International Journal of Procurement Management

ISSN online: 1753-8440 - ISSN print: 1753-8432
https://www.inderscience.com/ijpm

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DOI: 10.1504/IJPM.2023.10055940

Article History:

Received:	28 January 2023
Last revised:	30 January 2023
Accepted:	28 February 2023
Published online:	05 April 2024

Sustainable procurement practices and sustainable performance: evidence from small and medium-sized manufacturing enterprises in an emerging economy

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Abstract: This study investigates the explanatory link between sustainable procurement practices (SPPs) and sustainable performance dimensions (SuP) [environmental (EP), social (SP), and economic (EcP) performance]. Using a structured questionnaire, valid data were collected from 180 Ghanaian food manufacturing SMEs. The IBM SPSS Statistics (v. 26) and SmartPLS 3 software were used for data processing and analysed using the partial least square-structural equation modelling (PLS-SEM) tool. This study found that SPPs (GPP, LPP, and EPP) significantly improve EP, SP and, EcP. However, LPP had no significant influence on EcP of the food manufacturing SMEs. The outcomes would also help owners/managers to improve existing sustainable procurement policies and practices to achieve SuP objectives. In this study,

generalisation of findings is limited to food manufacturing SMEs in Ghana, a developing economy, with particular focus on firms within the Accra, Kumasi and Tema metropolises. This study establishes whether the adoption of key sustainable practices (green, lean and ethics) throughout procurement processes affect the sustainable performance of food manufacturing SMEs within a developing economy notably Ghana.

Keywords: sustainable procurement practices; SPPs; green procurement; lean procurement; ethical procurement; sustainable performance; SuP.

Reference to this paper should be made as follows: Agyapong, G.K.Q., Opoku, R.K., Asiedu, A. and Frimpong, S.E. (2024) 'Sustainable procurement practices and sustainable performance: evidence from small and medium-sized manufacturing enterprises in an emerging economy', *Int. J. Procurement Management*, Vol. 20, No. 1, pp.1–32.

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1 Introduction

Globally, sustainability in manufacturing is garnering attention due to strong pressures from stakeholders (customers, government and its agencies, ethicists, researchers and practitioners) (Garbie, 2016) a situation that is driving manufacturing firms to embrace sustainable initiatives throughout their operations, including procurement (Yadav et al., 2020). Procurement is a strategic activity that accounts for over 70% of firms' total assets (Opoku et al., 2020; Nyamah et al., 2022); thus, sustainable procurement has become non-negotiable since firms seek to address sustainable performance (SuP) issues (economic [EcP], environmental [EP], and social [SP]) (Teixeira et al., 2021; Jamwal et al., 2021). Sustainable procurement practices (SPPs) are practices implemented in procurement processes to ensure the acquisition of cost-efficient, innovative and environmentally-friendly products (UN, 2020). Their adoption ensures that firms acquire healthy products today without compromising meeting the needs of future generations

SPPs, dominated by 'green' [green procurement practice (GPP)], 'lean' [lean procurement practice (LPP)] and 'ethics' [ethical procurement practice (EPP)], generally emphasise waste elimination, adoption of environmentally friendly initiatives and adherence to high ethical standards (i.e., transparency, equity, and fairness) during procurement (Alibašić, 2020; Johnson and Klassen, 2022). GPP, for instance, emphasises environmental consciousness where procurement activities have little or no environmental and human-related effects (Afum et al., 2020; Johnson and Klassen, 2022). LPP also focuses on waste elimination by reducing non-value-adding activities (Buer et al., 2018; Nath and Agrawal, 2020); while, EPP characterises adoption of high ethical standards throughout a firm's procurement cycle (Gupta et al., 2021). These studies have generally concluded that adopting sustainable practices during procurement is crucial to acquiring energy-friendly materials, ecologically safe products amid ensuring transparency while meeting ethical and environmental standards; situations which are key to overall firm survival.

Manufacturing firms, dominated by the private individuals, are not obliged to follow strict processes during procurement, but they equally need to embrace sustainable practices to minimise global sustainability pressures due to green-house gas emissions, unnecessary waste disposal, high energy consumption and unethical practices (UN, 2020). Also, to ensure smooth operations in global markets, these firms must strictly adhere to local and international standards during procurement. The UN (2020) further reported that billions of dollars are annually spent by governments in various economies, especially in advanced economies (i.e., USA, EU, and UK) to minimise the adverse effects of climate change, global warming and human health-related hazards arising from some manufacturing enterprises' reliance on unsustainable practices.

Although sustainability remains under-developed in developing economies, their manufacturing industry, dominated by food manufacturing SMEs, are gradually embracing sustainable practices to ensure smooth procurement processes (Rajendran and Sharaai, 2020; Saqib and Zhang, 2021). Food manufacturers contribute to economic development via employment (about 40%) and gross domestic product (GDP) (about 20%) (World Bank, 2021). In Ghana, a fast-growing economy, the food manufacturing industry is ranked the most valuable sub-sector contributing marginally to job creation (i.e., 15% in 2019) and GDP (i.e., 5.3 in 2020) (AGI, 2021). However, the industry, dominated by SMEs, remains less advanced with minimal value addition to agricultural produce arising from under-developed processes, poor linkages to financial and market services and poor credit rating (AGI, 2021). Also, food manufacturers continue to rely on traditional procurement methods thereby, pushing them to contribute over 65% of all greenhouse gas emissions in Ghana (UN, 2020).

During procurement, Ghana's food manufacturing firms arguably procure environmentally-unfriendly products which consequently affects their overall production activities. This could be because, these firms place less emphasis on 'green', 'lean' and 'ethical' initiatives during procurement; a situation impeding the firms' attainment of SuP. According to Baig et al. (2020), most manufacturing SMEs in developing economies perceive the adoption of sustainable practices as vague and difficult to practice. Gupta et al. (2021), therefore, revealed that poor adoption of SPPs could affect the quality of raw materials acquired, increase wastages, earn bad reputations for unethical practices and impede financial success (reduced: sales, profit margins, market share). Such firms would also incur additional costs in fighting lawsuits arising from corrupt or fraudulent procurement practices and in worst cases, lead to total shut-down.

These are clear indications that, if food manufacturers embrace sustainable practices during procurement, their SuP levels are likely to increase.

This assertion is supported by the theory of constraints (TOC) and resource-based view (RBV) theory. TOC specifically suggests that food manufacturing SMEs need to implement sustainable practices throughout their production including procurement activities to overcome any operational constraint at could inhibit attainment of SuP (Şimşit et al., 2014). It specifically supports the adoption of SPPs (GPP, LPP and EPP) if such firms are to perform sustainably. Similarly, the RBV theory suggests that food manufacturers can achieve SuP by effectively using available resources like SPPs. RBV proposes that GPP, LPP and EPP are intangible resources required to promote SuPs of food manufacturing SMEs. In line with the theories, Afum et al. (2020) and Agyabeng-Mensah et al. (2020) stressed that Ghanaian manufacturing firms can achieve SuPs if they embrace sustainable practices notably 'lean' and 'green'.

Despite recent calls for sustainable practices in procurement processes, they have not garnered the needed attention especially within the context of the food manufacturing industry. Also, studies directly linking SPPs comprising GPP, LPP and EPP with SuP dimensions (EP, EcP and SP) remain scanty. Although some researchers have focused on green and lean practices in various economies (Yadav et al., 2020; Teixeira et al., 2021) including Ghana (Afum et al., 2020, 2021; Agyabeng-Mensah et al., 2020), they investigated them at a whole (i.e., entire manufacturing activities) and not in units (i.e., procurement). Ogbu and Asuquo (2018) also stressed that ethics guides procurement activities by offering acceptable rules and standards; yet, much attention has not been given to this practice especially in procurement activities. Conclusively, Ghana like other African countries' food manufacturing SMEs can overcome their SuP challenges if they implement SPPs; however, with paucity of research on this subject, can this assertion hold? The paper, therefore, builds on existing studies to offer important theoretical insights into SPPs and SuPs within the food manufacturing sub-sector.

The remaining sections of this study is as follows: Section 2 focuses on literature review and hypotheses development; Section 3 concentrates on research methods; Section 4 focuses on the data analysis and discussion while Section 5 entails the conclusions, practical implications and suggestions for future research.

