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Impact of Recycling Sustainability on Organizational Performance

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***Abstract*---**This is empirical research focusing on the impact of recycling sustainability on Organizational performance in Nigeria. To achieve the objective of this study, a sample of 10 publishing houses in four major cities in Delta State was adopted, and these cities include Asaba, Warri, Sapele, and Oghara. Given that Nigeria is the regional publishing powerhouse in West Africa with newspaper publications selling in the whole region, likewise, textbook publishers in Nigeria dominate the regional market. The industry contributes about 10% of the GDP and is one of the fastest-growing in the manufacturing sector. Unfortunately, Nigeria does not produce most of the raw materials for publishing. All paper materials used in Nigeria are imported, and the costs are rising with the reliability of the sources dwindling. In addition, the publishing industry in Nigeria is faced with a high rate of waste and returns. The study focused on the impact of adopting recycling sustainability as a possible solution to the dwindling raw materials, increasing costs, and high rate of returns. It used a stratified random sampling approach and a descriptive research design.

***Keywords*---**manufacturing sector, organizational performance, publishing industry, recycling sustainability, regional publishing.

Introduction

Resource limitations and environmental concerns have made sustainable operations of assets and environmental pollution one of the major global issues. The economy's overall development may not go "hand in hand" with the reduction of pollution and sustainable management of resources (Wang & Song, 2014). Building a sense of balance among high resource consumption and the development of economic relics is a constant challenge that forces organizations to run through eco-friendly professional deeds having high economic worth (Cheng & Lee, 2010). Many organizations are forced to adopt activities that generate and increase economic value (Li & Olorunniwo, 2008).

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The excessive use of non-renewable resources prompted by speedy economic development has hurt the atmosphere and elevated various environmental worries (Atlin & Gibson, 2017). To preserve energy and lessen emissions of carbon, numerous countries have established agencies and regulations for environmental sustainability and its protections; examples comprise limitations on "chlorofluorocarbons, the sustainable development announcements of the Johannesburg world summit," and limits on the usage of few hazardous materials "electrical and electronic equipment requirements, the European Union's Restriction of Hazardous Substances Directive" (Weng et al., 2015). Such impositions of rules and regulations have drawn the attention of environmental supervisors (Zhu et al., 2017), they also have the same outcome in varying the management and competition practices between the organizations (Feng & Chen, 2018). To adhere to the new eco-friendly regulations, to have a positive branding image (Chen, 2008), to improve their firms' performance, and to have a competitive advantage (Rusinko, 2007), organizations have had to accept eco-friendly practices.

Numerous investigations examined factors altering recycling sustainability practices, such as environmental regulations, ethics, legal systems, and supply chain (Feng & Chen, 2018; Gao et al., 2018). Studies have also examined an increase in awareness, the general public, and stakeholder pressure linked to green environmental issues. Moreover, literature provides evidence of optimized pressure from society, customers, and government bodies to practice recycling sustainability. However, the literature lacks findings on the relationship of stakeholders' pressure (competitor's pressure, government pressure, and employee conduct) about sustainability practices. The manufacturing sector faces higher stakeholder pressure due to possibly the highest waste-producing sector (Chang, 2017). The single industry was studied for recycling sustainability practices (El-Kassar & Singh, 2019; Seman et al., 2019). This study fills the gap in investigating these constructs in the manufacturing and service industries to enrich existing recycling sustainability practices and stakeholder pressure literature. Moreover, stakeholder pressure (customer) was examined for GI in third-party logistic firms (Chu et al., 2018), as well as in express companies (Zhang et al., 2020), and in manufacturing firms (Song et al., 2020). Those three studies were conducted in China's context, which highlights the issue of conducting and focusing on the stakeholder pressure in the manufacturing and service industries of Pakistan being a developing economy in the initial stages of recycling sustainability practices adoption (Shahzad et al., 2020).

While publishing plays a critical role in disseminating news, information, entertainment, and educational materials, Shahzad et al. (2020), noted that the industry has one of the highest rates of returned products. Arasa & Obonyo (2012), found that publishing firms deal in products with a very short shelf life, just below a day for newspapers and hardly a month for magazines. Even educational textbooks are used within a semester or a year before the users outlive them. This means publishing firms have to employ huge resources in obtaining raw materials for continuous publications. Gobbi (2008), agree on high costs and scarcity of raw materials as major challenges, especially for the publishing industry, implying that in the short run, the industry has to cope with high production costs leading to low-profit margins (Cheng & Lee, 2010), and

interrupted production due to dwindling source of raw materials. Innovative application of reverse supply chain strategies as suggested by Škapa & Klapalová (2012), including recycling, re-use, waste reduction, and reselling of returns and wastes could improve the performance of the publishing firms and ensure sustainable exploitation of the publishing materials.

