Environmental commitment and environmental sustainability practices of manufacturing small and medium enterprises in Uganda

Kasimu Sendawula
Department of Marketing and Management, Makerere University, Kampala, Uganda

Vincent Bagire
Faculty of Graduate Studies and Research, Makerere University Business School, Kampala, Uganda, and

Cathy Ikiror Mbidde and Peter Turyakira
Department of Marketing and Management, Makerere University, Kampala, Uganda

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Abstract

Purpose – This study aims to examine the relationship between environmental commitment and environmental sustainability practices of manufacturing small and medium enterprises (SMEs) in Uganda.

Design/methodology/approach – This study employed a cross-sectional and correlational design using evidence from 106 manufacturing SMEs in Uganda. Data was analyzed through Statistical Package for Social Sciences Version 23.

Findings – Results show that environmental commitment is a significant predictor of environmental sustainability practices and its dimensions which comprise of eco-friendly packaging, energy efficiency, waste management and water conservation of the manufacturing SMEs in Uganda.

Originality/value – This study offers initial evidence on the association between environmental commitment and environmental sustainability practices using evidence from a developing country's perspective. The results also provide new insights on the relationship between environmental commitment and the dimensions of environmental sustainability practices which comprise of eco-friendly packaging, energy efficiency, waste management and water conservation.

Keywords Environmental sustainability practices, Eco-friendly packaging, Energy efficiency, Waste management, Water conservation, Environmental commitment

Paper type Research paper

1. Introduction

In this paper, we report the results of a study carried to establish the relationship between environmental commitment and environmental sustainability practices with its dimensions

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that are eco-friendly packaging, energy efficiency, waste management and water conservation of manufacturing small and medium enterprises (SMEs). This study was motivated by the increasing global environmental concerns. For example, the World Meteorological Organization declared 2015 as a year in human history when the atmospheric carbon dioxide levels reached 400 parts per million, thereby marking the beginning of a new climate era (World Meteorological Organization, 2019). As a result, temperatures increased from 0.007°C per annum in 1900–1950 to 0.025°C in 1998–2016 (World Meteorological Organization, 2019). On the African continent, degradation of the atmosphere is more detrimental than on any other continent (Omisore, 2018) where 20% of the Africans are expected to be at a risk of hunger by 2050 because of deterioration of the natural environment. Subsequently, environmental issues are projected to result into cumulative gross domestic product (GDP) loss of about 4.7% of the continent worthy US$40bn per year by 2050 (Muzima and Mazivila, 2018).

In sub-Saharan Africa, particularly Uganda, most of the manufacturing SMEs continue to use firewood and charcoal as fuel (Okurut, 2018), polythene bags and plastic bottles as packaging materials (Josephat, 2018) and poorly disposing toxic wastes in residential areas, drainage channels and water sources (Komakech, 2014). This has resulted into floods, outbreak of diseases such as Cholera, Malaria and Typhoid leading to loss of lives and property [National Environment Management Authority (NEMA), 2019; Josephat, 2018]. A million dollar question is, "What catalyzes environmental sustainability practices in developing countries?" It is a challenge that scholars and policymakers often seek to overcome.

Environmental sustainability practices are the actions and methods that have a net positive impact on the natural environment (Alhaddi, 2015). This eventually catalyzes economic development without damaging the natural environment (Baden and Prasad, 2016). It is therefore important for SMEs to undertake environmental sustainability practices, as they are the engine of growth for Uganda's economic development. Specifically, SMEs generate 77% of the formal jobs, contribute 80% of the GDP, fund 60% of all investments and provide more than 80% of government domestic revenue (Namagembe *et al.*, 2019).

In promoting environmental sustainability practices among manufacturing SMEs, the stakeholders' theory suggests that businesses should operate in a way that conserves the environment. This is because the environment provides key resources such as raw materials, energy, water, labor and customers needed to sustain business operations (Freeman, 1984; Parmar *et al.*, 2010). The implication is that businesses should prioritize environmental protection by undertaking environmental sustainability practices (Orts and Strudler, 2002) which can be achieved if business managers are environmentally committed (Chang *et al.*, 2015; Lindblom and Ohlsson, 2011). Environmental commitment enables managers to develop a positive and supportive attitude towards environmental sustainability practices (Amponsah-Tawiah and Mensah, 2016).

