

# Green Production and Performance of Small and Medium Enterprises in North Central Nigeria

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**Abstract:** *This study investigated the effect of green production on the performance of small and medium enterprises in North Central Nigeria. Specifically, the study examined the effect of green products, green processes and operations, green use and green end-of-life management on the performance of small and medium enterprises in North Central Nigeria. The study is anchored on Ecological Modernization Theory and Stakeholders Theory. This study utilized the survey research design, the study area is North Central Nigeria, comprising of Benue State, Kogi State, Kwara State, Nasarawa State, Niger State, Plateau State and the Federal Capital Territory. The population of the study was 1,784 with a sample size of 327 generated scientifically using Yamen's Formula. The study made use of questionnaire with a validity and reliability index of .802. The study established that there are positive relationships between the dimensions of green production and performance of Agro-processing small businesses in Nigeria. It is concluded that green production through green products, green processes and operations, green use and green end-of-life management can improve the performance of small and medium enterprises in North Central, Nigeria. It is recommended that small and medium enterprises in North Central, Nigeria should adopt green products, green processes and operations, green use and green end-of-life management so as to improve their market share and customer satisfaction.*

**Keyword:** *Green Products, Green Processes, Green Use, Green End-of-life management, Performance, Small and Medium Enterprises.*

## 1.0

## INTRODUCTION

### 1.1 Background to the Study

Green production is rapidly growing in importance as populations grow and emerging economies expand to the extent that the planet's ecosystem and resources are experiencing tremendous challenges. Production systems that supply the growing demand for goods and services are linked to adverse environmental impacts (Frosch & Gallopoulos, 1989). Urgent measures have to be taken to achieve a pivotal change in the way society in general and industry in particular is managing natural resources (Lee, 2008). Governments of various countries have formally embraced environmental policies and regulations, and the free market is placing a clear premium on those companies who are able to offer green credentials. Such green credentials can be achieved in a

number of ways including the materials used within products, how products are produced, and the ease of dealing with a product at the end of its life. Basically, green production is the renewal of manufacturing processes and the establishment of environmental-friendly operations within the manufacturing field. Essentially, it is the greening of manufacturing, in which workers use fewer natural resources, reduce pollution and waste, recycle by products and moderate emissions in their production processes. Green production processes typically represent an effort to go an extra mile not just to conform to relevant environmental regulations but it involves four strategies; methods of growing, harvesting and extracting new raw materials in such a manner that energy is conserved and fewer or zero level artificial chemicals are introduced into the process; methods of reusing materials to minimize waste and indirectly serve energy; techniques of possibly avoiding high energy or intensive chemical production processes; schemes for re-processing production waste back into the system for secondary use.

This work uniquely and singularly draws attention to the manufacturing sector of Nigeria, specifically the agro processing sub sector to fill a long-left gap. Specifically, this study seeks to delve into factors that motivate the adoption of green manufacturing techniques and their influence on the adoption processes among small and medium firms in the agro-processing industry in Nigeria. The choice of small businesses is because they form the majority of processing firms in the Nigerian agro processing landscape (Quartey and Darkwa 2015). The legal definition of SMES varies from country and industry that generally consider number of employees, annual sales, value of assets and profit. With the outcomes of this study, government and industry players in the Nigerian manufacturing landscape can fine-tune the state policies and managerial decisions for better environmental responsibility. This therefore is the motivation behind this research. This paper sets out to review current literature, from a more conventional green production operations perspective, and production of Agro-Processing small businesses in Nigeria and contributes a set of findings that capture the current state-of-the-art of this topic.

## **1.2 Statement of the Problem**

The global food crisis is increasing with alarming speed and force, necessitating nations and international organizations all over the globe to respond with a strategic and long term approach. It has been observed that the current crisis is caused by a web of interconnected forces involving agriculture, energy, climate change, trade, and new market demands from emerging markets and therefore has grave implications for economic growth and development, international security, and social progress in developing countries (Centre for Strategic and International Studies (CSIS), 2008). Nigeria too is currently experiencing food crisis. This has been attributed to low productivity in the agricultural sector necessitating huge food imports. It based on the above premise that this study is conceive to determine the effect of green production on the performance of small and medium enterprises in North Central Nigeria.