Furthermore, previous studies have concentrated on the manufacturing sector as it is one of the most critical waste producers that upset the balance of the environment. With rising trepidations on global pollution, this industry is facing increasing pressures from customers, society, and governing agencies to save energy, resources, protect the eco-friendly environment and maintain its sustainability (Chang, 2017), or on a single industry (Lin & Ho, 2011). It would be beneficial to offer an all-purpose model to investigate issues about GI for both the service and manufacturing firms. Therefore, in this study, we borrowed help from the "stakeholder theory" (Atlin & Gibson, 2017), to aid in our investigation methodology. This theory has been utilized to get a comprehensive view of a particular organization to examine the impact of recycling sustainability practices on organizational performance. To answer the stakeholders' pressure, this study is therefore set to examine the impact of recycling sustainability on organizational performance.

Objectives of the study

- To examine the relationship between resource recycling and organizational cost-effectiveness
- To examine the relationship between waste recycling and organizational cost-effectiveness
- To determine if there is a significant relationship between resource recycling and organizational profitability
- To determine if there is any significant relationship between waste recycling and organizational profitability

Research questions

- Is there any significant relationship between resource recycling and organizational cost-effectiveness?
- Is there any significant relationship between waste recycling and organizational cost-effectiveness?
- Does resource recycling have any significant relationship with organizational profitability?
- Does waste recycling have any significant relationship with organizational profitability?

Research hypotheses

HO1: There is no significant relationship between resource recycling and organizational cost-effectiveness

HO2: There is no significant relationship between waste recycling and organizational cost-effectiveness

HO3: Resource recycling has no significant relationship with organizational profitability

HO4: Waste recycling has no significant relationship with organizational profitability

Literature Review

Conceptual framework

Sustainability recycling for paper-based organizations

According to Stevenson (2016), the primary raw material for paper production is pulps fibers obtained by a complicated chemical process from natural materials, mainly from wood. This fibres production is very energy demanding and at the manufacturing process, there are used many of the chemical matters which are very problematic from the viewpoint of environmental protection. A suitable alternative is obtaining the pulp fibres from already made paper. This process is far less demanding on energy and chemicals utilisation. Paper recycling, simplified, means the repeated defibring, grinding, and drying when there are altered the mechanical properties of the secondary stock, the chemical properties of fibres, the polymerisation degree of pulp polysaccharides components, mainly of cellulose, their supramolecular structure, the morphological structure of fibres, range and level of interfiber bonds e.g. The cause of above-mentioned alterations is the fibres aging at the paper recycling and manufacturing, mainly the drying process (Ryan, 2020; Nyandra et al., 2018).

With the repeated use of the secondary fibres, it needs deliberate the paper properties alter due to the fiber deterioration during the recycling when many alterations are irreversible. The alteration depth depends on the cycle's number and the way to the fibers used. The main problem is the decrease of the secondary pulp mechanical properties with the continuing recycling, mainly the paper strength (Sarwar Jahan, 2003; Hubbe & Zhang, 2005). This decrease is an effect of many alterations, which can but need not arise in the secondary pulp during the recycling process. Recycling causes the hornification of the cell walls that result in the decline of some pulp properties. It is due to the irreversible alterations in the structure of the cell during the drying (Ding & Wang, 2008).

The worse properties of the recycled fibers in comparison with the primary fibers can be caused by hornification but also by the decrease of the hydrophilic properties of the surface of the fibre during the drying due to the redistribution or migration of resin and fatty acids to the surface (Nazhad, 2005). Okayama (2002), observed the enormous increase of the contact angle with water which is related to the fiber inactivation at the recycling. This process is known as „irreversible hornification“.

