JEL Classification: M11; Q01; L91 **DOI**: https://doi.org/10.31521/modecon.V52(2025)-20

Felix Amoako Offei, PhD Student, Academic and Research Institute of Business, Economics and Management, Sumy State University, Sumy, Ukraine

ORCID ID: 0000-0003-3458-5185
e-mail: f.amoako@aspd.sumdu.edu.ua

Irene Aikins, PhD Student, Academic and Research Institute of Business, Economics and Management, Sumy State University, Sumy, Ukraine

ORCID ID: 0009-0008-9826-7868
e-mail: i.aikins@aspd.sumdu.edu.ua

Nataliia Letunovska, Doctor of Economics, Associate Professor, Associate Professor of the Department of Marketing, Sumy State University, Sumy, Ukraine

ORCID ID: 0000-0001-8207-9178
e-mail: n.letunovska@kmm.sumdu.edu.ua

Yevheniia Ziabina, PhD in Economics, Senior Lecturer of the Department of Marketing, Sumy State University, Sumy, Ukraine

ORCID ID: 0000-0003-0832-7932
e-mail: e.ziabina@biem.sumdu.edu.ua

Business-Oriented Approaches to Green Supply Chain Management: Enhancing Healthcare Delivery Through Sustainable Procurement

Abstract. Introduction*. Sustainable procurement is a key element of green supply chain management, particularly in the healthcare industry, where purchasing decisions impact service quality, operating costs, and environmental outcomes. Integrating environmental, economic, social, and ethical considerations into procurement processes can enhance both operational efficiency and long-term sustainability. In the context of Ghana, understanding the role of sustainable procurement in healthcare delivery is essential for improving hospital performance and community well-being.*

Purpose. *This study aims to explore how sustainable procurement practices influence healthcare delivery at Komfo Anokye Teaching Hospital in Ghana, focusing on environmental, economic, social, and ethical dimensions.*

Results. *A mixed-methods approach was employed, collecting data from 57 internal staff members and suppliers through structured questionnaires. Analysis using descriptive and statistical methods revealed that sustainable procurement practices significantly improve operational performance, including cost efficiency and reduced operational expenses, strengthened supplier relationships and open promotion of suppliers, reduced environmental waste through initiatives such as waste segregation, compliance with environmental and social standards, and equitable labor practices and ethical procurement decisions. Despite these advantages, several barriers were reported, including limited funding, low staff awareness or engagement, and weak infrastructure, which hinder full implementation of sustainable procurement practices.*

Conclusions. *Integrating sustainable procurement into healthcare supply chains can enhance hospital performance, strengthen community confidence, and reduce environmental harm in Ghana. The study recommends improving internal communication, providing continuous staff training, adopting digital monitoring systems, and establishing stronger policy frameworks to encourage wider adoption. Green supply chain management can serve as a strategic driver for transforming healthcare delivery, promoting fairness, long-term resilience, and ecological balance, thereby preparing the healthcare system to respond more effectively to current and future challenges.*

Keywords: *sustainable development; logistics; healthcare system; environmental sustainability; social and economic sustainability.*

УДК 658.7:614.2:502.131.1

Оффей Ф. А., аспірант Навчально-наукового інституту бізнесу, економіки та менеджменту Сумського державного університету, м. Суми, Україна

Айкінс І., аспірант Навчально-наукового інституту бізнесу, економіки та менеджменту Сумського державного університету, м. Суми, Україна

[1]**Стаття надійшла до редакції**: 24.08.2025
Received: 24 August 2025

Летуновська Н. Є., доктор економічних наук, доцент, доцент кафедри маркетингу Сумського державного університету, м. Суми, Україна

Зябіна Є. А., кандидат економічних наук, старший викладач кафедри маркетингу Сумського державного університету, м. Суми, Україна

Бізнес-орієнтовані підходи до зеленого управління ланцюгами постачання: покращення надання медичних послуг через сталу систему закупівель

Анотація. *Сталий розвиток у сфері закупівель є ключовим елементом управління зеленим ланцюгом постачання, особливо в галузі охорони здоров'я, де рішення про закупівлі впливають на якість послуг, експлуатаційні витрати та екологічні результати.*

Метою цього дослідження є вивчення того, як сталий розвиток закупівель – екологічний, економічний, соціальний та етичний – формує надання медичної допомоги в Гані на прикладі навчальної лікарні Комфо Анок'є.