2 Literature review

2.1 Theory of constraints

The TOC was propounded by Eliyahu Goldratt in 1984 as scheduling software for simple production (Şimşit et al., 2014). TOC focuses on how firms can deal with constraints which represent anything that restricts a system from attaining expected performance levels. TOC suggests continuous improvement in a firm's manufacturing planning and control systems to limit the threats of constraints (Cox and Boyd, 2020). It suggests clear processes and practices for addressing any constraint until it ceases to exist. Precisely, TOC proposes that food manufacturing SMEs are exposed to various constraints throughout procurement processes which can be addressed to attain SuPs if proper practices including SPPs are implemented.

2.2 RBV theory

RBV theory originated from Penrose's study in 1959 to explain how unique tangible and intangible resources assist organisations to achieve sustainable competitive advantages (Lockett et al., 2009). While Penrose's earlier work viewed firms as bundles of idiosyncratic resources, developments on RBV have directed attention towards the nature of resources and their positioning that might create barriers and economic rents for competitors. The theory induces firms to achieve competitiveness by prudently utilising available resources. As such, sustainable practices such as green, ethical and lean are vital intangible resources that could be adopted by food manufacturing SMEs throughout their procurement processes if they aim to attain SuP. Firms that emphasise SuP (EP, SP, and EcP) need to adopt these SPPs as key intangible resources.

2.3 Sustainable procurement practices

Sustainable procurement focuses on acquiring products and services with little or no adverse effects on the environment amid attaining positive social and financial outcomes (United Nations Development Programme, 2020). SPPs are the various practices adopted to ensure that procurement activities are devoid of environmental defects, ensure social welfare of stakeholders without compromising economic outcomes (Islam et al., 2017; Muhmad and Muhamad, 2021). SPPs are incorporated into procurement activities to stimulate innovation and promote transparency standards. SPPs specifically emphasis waste minimisation, inclusion of 'green' initiatives (i.e., environmental consciousness) without compromising high ethical standards. SPPs include GPP, EPP and LPP which are key to achieving sustainability goals during procurement (Islam et al., 2017; Nath and Agrawal, 2020).

2.3.1 Green procurement practice

GMP focuses on the use of efficient operational tools and processes to minimise waste, pollution and any adverse ecological effects. It is related with attaining operational targets without compromising environmental safety (Afum et al., 2020). GPP, an element of GMP, has grown in recognition due to calls for 'green' in procurement activities. It focuses on the acquisition of goods and services that have minimal environmental impact. With this practice, firms focus on the ecological impact of their procurement decisions rather than associated costs. GPP enables firms to ensure environmentally-friendly production by procuring items with minimal environmental issues (Solomon et al., 2019). Through GPP, firms can easily respond to demands for environmental sustainability by stakeholders, hence achieve environmental corporate responsibilities.

2.3.2 Lean procurement practice

Lean management (LMP) originated from Japanese production methods (Yadav et al., 2020) to emphasise product quality improvement and operational efficiency through waste elimination. LMP has its traditional concentration on waste elimination throughout production processes (Hu et al., 2015); but has recently embraced environmental issues caused by SCM activities (Yadav et al., 2020). LMP focuses on addressing energy inefficiencies, pollution, product design issues and global warming arising from

manufacturing activities (Vanichchinchai, 2019). Given its qualities, implementing lean practice in procurement activities is increasing in importance; thus, the term 'LPP'. LPP is concerned with purchasing items in small lot sizes from few suppliers who deliver them in the right quantities at specified places and time (Taghipour et al., 2020). With LPP, elements like reliability, quality, delivery performance, price including firm culture are all considered prior to contract award. Implementing LPP leads to inventory reduction, quality improvement, reduced material procurement recycles time, reliable delivery and long-term supplier relationships (Hu et al., 2015; Ivanova et al., 2020).

2.3.3 Ethical procurement practice

EPP is increasingly growing in importance among SPPs (Mwania, 2019). It plays valuable roles in guiding procurement activities by offering acceptable rules and standards (Ogbu and Asuquo, 2018). EPP focuses on addressing a variety of issues (i.e., unethical supplier business practices, acquisition of raw materials through unethical standards and failure to comply to ethical standards during procurement) that can affect sustainability objectives of procurement (Ray and Khaba, 2020). It also provides the acceptable norms that firms need to follow to achieve sound procurement processes. Procurement ethics ensures that procurement practitioners promote integrity, honesty, transparency while avoiding conflict of interest. It creates ground rules for every procurement activity to ensure compliance with legal and other established regulations while treating suppliers fairly (Islam and Alharthi, 2020). Firms' exposure to poor procurement ethics could damage public relations, create bad images and expose them to unnecessary sanctions amid procurement inefficiencies.

2.4 Sustainable performance

SuP focuses on ascertaining stakeholders' well-being by satisfying basic human needs and guaranteeing that environmental resources are well-looked-after to support people in the future (Kamble et al., 2020). SuP measures business performance by concentrating on three sustainability components: EcP, EP and SP dimensions (Henao et al., 2019). EP, for instance, focuses on how firms' activities promote ecological friendliness. It shows how firms reduce greenhouse emissions, and consumes less energy to protect the environment. SP, on the other hand, measures a firm's responsibilities to its stakeholders via social welfare, proper labour conditions and human rights protection. EcP also measures firm performance (FP) using financial indicators like profit margin, market share, production costs, and sales margins, among others (Henao et al., 2019). Therefore, firms' ability to achieve these performance dimensions are crucial to operating sustainably and thereby, becoming competitive.

2.5 Hypotheses development

2.5.1 GPP and SuP

Related studies have established a link between green practice and FP including SuP (Ghosh, 2019; Galeazzo et al., 2021; Yee et al., 2021; Afum et al., 2020; Kumar and Dua, 2022). However, these studies have largely concentrated on the composite of GMP, yet, their findings offer valuable contributions to this study. Galeazzo et al. (2021), for

instance, concluded that when firms embrace GMP, they tend to act responsibly towards stakeholders while emphasising environmentally-friendly operations; however, attention was not given to EcP. The RBV theory suggests that firms can attain SuP if they embrace sustainable practices throughout their manufacturing activities including procurement. Yee et al. (2021) similarly asserted that adopting GMP improves the triple bottom lines (SP, EP, and EcP) in Malaysian firms while Zhan et al. (2018) asserted that GMP promotes win-win relationships; consequently, leading to better EP, SP and overall FP; however, whether attention was not given to EcP. Although El-Kassar and Singh (2019) found GMP to improve FP; attention was not given to SuP. Afum et al. (2020, 2021) concluded that GMP directly leads to EP, EcP and SP of Ghanaian manufacturing SMEs; while Opoku et al. (2020) and Nyamah et al. (2022) found GPP to positively affect operational performance. However, there is paucity of research directly linking the adoption of green practices in procurement processes with SuP. Based on existing gaps, the study hypothesised that:

H1a GPP significantly and positively influences EP.

H1b GPP significantly and positively influences SP.

H1c GPP significantly and positively influences EcP.

2.5.2 LPP and SuP

LMP, including LPP, has proven to improve economic and operational performance in several cases (Henao et al., 2019; Johan and Soediantono, 2022); thus, with less focus on SP and EP. However, the growing awareness of the triple bottom line requires comprehensive performance assessment based on three elements: environmental protection, economic growth and social safety. Given the importance of LMP, it is link with SuP continue to gain attention. This assertion has been strengthened by the RBV theory and TOC. RBV theory, for instance, proposes that manufacturing firms should acquire intangible resources like lean practices if they aim at achieving SuP within their procurement activities. Henao et al. (2019) similarly concluded that LMP improves SuP while Johan and Soediantono (2022) found it to affect environmental and industrial performance with SP and EcP remaining unknown. GMP specifically ensures reduced energy usage, hazardous waste generation, water consumption and environmental pollution. Chavez et al. (2020) concluded that Chilean manufacturing enterprises would experience improved SP and EP but not EcP if they adopt internal LMP. Möldner et al. (2020) revealed that LMP adoption expands productivity through waste and cost minimisation with Afum et al. (2021) concluding that lean operations affect the social, eco-product innovativeness, business and green performance of Ghana's manufacturing SMEs. In contrast, Hu et al. (2015) found lean six sigma to have a low and negative significant effect on EP. Conclusively, existing literature on LPP and SuP remain unclear with more concentration on LMP; thus, requiring urgent attention. The following hypotheses were hereby developed:

H2a LPP significantly and positively influences EP.