To this end, the relevance of environmental commitment in predicting environmental sustainable practices is well documented in existing empirical studies (*see*; Guo *et al.*, 2019; Yu *et al.*, 2019; Castro-Casal *et al.*, 2019). However, scholars such as Yu *et al.* (2019), Sendawula *et al.* (2018) based their findings on university students using the connectedness and action regulation theory. Additionally, extant literature investigated sustainability generally (Berno, 2017; Shahedul Quader *et al.*, 2016), and there seems to be no study that has examined the association between environmental commitment and each dimension of environmental sustainability practices which are eco-friendly packaging, energy efficiency, waste management and water conservation. We differ from extant studies by focusing on environmental sustainability practices that are vital in conserving the natural environment

if they are well appreciated by SMEs. We also determined the association between environmental commitment and environmental sustainability practices as a global variable and then established the relationship between environmental commitment and eco-friendly packaging, energy efficiency, waste management and water conservation using the stakeholders' theory with a sample of 106 manufacturing SMEs. The findings indicate that environmental commitment explains 19.7% of the variance in environment sustainability practices of manufacturing SMEs in Uganda. Our results also demonstrate that environmental commitment predicts 6.4%, 4.8%, 18% and 14.1% of the changes in eco-friendly packaging, energy efficiency, waste management and water conservation of the manufacturing SMEs, respectively.

The rest of the paper presents literature review, description of the research methodology, study results, discussion, conclusion, implications and suggestions for future research.

2. Literature review

2.1 Theoretical foundation

The stakeholders' theory emerged from the stockholders' theory by Friedman (1970), who argued that the sole responsibility of the firm is to increase its profits or share values. He claims that companies are bound to look out for their stockholders' best interests. Friedman disregards the interests of other stakeholders as advanced by Freeman (1984), who postulates that doing business requires value which needs to be shared among the business stakeholders. Specifically, some stakeholders such as the government, the society and other civil society organization cherish environmental conservation. Thus, businesses are expected to have a net positive impact on the environment. This is achieved when a business undertakes environmental sustainability practices that are eco-friendly packaging, energy efficiency, waste management and water conservation.

Freeman *et al.* (2010) point out that undertaking environmental practices enables businesses sustainably access resources such as raw materials, energy, water, labor and customers needed to ensure business continuity. This implies that businesses should prioritize environmental protection by undertaking environmental sustainability practices (Harrison *et al.*, 2015; Amarah and Langston, 2017). This is because environmental degradation has not only affected governments through incurring endless expenses (Muzima and Mazivila, 2018) but also the general society that has been affected by its consequences such as floods, outbreak of diseases such as Cholera, Malaria and Typhoid leading to loss of lives and property (National Environment Management Authority [NEMA], 2019; Josephat, 2018).

In addressing environmental issues, stakeholders' theory suggests the need for businesses to be environmentally committed (Chang *et al.*, 2015; Lindblom *and* Ohlsson, 2011). Environmental commitment presents the willingness and readiness of businesses to support environmental sustainability practices. The authors further indicate that business managers' environmental commitment enables them to respect and comply with environmental regulations, laws and principles as enacted and implemented by the government through its agencies.

2.2 Environmental sustainability practices

Scholars have conceptualized environmental sustainability practices as Ecopreneurship (Kirkwood *et al.*, 2017), environmental/ecological entrepreneurship (Dixon and Clifford, 2007), green entrepreneurship (Schaltegger, 2005) and green initiatives (Yacob *et al.*, 2019). As such, the concept has been viewed differently. The current study defines environmental sustainability practices as adoption of actions and methods that have a net positive impact

on the natural environment (Alhaddi, 2015). Adoption of environmental sustainability practices minimizes carbon-dioxide emissions, environmental footprint, promotes re-use of materials, appropriate usage of scarce natural resources and minimizes consumption of hazardous products (Gallego-Alvarez *et al.*, 2014). Cantele and Zardini (2018) also add that these practices enable businesses to attain competitive advantage through customer retention, brand reputation, financial performance, employee motivation, management of risks and getting market opportunities. Given the relevance of environmental conservation, Shahedul Quader *et al.* (2016) noted that SMEs have started to appreciate their responsibilities of protecting the environment. We operationalized environmental sustainability practices in terms of eco-friendly packaging, energy efficiency, waste management and water conservation (Ahmad, 2016; Hoogendoorn *et al.*, 2015).

2.3 Environmental commitment and environmental sustainability practices

Environmental commitment depicts the methods, tasks, principles, and standards implemented by a business to minimize its negative impacts on the natural environment (Colwell and Joshi, 2013). Environmental commitment also pertains to the ability of a business to frequently improve its operations to achieve the highest standards of environmental sustainability (Gavronski *et al.*, 2011). Amponsah-Tawiah and Mensah (2016) further presented that environmental commitment shows the extent to which a business' top management depicts a positive and supportive attitude towards environmental conservation. Commitment to the environment shows what a business is exactly doing to safeguard the environment (Nath and Ramanathan, 2016). In the context of the manufacturing SMEs, environmental commitment is mainly championed by the entrepreneurs who at times double as managers (Colwell and Joshi, 2013). Thus, this study defines environmental commitment as the degree to which manufacturing owner-managers are dedicated and willing to support practices that conserve and protect the natural environment.

According to Chen *et al.* (2015), business managers with a strong environmental commitment demonstrate higher chances of adopting environmental sustainability practices. Yusliza *et al.* (2019) also confirmed that environmental commitment is vital in ensuring that business goals on environmental sustainability are realized. Commitment to the conservation and protection of the environment is positively related to undertaking environmental sustainability practices (Liu *et al.*, 2018).