Для збору даних від 57 внутрішніх співробітників та постачальників було використано змішаний підхід за допомогою анкет, результати яких були проаналізовані описовими та статистичними методами.

Аналіз показав, що сталий розвиток закупівель істотно покращує операційну діяльність у сфері охорони здоров'я. Це досягається завдяки підвищенню економічної ефективності, зміцненню відносин і співпраці з постачальниками, зменшенню обсягів відходів та забезпеченню дотримання екологічних і соціальних стандартів. Респонденти підкреслили важливість таких ініціатив, як сегрегація відходів, впровадження енергоефективного обладнання, справедлива корпоративна політика та прозорість постачальників, що сприяють якісному наданню медичних послуг і довгостроковій стійкості системи охорони здоров'я.

Дослідження показує, що впровадження сталих закупівель у ланцюги постачання охорони здоров'я може покращити ефективність роботи лікарень у Гані, зміцнити довіру громади та зменшити шкоду для довкілля. Рекомендується вдосконалювати внутрішню комунікацію, забезпечувати постійне навчання персоналу та впроваджувати цифрові системи моніторингу. Управління екологічно чистими ланцюгами постачання може стати стратегічним рушієм трансформації надання медичної допомоги, сприяючи справедливості, довгостроковій стійкості та екологічному балансу, а також підвищуючи здатність національних систем охорони здоров'я ефективно реагувати на сучасні та майбутні виклики.

Ключові слова: *сталий розвиток; логістика; система охорони здоров'я; екологічна стійкість; соціальна та економічна стійкість.*

JEL Classification: *M11; Q01; L91*

Formulation of the problem. Green Supply Chain Management (GSCM) integrates environmental factors throughout the supply chain, including sourcing, procurement, distribution, and waste management. The goal of GSCM is to reduce environmental impact while maintaining or improving supply chain efficiency [1]. A core element of GSCM is sustainable procurement, which involves purchasing goods and services based not just on cost and quality, but also on their environmental and social impacts [2]. In healthcare systems, where procurement accounts for a significant portion of operational costs and directly affects service delivery, sustainable procurement has the potential to improve healthcare quality and environmental outcomes [3]. Healthcare delivery in developing nations faces mounting pressure due to rapid population growth, limited financial and material resources, fragmented infrastructure, and growing demand for quality medical care. These issues are further complicated by environmental problems such as excessive medical waste, poor logistics, and energy-intensive processes. Traditional healthcare supply chains often depend on single-use items, and reactive procurement significantly contributes to environmental deterioration [4]. GSCM provides a practical framework for addressing these issues. It encourages healthcare providers to adopt environmentally friendly procurement practices, reduce waste, increase energy efficiency, and establish more resilient operations. Examples of GSCM in action include obtaining biodegradable items, optimizing transportation routes to reduce fuel usage, and incorporating renewable energy into storage and distribution facilities [5].

Countries such as Ghana, Kenya, and India have implemented green procurement rules in their public health sectors. In Ghana, for instance, some hospitals collaborate with local suppliers to reduce emissions and packaging waste, while others test digital inventory systems to prevent overstocking and reduce expired products [6]. However, implementation remains inconsistent due to legislative limitations, funding constraints, and insufficient staff training on GSCM principles.

The study focuses on four dimensions of sustainable procurement: environmental, economic, social, and ethical. Data will be collected using quantitative methods, including structured questionnaires administered to procurement officers, stores and logistics staff, and other hospital staff directly or indirectly involved in stock handling and movement. The data will be statistically analyzed to explore the relationship between sustainable procurement practices and operational performance in healthcare delivery.

Analysis of recent research and publications. GSCM incorporates environmental, economic, and social sustainability principles into supply chain design and operations. In the healthcare sector, GSCM ensures service delivery is resilient, efficient, and environmentally conscious. In developing countries like Ghana, where

resource constraints and infrastructure challenges persist, adopting sustainable procurement practices has the potential to improve healthcare delivery outcomes while reducing environmental and economic costs. Sustainable procurement is a core element of GSCM. It considers the social, environmental, and long-term economic impacts of purchasing decisions, going beyond merely attaining the best price. In healthcare, this could mean sourcing recyclable packaging, prioritizing energy-efficient equipment, or selecting suppliers with ethical labor practices.