H2b LPP significantly and positively influences SP.

H2c LPP significantly and positively influences EcP.

2.6 EPP and SuP

TOC proposes that manufacturing firms need to adopt ethical practices in order to overcome possible constraints during procurement; thereby, attain sound SuPs. However, studies directly linking EPP to SuP remains scanty, leading to scarcity of literature on this subject. Although ethics in procurement is increasingly receiving attention, its effect on SuP remains inconclusive. However, little research (Musyoka, 2017; Mwania, 2019; Fiati, 2019) has affirmed the relevance of EPP to improving FP. Kilonzo (2018) similarly concluded that EPP expands FP but can same be said of SuP? Kangogo and Kiptoo (2013) also revealed that procurement performance would improve if Kenya's public organisations embrace ethics whereas Fiati (2019) established the relevance of EPP to operational performance of Ghanaian manufacturing firms. Deductively, ethical practices entailing fair negotiations, transparency, accountability and responsible purchasing in procurement processes could result into improved SuP via purchase of healthy materials from suppliers, minimised purchasing costs without compromising environmental protection. The study proposed that:

H3a EPP significantly and positively influences EP.

H3b EPP significantly and positively influences SP.

H3c EPP significantly and positively influences EcP.

Based on the research hypotheses, the researcher developed a research model (see Figure 1).

3 Research methods

3.1 Research approach and design

This study adopted the quantitative approach due to its predictive nature; hence its reliance on the explanatory research design. This design helps researchers to provide clearer explanation of a subject (Mohajan, 2020; Ghauri et al., 2020). It plays crucial roles in establishing causal linkages between predictor and outcome variables. The design also uses inferential tools notably linear regression to investigate into a given situation (Mertler, 2021). It allows researchers to gather data from relatively large sample sizes and generalise findings across an entire population.

Table 1 Empirical review of related literature in Ghana

Author(s)	*Exogenous variable*	*Endogenous variable*	*Theory(ies)*	*Study context*	*Conclusions*	*Limitation*
Baah et al. (2020)	environmental production practices (EPP): proactive and reactive	Firm performance [process (PP), financial (FP), and environmental (EP)]	Institutional theory Stakeholder theory Natural resource-based view	Manufacturing firms	Proactive EPP positively affects PP and EP but negatively affects FP Reactive EPP significantly improves PP, EP and FP respectively	The study was limited to environmental production practices; thus, calling for other studies to consider other variables
Acquah et al. (2020)	Green human resource management practices (GHRMP), green supply chain management practices (GSCMP)	Firm performance comprising market, operational, social, financial and environmental	N/A	Manufacturing and hospitality industry	GSCMPs play complementary partial mediating role between GHRM and operational, market, social and environmental performances	Focused on the composite of GSCMPs and GHRM The study was also limited to the manufacturing and hospitality industry in Ghana
Anane et al. (2019)	Procurement practices (procurement policy, planning and sustainable procurement)	Service delivery		Public entity	The study concluded that all the three procurement practices are key predictors of service delivery at Volta River Authority	Findings were limited to a public entity in Ghana Also, the study was limited to three procurement practices comprising procurement planning, policy and sustainable procurement
Agyekum et al. (2022)	Stakeholder involvement	Sustainable procurement (SP)	N/A	Tertiary institutions	The study found three cluster of barriers to stakeholder involvement in SPP works These clusters included stakeholder fatigue, organisational structure and information sharing processes	The study was limited to identifying the various barriers of stakeholder engagement in SPP works; thus, had no interest in establishing causal relationships
Ayarkwa et al. (2020)	Environmentally sustainable procurement practices	N/A	N/A	Public universities	The study concluded that public procurement is exposed to eight key barriers including inconsistencies in decision making, collusion among stakeholders and difficulty in imposing change	The study adopted the case study approach and obtained data via semi-structured questionnaires from six procurement experts at the Kwame Nkrumah University of Science and Technology (KNUST)

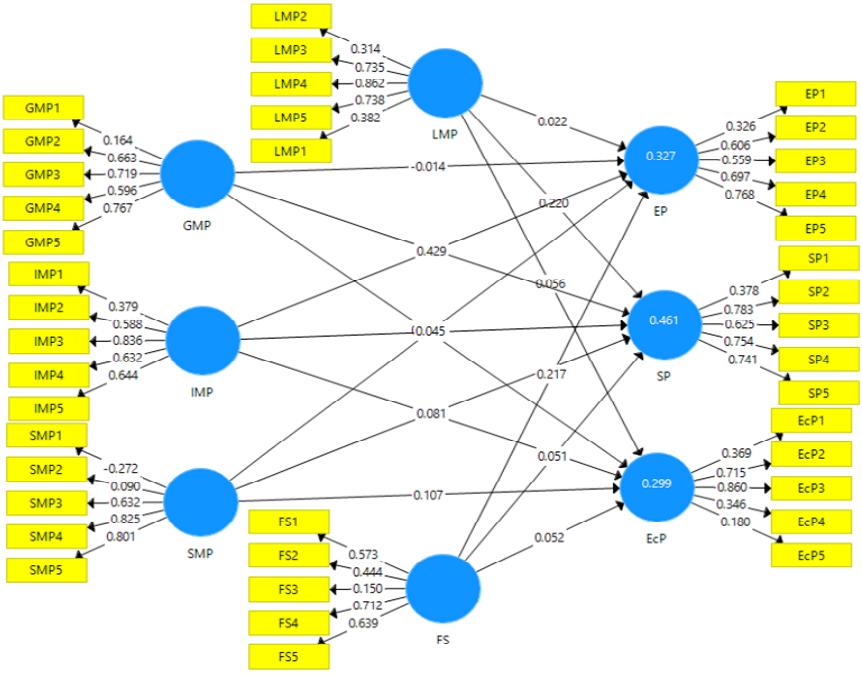
Table 1 Empirical review of related literature in Ghana (continued)

Author(s)	*Exogenous variable*	*Endogenous variable*	*Theory(ies)*	*Study context*	*Conclusions*	*Limitation*
Afum et al. (2020)	Green manufacturing Operational competitiveness Firm reputation	Sustainable performance dimensions	N/A	Manufacturing sector	Green manufacturing significantly improves SuP dimensions Also, operational competitiveness, firm reputation and environmental performance play no mediation role between green manufacturing and economic performance Finally, social performance mediates the link between green manufacturing and economic performance	The study was limited to the composite of manufacturing firms The study was also limited to only one dimension of sustainable practices notably green manufacturing
Afum et al. (2020)	Green manufacturing practices (GMP) Green supply chain integration (GSCI)	Sustainable performance (SuP) (social, environmental, economic)	Stakeholder theory and natural resource-based view theory	Manufacturing SMEs	GMPs significantly improve SuPs of the firms GSCI significantly mediates the link between GMPs and SuP	The study measured the composite of GSCI despite it having three elements The study was also limited to the composite of manufacturing SMEs in Ghana
Baah and Jin (2019)	Sustainable supply chain management (SSCM) Competitive advantage (CA)	Organisational performance (OP)	N/A	Logistics firms	SSCM is a key predictor of CA and OP CA significantly improves OP of the logistics firms	The study focused on the logistics industry It also focused on the composite of SSCM and OP
Baah et al. (2021)	Supply chain collaboration (SCC)	Supply chain visibility (SCV), stakeholder trust (ST), environmental performance (EP) and financial performance (FP)	N/A	Manufacturing firms	SCC significantly improves SCV, ST, EP and FP	The study emphasised SCC; thus, further research can consider other predictor variables Also, it could be seen that the study was limited to two dimensions of sustainable performance (i.e., EP and FP)
Etse et al. (2021)	Sustainable public procurement (SPP)			Health and educational sectors	SPPs within Ghana's health sector are stronger than those within the educational sector in Ghana	The study conducts a comparative analysis using two sectors: health and education