Paper recycling saves the natural wood raw stock, decreases the operation and capital costs to the paper unit, decreases water consumption, and last but not least this paper processing gives rise to environment preservation (e.g. 1 t of waste paper can replace cca 2.5 m3 of wood). A key issue in paper recycling is the impact of energy use in manufacturing. Processing waste paper for paper and

board manufacture requires energy that is usually derived from fossil fuels, such as oil and coal. In contrast to the production of virgin fiber-based chemical pulp, waste paper processing does not yield a thermal surplus and thus thermal energy must be supplied to dry the paper web. If, however, the waste paper was recovered for energy purposes the need for fossil fuel would be reduced and this reduction would have a favorable impact on the carbon dioxide balance and the greenhouse effect. Moreover, pulp production based on virgin fibers requires the consumption of round wood and causes emissions of air-polluting compounds as does the collection of waste paper. For better paper utilization, an interactive model, the Optimal Fibre Flow Model, considers both a quality (age) and an environmental measure of waste paper recycling was developed (Byström & Lönnstedt, 1997).

Sustainably recycling and environmental value of recyclable paper

Paper is made from wood, while wood originates from the forest. Recycled paper is known as "the Fourth Forest" besides virgin, natural and artificial forests. Waste paper from scrap newspapers, books, and periodicals, office paper, kraft paper, paper boxes, and corrugated paper are all valuable fibrous raw materials. Recycling renewable fibrous raw materials can promote the reuse of pulp and improve the pulp utilization rate. This also implies higher paper output from the same amount of wood and reduced demand for high-intensity forest logging in the pulp and paper industries, which will, in turn, promote the realization of sustainable forest management.

Using recycled fibrous raw materials to make the paper can greatly reduce the consumption of wood, water, and electricity and the emission of pollutants in the primary pulping process. Recycling one ton of recycled waste paper can produce 800 kilograms of recycled fiber raw materials, thus saving 17 big trees and a landfill space of 3m3. In addition, papermaking with recycled fibers is characterized by low energy consumption, low environmental treatment cost, low unit raw material cost, and can save papermaking energy by over 50% and reduce water pollution by 35%. With growing public awareness of cost control and environmental protection, fibrous materials provided by recycled paper have now become an indispensable source of raw material for the paper industry (Zhang, 2018).

The concept of organizational performance

Organizational performance is concerned with the overall productivity in an organization in terms of stock turnover, customers, profitability, and market share. The concept of organizational performance is core to businesses because the major objective of businesses is to make profits. Ongori et al. (2013), state that one of the important questions in business has been why some organizations succeed and why others fail and this has influenced a study on the drivers of organizational performance. Arasa & Obonyo (2012), view performance as a formula for the assessment of the functioning of an organization under certain parameters such as productivity, employee morale, and effectiveness. Owolabi & Makinde (2012), opined that Performance management and improvement are at the heart of strategic management because a lot of strategic thinking is geared

towards defining and measuring performance. Nkemchor & Ezeanolue (2021), assert that for an organization to be successful it has to record high returns and identify performance drivers from the top to the bottom of the organization.

Njagi & Malel (2012), identified three approaches to performance in an organization are the goal approach, which states that an organization pursues definite identifiable goals. This approach describes performance in terms of the attainment of these goals. The second approach is the systems resource approach which defines performance as a relationship between an organization and its environment. This concept defines performance according to an organization's ability to secure the limited and valued resources in the environment. The third approach is the process perspective which defines performance in terms of the behaviour of the human resource of an organization. Organizational performance is the measure of standard or prescribed indicators of effectiveness, efficiency, and environmental responsibility such as cycle time, productivity, waste reduction, and regulatory compliance. The performance also refers to the metrics relating to how a particular request is handled, or the act of performing; of doing something successfully; using knowledge as distinguished from merely possessing it.

Conceptual framework of the relationship between recycling sustainability and organizational performance