In the words of Walker and Brammer [7], sustainable procurement is concentrated on achieving value for money throughout the entire lifespan of products and services. This approach is especially important in healthcare, where procurement decisions directly affect service quality, environmental impact, and budget sustainability.

Two theories help explain the growing integration of sustainability into procurement. One is Stakeholder Theory [8], which encourages organizations to consider the interests of all parties involved, including suppliers, employees, communities, and customers. From this perspective, sustainable procurement aims to create mutual value and minimize harm across the supply chain. The second theory is Institutional Theory [9]. It suggests that organizations adopt sustainable practices in response to societal pressures, standards, and principles. As general public expectations progress, institutions align their procurement behavior with emerging standards for legality and long-term performance.

Formulation of research goals. This study aims to address this gap by examining the influence of sustainable procurement practices on the operational performance of healthcare institutions in Ghana, with a particular focus on the Komfo Anokye Teaching Hospital (KATH) in Kumasi. The main objective is to evaluate the impact of these practices on operational performance in healthcare delivery. Specifically, the study aims to:

1) examine how practices related to environmental sustainability such as waste reduction, energy use, and eco-friendly sourcing affect the efficiency and reliability of healthcare service delivery;
2) analyze the impact of economic sustainability, focusing on how cost-conscious procurement strategies support long-term operational stability and resource optimization;
3) investigate the role of social sustainability, including fair labor practices, community engagement, and supplier diversity, in strengthening institutional trust and service responsiveness;
4) explore how ethical sourcing, particularly transparency, accountability, and supplier integrity, influences procurement decisions and operational outcomes within healthcare facilities.

This study contributes to the growing field of green supply chain management and sustainable procurement by examining how procurement decisions affect operational outcomes in healthcare. This topic is especially important in developing nations like Ghana, where hospitals often struggle with limited funding, increasing demand for services, and environmental risks.

Outline of the main research material. The study used a mixed-methods approach, combining qualitative and quantitative techniques to identify patterns and trends and understand lived experiences across different facets of GSCM. It examined how public healthcare institutions in Ghana adopt sustainable procurement practices and the effects of these practices on service delivery. The study focused on three main areas: the design of procurement systems, operational performance indicators, and institutional influences on procurement decisions. The study surveyed procurement officers, supply officers, and supply chain managers. A purposive non-probability sampling method was employed, yielding 57 valid responses out of 65 disseminated questionnaires. Organized questionnaires were used to collect data and identify respondents' views, difficulties, and supplier collaborations associated with sustainability. Secondary data from various sources were also used to support the primary findings of this research. This study's data analysis employed both quantitative and qualitative methods. The data were analyzed using SPSS, which allowed for thorough interpretation of the results. The quantitative analysis included descriptive statistics to evaluate the impact of sustainable practices. Overall, the investigation combined empirical findings with contextual knowledge to shed light on sustainable procurement practices in Ghana's healthcare landscape.

The demographic data about the study's respondents involves information on their gender, educational background, years of experience in procurement, and institutional affiliation or department. These were analyzed using the relative importance index (RII) method and descriptive statistics. The results provide useful context for understanding the responses gathered from hospital staff and supplier representatives (Table 1).

Table 1 **Demographic characteristics of respondents**

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	39	68%
	Female	18	32%
Level of Education	Master's Degree	17	30%
	First Degree	27	47%
	Higher National Diploma	12	21%
	Diploma	1	2%
Years of Experience	1–2 years	16	28%
	3–5 years	15	26%
	6–10 years	10	18%
	More than 10 years	16	28%
Respondent Category	KATH staff	37	65%
	Supplier staff	20	35%

Source: field survey with authors' own elaborations

The results show a moderate level of alignment between KATH's procurement staff and its suppliers regarding the hospital's commitment to eco-friendly medical products. Among procurement and supply officers, seven respondents (19%) disagreed or strongly disagreed that such prioritization exists. Five respondents (14%) remained neutral, while 25 respondents (67%) either agreed or strongly agreed with the assertion. Among suppliers, no one strongly disagreed; one respondent (5%) disagreed, and five respondents (25%) were neutral. A majority of nine respondents (45%) agreed, and five respondents (25%) strongly agreed. The KATH staff's high level of agreement suggests that they perceive a stronger internal commitment to prioritization than the suppliers' staff do. This highlights the need for improved communication and collaboration between the hospital and its suppliers to align actions toward eco-friendly purchasing.