Table 1 Empirical review of related literature in Ghana (continued)

Author(s)	*Exogenous variable*	*Endogenous variable*	*Theory(ies)*	*Study context*	*Conclusions*	*Limitation*
Famiyeh et al. (2018)	Environmental management practices (EMPs) Operational competitiveness (OC)	Environmental performance (EP)			EMP by firms have a significant positive effect on firms' OC EMP has a direct positive effect on the EP of the firms studied	The study focused on only the EMP dimension of overall sustainable practices The study was also limited to the composite of manufacturing firms in Ghana Finally, the study focused on only the environmental performance element of sustainable performance

Figure 1 Initial model with all indicator loadings (see online version for colours)



3.2 *Population, sample and data collection*

AGI (2021) reported an estimated 340 registered food manufacturing SMEs operating in Ghana; thereby, representing the population. The report also revealed that three metropolises (Accra, Kumasi, Tema), known as Ghana's industrial hubs, combine to harbour over 70% (258) of these firms. To form the target population, a representative was chosen from each of the 258 firms because of strict compliance to firms' unique procurement policies and practices. As such, including more than one representative could lead to similarities or duplicates of responses; thereby, affecting data quality. Therefore, the study's target population size consisted of 258 owner-managers of such firms operating within the three selected metropolises in Ghana. The managers occupied procurement/purchasing or operation/production positions within these firms. The census technique was then chosen; wherein, all the 258 members partook in the data collection exercise to ensure access to in-depth and large information (Mertler, 2021).

Prior to data collection, the researcher used two weeks to contact the 258 owner-managers via e-mails, telephone and WhatsApp to obtain their consent. After the period, 227 of them expressed their interest in partaking in the study. The researcher drafted a questionnaire and first pre-tested it among 30 owner-managers of food manufacturing SMEs within the Central region of Ghana. The pre-test was done to obtain the needed validity (content, face, etc.) and the instrument's reliability prior to actual data collection. The instrument's quality was improved and sent to the respondents via emails and self-administration with attachment of introductory letters. During the exercise, the question items were explained to the respondents to ensure receipt of quality data. The respondents were first given two-months (14th March 2021–13th May 2021) to fill the

questionnaires and return them to the designated points of collection. During this period, a total of 156 responses were retrieved with 143 being valid; leading to an extension of two weeks to complete this exercise. Additional 40 responses (i.e., with 37 valid responses) were retrieved after several reminders through follow-up telephone calls and emails to the non-respondents. Therefore, 180 of the responses with a response rate of 69.77% were deemed valid for further processing and analysis. According to Baruch and Holtom (2008), a response rate of 35.5% or more is acceptable for statistical analysis. Non-response bias raises questions with respect to whether early responses differ from late responses (Armstrong and Overton, 1977). The Levene's test was performed to check for homogeneity of variances in the study (Dillman, 2000). The rule suggests that the sig. value of each item should be >0.05 to indicate absence of non-response bias. After the Levene's test (see Appendix), all the items had scores >0.05; suggesting assumption of equal variances.

Table 2 showed the respondents' demographic features (i.e., age, job position, working experience) and the firms' profile (number of employees). In terms of the respondents' age, 33.3% are within 41–50 years; 27.8% are between 31–40 years; 21.7% are over 50 years while 17.2% are within 18–30 years. Table 2 shows that 63.9% of the respondents are managers occupying differing roles: operations/production, logistics and procurement/purchasing. Also, 20% of them were owner/managers, while 16.1% of them were owners of the food manufacturing SMEs. These results reveal that all the respondents occupy strategic positions within their respective firms, hence, their information could be relied upon to make informed decisions and inferences.

Table 2 Respondents' demographic characteristics and business profile

Item	*Options*	*Frequency*	*Percent (%)*
Age	18–30	31	18.7
	31–40	50	28.3
	41–50	60	32.1
	Over 50	39	20.9
Job position	Owner	29	18.7
	Manager	115	62.0
	Owner/manager	36	19.3
Work experience (years)	<10	42	23.3
	10–20	79	43.9
	<20	59	32.8
Number of employees	<29	107	59.4
	29–100	73	40.6

Concerning work experience, 43.9% of the respondents have 11–20 years of work experience; 32.8% have over 20 years of experience and 23.3% have less than ten years of work experience. In terms of a number of employees, 59.4% of the respondents are from small-sized businesses with less than 29 employees while 40.6% of them came from medium-sized enterprises with between 29 to 100 employees.

3.3 Measurements

The structured questionnaire was used to collect primary data for this study. This instrument was structured based on comprehensive reviews of related literature as well as suggestions from key practitioners. All the constructs' indicators were gathered from related studies and modified to reflect the context of Ghanaian food manufacturing SMEs. In total, 30 indicators were adapted to measure six constructs where each construct had five indicators. The items were placed on a five-point Likert-like scale with 1 representing weak agreement and five representing highest agreement. The scale was preferred because it has widely been adopted by researchers (Agyapong and Attram, 2019; Afum et al., 2020; Agyabeng-Mensah et al., 2020; Nyamah et al., 2022) who seek to establish cause-and-effect relationships between/among variables of interest. Sachdev and Verma (2004) also revealed that this scale is adopted when researchers aim at reducing the levels of frustration among patient respondents to increase response quality and response rate.

Moreover, a literature review was initially conducted to develop research gaps, and hypotheses and obtain each construct's measurement indicators for the development of the structured questionnaire. This study obtained published articles from relevant databases: Scopus, Emerald, Science Direct, Inderscience, Wiley, Google Academic and Taylor and Francis. During the review, several indicators for each construct were identified and underwent pre-testing to ascertain their relevance and accuracy to this study's geographical scope. Forza (2002) opined that pre-testing is necessary for validating and adjusting a questionnaire before its application.

3.4 Analytical tool

The data gathered was first processed using the SmartPLS3.3 software and analysed via partial least square-structural equation modelling (PLS-SEM). PLS-SEM is a variance-based approach with the capability of examining causal relationships regardless of model complexity (Hair et al., 2019, 2021). It also offers robust results; thereby, promoting factual findings, conclusions and generalisations of outcomes. PLS-SEM can handle complex predictive associations; thus, can measure the degree to which a model's part accurately predicts other parts. Also, PLS-SEM can handle both formative and reflective (as in this study) models unlike covariance-based analytical techniques (Hair et al., 2019). The study followed the two-stage process of PLS-SEM: structural (inner) and measurement (outer) model proposed by Hair et al. (2019) and Memon et al. (2021).

3.5 Common method bias

Common method bias (CMB) is concerned with the data obtained from single respondents; focusing on possible measurement errors that could arise from gathering primary data from single respondents (MacKenzie and Podsakoff, 2012). It occurs when variations in responses are caused by the instrument rather than the respondents' actual predispositions that the instrument aims to reveal (Tehseen et al., 2017). Related researchers (Chin et al., 2012; Tehseen et al., 2017; Kock, 2015) have suggested some approaches to addressing CMB. To address CMB in this study, both procedural (ex-ante) and statistical (ex-post) controls were adopted (Kock, 2015). For procedural control, respondents were kept anonymous and they were also informed that there are no correct

or wrong answers (Kock, 2015). Also, some unrelated questions were introduced into the questionnaire to check whether the respondents actually read and fully understood each question item before answering (Tehseen et al., 2007). The questionnaire was also kept concise to address redundancy to enhance respondents' motivation.

Concerning statistical control, recent studies (Dash and Paul, 2021; dos Santos and Cirillo, 2021) have suggested the use of variance inflation factor (VIF) scores to verify CMB. Hair et al. (2019) and Dash and Paul (2021) suggested that VIF values >3.3 indicate the presence of CMB and vice versa. Per the VIF scores (i.e., <3.3), the researcher adequately and realistically confirmed the absence of CMB in this study. The section presented both the inner VIFs (Table 3) and outer VIFs (Table 4) to indicate the absence of CMB. Deductively, both the inner and outer VIFs had values <3.3 with the highest inner VIF of 1.333 while the outer VIF had the highest score of 1.397.