## **1.3 Objectives of the Study**

The broad objective of the study is to review the effect of green production on the performance of small and medium enterprises in North Central Nigeria. The specific objectives are;

- i. To determine the effect of green products on the performance of small and medium enterprises in North Central Nigeria;
- ii. To examine the effect of Green processes on the performance of small and medium enterprises in North Central Nigeria;

- iii. To ascertain the effect of Green use on the performance of small and medium enterprises in North Central Nigeria;
- iv. To investigate the effect of green end-of-life management on the performance of small and medium enterprises in North Central Nigeria.

#### **1.4 Significance of the Study**

First and foremost, this study is expected to be useful to the future scholars, researchers and other bodies that will want to get information or research on green production. They will be able to get the insights surrounding the green production concept, the theories and models surrounding the concept both locally and internationally. The study will help policy makers in developing economies to set environmental standards to attract investors. The finding shall provide policy implications for government in supporting green production practices. It also provides information to the government policy maker to encourage additional organizations to adopt green production practices through the use of voluntary environmental programs and partnership with organizations. Finally, the research shall provide data that will assist the industrial sector with implementation and management of green production practices. By examining the effects of the green production and performance, the research shall enable the various manufacturers in various sectors get clear information on how they stand to gain by adopting the green production concept.

## **2.0**

## **LITERATURE REVIEW**

This section discusses theoretical framework, conceptual framework and review of related studies.

### **2.1 Theoretical Framework**

This paper is anchored on ecological modernization theory and supported by stakeholders' theory.

#### **2.1.1 Ecological Modernization Theory**

The proponents of ecological modernization theory also provide the rational theory for environmental entrepreneur (Hajer, 1995 & Mol, 1995). According to the theory, it is possible to promote economic growth by giving higher priority to the environment. It is no longer necessary to trade off economic growth for environmental quality (Tillery & Young, 2009). The capitalist system is seen as having the capacity to develop sustainable solutions to environmental problems. That capitalist drive for innovation can be harnessed to produce environmental improvements (Beveridge & Gug, 2005). Ecological modernization theorists believe that "the environmental problems facing the world today, act as a driving force for future industrial activity and economic development. Entrepreneurial action therefore is the best solution to our environmental problems because this new generation of ecopreneurs is seeking to combine environmental awareness and conventional entrepreneurial activity to achieve entrepreneurial success (Anderson, 1998). Ecopreneurs have the potentials to be a major force in the overall transition towards a more sustainable business paradigm (Schaper, 2002). The justification for using this theory is that ecological modernization theorists believe that "the environmental problems facing the world today, act as a driving force for future industrial activity and economic development". The theory also believes that it is possible to promote economic growth by giving higher priority to environmentally friendly production. It is no longer necessary to trade-off economic growth for environmental quality. This theory has served as a morale booster to ecopreneurs and has also given credence to the study of ecopreneurship.

### **2.1.2 Stakeholder Theory**

Stakeholder theory starts with the assumption that values are necessarily and the main reason for doing business. The theory was propounded by R. E Freeman in 1984. It asks managers to be responsible and have a shared sense of value and have knowledge on what bring core stakeholders together. It also forces managers to be very clear about how they want to run the business, in particular what kinds of relationships they want and need to create and maintain with their stakeholders so as to deliver on their purpose and expectations. Firms should not narrowly focus their strategic management decisions on creating shareholder value only but rather broaden their objectives to include the expectations and interest of the wide group of stakeholders. Poor environmental performance will definitely lead to poor company's relationship with its stakeholders. This will go ahead and affect the firm's reputation and shareholders will suffer financial losses if a firm's is found liable to environmental damages. Shareholders and financial institutions usually perceive companies with poor environmental reputation as riskier to invest in and therefore may demand a higher risk premium. Increased consumer awareness has led them to demand for industrial improvement on environmental management. The threats posed by various stakeholders in response to the poor environmental management thus induce firms to comply and improve their corporate environmental practice. It is strategically beneficial and innovative to incorporate and manage stakeholders concerns in a way that guarantee strategic success and competitive advantage.