Staff responses indicated a firm conviction in the efficacy of waste segregation, recycling programs, and hazardous waste disposal procedures. Approximately 70% of KATH staff agreed or strongly agreed that these practices reduce environmental impact. The largest group, at 38%, simply agreed with the assertion. However, 30% either disagreed or were neutral, showing that not all staff are equally convinced. Among suppliers, 70% agreed or strongly agreed that waste management practices are effective; nevertheless, 30% were neutral or disagreed. Suppliers appeared slightly more cautious in their evaluation than staff. Overall, both groups clearly recognize the hospital's efforts. However, the difference in responses suggests room for improvement in communicating and evaluating waste management policies and practices across the entire supply chain.

Staff and supplier responses show overall support for KATH's sustainability efforts, though awareness levels varied. Regarding energy savings and efficient lighting and HVAC systems, 76% of staff and 75% of suppliers, respectively, agreed or strongly agreed that these initiatives are valuable. Fourteen percent of staff and 25% of suppliers had neutral responses, and only 10% of staff disagreed. These results suggest strong approval, though clearer communication could improve supplier engagement. Water resource management drew a variety of responses from the respondents. Among staff, 51% agreed or strongly agreed that KATH assesses these measures, while 24% were neutral and 19% disagreed. Suppliers were more favorable, with 70% agreeing, 10% being neutral, and 15% disagreeing. These results highlight the importance of raising awareness of water conservation initiatives, especially among internal stakeholders. When asked about eco-friendly transportation guidelines, 62% of staff and 75% of suppliers responded positively. However, 19% of staff remained neutral and 19% disagreed. Supplier disagreement was low at 5%. These results suggest that staff may need more information about transportation policies and guidelines to endorse them fully. Regarding sustainable construction practices, 62% of staff and 70% of suppliers agreed or strongly agreed that such efforts are underway at KATH, which is a positive sign. Of the staff surveyed, 27% were neutral and 11% had different opinions. The 30% neutral response from suppliers, though not negative, suggests a potential lack of clarity surrounding these initiatives. Environmental performance is widely considered a criterion for evaluating suppliers.

Approximately 78% of staff and 80% of suppliers agreed or strongly agreed. Only 5% of staff disagreed, and none of the suppliers did. However, 16% of staff and 20% of suppliers were neutral, suggesting the need for greater clarity in the evaluation process. Regarding training related to sustainable procurement, 68% of staff said such programs exist, while nearly 30% were neutral or disagreed. Among suppliers, 80% agreed or strongly agreed, while the remaining 20% were neutral or disagreed. Suppliers' stronger responses indicate that internal communication and training need improvement. Regarding patient or client education on environmental and health sustainability, 59% of staff agreed or strongly agreed, 27% were neutral, and 14% disagreed. Suppliers showed greater support, with 80% agreeing and only 5%

disagreeing. This suggests that staff could benefit from greater involvement in these outreach efforts.

Lastly, 59,5% of staff and 90% of suppliers agreed or strongly agreed that KATH is involved in partnerships to support sustainability. 29,7% of staff and 5% of suppliers were neutral, while 10,8% of staff and one supplier disagreed. Staff could be better informed about these partnerships to improve internal alignment.

Effect of economic sustainability on healthcare delivery. This section examines how KATH's economic sustainability practices influence healthcare delivery, drawing on feedback from staff and suppliers. Themes include cost savings, return on investment (ROI), budget evaluation, supplier collaboration, and sustainability monitoring. A strong majority of staff (78%) and suppliers (80%) believe that sustainable procurement leads to cost savings at KATH. Only 8% of staff and 5% of suppliers disagreed, while 14% of staff and 15% of suppliers remained neutral. These responses support the general opinion that sustainability enhances financial effectiveness, consistent with some earlier studies. When asked if KATH assesses the ROI of sustainable investments, 64% of staff and 70% of suppliers agreed. Though, 30% of staff and suppliers were neutral and only 6% of staff disagreed. The relatively high level of neutrality, particularly among staff, may indicate gaps in communication or awareness regarding how ROI is evaluated. Regarding the budget for evaluating sustainability, 67% of staff agreed that KATH consistently reviews its budget for such initiatives. Supplier agreement was even higher, at 95%. The Neutral responses were higher among staff (22%) than suppliers (5%), and 11% of the staff disagreed. This suggests that suppliers may have more confidence in the hospital's financial planning than some internal staff. Regarding collaboration with suppliers, 76% of staff and 90% of suppliers agreed that KATH works closely with vendors on sustainability and its influence on operations. Neutral responses were 16% and 10%, respectively, with very few disagreeing. These results demonstrate a shared belief that collaborating with stakeholders improves performance. Regarding monitoring the impact of sustainability on operational costs, 84% of staff and 85% of suppliers also agreed that it is a strength. Only 11% of staff and 15% of suppliers had neutral views, reflecting a strong commitment to performance tracking. Regarding waste reduction and disposal cost savings, 81% of staff and 80% of suppliers agreed that sustainability helps significantly. However, 16% of staff and 10% of suppliers disagreed, suggesting that, although most recognize the benefits, some question the consistency of the measure.