Table 3 Inner VIF scores

	EPP	*EP*	*EcP*	*GPP*	*LPP*	*SP*
EPP		1.333	1.333			1.333
EP						
EcP						
GPP		1.314	1.314			1.314
LPP		1.019	1.019			1.019
SP						

Table 4 Outer VIF scores

	VIF
EP2	1.132
EP4	1.261
EP5	1.255
EPP3	1.266
EPP4	1.270
EPP5	1.311
EcP2	1.128
EcP3	1.128
GPP2	1.130
GPP3	1.320
GPP5	1.283
LPP3	1.375
LPP4	1.476
LPP5	1.278
SP4	1.397
SP5	1.397

4 Analysis and results

4.1 Reflective measurement model

Before the study's hypotheses were tested, the reflective model was checked for validity and reliability. To achieve this, the following assessments were done:

1 factor loadings

2 construct reliability (CR) (rho_A)

3 indicator reliability (IR)

4 convergent validity (CV) (AVE values)

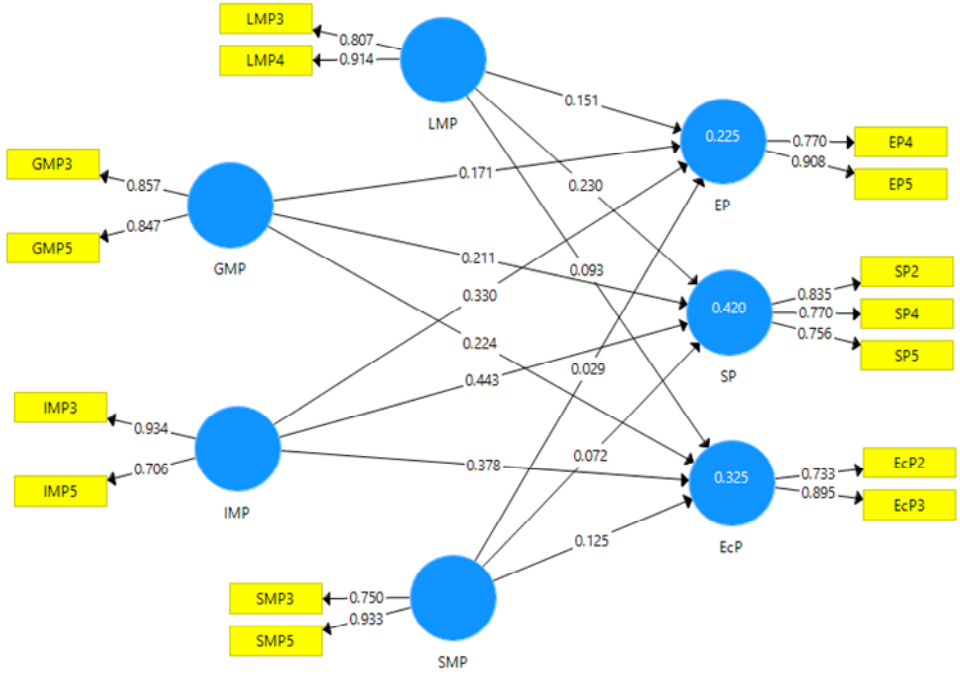
5 discriminant validity (DV) [heterotrait-monotrait (HTMT) ratio]

Before the assessments, Table 5 presented the constructs and their associated measurement items.

4.1.1 Factor loadings

The factor loadings of the constructs were first presented with the rule that all indicator loadings should be >0.60 (Hair et al., 2019). The rule suggests that item/indicator loadings >0.6 implies a 'quality' measure of a given construct. Simply put, indicators above this threshold imply that it is a quality measure of its assigned construct within the study area. Figure 2 presented the result of the factor loadings of the model.

Figure 2 Final model extracted (see online version for colours)



4.1.2 CR and validity

4.1.2.1 Construct reliability

The model's CR was first assessed using rho_A score and composite reliability. The rule suggests that both rho_A and composite reliability values should be ≥ 0.6 (Hair et al., 2021). In Table 6, all the rho-A and composite reliability values exceeded the acceptable threshold of 0.6; suggesting that the reflective model is devoid of reliability issues.

Table 5 Constructs and measurement items

Constructs	*Measurement items*	*Sources*
	Sustainable procurement practices (SPPs)	
Lean procurement practice (LPP)		Dixit (2022) and Thanki and Thakkar (2018)
LPP1	Conduct procurement activities with emphasise on waste elimination	
LPP2	Ensuring an optimal supply base	
LPP3	Reduction in work processes to minimise production wastes	
LPP4	Firms makes maximum use of materials	
LPP5	Focus on continuous flow of production	
Green procurement practice (GPP)		Gardas et al. (2019) and Abdul-Rashid et al. (2017)
GPP1	Purchases only environmentally-friendly raw materials	
GPP2	Emphasising environmentally-friendly products during its product design stage	
GPP3	Procures products with recycled and reused contents	
GPP4	Procures eco-technology processes and equipment	
GPP5	Procure only energy-efficient items	
Ethical procurement practice (EPP)		Grandia and Kruyen (2020) and Islam and Alharthi (2020)
EPP1	Strictly follows sustainable laws, policies and standards during procurement	
EPP2	Conduct proper monitoring to ensure that all procurement processes meet expected ethical and environmental requirements	
EPP3	Prepared ethical codes of conducts to guide procurement activities	
EPP4	Procurement officers act professionally and ethically	
EPP5	Regular revision of codes of conducts to meet changing situations	
	Sustainable performance (SuP)	
Environmental performance (EP)		Pachar and Gupta (2020), Chavez et al. (2020) and Hami et al. (2015)
EP1	Reduced the environmental impact of procurement activities	
EPP2	Environmental audits are regularly conducted	
EPP3	volume of energy consumption has reduced overtime	
EPP4	Continuous reuse our production residuals	
EPP5	Reduction in consumption of environmentally-unfriendly or hazardous materials	

Table 5 Constructs and measurement items (continued)

Constructs	*Measurement items*	*Sources*
	Sustainable performance (SuP)	
Social performance (SP)		Chavez et al. (2020) and Baliga et al. (2020)
SP1	Increased number of social projects	
SP2	Improved employee health and safety	
SP3	Improved relationships with stakeholders and community	
SP4	Improved work environment and working conditions	
SP5	Attaining regulatory agencies' requirements	
Economic performance (EcP)		Abbas et al. (2019) and Baliga et al. (2020)
EcP1	Increased return on investment	
EcP2	Growth in market shares	
EcP3	Reduced overall procurement costs	
EcP4	Higher return on assets	
EcP5	Increased profitability levels, considering current market situations	

Table 6 Construct and IR and CV

Construct	*Factor loadings*	*Rho_A*	*Composite reliability (CV)*	*AVE*
Green procurement practice (GPP)		0.712	0.794	0.563
GPP2	0.686			
GPP3	0.791			
GPP5	0.770			
Lean procurement practice (LPP)		0.729	0.829	0.619
LPP3	0.756			
LPP4	0.865			
LPP5	0.734			
Ethical procurement practice (EPP)		0.728	0.805	0.582
EPP3	0.858			
EPP4	0.720			
EPP5	0.701			
Environmental performance (EP)		0.710	0.787	0.553
EP2	0.687			
EP4	0.734			
EP5	0.806			
Social performance (SP)		0.706	0.867	0.766
SP4	0.894			
SP5	0.855			
Economic performance (EcP)		0.710		0.656
EcP2	0.692			
EcP3	0.913			

4.1.2.2 Convergent validity

CV measures the extent to which a specific construct's indicators are positively linked (Hair et al., 2021). The average variance extracted (AVE) is the common criterion for assessing the CV of any reflective model. AVEs show how an indicator's variance is captured by the latent construct in terms of the sum of variance and its associated measurement error (Benitez et al., 2020). The rule suggests that AVEs should be >0.5 to suggest evidence of CV (Hair et al., 2021). From Table 6, the AVE values ranged between 0.553 and 0.766; showing CV.