## **2.2 Conceptual Framework**

### **2.2.1 Green Production**

Melnyk and Smith (1996), defined green production as a system that integrates product and process design issues with manufacturing planning and control in such a manner as to identify, quantify, assess, and manage the flow of environmental waste with the goal of reducing and ultimately minimizing negative environmental impact while also trying to maximize resource efficiency. Liu *et al.* (2005), defined it as a modern manufacturing mode considering both the environmental impact and the resource consumption during the whole product life cycle, from design, fabrication, packaging, transportation, usage, recycling, to waste disposal, and its objective is to minimize the negative environmental impacts and maximize the utilization rate of resource, and harmonize optimization of economic benefit and social benefit with the maximum integrated benefit.

### **2.2.2 Dimensions of Green Production**

Baines *et al.* (2012), identified the dimensions of Green Production to include: green products, green processes, green uses and green end-of-life management and the same have been adopted for this study and are hereby explained below;

**i. green products:** This refers to reducing the negative impact of the materials included in the product and its packaging. This credential concerns reducing the harmful effects of the materials included in the product or its packaging, for example avoiding use of toxic materials, minimizing the use of non-renewable materials, and using renewable ones according to their rate of replenishment.

**ii. Green processes and operations:** This entails reducing the negative impact of the transformation of raw materials into finished goods. Work on green processes includes machine that reduce air emissions, minimizing solid and liquid wastes, saving water and energy, and

protecting health and safety of production workers, customers and the local community (Ball, Evans, Levers & Ellison, 2009).

**iii. Green use:** This means reducing the negative impact associated to the use phase. It is concerned with minimizing emissions, waste and energy consumption associated with the product in use (Seliger, Kim et al., 2008). This is usually achieved by changing the design of the product and implementing innovative technologies, as in the case of low-emission diesel vehicles or of the hybrid petrolelectric cars released by Toyota, Nissan and Lexus (Jovane et al., 2008).

**iv. Green end-of-life management:** This is concerned with enabling reuse or recycle of products at the end of its useful life. Companies are increasingly expected, or legally required, to take responsibility for the entire life of their products, including proper recycling and disposal (Corbett & Klassen, 2006). Reverse supply chains include used-product acquisition, reverse logistics (moving end-of life products to reprocessing facilities), inspection and disposition (determining whether to repair, remanufacture, use of spare parts, or recycle), remanufacturing and recycling (Corbett & Klassen, 2006).

### **2.2.3 Concept of Performance**

Performance is understood as achievement of the organization in relation with its set goals. It includes outcomes achieved, or accomplished through contribution of individuals or teams to the organization's strategic goals. The term performance encompasses economic as well as behavioral outcomes. Performance Measurement is defined as a regular measurement of outcomes and results, which generates reliable data on the effectiveness and efficiency of organizations (Nomhwange, Adukanya & Annum, 2021). Performance Measurement is seen as a process of quantifying the efficiency and effectiveness of past actions through acquisition, collation, sorting, analysis, interpretation and dissemination of appropriate data (Neely, 2012). Ogunmokun and Li (2014), who defined performance measurement as an evaluation of how well organizations are managed and the value they deliver for customers and other stakeholders. Their definition clearly shows the purpose of performance measurement and emphasizes the assessment both of the value an organization gives to its various stakeholders and the way the organization is managed.

### **2.2.4 Measures of Performance**

There are several ways of measuring a firm's performance, for instance, Mbithi, Mutari and Rambo (2015) opined that an organization can measure its performance using: Total output turnover, Profitability, Sales quantities and capacity utilization. Nwokah et al (2009) identify dimensions of organizational performance as financial profitability, sales volume and customer loyalty. Shukri and Mahmood (2014) identified the most effective and common performance measures to include but not limited to: market share, sales volume, company reputation, return-on-investment (ROI), profitability, and established corporate identity. For this study, performance measures are market share and customer satisfaction.