A strong majority also agreed that sustainable procurement helps KATH comply with environmental regulations, with 81% of staff and 90% of suppliers agreeing. Only 3% of staff and no suppliers disagreed. This indicates a shared confidence in the hospital's regulatory approach. 74% of the staff and 85% of suppliers agreed that KATH prioritizes contracting certified sustainable suppliers for their activities. However, 16% of staff were neutral and 10% disagreed. Suppliers did not disagree with this statement; only 10% were neutral. This suggests that they are more aligned with the hospital's procurement standards than the staff is. Regarding policy development, 67% of staff and 95% of suppliers said that KATH has worked with suppliers to develop sustainability policies and guidance. Neutral responses came from 22% of the staff and just 5% of suppliers. This shows that suppliers feel more engaged in policy processes and procedures than some staff members, who may not be fully updated or involved.

Ultimately, 78% of staff and 90% of suppliers agreed that KATH effectively monitors supplier compliance with sustainability standards. Among staff, 16% were neutral, and 6% disagreed. Supplier responses showed 5% neutrality and 5% disagreement. Overall, these results reflect a positive trend of supplier accountability, which is indeed a key to maintaining a dependable and reliable ethical supply chain. Table 2 below explains the effect of economic sustainability on healthcare delivery.

Influence of social sustainability on healthcare delivery. This section uses feedback from staff and suppliers to explain how economic sustainability practices at KATH impact operational performance. The focus is on cost savings, return on investment (ROI), budget evaluation, supplier collaboration, and sustainability monitoring. The majority of staff (78%) and suppliers (80%) believe that sustainable procurement can lead to cost savings at KATH. Only 8% of staff and 5% of suppliers disagreed, while 14% of staff and 15% of suppliers remained neutral. These results support the general view that sustainability contributes to financial efficiency, in line with earlier studies.

Table 2 **Effect of economic sustainability on healthcare delivery**

Statement	Group	SD (%)	D (%)	N (%)	A (%)	SA (%)
Cost savings through sustainable procurement	Staff	8	0	14	59	19
	Supplier	0	5	15	60	20
ROI assessment of sustainable investments	Staff	3	3	30	48	16
	Supplier	0	0	30	55	15
Evaluation of sustainability budget allocation	Staff	5	6	22	46	21
	Supplier	0	0	5	70	25
Collaboration with suppliers on sustainability	Staff	3	5	16	43	33
	Supplier	0	0	10	55	35
Monitoring impact on operational costs	Staff	5	0	11	54	30
	Supplier	0	0	15	35	50
Reduction in waste generation and disposal costs	Staff	8	8	3	59	22
	Supplier	0	10	10	45	35
Compliance with regulatory requirements	Staff	0	3	16	38	43
	Supplier	0	0	10	45	45
Contracting with certified suppliers	Staff	3	7	16	41	33
	Supplier	0	0	10	45	45
Sustainability policy development with suppliers	Staff	5	6	22	38	29
	Supplier	0	0	5	45	50
Monitoring and evaluation of supplier compliance	Staff	3	3	16	38	40
	Supplier	0	5	5	45	45

Keynote: *(SD – Strongly Disagree), (D – Disagree), (N – Neutral), (A – Agree), (SA – Strongly Agree)*