Environmental commitment further enables business managers to develop business goals and values that are environmentally friendly (Tilleman, 2012). This translates into business managers developing a feel of obligation and responsibility to the conservation of the natural environment (Benjamin and David, 2012). Therefore, business managers who consider environmental protection as their responsibility usually feel that they should undertake practices such as eco-friendly packaging, energy efficiency, waste management and water conservation that safeguard the natural environmental (Yu *et al.*, 2019). Relatedly, Benjamin and David (2012), Tilleman (2012) argued that business managers that are environmentally committed usually realize the need to undertake green practices because of the monetary or non-monetary benefits associated with their implementations. Thus, if the benefits outweigh the costs, business managers have a high chance of incorporating environmental sustainability practices in their businesses (Benjamin and David, 2012; Castro-Casal *et al.*, 2019). Sendawula *et al.* (2018) also noted that lack of commitment by the business owner-managers undermines their efforts to undertake green goals and values that have potential to conserve the natural environment. Based on the foregoing discussion, it can be hypothesized as follows:

H1. There is a significant relationship between environmental commitment and environmental sustainability practices of the manufacturing SMEs in Uganda.

Environmental sustainability practices is a multidimensional variable; each of its dimensions that is eco-friendly packaging, energy efficiency, waste management and water conservation (Ahmad, 2016; Hoogendoorn *et al.*, 2015) can be predicted by environmental commitment of the manufacturing SMEs.

2.4 Environmental commitment and eco-friendly packaging

Eco-friendly packaging has attracted attention of consumers, entrepreneurs and policymakers across the globe. Concepts such as sustainable packaging, environmental friendly packaging, green and nature friendly packaging, as well as eco-packaging are used by scholars to explain eco-friendly packaging (Nguyen *et al.*, 2020; Abdul-Rashid *et al.*, 2017). Hong *et al.* (2019) conceptualized eco-friendly packaging as use of a packaging material that is not harmful to the natural environment.

The widely recognized description of eco-friendly packaging is presented by the Sustainable Packaging Coalition (2011) as use of a packaging material that is:

> [. . .] beneficial, safe and healthy for individuals and communities throughout its life cycle; meets market criteria for performance and cost; is sourced, manufactured, transported, and recycled using renewable energy; maximizes the use of renewable or recycled source materials; is manufactured using clean production technologies and best practices; is made from materials healthy in all probable end of life scenarios; is physically designed to optimize materials and energy; and is effectively recovered and utilized in biological and/or industrial cradle-to-cradle cycles.

Nguyen *et al.* (2020) add that these packaging materials are recyclable, reusable, biodegradable and are made from post-consumer recycled material.

Extant literature indicates that environmental commitment fosters usage of eco-packing. Accordingly, Chin *et al.* (2015) revealed that commitment of entrepreneurs facilitates adoption of packaging materials that are safe for people and the environment such as paper, cloth and Nylon. This is consistent with Salimzadeh and Courvisanos (2015) who reported that SME managers' values and attitude make them committed to use eco-friendly packaging in their effort to foster sustainable development in Austria. We then hypothesize the following:

H2. There is a significant relationship between environmental commitment and eco-friendly packaging of the manufacturing SMEs in Uganda.

2.5 Environmental commitment and energy efficiency

The increased levels of carbon emissions and depletion of natural resources, especially forests, have made the adoption of energy efficiency a vital practice among businesses across the globe. Energy efficiency is the decrease in the amount of energy used (Brunke *et al.*, 2014). It also pertains the use of technology and systems that minimize the amount of energy such as electricity, solar, charcoal, biogas, firewood and gas used in the business (Santo *et al.*, 2015). It is therefore important for entrepreneurs to incorporate energy efficient systems and procedures in the operations of their businesses to reduce manufacturing costs, maximize productivity and ultimately attain competitive advantage (Koseleva and Ropaite, 2017).

Scholars such as Cantor *et al.* (2013) reported that commitment levels of a person in charge of green practices affect the probability of a business' uptake of energy efficiency practices. This is not surprising in the context of the SMEs because owners double as managers and thus being responsible to make and support implementation of business decisions. Hence, their commitment to environmental conservation makes it vital in supporting and implementing energy efficiency activities in their businesses. This is in line with Bunse *et al.* (2011) who indicated that commitment, increasing energy prices, stringent environmental laws and changing customer purchasing behavior with concerns to green and energy conservation products and services are the driving factors for adopting and integrating energy efficiency practices in businesses.

Specifically, environmental commitment enables business managers to achieve energy efficiency through energy management, energy technology and energy regulations (Abdelaziz *et al.*, 2011). Environmental commitment further facilitates development of plans for purchasing energy-efficient tools and equipment, use of energy efficient bulbs, encouraging employees to turn off lights and equipment when not in use, increasing the use of renewable sources of energy such as solar, conducting energy-saving training for employees and employing an energy-saving officer to promote good energy practices for the business (Chin *et al.*, 2015). However, lack of initiation, commitment, knowledge, skills, experience and resource constraints limit the ability of manufacturing SMEs from undertaking energy efficient procedures (Thollander *et al.*, 2013). Basing on the foregoing discussion, we hypothesize the following:

H3. There is a significant relationship between environmental commitment and energy efficiency of the manufacturing SMEs in Uganda.

