform their business models to align with the global energy transition (Hart & Dowell, 2011).

Empirical evidence suggests that firms leveraging environmental knowledge can enhance their resilience

by reducing regulatory risks, improving operational efficiencies, and gaining stakeholder trust (Ambrosini & Bowman, 2009). For instance, companies that integrate green knowledge into their strategies are better positioned to mitigate environmental liabilities, adapt to fluctuating oil prices, and diversify into renewable energy sectors (Teece, 2014). Thus, applying DCT to green environmental knowledge utilization provides a robust analytical lens for understanding how upstream oil and gas firms can enhance resilience amid sustainability challenges.

3. Methodology

The methodology of this study is founded on the positivist research paradigm. Thus, a causal research design was employed by the researchers to establish the impact of green environmental knowledge utilization on organizational resilience of upstream oil and gas companies in Nigeria. The population of this study comprised five (5) International Oil Companies (IOCs) with upstream operations in the South-South (Niger Delta) region of Nigeria.

The key IOCs that constituted the population are Shell, Chevron, TotalEnergies, ExxonMobil (limited), and Eni/Agip. However, due to divestments and Nigerian government policies encouraging local participation, many of their onshore/shallow water assets are being transferred to indigenous companies like Seplat, Oando, Aradel, and others.

No sampling technique was employed to determine sample size, as all the companies were studied because the population is small. However, 40 respondents comprising; Environmental Managers, HSE Advisors, Corporate Social Responsibility Managers, Sustainability Managers, HSE Superintendents, Environmental Compliance Officers, Environmental Coordinators, and Biodiversity Specialists, provided primary provided data for the study through a semi-structured questionnaire consisting of 16 measurement items. The instrument was designed in Likert 5–point scale of very high extent to very low extent. That is, (very high extent = 5; high extent = 4; moderate extent = 3; low extent = 2; very low extent = 1). In establishing the impact of the predictor variable on the criterion variables, Regression Analysis was conducted and 3 hypotheses were tested whose probability values were subject to a critical value of 0.05. The analysis was done with the aid of Statistical Package for Social Sciences (SPSS) version 25.

4. Results and Discussion

4.1 Testing of Hypotheses

Test of Hypotheses One: Green environmental knowledge utilization does not significant impact adaptability of upstream oil and gas companies in Nigeria.

Table 1: Coefficients[a] of the impact of Green Environmental Knowledge Utilization on Adaptability of Upstream Oil and Gas Companies in Nigeria

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.368	1.460		2.678	.001
	Green Environmental Knowledge Utilization	.242	.027	.828	9.105	.000

a. Dependent Variable: Adaptability

Source: SPSS Output

Results of the analysis in Table 1 revealed that green environmental knowledge utilization has a very strong impact on adaptability of upstream oil and gas companies in Nigeria. As shown in the unstandardized coefficients indicate that 1% increase in green environmental knowledge utilization will bring about approximately 0.24% increase in adaptability. Additionally, the Beta value of 0.828 indicates that

green environmental knowledge utilization has a very strong and positive impact on adaptability. Furthermore, the impact is significant as shown in the probability value 0.000 < 0.05. Based on this result the researchers reject the null hypothesis which states that; green environmental knowledge utilization does not significant impact adaptability of upstream oil and gas companies in Nigeria.

Test of Hypotheses Two: Green environmental knowledge utilization does not significant impact production efficiency of upstream oil and gas companies in Nigeria.

Table 2: Coefficients[a] of the impact of Green Environmental Knowledge Utilization on Production Efficiency of Upstream Oil and Gas Companies in Nigeria

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.803	1.970		3.888	.006
	Green Environmental Knowledge Utilization	.183	.048	.733	11.999	.000

a. Dependent Variable: Production Efficiency

Source: SPSS Output

Results of the analysis in Table 2 revealed that green environmental knowledge utilization has a strong impact on production efficiency of upstream oil and gas companies in Nigeria. As shown in the unstandardized coefficients indicate that 1% increase in green environmental knowledge utilization will bring about approximately 0.18% increase in production efficiency. Additionally, the Beta value of 0.733 indicates that green environmental knowledge utilization has a strong and positive impact on production efficiency. Furthermore, the impact is significant as shown in the probability value 0.000 < 0.05. Based on this result the researchers reject the null hypothesis which states that; green environmental knowledge utilization does not significant impact production efficiency of upstream oil and gas companies in Nigeria.