Source: field survey with authors' own elaborations

KATH was asked if they assess the ROI of sustainable investments. Sixty-four percent of staff and 70% of suppliers agreed. However, 30% of staff and suppliers were neutral, and only 6% of staff disagreed. This relatively high level of neutrality, particularly among staff, may indicate gaps in communication or awareness regarding how ROI is evaluated. Regarding budget evaluation for sustainability, 67% of staff agreed that KATH consistently reviews its budget for such initiatives. Supplier agreement was even higher, at 95%. Staff had more neutral responses (22%) than suppliers (5%), but 11% of staff disagreed. This suggests that suppliers may have more confidence in the hospital's financial planning than some internal staff members do. Regarding collaboration with suppliers, 76% of staff and 90% of suppliers agreed that KATH works closely with vendors on sustainability and its influence on operations. Sixteen percent of staff and 10% of suppliers had neutral responses, with very few disagreeing. These results demonstrate a shared belief that collaboration improves performance. Monitoring the impact of sustainability on operational costs is also viewed as a strength, with 84% of staff and 85% of suppliers agreeing. However, neutral responses were limited, at 11% for staff and 15% for suppliers, indicating strong support for performance tracking.

In terms of waste reduction and disposal cost savings, 81% of the staff and 80% of suppliers agreed that sustainability really helps in reducing disposal costs. 16% of the staff and 10% of suppliers disagreed, showing that while most see it as a benefit, there are still questions to be asked about consistency or scale. A strong majority also agreed that sustainable procurement helps KATH comply with environmental regulations 81% of staff and 90% of suppliers. Only 3% of staff disagreed, and none of the suppliers did. This demonstrates collective trust in the hospital's regulatory strategy. 74% of staff and 85% of suppliers agreed that KATH prioritizes contracting certified sustainable suppliers for activities. However, 16% of the staff were neutral while 10% disagreed. Among suppliers, disagreement was absent, and only 10% were neutral, suggesting that they are more aligned with the hospital's procurement standards than the staff. Concerning policy development, 67% of the staff and 95% of suppliers said KATH worked with suppliers to develop sustainability policies and regulations. Neutral responses came from 22% of the staff and only 5% from suppliers. It reveals that suppliers feel more engaged in policy processes, while some staff may not be fully updated or involved. Finally, 78% of the staff and a huge 90% of suppliers agreed that KATH monitors supplier adherence to sustainability guidelines. Among the staff, 16% were neutral and 6% disagreed. Supplier responses showed 5% neutrality and 5% disagreement. In summary, this demonstrates a solid dedication to supplier accountability, very important for upholding a reliable and ethical supply chain.

The majority of KATH staff (70%) agreed (43%) or strongly agreed (27%) that the hospital meets sustainable procurement standards, demonstrating robust internal support for sustainability practices and implementation. However, 19% were neutral and 11% (3% disagree and 8% strongly disagree) expressed some doubt. Supplier feedback was even more positive: 90% agreed or strongly

agreed, and only 10% were neutral. No supplier disagreed with this assertion. While both groups agree on sustainability, the neutral staff responses suggest the need for clearer internal communication and collaboration regarding these efforts. When asked about procurement oversight, 81% of staff believed that proper checks and balances are in place (38% agreed and 43% strongly agreed), with 11% showing neutrality and 8% disagreeing. No staff member strongly disagreed. Among suppliers, 90% (45% agreed and 45% strongly agreed) expressed confidence, with only 10% remaining neutral. This uniformity suggests an efficient procurement process, though enhancing transparency could address staff concerns.

Regarding adherence to environmental and social standards, 84% of respondents agreed or strongly agreed, 10% were neutral, and 6% disagreed. Similar results were shown by the suppliers, with 85% in agreement, 5% neutral, and 10% in disagreement. Both groups view KATH as adhering to regulations, though a minority remains skeptical, suggesting the need for continued engagement. Regarding compliance with safety and government regulations, 78% of staff agreed or strongly agreed, 11% were neutral, and 11% disagreed. Suppliers were much more confident, with 95% agreeing, 5% being neutral, and no disagreement. This difference may reflect suppliers' exposure to audits or external checks. However, stronger internal communication could boost staff confidence and inform them. Regarding awarding contracts to the lowest responsive and responsible bidder, 78% of staff agreed or strongly agreed, 19% were neutral, and 3% disagreed. Suppliers were more likely to agree with this assertion, with 90% agreeing, 5% being neutral, and 5% disagreeing. This indicates a collective conviction in fairness, though staff neutrality implies that some are not fully informed about the award process.