2.6 Environmental commitment and waste management

Waste management is another environmental sustainability practice and this promotes effective and efficient disposal of wastes generated from business operations (Adogu *et al.*, 2015). In developing countries such as Uganda, common wastes generated from manufacturing businesses include plastic bottles, polythene bags, papers and metals. Poor waste management negatively affects the environment in form of pollution and blockage of the drainage systems and water sources. This results into floods, loss of property, animals and human beings (Sang *et al.*, 2015; Komakech, 2014).

Extant literature indicates that environmental commitment of the business managers is vital in achieving proper waste management. This is in agreement with Aryampa *et al.* (2019) who demonstrated that business managers who are environmentally committed develop effective waste management plans that facilitate waste prevention, re-use, recycling, recovery and disposal as appropriate strategies to foster proper waste management and conservation of the natural environment. Similarly, in their study of benchmarking green practices of the manufacturing industries, Sangwan and Choudhary (2018) reported that commitment of top management affects the success of green manufacturing practices, especially waste management of the Indian manufacturers. However, Mittal and Sangwan (2014) noted that absence of management commitment is one of the barriers to undertaking proper waste management actions. On the basis of the foregoing discussion, we hypothesize the following:

H4. There is a significant relationship between environmental commitment and waste management of the manufacturing SMEs in Uganda.

2.7 Environmental commitment and water conservation

Water conservation involves the appropriate use of water resources in business operations (Han and Hyun, 2018). Water is one of the most important inputs needed by manufacturing businesses to carry out their operations. Therefore, water conservation is vital if SMEs are to register high performance and foster environmental conservation. Warner *et al.* (2018) noted that careful conservation of water resource enables SMEs to minimize water wastage and overall reduction in the cost of doing business. The authors also indicated that business can promote water conservation through rain water collection, water reuse, micro, drip and sub irrigation, soil moisture sensors, climate-based irrigation and irrigation audits. Yacob *et al.* (2019) further noted that manufacturing SMEs enhance water conservation through re-use of water in production process, setting measurable targets in reducing water usage, applying effective strategies in improving water conservation, installing water-efficient devices to control water usage, regularly monitoring the trends in water usage and ensuring that activities minimize the amount of effluent to water.

Existing literature shows that managers who are committed can motivate their employees to undertake water conservation practices (Ahorbo, 2014). This is consistent with Erdogan *et al.* (2015) who revealed that management commitment moderates the relationship between organizational support and the environment. This suggests that commitment of the business-managers makes their businesses support activities such as water conservation that has a net positive impact on the environment. In view of the foregoing discussion; we hypothesize the following:

H5. There is a significant relationship between environmental commitment and water conservation of the manufacturing SMEs in Uganda.

3. Methodology

3.1 Research design, population and sample

This study is cross-sectional and correlational. A cross-sectional design was used due its cost effectiveness and flexibility (Spector, 2019). A sample of 242 manufacturing SMEs was drawn from a population of 642 businesses registered with Uganda Manufacturers' Association that are operating from Kampala. This was determined by using Krejcie and Morgan's (1970) sampling table. Businesses in Kampala were sampled, as the district has the highest concentration of business activities in Uganda (UBOS, 2016). Simple random sampling was used to select businesses and then a lottery approach was adopted to pick the final respondents. The unit of inquiry was the business managers. Data of 106 managers (about 44% response rate) was obtained from primary sources using a self-administered questionnaire. A 44% response rate is acceptable given the current situation that is characterized by the fear caused by the outbreak of the novel COVID-19 pandemic that has affected all activities across the globe. In environmental and sustainability performance studies, low response rates are common. For example in a study of environmental management practices and environmental performance by Yu and Ramanathan (2016), a response rate of 5.6% was achieved.

3.2 Sample characteristics

Study results in Table 1 show that a majority of the respondents were male at 65%, suggesting that more males are working in the manufacturing SMEs than their female counterparts. Regarding the age bracket of the respondents, most are in the age bracket of

No.	Item	Frequency	(%)
1	*Gender*		
	Male	69	65
	Female	37	35
2	*Age bracket*		
	18–29	29	27
	30–39	45	42
	40–49	23	22
	50–59	6	6
	60 and above	3	3
3	*Highest level of education*		
	Certificate	9	9
	Diploma	24	23
	Bachelor's degree	63	59
	Master's degree	10	9
4	*Experience in business*		
	Less than 2 years	8	8
	2–5 years	40	38
	6–10 years	41	38
$n = 106$	above 10 years	17	16

Source: Primary data

Table 1. Respondent characteristics

30–39 years and the least are in between 60 and above at 3%. This implies that manufacturing SMEs in Kampala are dominated by youth in the 30–34 age group who vigorously manage the operations of these businesses. Concerning the level of education, most of the respondents have a bachelors degree at 63% and the least have a certificate and masters degree at 9% and 10%, respectively. This shows that majority of the SME managers have the knowledge and expertise needed in fostering environmental sustainability practices in SMEs. For experience in business, majority have experience of 6–10 years at 38% and the least with less than 2 years' of experience in business at 8%, signifying that SME managers have enough experience that is fundamental in embracing practices that have a net positive effect on the natural environment.