- i. Market share:** Market share is the percentage of a market accounted for by a specific entity. It may be defined as the percentage of an industry or market's total sales that is earned by a particular company over a specified time period. Market share is calculated by taking the company's sales over the period and dividing it by the total sales of the industry over the same period.



- ii. **Customer Satisfaction:** Customer satisfaction is a term frequently used to describe a measure of how products and services supplied by a company meet or surpass customer expectation. It is defined as the number of customers or percentage of total customers whose reported experience with a firm, its products, or its services (ratings), exceeds specified satisfaction goals (Farris, et al 2010).

### **2.2.5 Small and Medium Enterprises (SMEs)**

The role of small and medium-scale enterprises (SMEs) has become increasingly prominent all over the world. The SMEs sub-sector has been described as the engine of economic development of any nation (Saka et al., 2013). The term SMEs has a wide range of definitions which vary from country to country. Some of the criteria used are the number of employees, total net assets, sales, and investment level. Despite the importance of SMEs to national development, there is no unique universally accepted definition for small and medium enterprises (SMEs). To define SMEs, the World Bank uses three quantitative criteria: number of employees, total assets denominated in U.S dollars, and annual sales in U.S dollars. SMEs are categorized into three: micro, small and medium enterprises. For small businesses to be categorized as micro, small and medium enterprises, a business is expected to meet the quantitative criteria for the number of employees and at least one financial criteria.

## **2.3 Empirical Review**

Otundo (2019), examined the effect of green production on financial performance of manufacturing firms in Mombasa County, Kenya. The study was guided by two theories; resource dependence theory, and institutional theory. This study adopted a descriptive research design. The target population of this study was all the manufacturing firms in Mombasa County. The study employed purposive sampling technique by using a sample comprising of all 70 firms registered with the Kenya Association of Manufacturers as at December 2017. Primary data in this study was collected using a semi-structured questionnaire that was administered using drop and pick later method. The completed questionnaires were first edited for consistency and completeness before processing responses. After data cleaning, data was coded, entered into the computer for analysis. Data was analyzed using SPSS. The data was analyzed and presented using descriptive statistics such as means and percentages, frequency counts, and standard deviations. Out of the 70 questionnaires given to the field, 60 of them were filled and return making the return rate to be 85.7%. Also, majority (70%) of the firms have been in operation between five to ten years, followed by those that have been in operation for over ten years (20%) and finally those who have operated for less than five years came last at 10%. Equally, all the firms (100%) were registered with the various environmental management bodies before carrying out their activities. Further, majority of the firms: (80%) had a well outlined environmental protection policy; (70%) had environmental management department; and (91.7%) indicated that firms were ISO 14001 Certified. In relation to green operation strategies, the trend indicates that majority of the respondents (97%) have heard of green operation strategies in their firms. In relation to design for use of raw materials, use of recyclable materials is the most implemented green production practice as indicated by a mean of 4.34. In relation to design for manufacture, the most prevalent adopted design for manufacture or production is alternative production techniques (4.32), followed by Low generation of waste (4.12), Low/clean energy consumption (4.01), fewer production processes (3.78) etc. As per the issue of design for product use, no energy/auxiliary material use practice of

design for product use was the most adopted by firms (3.929), followed by Clean energy source practice (3.898), Clean consumables during use (3.762), Low energy consumption (3.712) etc. In relation to firms' performance, the firms that had adopted green manufacturing concepts had their financial performance components improved. The most improved financial component was earnings before interest and tax with a mean score of 4.471. This was followed by: return on sales (4.327), return on investment (4.215), sales growth (4.112), profitability (4.061), and finally return on equity (3.904).