4.1.3 Indicator reliability

The reflective model was checked for IR using the factor loadings. Benitez et al. (2020) and Hair et al. (2019) proposed that factor loadings should be >0.70 to indicate that over 50% of a single indicator's variance can be explicated by its associated construct. However, Rönkkö et al. (2016) claimed that factor loadings >0.60 are acceptable if their presence is key to the model's estimations. Given this, all factor loadings below 0.60 thresholds were carefully removed (Table 6).

4.1.4 Discriminant validity

The reflective model was also checked for possible DV which describes the extent to which the constructs are unique and distinct from each other. The HTMT correlation ratio was reported instead of cross-loadings and Fornell-Larcker criteria. According to Voorhees et al. (2016), HTMT is suitable for reporting DV since Fornell-Larcker performs poorly when a slight difference exists among a construct's indicators. DV is, however, confirmed if each construct's score is $<HTMT^{0.85}$ (Ab Hamid et al., 2017). From Table 7, the HTMT ratios were below the proposed threshold (i.e., 0.85); indicating DV.

Table 7 Validation of DV using HTMT

	EPP	*EP*	*EcP*	*GPP*	*LPP*	*SP*
EPP						
EP	0.626					
EcP	0.780	0.768				
GPP	0.782	0.565	0.718			
LPP	0.201	0.303	0.181	0.194		
SP	0.546	0.636	0.708	0.580	0.441	

4.2 Structural model

4.2.1 Predictive accuracy (R^2) and predictive relevance (Q^2)

The R^2 describes the combined contributions of independent variables to linearly account for any change in the dependent variable(s). From Table 7, the three SPPs (i.e., GPP, LPP and EPP) combine to linearly account for 22.2% of the change in EP; 26.3% of change in SP and 30.6% of the change in EcP. The adjusted R^2 scores were also reported to indicate the percentage of variation in an outcome variable that is explained by the predictors. In

this study, the percentage of variation in EP, EcP and SP respectively by 0.209, 0.294 and 0.251 are explained by SPP (GPP, LPP and EPP). Table 7 also showed the Q^2 values to estimate the model's predictive relevance. The rule suggests that Q^2 values should be >0; thus, values <0 suggest a model's lack of predictive relevance. Deductively, the reflective model's Q^2 values have predictive relevance for all the constructs because they are higher than 0 (i.e., 0.075–0.171).

4.2.2 Effect size (f^2) and quality of predictive relevance (q^2)

The reflective model's f^2s were further examined to indicate whether the exogenous constructs make any substantive contributions to each endogenous construct. The rule suggests that f^2 values between 0.02–0.150, 0.150–0.350 and >0.350 indicate weak, medium and large f^2s (Benitez et al., 2020). Deductively from Table 7, EPP is a medium predictor of EcP ($f^2 = 0.182$), but a weak predictor of EP ($f^2 = 0.088$) and SP ($f^2 = 0.060$) respectively. However, GPP had weak effects on EP ($f^2 = 0.036$), EcP ($f^2 = 0.047$) and SP ($f^2 = 0.061$). LPP finally reported weak effects on SP ($f^2 = 0.085$), EP ($f^2 = 0.028$) and EcP ($f^2 = 0.004$). The quality of the predictive relevance was examined by reporting the q^2 values. The formula for calculating q^2 is: (Q^2 included – Q2 excluded) / (1 – Q^2 included). The q^2 assesses whether the exogenous variables are quality predictors of any change in the endogenous variable(s) (Henseler, 2018). The rule suggests that q^2 should be >0 (Henseler, 2018); and its strength was determined by Benitez et al.'s (2020) criterion. From Table 7, all the q^2s were higher than 0; indicating the predictive relevance' quality. However, all the values showed small quality predictive relevance with LPP reporting the smallest q^2 on EP ($q^2 = 0.011$). EPP, however, reported a better q^2 on EcP ($q^2 = 0.095$); meaning that EPP is a quality predictor of any change in EcP than GPP and LPP. Therefore, implementing EPP will improve EcP better than LPP and GPP. Also, LPP ($q^2 = 0.056$) is likely to predict any change in SP better than EPP ($q^2 = 0.035$) and GPP ($q^2 = 0.036$). Finally, EPP ($q^2 = 0.039$) plays a slightly higher quality role in predicting any change in EP as compared to GPP ($q^2 = 0.013$) and LPP ($q^2 = 0.011$) respectively.

Table 8 Predictive accuracy, predictive relevance, effect size and accuracy of predictive relevance

LV	*R^2/adjusted R^2*			*f^2*			*Q^2*			*q^2*		
	EP	*SP*	*EcP*	*EP*	*SP*	*EcP*	*EP*	*SP*	*EcP*	*EP*	*SP*	*EcP*
GPP				0.036	0.061	0.047	0.098	0.156	0.162	0.013	0.035	0.023
LPP				0.028	0.085	0.004	0.100	0.139	0.171	0.011	0.056	0.012
EPP				0.088	0.060	0.182	0.075	0.156	0.103	0.039	0.036	0.095
SuP	0.222/ 0.209	0.263/ 0.251	0.306/ 0.294									

Note: LV = latent variable, R^2 = R-squared, f^2 = effect size, Q^2 = Stone Geisser's predictive relevance, and q^2 = quality predictive relevance.

5 Results

After meeting the model's quality criteria, the hypotheses were tested by estimating the path coefficients. Table 9 reported the t-stats and p-values in the bootstrapping program to test the hypotheses. It also reported the β-values, decision rule and bias-corrected confidence intervals (BCCI). With BCCI, all the results in the PLS output had the value zero (0) not included in the 97.5% interval (Sheko and Braimllari, 2018). In PLS-SEM, t-statistics are mostly used to test the hypotheses (Henseler, 2018; Hair et al., 2019, 2021); the rule suggests that t-values should be ≥1.96 (i.e., $p < 0.05$) to indicate that the hypothesis is statistically significant. From Table 9, all the hypotheses were supported (H1a, H1b, H1c, H2a, H2c, H3a, H3b, and H3c); except H2b. Thus, H1a ($t = 4.028$, $p = 0.00$, $\beta = 0.301$) was supported to show that GPP plays a significant positive and medium role in improving the firms' EP.

Table 9 Hypotheses testing and path coefficients

Hyp.		*T stats*	*P values*	*Decision*	*β-value*	*Bias-corrected confidence intervals*	
						2.5%	*97.5%*
H1a	GPP → EP	2.393	0.017	Support	0.191	0.028	0.336
H1b	GPP → SP	2.801	0.005	Support	0.242	0.070	0.404
H1c	GPP → EcP	2.777	0.005	Support	0.208	0.052	0.351
H2a	LPP → EP	2.062	0.039	Support	0.149	–0.007	0.277
H2b	LPP → SP	3.222	0.001	Support	0.253	0.073	0.391
H2c	LPP → EcP	0.718	0.473	Reject	0.052	–0.102	0.186
H3a	EPP → EP	4.028	0.000	Support	0.301	0.151	0.442
H3c	EPP → SP	2.591	0.010	Support	0.242	0.143	0.552
H3b	EPP → EcP	5.192	0.000	Support	0.411	0.054	0.428

Table 10 Test of homogeneity of variances

		Levene statistic	*df1*	*df2*	*Sig.*
The firm's production activities are aimed at eliminating wastes	Based on mean	3.404	1	178	0.067
The firm uses appropriate raw materials during production	Based on mean	1.107	1	178	0.294
My firm ensures reduction of work in process inventory	Based on mean	0.687	1	178	0.408
The firm ensures more frequent and precise specification of materials needed for production	Based on mean	3.468	1	178	0.064
The firm has an optimised supplier base	Based on mean	2.028	1	178	0.156
The firm purchases only raw materials which are environmentally friendly	Based on mean	0.300	1	178	0.584
The firm emphasises on environmentally friendly products during its product design stage	Based on mean	1.218	1	178	0.271
The firm is ensuring decreased consumption of harmful/toxic materials during production	Based on mean	0.187	1	178	0.666

Table 10 Test of homogeneity of variances (continued)