3.3 Measures and the questionnaire

We used a self-administered questionnaire to collect data, which was anchored on a five-point Likert scale ranging from strongly disagree to strongly agree. Environmental sustainability practices was measured in terms of eco-friendly packaging, energy efficiency, waste management and water conservation (Magnier and Crié, 2015; Yacob *et al.*, 2019) and environmental commitment was measured as a unidimensional variable (Digalwar *et al.*, 2013; Nath and Ramanathan, 2016; Xing *et al.*, 2019).

We also control for legal status and firm age since according to Bartov *et al.* (2000), failure to control for confounding factors may lead to rejecting hypothesize when in fact they would have been accepted. Controlling for confounding factors helps to eliminate the noise in the model.

3.4 Validity and reliability

To establish the validity and reliability of the data collection instrument, we used exploratory factor analysis, Cronbach's alpha coefficient and content validity index (CVI).

The calculated CVI was 0.92 and 0.77 for environmental commitment and environmental sustainability practices, respectively, indicating that the instrument was valid; while, Cronbach's alpha values of 0.91 and 0.823 environmental commitment and environmental sustainability practices are above the recommended cutoff of 0.7 (Nunnally, 1978). Furthermore, exploratory factor analysis was adopted to reduce the data to a manageable size as presented in Tables 2 and 3.

4. Study findings

4.1 Descriptive statistics

Descriptive statistics for our study variables are presented in Table 4. Concerning environmental sustainability practices as the dependent variable, we note that the mean is 3.61 and the standard deviation is 0.46. The mean and standard deviation for environmental commitment is 3.29 and 0.86, respectively. We also note the mean for eco-friendly packaging, energy efficiency, waste management and water conservation is 3.5531, 3.8491, 3.6689, 3.3573 and the standard deviations on the other hand are 0.73859, 0.54737, 0.63356 and 0.71411, respectively. According to Field (2009), mean values indicate the summary of the data and standard deviations present the extent to which the mean values represent the data. This is intended to establish whether the statistical mean values fit the observed data well (Field, 2009). As such, results indicate that standard deviations are small as compared to mean values for all study variables, implying that the calculated mean values strongly reflect the observed results (Field, 2009).

4.2 Correlational analysis results

Pearson correlation coefficients are presented in Table 5. Study results show that there is a significant positive association between environmental commitment and environmental sustainability practices of SMEs ($r = 0.454^{**}$, $p < 0.01$). This indicates that a positive change in environmental commitment brings about a positive change in environmental sustainability practices of the SMEs and thus *H1* which states that there is a significant relationship between environmental commitment and environmental sustainability practices of the manufacturing SMEs is preliminarily supported.

Study results also demonstrate that there is a significant positive relationship between environmental commitment and eco-friendly packaging ($r = 0.228^{**}$, $p < 0.05$). This implies that a unit change in environmental commitment will result into 0.228 change in eco-friendly packaging. This provides preliminary support for *H2* which states that there is a significant relationship between environmental commitment and eco-friendly packaging of the manufacturing SMEs.

Results similarly indicate that there is a significant positive relationship between environmental commitment and energy efficiency ($r = 0.211^{**}$, $p < 0.05$). This suggests that a unit change in environmental commitment will result into 0.211 change in energy efficiency. This provides initial support for *H3* which states that there is a significant relationship between environmental commitment and energy efficiency of the manufacturing SMEs.

Our results further show that there is a significant positive relationship between environmental commitment and waste management ($r = 0.442^{**}$, $p < 0.01$). This implies that a unit change in environmental commitment will result into 0.442 change in waste management. This provides preliminary support for *H4* which states that there is a significant relationship between environmental commitment and waste management of the manufacturing SMEs.