Sihemeje *et al.* (2020), evaluated the effect of green production practices on the continued survival of agro-allied businesses in Nigeria. This study was carried on 306 owners and managers of Agro-Allied small businesses within the study area. The primary and secondary data were respectively collected using questionnaire and literature and were statistically analysed. A null hypothesis was formulated that was tested using the Z-test statistical tool and the SPSS package. The findings revealed that green agricultural production would significantly affect the continued survival of agro-allied businesses in Nigeria. The study concluded that despite notable changes in legislation and regulations to protect the environment, Nigeria and various other countries are constrained with unprecedented environmental problems arising from climate change and established that environmental problems can only be solved through technological advancement by the input of ecopreneurship.

### **3.0 METHODOLOGY**

This study utilized the survey research design, the study area is North Central Nigeria, comprising of Benue State, Kogi State, Kwara State, Nasarawa State, Niger State, Plateau State and the Federal Capital Territory. The population of the study was 1,784 with a sample size of 327 generated scientifically using Yamen's Formula. The study made use of questionnaire with a validity and reliability index of .802. The model employed for this study is multiple regression analysis model which involves the independent variable (green production), and the dependent variable (performance). Therefore the following model specifications to test the formulated hypotheses are as follows:

The model for this research is given as

Perf = (GPR) = (GEP, GPS, GEU, GEM)

Where

Perf = Performance

GEP = Green Product

GPS= Green Process

GEU= Green Use

GEM = Green End-of-Life Management

The regression model, thus is given as

Perf =  $x + \beta_1 \text{GEP} + \beta_2 \text{GPS} + \beta_3 \text{GEU} + \beta_4 \text{GEM} + e \dots\dots\dots (1)$

Where

$x$  = Intercept of the regression

$\beta_1 - \beta_4$  = parameter estimates

$e$  = error term

Descriptive and inferential statistics were used to analyze data to evaluating the effect among the variables. Inferential statistics that was used is regression analysis, to analyze data in order to determine the effect of green production on the performance of small and medium enterprises in

North Central Nigeria. The hypotheses formulated for this study were tested using student t-statistics generated from the regression model. The level of significance for the study is 5%, for a two-tailed test. The decision rule was that we accept the null hypothesis if the critical/t-value ( $\pm 1.96$ ) is greater than the calculated value, otherwise, we reject the null hypothesis. That is, using the student t-test (t-statistic), we say that a variable is statistically significant if  $t^*$  (t-calculated) is greater than the tabulated value of  $\pm 1.96$  under 95% (or 5%) confidence levels and it was statistically insignificant if the  $t^*$  is less than the tabulated value of  $\pm 1.96$  under 95 % (or 5%) confidence levels.

## **4.0 RESULTS AND DISCUSSION**

This section composed of data analysis, test of hypotheses and discussion of findings based on the objectives of the study, the corresponding research questions and hypotheses that guided the study.

### **4.1 Data Presentation**

In other to have the 327 return rate of the questionnaire were distributed to respondents in the manufacturing small and medium enterprises chosen for this study, out of which three hundred and twenty seven (327), were successfully filled and returned in analyzable form, recording a 100.0 % return rate.

#### **4.1.1 Descriptive Statistics Analysis**

The result in Table 1 shows predictors of the dependent and independent variables. The mean and standard deviation show the level of agreement of the respondents with the questions. For green product it has the mean and standard deviation values as (M=3.53, SD=0.630); green process has mean value of 3.62 and standard deviation =0.720; green use (M=3.52, SD=0.736); green end-of-life management (M=3.60, SD=0.611), and performance (M=3.61, SD=0.688) indicating that there is improvement in the performance of small and medium enterprises in North Central Nigeria.

**Table 1: Descriptive Statistics Analysis**

<b>Variable</b>	<b>Mean</b>	<b>Standard Deviation</b>
Green product	3.53	.720
Green process	3.62	.630
Green use	3.52	.726
Green management	3.60	.688
Performance	3.61	.611

**Source:** Authors' Computation from SPSS Output, 2023

#### **4.1.2 Regression Analysis**

The model used to test the hypotheses designed for this study, explores the effect of green production on the performance of small and medium enterprises in North Central Nigeria.