Regarding accountability, 82% of staff and 41% of suppliers agree or strongly agree. It is believed that KATH staff are held accountable for their procurement activities. This reflects trust in internal control systems for sourcing and procurement. Regarding the existence of a technical code of conduct, 81% of staff and 85% of suppliers confirmed its existence, demonstrating comprehensive confidence in ethical guidelines and procedures. Similarly, 81% of staff strongly agree or agree with the assertion, as do 90% of suppliers, consisting of 60% who strongly agree and 30% who agree. They said that KATH operates with due diligence in its daily activities, with only a few neutral or disagreeing responses. Eighty-one percent of staff agreed or strongly agreed that an ethical unit exists at KATH, while 8% disagreed. Among suppliers, 80% confirmed its existence, 10% were neutral, and 10% disagreed. These results demonstrate a shared recognition of ethical governance, though not unanimous.

Lastly, 70% of staff believed employees act without personal interest in procurement decisions, while 19% were neutral. Among suppliers, 65% agreed, 5% were neutral, and 5% disagreed. While most trust the staff's conduct, the level of neutrality suggests a need to reinforce ethical values internally.

The results showed that sustainable procurement translates into measurable improvements in hospital services, supplier collaboration, inventory control, and cost efficiency, not just an ideal. Respondents strongly supported the idea that environmental sustainability improves healthcare delivery. Seventy percent agreed that practices such as effective waste management and reducing the environmental footprint create safer and healthier conditions for patients, staff, and suppliers. These findings echo those of [10], who linked sustainable procurement to stronger supply chain resilience and reduced environmental harm.

Economic sustainability has emerged as a significant influence on the performance of healthcare delivery. Cost efficiencies are gained through thoughtful planning, accurate predictions, and expert negotiation. This improves resource utilization, which reinforces the findings of Martinez-Ferrero et al. [11] and Zimmer and Durham [12], who emphasized the importance of financial evaluation in sustainable procurement. Social sustainability and ethical sourcing also improve performance in the healthcare sector. Staff and suppliers prioritize fair labor standards, inclusiveness, and community involvement to create a more equitable workplace and improve services.

Implementing technologies such as barcode scanning and real-time inventory systems has enhanced stock monitoring, reduced losses, and expedited reorder processes. This has resulted in fewer surgery delays and improved medication availability. Although rural facilities continue to encounter issues with manual systems, inadequate connectivity, and insufficient training, Cheng et al. [5] corroborate these findings. Staff generally agreed that sustainable procurement improved service delivery by making supply access more predictable and creating a more stable work environment. However, delayed approvals, budget limitations, restricted autonomy, and the involvement of heads of each department still disrupted planning and efficiency, consistent with Gupta et al. [3]. Several themes emerged throughout the study: sustainability practices that consistently supported cost efficiency, varying awareness of financial assessments, and greater supplier engagement with sustainability than staff engagement. Both groups agreed that KATH maintains strong monitoring and compliance in its sustainable procurement processes.

Conclusions. The present study builds upon the insights of Letunovska et al. [13]. While their research focused on strategic brand positioning and public perception, this study extends these considerations to the operational level. It explores how business-oriented green supply chain management and sustainable procurement practices can improve healthcare delivery. The results show that integrating environmental, economic, social, and ethical sustainability into procurement practices

significantly improves operational performance in the healthcare sector. Specifically, sustainable procurement, budget-friendly planning, fair labor practices, and ethical sourcing have been shown to improve the quality, reliability, and efficiency of healthcare services. These findings are consistent with those of Govindan et al. Govindan et al. highlight that these sustainable procurement practices may result in long-term operational advantages and environmental accountability. The research highlights the benefits of green supply chain management (GSCM), including reduced costs, improved resource management, lower environmental impact, and a stronger institutional reputation. These advantages were evident in hospitals and other healthcare institutions that employed green purchasing, eco-design, reverse logistics, energy efficiency, and sustainable transportation practices. Ahuja and Khanna [15] also found that green purchasing can lead to both emissions reductions and financial savings, while Berrone et al. [16] highlighted that energy-efficient practices in hospitals and healthcare facilities can contribute to reduced utility costs and enhanced brand perception. This study and earlier works, such as Govindan et al. [14], note that the application of eco-design and reverse logistics offers tangible environmental and operational benefits. Case studies from local and international contexts highlight the importance of these strategies in improving healthcare service delivery and sustainability outcomes.