Table 2. Rotated component matrix for environmental sustainability practices

Item	Component 1	2	3	4
We apply effective strategies in improving water conservation	0.681			
Our business set measurable targets to reduce water usage	0.633			
We use water-efficient devices to control water usage	0.598			
We regularly monitor trends in water usage	0.564			
We employ water-saving officer in our business	0.547			
We give our employees special training in water conservation	0.520			
Our packaging materials decompose easily		0.671		
Our packaging materials have an environmental friendly label		0.619		
Our packaging material is made from renewable resources		0.540		
Our customers are given eco-friendly packaging materials free of charge		0.534		
We use packaging materials that are safe for people's health		0.520		
We give our employees special training in waste management			0.687	
We have separate waste storage facilities			0.567	
We reward employees that promote proper waste management			0.543	
We have waste disposal containers in all business units			0.529	
We ensure that business activities minimize the amount of energy used				0.640
We encourage our staff to turn off lights and equipment when not in use				0.589
We use highly energy efficient tools and equipment				0.563
We set measurable targets for reducing energy usage in the business				0.536
Eigenvalues	5.245	2.664	2.562	2.173
% of Variance	11.447	8.877	8.531	8.335
Cumulative %	11.447	20.324	28.855	37.190
Kaiser–Meyer–Olkin Measure of Sampling Adequacy	0.613			
Bartlett's Test of Sphericity Approx. Chi-Square	1227.756			
Df	561			
Sig.	0.000			

Notes: Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 6 iterations.

Item	Component 1
We train our employees in environmental conservation practices	0.814
Our business has communicated its environmental plan to its employees and other stakeholders	0.811
We search for environmental conservation information	0.781
Our business benchmarks environmental performance with other firms	0.756
Our business has a well-developed environmental, health and safety unit	0.731
Our business' budget planning includes the concerns of environmental investment	0.721
We review environment performance in top management meetings	0.700
Our business has an insightful environmental vision, mission and core values	0.700
We reward employees that exhibit pro-environmental behaviours	0.660
Our business has a good plan for environmental conservation	0.652
Top management assumes that environment friendly product development is a way to increase profit	0.620
Top management assumes responsibility for environmental quality	0.607
Eigenvalues	6.304
% of Variance	48.495
Cumulative %	48.495
Kaiser–Meyer–Olkin Measure of Sampling Adequacy	0.883
Bartlett's Test of Sphericity Approx. Chi-Square	744.916
Df	78
Sig.	0.000

Notes: Extraction Method: Principal Component Analysis. 1 components extracted.

Table 3. Rotated component matrix for environmental commitment

Item	N	Min	Max	Mean	SD
Legal status	106	1	4	2.05	0.940
Firm age	106	1	3	2.16	0.664
Eco-friendly packaging	106	1.50	5.00	3.5531	0.73859
Energy efficiency	106	2.38	5.00	3.8491	0.54737
Waste management	106	1.50	5.00	3.6689	0.63356
Water conservation	106	1.00	4.75	3.3573	0.71411
Environmental sustainability practices	106	2.48	4.49	3.6071	0.46146
Environmental commitment	106	1.38	4.85	3.2881	0.85737
Valid N (listwise)	106				

Source: Primary data

Table 4. Descriptive characteristics

Likewise, study results demonstrate that there is a significant positive relationship between environmental commitment and water conservation ($r = 0.385^{**}$, $p < 0.01$). This suggests that a unit change in environmental commitment will result into 0.385 change in water conservation. This provides a maiden support for *H5* which states that there is a significant relationship between environmental commitment and water conservation of the manufacturing SMEs.

4.3 Regression analysis results

As the results of the correlation analysis provide preliminary support for the study hypotheses, regression has been carried out to confirm our hypotheses and to determine the

explanatory power of the independent variable on the dependent variables. We first established the predictive potential of environmental commitment on environmental sustainability practices as a global variable to confirm *H1* which states that there is a significant relationship between environmental commitment and environmental sustainability practices of the manufacturing SMEs. Regression results presented in Table 6 show that environmental commitment explains environmental sustainability practices of SMEs ($\beta = 0.430$, $p < 0.05$). Environmental commitment predicts up to 19.7% of the variance in environmental sustainability practices of SMEs. The model was statistically significant at ($P < 0.01$) and hence *H1* is confirmed.

We also used regression analysis to establish the explanatory power of environmental commitment on each dimension of environmental sustainability practices which are eco-friendly packaging materials, energy efficiency, waste management and water conservation (Ahmad, 2016; Hoogendoorn *et al.*, 2015). According to regression results presented in Table 6, environmental commitment explains eco-friendly packaging of SMEs ($\beta = 0.200$, $p < 0.05$) and predicts up to 6.4% of the variance in eco-friendly packaging of SMEs. The model was statistically significant and hence *H2* is confirmed. In addition, environmental

Item	1	2	3	4	5	6	7	8
Legal status (1)	1							
Firm age (2)	0.324**	1						
Eco-friendly packaging (3)	0.243*	0.114	1					
Energy efficiency (4)	0.185	−0.034	0.242*	1				
Waste management (5)	0.194*	0.075	0.289**	0.415**	1			
Water conservation (6)	−0.016	−0.057	0.240*	0.288**	0.462**	1		
Environmental sustainability practices (7)	0.213*	0.039	0.664**	0.647**	0.761**	0.727**	1	
Environmental commitment (8)	0.237*	0.110	0.228**	0.211**	0.442**	0.385**	0.454**	1

Table 5.
Correlational analysis results

Notes: **Correlation is significant at the 0.01 level (two-tailed); *Correlation is significant at the 0.05 level (two-tailed)