Test of Hypotheses Three: Green environmental knowledge utilization does not significant impact agility of upstream oil and gas companies in Nigeria.

Table 3: Coefficients[a] of the impact of Green Environmental Knowledge Utilization on Agility of Upstream Oil and Gas Companies in Nigeria

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.778	2.080		5.709	.096
	Green Environmental Knowledge Utilization	.109	.067	.632	7.798	.000

a. Dependent Variable: Agility

Source: SPSS Output

Results of the analysis in Table 3 revealed that green environmental knowledge utilization has a strong impact on agility of upstream oil and gas companies in Nigeria. As shown in the unstandardized coefficients indicate that 1% increase in green environmental knowledge utilization will bring about approximately 0.11% increase in agility. Additionally, the Beta value of 0.632 indicates that green environmental knowledge

utilization has a strong and positive impact on agility. Furthermore, the impact is significant as shown in the probability value 0.000 < 0.05. Based on this result the researchers reject the null hypothesis which states that; green environmental knowledge utilization does not significant impact agility of upstream oil and gas companies in Nigeria.

Discussion of Findings

Results of the analysis revealed that green environmental knowledge utilization has a very strong, positive and significant impact on adaptability of upstream oil and gas companies in Nigeria. The result also indicated that, 1% increase in green environmental knowledge utilization will bring approximately 0.24% increase in adaptability. Based on this result the researchers rejected the null hypothesis which states that; green environmental knowledge utilization does not significant impact adaptability of upstream oil and gas companies in Nigeria.

Similarly, the analysis revealed that green environmental knowledge utilization has a strong, positive and significant impact on production efficiency of upstream oil and gas companies in Nigeria. The result also showed that 1% increase in green environmental knowledge utilization will bring about approximately 0.18% increase in production efficiency. Based on this result the researchers reject the null hypothesis which states that; green environmental knowledge utilization does not significant impact production efficiency of upstream oil and gas companies in Nigeria.

More also, the analysis revealed that green environmental knowledge utilization has a strong, positive and significant impact on organizational agility of upstream oil and gas companies in Nigeria. It is further indicated that 1% increase in green environmental knowledge utilization will bring about approximately 0.11% increase in organizational agility. Based on this result the researchers reject the null hypothesis which states that; green environmental knowledge utilization does not significant impact organizational agility of upstream oil and gas companies in Nigeria.

5. Conclusion and Recommendations

Based on the findings of this study, it is concluded that green environmental knowledge utilization has a positive and significant impact on organizational resilience of upstream oil and gas companies in Nigeria. The evidence demonstrates that green environmental knowledge utilization has a very strong influence on adaptability, equipping companies with the capacity to adjust effectively to environmental regulations, technological transitions, and stakeholder expectations. This adaptability ensures that firms remain operationally viable within a challenging ecological and economic landscape.

The study further reveals that green environmental knowledge utilization exerts a strong positive impact on production efficiency, as the adoption of environmentally sound practices reduces waste, optimizes energy use, and promotes cleaner production processes. These outcomes enhance cost-effectiveness while aligning operations with sustainability imperatives. In addition, green environmental knowledge utilization shows a strong positive impact on organizational agility**,** enabling firms to respond rapidly to environmental disruptions and market fluctuations. By integrating green knowledge into their strategies and operations, companies strengthen their ability to innovate and maintain competitiveness.

Thus, this study establishes that the effective utilization of green environmental knowledge significantly enhances adaptability, production efficiency, and agility, thereby reinforcing the resilience and long-term sustainability of upstream oil and gas companies in Nigeria.

Therefore, it is recommends that upstream oil and gas companies in Nigeria strategically integrate green environmental knowledge into their operations and decision-making processes to strengthen adaptability, enhance production efficiency, and improve organizational agility for long-term resilience.

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