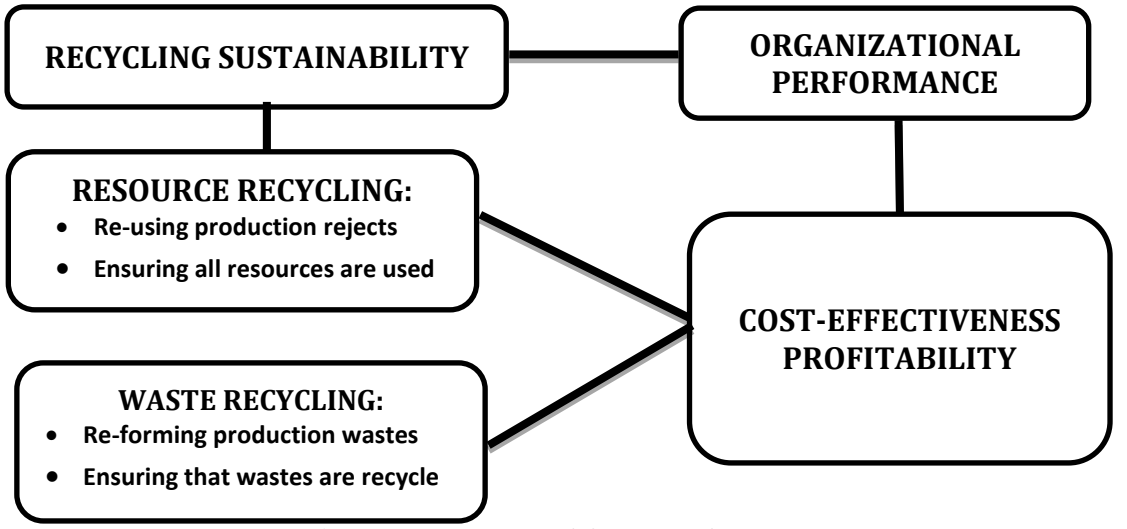

Figure 1. Conceptual framework
Source: Author's Conceptual Framework

Theoretical framework

For this study, reverse supply chain theories Transaction Cost Economics, and Resource-based view were identified. Transaction Cost Economics (TCE) specifies the conditions under which a firm should manage an economic exchange internally within its boundary or externally through the inter-organizational arrangement. TCE focuses on minimizing the total transaction costs of producing

and distributing a particular good or service. According to Archana et al. (2016), the external (or macro) environment comprises four sectors, namely input (referring to suppliers), regulatory (referring to the government and interested aggregators such as lobbying groups), output (referring to buyers), and competitive (referring to competitors). The internal environment consists of strategic factors (such as strategic costs, overall quality, customer service, environmental concerns, and legislative concerns) and operational factors like recycling. The reverse supply chain strategies synchronize with the TCE in maximizing firms' internal resources to remain competitive and profitable (Gobbi, 2008). Application of recycling sustainability has been found to lead to higher than average return on investment (Ehiedu & Toria, 2021), improved cycle time (Thyagaraju, 2016), higher marketing performance (Yılmaz et al., 2016), greater efficiency and effectiveness (Troschinetz & Mihelcic, 2009), and improved firm financial performance over competitors.

A firm's resources and capabilities include all financial, physical, human, and organizational assets used in a firm to develop manufacturers and deliver products or services to the customers. These resources create a sustainable competitive advantage for a firm if they have the following characteristics: Value-adding (Valuable), rareness (Scarce), Costly to imitate, and non-tradable (limited transferability). Njagi & Malel (2012), identifies the scarcity of raw materials for publishing and the overall cost saving of reverse supply chain strategies. RBV also accounts for the incorporation of the reverse supply chain as part of long-term company business strategies by some large corporations to attain sustainable competitive advantage. Li et al. (2016), notes that publishing firms that perfect the application of recycling enhance their competitiveness in both efficiency and profitability

Empirical Review

Tibben-Lembke & Rogers (2002), observed that recycling accounts for approximately four percent of the total logistics costs in the publishing industry. In the retail and manufacturing sectors, it is estimated that recycling accounts for 5-6 percent of total logistics costs. Gobbi (2008), also adds the limitation of the mandatory product take-back legislation, especially in Europe, when legislation does not provide incentives. Kange (2013), discussed the role of recycling in e-waste management in East Africa and found environmental sustainability, economic prosperity and social value recovery of consumers by individual firms, market expansion through appealing waste management policies, assets optimal utilization, product or environmental returns, as the outcomes of recycling.

Another perspective is given by Rusinko (2007), who suggests cost reduction across the supply chain as a major contribution of recycling. On their part, Ellram et al. (2007). summarize the importance of recycling as positive environmental impact, legal compliance, competitiveness advancement, and improved customer service. Several types of research in the recent past also focused on barriers to the adoption of recycling sustainability. Tibben-Lembke & Rogers (2002), identify the main barrier for recycling relative to other issues: recycling does not receive priority within the company. Another barrier is company policies which might be motivated by fear of the danger of market

cannibalization or brand-damaging, the company avoids implementing return policies. This is shared by Anantadjaya et al. (2021), who portends that the lack of systems to receive incoming goods and proceed with inspection, registration, and recovery option selection also remains a barrier. Other barriers according to Tibben-Lembke & Rogers (2002), include competitive issues management inattention, personnel resources, and financial resources required for implementing new systems and processes that require investments in terms of personnel training and financial resource usage.