The result of the model summary in Table 2 explains the relationship between the dependent variable and the independent variables and the goodness of fit in the model in terms of R-value and R square. The R<sup>2</sup> value of 0.578 entailing that 57.8% of SMEs performance was explained by predictor variables which include green product, green process, green use, green end-of-life management. The remaining 42.2% is explained by other factors not included in this study. The value of R (.760) indicates that there is a strong relationship between the variables.



**Table 2: Model Summary**

Model	R	R Square	Adj.R Square	Std. Error of Estimate	Durbin Watson
1	.760 <sup>a</sup>	.578	.570	.451	1.832

a: Predictors (constant), green product, green process, green use, green end-life-of management

b. Dependent variable: Performance

**Source:** SPSS printout (Version 25.0 for windows output), 2023

The result of the Analysis of Variance (ANOVA) in Table 3 describes the effect of the independent variables on the dependent variable since the F value was more than 4 and significance level is less than 0.05 (F=107.408; Sig=0.000).

**Table 3: ANOVA<sup>b</sup> for the overall significance of the model**

Model	Sum of squares	Df	Mean square	F	Sig
Regression	255.460	4	63.865	107.408	.000 <sup>b</sup>
Residual	190.867	321	0.5946		
Total	446.327	325			

a: Predictors (constant), green product, green process, green use, green life of management

b. Dependent variable: Performance

**Source:** SPSS printout (Version 25.0 for windows output), 2023

The result presented in Table 4 shows that taking all other independent variables at zero, a unit change in green product would lead to a 20.0% increase in SMEs performance; a unit increase green process would lead to 45.8 % change SMEs performance while a unit change in green use affects SMEs performance by 19.2%. Furthermore, a unit change in green life management would affect SMEs performance by 17.5%. The result implies that green process has significant effect on the performance of small and medium enterprises in North Central Nigeria.

**Table 4: Regression Coefficient Result**

Model	Beta	T	Sig
1 (Constant)	1.099	1.181	.000
Green product	.200	3.377	.001
Green process	.458	8.159	.020
Green use	.192	1.489	.000
Green mgt	.175	3.050	.012

Dependent variable: Performance

**Source:** SPSS regression print out (version 25.0 for windows output), 2023.

## **4.2 Test of Hypotheses and Discussion of Findings**

The test of hypothesis one states that green product has no significant effect on the performance of small and medium enterprises in North Central Nigeria. Regression analysis was used in testing the hypothesis at 0.05 level of significance and the significance level was less than 0.05 ( $\beta = .200$ ;  $p = .001$ ), hence the null hypothesis was rejected and we conclude that there is significant effect of green product has no significant effect on the performance of small and medium enterprises in North Central Nigeria. The findings of this study is in agreement with that of Lin (2013), that green product innovation protects the natural environment and makes contributions to environmental benefits more than competitive products. Since, environmental concerns has become more important in the business world, green product innovation has been crucial among manufacturing companies. Many companies make investments in sustainability initiatives for risk mitigation, cost savings, and revenue generation (Dangelico *et al.*, 2017).

The result of the second hypothesis indicates that there is significant effect of green process has no significant effect on the performance of small and medium enterprises in North Central Nigeria. ( $\beta = .458$ ;  $p = .020$ ), hence the null hypotheses which states that green process has no significant effect on the performance of small and medium enterprises in North Central Nigeria was rejected. The findings of this study is in tandem with that of Dai and Zhang, (2017), whose study revealed that green process innovation focuses on processes for saving energy during manufacturing and other processes. The findings also corroborated that of Karabulut (2019), who posit that green process innovation highlights ability of companies to enhance current processes and develop new processes for saving energy, preventing pollution, leaving less toxicity and recycling waste in innovation processes.

Hypothesis three test whether there is a significant effect green use has no significant effect on the performance of small and medium enterprises in North Central Nigeria and the result was as follows:  $\beta = .192$ ;  $p = .000$ , hence the null hypothesis was accepted. This implies that green use has a significant effect on the performance of small and medium enterprises in North Central Nigeria. The findings are in line with Seliger, Kim *et al.* (2008), whose study found that, green use helps in minimizing emissions, waste and energy consumption associated with the product in use. This is usually achieved by changing the design of the product and implementing innovative technologies, as in the case of low-emission diesel vehicles or of the hybrid petrolelectric cars released by Toyota, Nissan and Lexus (Dills & Stone, 2007; Jovane *et al.*, 2008).