Item	Environmental sustainability practices	Eco-friendly packaging	Energy efficiency	Waste management	Water conservation
Constant	2.793	2.662	3.456	2.522	2.532
Control variables					
Legal status	0.127	0.19	0.179	0.096	−0.091
Firm age	−0.049	0.032	−0.112	−0.002	−0.073
Independent variable					
Environmental commitment	0.430**	0.200**	0.201**	0.419**	0.415**
Model summary					
R	0.469	0.301	0.274	0.451	0.407
R^2	0.22	0.091	0.075	0.204	0.166
Adjusted R^2	0.197	0.064	0.048	0.18	0.141
Model F	9.608	3.395	2.762	8.693	6.749
Durbin-Watson	1.692	1.842	1.922	1.736	1.1376

Table 6.
Regression analysis

Source: Primary data

commitment explains energy efficiency of SMEs ($\beta = 0.201$, $p < 0.05$) and predicts up to 4.8% of the variance in energy efficiency of SMEs. The model was statistically significant and hence *H3* is confirmed. Furthermore, regression results show that environmental commitment predicts waste management of SMEs ($\beta = 0.419$, $p < 0.05$) and predicts up to 18% of the variance in waste management of SMEs in Uganda. The model was statistically significant and hence *H4* is confirmed. Lastly, regression results show that environmental commitment explains water conservation of SMEs ($\beta = 0.415$, $p < 0.05$) and predicts up to 14.1% of the variance in water conservation of SMEs. The model was statistically significant and hence *H5* is confirmed. Other than the constant variables and model summary values, the rest of the figures are standardized beta coefficients.

Table 6 results reveal that all the control variables are not significant and thus our models are stable. We also test whether there are serial correlations among variables and find that there were no serial correlations, as Durbin Watson values for almost all the models is closer to 2. Field (2009) suggests that a Durbin Watson value closer to 2 is a clear indicator of absence of serial correlations.

5. Discussion

The current study findings indicate that environmental commitment significantly explains environmental sustainability practices of manufacturing SMEs. This suggests that business owner-managers should support actions, methods and practices that protect and conserve the natural environment. In addition, environmental commitment is significantly associated with eco-friendly packaging, energy efficiency, waste management and water conservation. As such, SMEs that have a good plan for environmental conservation with an insightful environmental vision, mission and core values are likely to achieve greater environmental sustainability practices than those without. More so, SMEs that include environmental investment in their budget planning and reward employees who exhibit pro-environmental behaviors are likely to foster environmental conservation.

Given that the stakeholders' theory identifies both internal and external stakeholders that have different interests, it becomes apparent that those interested in the natural environment may wish to see how SMEs are committed to conserving the environment. This study results support the stakeholders' theory since they reveal that SMEs with an environmental commitment goal achieve better environmental sustainability practices. Even when some stakeholders may not explicitly be interested in environmental issues, environmental related disasters such as climate change, global warming affect every stakeholder in one way or the other. It is therefore important that even those stakeholders that are interested in the financial position of a company begin to think that mankind needs to live in harmony with the natural environment.

Our results are in agreement with Chen *et al.* (2015) who indicated that SMEs with a strong environmental commitment demonstrate higher chances of adopting environmental sustainability practices. Yusliza *et al.* (2019) also confirmed that environmental commitment is vital in ensuring that organizational goals on environmental sustainability are realized. Liu *et al.* (2018) further demonstrated that commitment to conserve and protect the environment is positively related with undertaking environmental sustainability practices. Thus, environmental commitment enables business managers to develop business goals and values that are environmentally friendly (Tilleman, 2012). This translates into developing a feel of obligation and responsibility to the conservation of the natural environment (Benjamin and David, 2012).

Accordingly, business managers who consider environmental protection as their responsibility usually feel that they should undertake practices such as eco-friendly

packaging, energy efficiency, waste management and water conservation that have a net positive impact on the natural environment. Relatedly, Benjamin and David (2012), Tilleman (2012) argued that business managers that are environmentally committed usually realize the need to undertake green practices because of the monetary or non-monetary benefits associated with the implementations. Thus, if the benefits outweigh the costs, business managers have a high chance of incorporating environmental sustainability practices in their businesses (Benjamin and David, 2012; Castro-Casal *et al.*, 2019).

Our results also indicate that there is a significant positive relationship between environmental commitment and eco-friendly packaging of the manufacturing SMEs. This implies that a unit change in environmental commitment results into a change in eco-friendly packaging of the manufacturing SMEs. As such, when business managers assume responsibility for environmental quality, they are likely to use packaging materials that are recyclable, reusable, biodegradable and safe for people's health. Such packaging materials do not only negatively affect the natural environment but also facilitate business sustainability. This is consistent with Salimzadeh and Courvisanos (2015) who reported that SME manager's values and attitude make them committed to use eco-friendly packaging in their effort to foster sustainable development in Austria. Chin *et al.* (2015) also confirmed that commitment of entrepreneurs facilitates adoption of packaging materials that are safe for people and the environment such as paper, cloth and Nylon.