Methodology

This study adopted the survey research design. The sample of the research was composed of 10 publishing organizations spread across four major cities in Delta State, namely Asaba, Warri, Sapele, and Oghara. The sample used for this study consisted of 200 employees who are in these publishing organizations determined by the convenience sampling method. However, a questionnaire was distributed as the instrument for data collection. The questionnaire form contains four different measures related to research variables. From the 200 questionnaires that were sent out and retrieved successfully, representing a response rate of 100%. For data analysis, the study employed the ordinary least square (OLS) multiple regression estimation technique was used.

Model Specification:

$$\mathbf{OrgC = \alpha_0 + \beta_1 ResRec + \beta_2 WasRec + \varepsilon_i} \quad \textbf{(i)}$$

$$\mathbf{OrgP = \alpha_0 + \beta_1 ResRec + \beta_2 WasRec + \varepsilon_i} \quad \textbf{(ii)}$$

Where:

OrgC:	Organizational Cost Effectiveness
OrgP:	Organizational Profitability
ResRec:	Resource Recycling
WaRec:	Waste Recycling
α_0:	a constant, equals the value of Y when the value of X = 0
β:	coefficient of the independent variables
ε_i:	the error term

Results and Discussion

Regression results presentation

Table 1
Regression estimation for model I

$OrgC = \alpha 0 + \beta 1 ResRec + \beta 2 WasRec + \varepsilon_i$ (i)		
Independent variables	Resource Recycling and Organizational Profitability	
	OLS Summary Coeff.	p-value
Intercept	54.58422	0.0000
ResRec	0.428745	0.0411

WasRec	0.512366	0.0025
N	200	
Adjusted R-squared	0.812364	
F-test		0.045875

[a]Significance at the level 5% level (two-tailed)

Table 2
Regression estimation for model II

OrgP = α0 + β1ResRec + β2WasRec +ε,		(ii)
Independent	Waste Recycling and Organizational Profitability	
variables	OLS Summary	
	Coeff.	p-value
Intercept	0.352922	0.0000
ResRec	0.632596	0.0011
WasRec	0.120616	0.0076
N	200	
Adjusted R-squared	0.863547	
F-test		0.007497

[a]Significance at the level 5% level (two-tailed)

Discussion of findings

The study found that recycling sustainability had a significant influence on the performance of publishing organizations in Delta State. The regression analysis of the relationship between recycling sustainability and organizational performance yielded a positive coefficient and a significant P-value which indicates recycling sustainability has a positive and significant relationship with organizational performance as measured by cost-effectiveness and profitability. The Regression analysis of recycling sustainability on firm performance found that resource recycling and waste recycling influence firm performance as shown in the regression result. The regression analysis yielded a positive and This finding compares with a study by Tibben-Lembke & Rogers (2002), in which recycling was found to have many strategic benefits including; reducing the consumption of fresh raw materials, reducing energy usage, and reducing air pollution. Kange (2013), also noted that the process of recycling is advantageous for many reasons as it reduces the amount of waste sent to landfills, conserves natural resources, saves energy, reduces greenhouse gas emissions, and helps create new jobs. Recycled materials can also be converted into new products that can be consumed again such as paper, plastic, and glass (Sutcu & Akkurt, 2009). To an individual firm, this translates to cost savings and new streams of income which should improve profitability.

Conclusion

Following the findings of this study, it is evident from the findings that recycling sustainability has a positive and significant relationship with organizational performance. Hence, given the results obtained as well as the literature reviewed, it is pertinent to state in the conclusion of this study that recycling sustainability

through resource recycling and waste recycling has a positive and significant relationship with organizational cost-effectiveness and organizational performance.

Recommendation

From the findings above, the study recommends to entrepreneurs adopt recycling sustainability and set up intermediary businesses, capitalizing on wastes and returns from the mainstream publishing firms. Within the publishing supply chains, the study recommends that publishing firms embrace recycling as an investment for improved performance, thereby moving towards sustainable growth which is one of the foundations of Nigerian Vision 2030.

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