		Levene statistic	*df1*	*df2*	*Sig.*
The firm has observed decreased liquid and solid waste generations in its production processes	Based on mean	3.362	1	178	0.068
The firm deals with suppliers who provide sustainable materials	Based on mean	0.411	1	178	0.522
The firm ensures that sustainable standards are met in every order	Based on mean	0.014	1	178	0.907
All procurement transactions and processes are subjected to scrutiny or proper checks	Based on mean	3.444	1	178	0.065
The firm adheres to all environmental and social standards during production and transportation of its products to customers	Based on mean	0.428	1	178	0.514
The firm has implemented and constantly follows the safety aspects and governmental laws concerning their operations	Based on mean	0.548	1	178	0.460
When purchases become competitive, awards go to the lowest responsive and responsible bidder	Based on mean	0.024	1	178	0.877
The firm has projects to improve/recover the environment	Based on mean	0.206	1	178	0.651
The firm uses recyclable materials during production	Based on mean	0.034	1	178	0.855
The firm reuses its production residuals	Based on mean	0.051	1	178	0.822
The firm monitors the volume of energy consumption	Based on mean	0.000	1	178	0.987
The firm has low level of energy intensity	Based on mean	1.237	1	178	0.267
The firm employs more people from minority groups	Based on mean	1.251	1	178	0.265
The firm has a number of social and cultural projects	Based on mean	1.306	1	178	0.255
The firm engages the people before carrying out some health-related projects	Based on mean	1.199	1	178	0.275
The firm meets the regulatory agencies requirements	Based on mean	0.400	1	178	0.528
The firm works to reduce vulnerability in our community	Based on mean	1.179	1	178	0.279
The firm is experiencing increase in economic value	Based on mean	0.036	1	177	0.849
The firm’s return on equity has improved	Based on mean	2.985	1	178	0.086
The firm’s net income has been increasing steadily	Based on mean	0.704	1	178	0.402
The firm is experiencing positive changes in market value	Based on mean	1.670	1	178	0.198
The firm is experiencing increasing value addition	Based on mean	0.220	1	178	0.639

Also, H1b ($t = 2.777$, $p = 0.005$, $\beta = 0.208$) was supported to indicate that continuous adoption of GPP would translate into improved SP of Ghana's food manufacturing SMEs. The research also hypothesised that GPP plays a significant and positive role in improving EcP (H1c). Given the t-stat (2.801), p-value (0.005) and β-value (0.242), H1c was supported; revealing that GPP offers a significant but weak contribution to improving the profit levels, and financial growth of the firms. Deductively, food manufacturers can enhance SuPs (EP, SP and EcP) if they adopt the green practice during procurement. Moreover, in terms of H2a, it was proposed that GPP significantly and positively affect EP. With t-stat (2.062), p-value ($0.039 < 0.05$) and β score (0.149); H2a was supported; thus, for any unit change in GPP, EP would significantly change by 14.9% (weak). H2b was also was supported with t-stat = 3.222; $p = 0.001$ and $\beta = 0.253$; meaning that LPP significantly affects SP by 25.3% (weak). However, H2c with t-stat (0.718) and p-value (0.473) was not supported; meaning that LPP does not play any significant role in improving EcP. Thus, food manufacturing SMEs would experience no significant change in economic performance if they go 'green' during procurement.

In contrast, H3a was supported ($t = 4.028$, $p = 0.000 < 0.05$, $\beta = 0.301$) to suggest that food manufacturing SMEs would have higher EP by 30.1% (medium) if they embrace EPP. Similarly, H3b was supported with $t = 2.591$, $p = 0.010$ and $\beta = 0.242$ to indicate that the quality of stakeholders' (employees, consumers, suppliers, minority group) well-being would improve by 24.2% if firms implement ethical practices throughout their procurement processes. Finally, the study's outcome ($t = 5.192$, $p = 0.000$, $\beta = 0.411$) supported the hypothesis that EPP significantly and positively improves EcP; indicating that implementing EPP would minimise production costs and increase profit margin by 41.1% (medium). Deductively, although EPP significantly affects all SuP dimensions, its effect on EcP had the strongest impact; followed by EP and SP respectively.

6 Discussion

The study investigated the effects of SPPs comprising green, lean and ethical practices on SuP (EP, EcP, and SP) of food manufacturing firms in a developing economy. The study found GPP, for instance, to significantly improve these firms' SuPs notably EP. This result suggests that food manufacturing SMEs can ensure environmental friendliness and reduce associated hazards if they adopt green practices during procurement. The RBV theory similarly suggests that firms that consider and adopt intangible resources like green practices stand higher chances of attaining competitive advantages by ensuring environmental soundness. Also, Ghosh (2019) and Yee et al. (2021) revealed that implementing 'green' helps manufacturing enterprises to attain higher EP. Their findings are consistent with studies by Galeazzo et al. (2021) and Afum et al. (2020). The study also found GPP to significantly affect the EcP of the firms' studied; indicating that firms that ensure cleaner procurement processes devoid of environmental concerns are highly likely to enjoy higher financial soundness. This result suggests that food manufacturers who embrace green practices in their procurement activities would witness improved business profits, market share and sales margin. This finding is supported by TOC which posits that firms that adopt sustainable practices including 'green' are highly likely to overcome their constraints and subsequently attain higher financial outcomes. Similar studies by Zhan et al. (2018), Afum et al. (2020) and Galeazzo et al. (2021) found this

practice to promote the EcP of overall manufacturing SMEs. Zhan et al. (2018) stressed that emphasising 'green' offer firms the chance to build better win-win relationships with multiple partners; thereby, contributing to improved EcP. Finally, GPP had the highest influence on SP; thus, adopting GPP plays a valuable role in safeguarding stakeholders' health while meeting regulatory agencies' requirements. Simply put, when food manufacturers emphasise environmental consciousness during procurement, it would lead to improved quality of life of their stakeholders. TOC posits that achieving social performance can be impeded by various constraints which can only be addressed if food manufacturing SMEs embrace sustainable practices notably 'green' during procurement. Therefore, implementing the green practice in overall manufacturing activities including procurement would yield higher SP (Afum et al., 2020; Agyabeng-Mensah et al., 2021).

Additionally, implementing 'lean' in procurement significantly improves food manufacturing SMEs' EP. Thus, ensuring an optimal supply base, making maximum use of available materials and minimising waste throughout procurement lifecycles are key to achieving environmental soundness. As such, if food manufacturers emphasise energy-efficient technology, processes and items during procurement, it could lead to environmental safety; thereby, minimising carbon emissions, energy consumption, solid waste and contaminations. In line with the TOC theory, Henao et al. (2019) found the lean practice to play an important role in achieving EP by improving the procurement of recyclable materials while ensuring low energy consumption levels. The study also found LPP to significantly improve the SP of the food manufacturing firms in Ghana. This result indicates that when much attention is given to waste elimination and continuous improvement in procurement processes, SP would witness significant improvements. Chavez et al. (2020) revealed that lean manufacturing plays a significant role in reducing environmental hazards and the consumption of unsafe or unfriendly materials. Möldner et al. (2020) similarly found the lean practice in manufacturing activities to promote stakeholders' quality of life. Afum et al. (2021) concluded that lean manufacturing has positive consequences on both EP and SP of Ghanaian manufacturing enterprises.

However, the study found LPP to have no significant effect on Ghanaian food manufacturers' EcP. Although this result seems surprising, it could, however, be relevant among food manufacturing SMEs in Ghana. This is because, ensuring 'lean' (i.e., having optimal supply base, eliminating waste and reducing work processes) throughout procurement processes is generally expensive which could have severe impacts on Ghanaian firms' financial structure if not adopted with caution. As such, these firms, given their relatively low budgets, might be hesitant to invest heavily in it; thereby, yielding little to no financial benefits. Also, LPP emphasises waste elimination throughout procurement processes; as such, these firms arguably adopt it to address environmental and social issues in Ghana but not necessarily to reap financial rewards. Finally, with lean adoption among Ghanaian food manufacturers' procurement activities still at its inception stage, its adoption could emphasise SP and EP; but not necessarily EcP. This finding is buttressed by Chavez et al. (2020) who found lean practice to have no significant effect on EcP among Chilean firms; however, Afum et al.'s (2021) study on Ghana's manufacturing firms had a differing view by concluding that lean significantly improves EcP. Although this study was conducted in Ghana, it focused on the composite of the manufacturing industry; while this study centres on food manufacturing SMEs. This study, therefore, offers important information suggesting that implementing lean practices in procurement activities does not necessarily lead to EcP; thus, firms would experience an unchanged financial outcome when LPP is adopted.