Finally, the test of hypothesis four indicated a significant effect of green end-of-life management has a significant effect on the performance of small and medium enterprises in North Central Nigeria. ( $\beta = .175$ ;  $p = .003$ ). The null hypothesis was thus rejected. The findings are in tandem with those of Kleindorfer *et al.* (2005); Corbett & Klassen (2006), reverse supply chains include used-product acquisition, reverse logistics (moving end-of life products to reprocessing facilities), inspection and disposition (determining whether to repair, remanufacture, use of spare parts, or recycle), remanufacturing and recycling. Therefore, waste management strategies increasingly involve delivery of products that can be easily reused and recycled at the end of the useful life (Rahimifard & Clegg, 2007).

## **5.0 CONCLUSION AND RECOMMENDATIONS**

### **3.1 Conclusion**

Based on the findings of this study, it is concluded that the use of green products, green processes and operations, green use and green end-of-life management has improved the performance of Manufacturing Small and Medium Enterprises in North Central Nigeria and manufacturing SMEs will gain competitive advantage when they implement green production since it leads to quality improvement, increased flexibility and speed. Therefore, green production has a positive and significant effect on the performance of manufacturing small and medium enterprises in North Central Nigeria.

### **5.2 Recommendations**

- i. Managers of manufacturing small and medium enterprises should integrate green product so as to protect the natural environment and makes contributions to environmental benefits more than competitive products. Since, environmental concerns has become more important in the business world, green product has been crucial among manufacturing companies in order to achieve improved performance in their market share and customer satisfaction.
- ii. Managers of manufacturing small and medium enterprises should implement green process in the operations of their firms since it highlights ability of companies to enhance current processes and develop new processes for saving energy, preventing pollution, leaving less toxicity and recycling waste in innovation processes so as to enhance their performance through market share and customer satisfaction.
- iii. Managers of manufacturing small and medium enterprises should green use since it is used in reducing the negative impact associated to and be much concerned with minimising emissions, waste and energy consumption associated with the product in use. This is usually achieved by changing the design of the product and implementing innovative technologies.
- iv. Managers of manufacturing small and medium enterprises should commit to long-term investment on green end-of-life management since it is the least employed green production practice. This can be done if the government and other regulating institutions should come up with policies that encourage manufacturing firms to implement green end-of-life management practice as practiced green production concept through enhanced performance.

### **5.3 Scope and Limitations of the Study**

The primary focus of research is to examine the effect of green production on the Performance of manufacturing small and medium enterprises within North Central Nigeria. This study covers the operations of the selected manufacturing small and medium enterprises within North Central Nigeria with two green production variables (green product, green process, green use and green end-of-life management) and performance variable (market share, customer satisfaction). This study was limited by the fact that some respondents deemed the information required as confidential and no survey policy. Most of the respondents were reluctant to corporate. The study focused on manufacturing SMEs in North Central Nigeria, which is a narrow area of focus thus

did not capture the views of a wider population spread all over Nigeria as a country. The study was only focused on green manufacturing concepts and their effect on performance (market share and customer satisfaction), thus did not take into account other variables that affect performance.

#### **5.4 Practical Implications**

The results of this study have important practical consequences for managers. Precisely, the implications of the results to the practice is that green innovation is a worthwhile strategy to which the management should be committed to gain sustainable competitive advantage, as well as to improve business performance in a competitive industry with a changing dynamic marketing environment. In addition, this study will also help SMEs owners and managers of SMEs operating within the manufacturing sector to identify the necessary green innovation practices that will give them a sustainable competitive advantage, as well as enhance their business performance. Manufacturing companies explicitly provide access, improve their profitability and have a competitive advantage over companies that do not care for the environment, which develop new and improved products and services with environmental inputs in mind.

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