Study findings further demonstrate that there is significant positive relationship between environmental commitment and energy efficiency of the manufacturing SMEs. This suggests that a unit change in the commitment of the business owner-manager to support practices that have a net positive impact on the natural environment translates into a change in the energy efficiency of the business. Thus, when business managers communicate their energy efficiency plan to their employees and other stakeholders, it facilitates undertaking of business activities that minimize the amount of energy used, use of high energy efficient tools and equipment and regularly monitor trends in energy consumption. Employees also become responsible enough to turn off lights and equipment when not in use solely to foster energy efficiency.

Our findings are in agreement with Bunse *et al.* (2011) who indicated that commitment, increasing energy prices, stringent environmental laws and changing customer purchasing behavior with concerns to green and energy conservation products and services are the driving factors for adopting and integrating energy efficiency practices in businesses. This is also supported by Cantor *et al.* (2013) who reported that commitment levels of a person in charge of green practices affect the probability of a business' uptake of energy efficiency practices.

Our results further indicate that there is a significant positive relationship between environmental commitment and waste management of the manufacturing SMEs. This means that when business managers are environmentally committed, they will undertake proper waste management practices such as recycling of waste, separate waste storage facilities and put waste disposal containers in all business units. Such managers are also likely to give their employees special training in waste management and reward employees who promote proper waste management. This is in line with Sangwan and Choudhary (2018) who noted that commitment of top management affects the success of green manufacturing practices especially waste management of the Indian manufacturers. Aryampa *et al.* (2019) added that business managers who are environmentally committed develop effective waste management plans that facilitate waste prevention, re-use, recycling, recovery and disposal as appropriate strategies to foster proper waste management and conservation of the natural environment. However, our results are contrary to the findings of

Mittal and Sangwan (2014) who indicated that lack of commitment limits uptake of proper waste management actions.

Results further show that there is a significant positive relationship between environmental commitment and water conservation of the manufacturing SMEs. This implies that business managers who are committed to support environmental friendly practices usually search for environmental conservation information and benchmark with other firms to emulate water conservation practices that are non-existent in their businesses. Such behaviors enable them to set measurable targets to reduce water usage while employing water-efficient devices that also promote water harvesting facilities. This is in agreement with Warner *et al.* (2018) and Yacob *et al.* (2019) who noted that manufacturing SMEs which are committed promote water conservation through rain water collection, water reuse, micro, drip and sub irrigation, soil moisture sensors, climate-based irrigation and irrigation audits. Ahorbo (2014) further added that managers who are committed can motivate their employees to undertake water conservation practices.

6. Conclusion

The aim of this study was to establish the relationship between environmental commitment and environmental sustainability practices of manufacturing SMEs in Uganda. This was achieved through a questionnaire survey of 106 SMEs and the business managers were the unit inquiry. Our results indicate that environmental commitment significantly predicts environmental sustainability practices and its dimensions that are eco-friendly packaging, energy efficiency, waste management and water conservation. Results imply that when business managers are environmentally committed, uptake of environmental sustainability practices and its dimensions will become possible. This is because commitment facilitates development of plans for incorporating practices that have a net positive impact on the natural environment into business operations.

7. Implications

This study makes several contributions to academicians, policy makers and the society. The study contributes to the existing literature by presenting the initial empirical evidence on the association between environmental commitment and environmental sustainability practices and its dimensions that are eco-friendly packaging, energy efficiency, waste management and water conservation using the stakeholders' theory with evidence from Uganda's manufacturing SMEs. Among the environmental sustainability practices, environmental commitment is highly associated with waste management and water conservation as compared to eco-friendly packaging and energy efficiency. Thus, policymakers need to encourage business owner-managers to become committed and get ready to undertake practices that will foster environmental conservation such as waste management and water conservation. Additionally, policymakers should develop programmes that will enable business owner-managers to support the integration of environmental sustainability practices into the businesses as a strategy of conserving the natural environment. Lastly, the society needs to appreciate that for manufacturing SMEs to conserve the natural environment, owner-managers need to be environmentally committed.

8. Limitations and suggestions for future research

Like any other study, our study has some limitations which scholars can address in future research. Environmental commitment predicts up to 19.7% of the variance in environmental sustainability practices of SMEs. This suggests that there is need for further studies to

explore other antecedents of environmental sustainability practices. In addition, we adopted a quantitative approach and perhaps the qualitative approach could provide a comprehensive understanding of environmental sustainability practices. Future research may adopt a mixed methods approach to validate our finding. However, this study offers initial empirical evidence on the link between environmental commitment and environmental sustainability practices and its dimensions that are eco-friendly packaging, energy efficiency, waste management and water conservation using the stakeholders' theory with evidence from Uganda's manufacturing SMEs.

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Further reading

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Corresponding author

Kasimu Sendawula can be contacted at: sendawulakasimu@gmail.com