EPP was also found to significantly improve EP; indicating that when food manufacturers adhere to required international and local sustainability laws and standards during procurement, their consumption of environmentally unfriendly materials is likely to reduce. Simply put, firms that ensure high ethical standards during procurement would experience reduced energy consumption, purchase of non-hazardous materials and continuous reuse of residuals. This finding is buttressed by TOC which argues that implementing ethical practices are key to addressing constraints related with procurement processes; thereby, improving sustainable outcomes notably environmental safety. Likewise, Kangogo and Kiptoo (2013) concluded that manufacturing firms that embrace ethical standards are likely to liaise with eco-oriented supply chain actors to procure less hazardous raw materials which are environmentally friendly. Although Fiati (2019) focused on the composite of manufacturing firms in Ghana, the study claimed that implementing ethical practices promote the attainment of environmental protection goals. This study also found that EPP plays a crucial role in improving SP; as such, food manufacturing firms would achieve goodwill while reducing vulnerabilities of the minority groups when EPP is implemented. This outcome was buttressed by Mwania (2019) where they averred that adopting ethical practice in manufacturing activities is key to achieving higher SuP including SP. The study finally found EPP to expand the manufacturing firms' EcP in Ghana. Thus, the higher the adoption of ethical practices during procurement, the higher the firms' profit, return on assets and return on investment levels. Fiati (2019) similarly asserted that Ghanaian manufacturing firms would struggle to achieve higher SuP when they fail to comply with ethical standards. Therefore, compliance with all ethical requirements and inducing procurement officers to act ethically and professionally during procurement are key to achieving better economic output within the food manufacturing industry.

7 Conclusions

The paper establishes the effects of SPPs on SuP of food manufacturing SMEs within a developing economy. The study specifically investigated how SPPs comprising GPP, EPP and LPP individually affect SuP (EP, EcP, and SP) given the paucity of research in this area. These constructs were used to develop nine hypotheses and tested via the PLS-SEM approach. Given the study's key findings, it was concluded that implementing sustainable practices in procurement activities are key to promoting the SuPs of Ghanaian food manufacturing SMEs. Thus, food manufacturers who embrace SPPs (GPP, LPP, and EPP) are highly likely to attain higher SuPs; however, only LPP does not significantly affect EcP. The research concluded that both GPP and EPP directly predict SuPs while LPP improves only EP and SP. Concerning SP, the study concluded that LPP had the highest significant effect; followed by GPP and EPP respectively. Also, EPP had the highest substantial effect on EP; followed by GPP and LPP respectively. Concerning EcP, EPP had the most significant effect; followed by GPP while LPP was insignificant. The study's outcomes could be linked to the fact that Ghanaian manufacturing SMEs especially food processors are currently under immense pressure from key industrial players like Food and Drugs Authority (FDA) to strictly comply with all legal and ethical standards throughout their operational activities; thereby, contributing to better sustainable outcomes. This study, therefore, provides valuable insights into the need for the adoption of sustainable practices throughout procurement activities. Conclusively,

Ghana's food manufacturing SMEs' adoption and investment in SPPs would be crucial to attaining SuPs. Thus, for food manufacturers in developing economies like Ghana to pursue higher SuPs, they need to adopt lean, ethical and green practices throughout their procurement lifecycles.

8 Implications

This section discussed the implications of the study's key findings to policy, practice/ managerial and theory.

8.1 Policy implications

Concerning policy, the study's outcomes would provide policymakers (i.e., government, and industrial players) with a comprehensive framework on SPPs to guide them during policy revision, formulation and implementation. More precisely, the study would strengthen the need for comprehensive national policies that would induce food manufacturing SMEs in Ghana and similar manufacturing environments to adopt and invest heavily in SPP to attain SuPs. This is significant given the fact that adoptions of SPPs are in their infant stages across manufacturing industries of developing economies. As such, establishing relevant sustainability-related policies based on the study's outcomes could be key to attaining smooth procurement processes and invariably yield sustainability-related outcomes. The study also offers strategic and valuable directions for key industrial players including owners/managers of food manufacturing SMEs to understand the relevance of embracing sustainable practices throughout procurement stages; thereby, investing heavily in them to promote SuP. The findings, therefore, offer valuable information to develop crucial policies that would strengthen the essence of ethics, green and lean practices throughout the procurement cycle within the food manufacturing sub-sector. The study's outcome also induces authorities like Ghana Enterprise Agency (GEA), FDA and AGI to continue pressurising food manufacturing SMEs to adopt and ensure strict compliance to 'green', 'lean' and 'ethical' practices during procurement and production.

8.2 Managerial/practical implications

In line with the study's key findings, some practical implications were hereby made. For instance, the study's findings imply that food manufacturers would struggle to achieve SuP goals if they fail to adopt sustainable practices when procuring. Thus, the more food manufacturers embrace practices like waste elimination, optimum use of available resources and strict adherence to ethical standards, the higher their SuPs especially in areas of SP and EP. This study's results also implies that management of food manufacturing SMEs in Ghana can positively respond to stakeholders' calls for human and environmental safety without compromising their financial goals if they embrace SPPs. However, if these firms intend to attain higher economic gains, then much attention should be given to green and ethical practices during procurement. Although, LPP had no significant effect on economic growth, it does not necessarily imply that food manufacturers should ignore it, but should adopt a conscious approach when investing in it. This outcome is, therefore, important for food manufacturers to appreciate the fact that

LPP may not certainly enhance EcP despite its relevance in SP and EP. Hence, ensuring break-even during LPP implementation could be crucial to achieving other sustainability objectives (SP and EP). The study's results further encourage food manufacturers to view sustainable practices as key intangible resources that aim at addressing their constraints in bid to achieve sustainable outcomes. More precisely, with GPP and EPP significantly predicting SuP dimensions, food manufacturers' failure to properly adopt them during procurement could threaten attainment of SuPs. The study, therefore, makes significant contributions to expanding sustainable practices of food manufacturing SMEs during procurement in order to attain the triple bottom lines.

8.3 Theoretical implications

This research expands existing theories (TOC and RBV theory) underpinning issues related to SPPs and SuP by developing an important model that tests the direct effects of GPP, LPP, and EPP on EcP, EP, and SP. In terms of the TOC, the study's findings propose the inclusion of SPPs (GPP, EPP, and LPP) to assist firms overcome their procurement-related constraints. Although TOC proposes implementation of key practices, procedures and strategies to overcome constraints which could inhibit manufacturing firms' systems, this study strengthen calls for inclusion of sustainable practices into the theory's propositions. More precisely, the study echoes the adoption and constant improvement in sustainable practices notably green, lean and ethical practices to overcome constraints embedded in procurement activities and thereby, promote SuP dimensions. The RBV theory also suggests that food manufacturers can attain superior FP and become competitive if they rely and invest in relevant resources (tangible or intangible). Regarding the study, RBV theory suggests that Ghana's food manufacturing firms need to acquire more sustainable resources if they aim to achieve sustainability goals. As such, the study's findings suggest that sustainable practices (lean, ethical and green) should be considered as key intangible resources in order to attain SuPs. The study, therefore, makes valuable contribution to RBV theory by calling for the inclusion of these sustainable practices as part of firms' intangible resources to be adopted during procurement processes.

9 Limitations and suggestions for further research

Although this study offers important contributions to current literature, it was still exposed to some shortcomings that could be noted by future researchers. First, the study's generalisation of findings across the entire food manufacturing SMEs in developing economies was quite problematic since data was gathered from Ghana. Hence, future researchers can adopt a broad-based approach by widening the study's current scope to include food manufacturing SMEs in other developing economies. Comparative analysis can also be adopted to check whether the study's findings within the context of Ghana could be compared with other settings. This study was unique because it focused on the food manufacturing sub-sector; however, future researchers can replicate it in different sub-sectors like plastic/rubber, paper processors and metal/aluminium smelting industries. Finally, further research could investigate the roles of other variables (i.e., total quality management, firm innovation, resilience, and agility) in SPPs and SuPs.

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