The study also identified several implementation challenges. These challenges are particularly prevalent within resource-constrained healthcare systems in developing economies. These challenges include financial limitations, poor infrastructure, resistance to change, and limited staff awareness of the implementation plans. Jones et al. [17] highlighted these concerns, noting that capacity gaps and funding shortfalls can hinder sustainability efforts in healthcare settings, particularly in developing countries. Despite these barriers, hospitals and healthcare institutions that invested in long-term supplier relationships, digital inventory systems, and staff training achieved better results. Evidence suggests that adopting GSCM practices requires collaboration rather than isolated efforts. It demands a system-wide approach that connects people, technology, policy, and institutional culture. Supplier engagement alone is insufficient; internal staff involvement, consistent monitoring, and data-driven decision-making are equally essential. For institutions such as KATH, balancing environmental goals, regulatory compliance, and cost-effectiveness is key to success. To build on the progress already made, several recommendations are put forward. These include strengthening internal communication, providing staff with training on sustainable procurement, leveraging supplier collaboration to improve the entire supply chain, using real-time monitoring data to guide procurement strategy, and providing proof of cost savings to build organizational support.

In conclusion, incorporating sustainable procurement into GSCM offers healthcare institutions in Ghana a practical and effective means of enhancing healthcare service delivery while promoting ecological preservation. With the necessary commitment and resources, including financial ones, these practices can help create a more resilient and equitable healthcare system that meets current demands without endangering future needs.

Future research could explore implementing business-oriented green supply chain management practices in diverse healthcare contexts across different countries to assess the applicability and scalability of the authors' recommendations across cultures.

This study was funded by the Ministry of Education and Science of Ukraine (grant number 0125U000531, «Institutional and Functional Adaptation of the Public Health System to Post-War Recovery of Ukraine's Economic and Human Potential»).

References:

1. Srivastava, S. K. (2007). Green supply-chain management: A state-of-the-art literature review. *International Journal of Management Reviews,* 9(1), 53-80. https://doi.org/10.1111/j.1468-2370.2007.00202.x.
2. Walker, H., Seuring, S., Sarkis, J., & Klassen, R. D. (2019). Sustainable operations management: Recent trends and future directions. *International Journal of Operations & Production Management,* 39(1), 1-21.
3. Gupta, S., Singh, R. K., & Kumar, P. A review on sustainable supply chain management in healthcare. *Sustainable Production and Consumption,* 29, 27-43. https://doi.org/10.1016/j.spc.2021.09.011.
4. Wilkerson, K., Sharma, A., & Dube, T. (2015). Waste generation and management in developing countries' healthcare systems. *Waste Management,* 38, 327-337.
5. Cheng, J., Wang, J., Li, S., & Lin, B. (2023). A review of sustainable supply chain management practices in the healthcare industry. *Journal of Cleaner Production,* 386, 135765. https://doi.org/10.1016/j.jclepro.2022.135765.
6. Mensah, E., Ofori, D., & Boateng, F. (2021). Sustainable procurement practices in Ghanaian public hospitals: Challenges and prospects. *Ghana Journal of Procurement and Logistics,* 3(1), 22-33.
7. Walker, H., & Brammer, S. (2012). The relationship between sustainable procurement and e-procurement in the public sector. *International Journal of Production Economics,* 140(1), 256-268. https://doi.org/10.1016/j.ijpe.2012.01.008.
8. Freeman, R. E. (1984). *Strategic management: A stakeholder approach*. Pitman.
9. Scott, W. R. (1995). *Institutions and organizations*. Sage.
10. Chen, X., Zhao, Y., & Wang, L. (2021). The impact of sustainable procurement on operational performance in the manufacturing sector. *Journal of Cleaner Production,* 319, 128565.

11. Martinez-Ferrero, J., Garcia-Sanchez, I., & Cuadrado-Ballesteros, B. (2019). Sustainable procurement and firm performance: Evidence from Europe. *Corporate Social Responsibility and Environmental Management,* 26*(*4), 951-967.
12. Zimmer, K., & Durham, L. (2020). Financial evaluation tools for sustainable procurement decisions. *Journal of Business Economics,* 90(4), 527-544.
13. Letunovska, N., Demchyshak, N., Minchenko, M., Kriskova, P., Kashcha, M., & Volk, A. (2023). Management of country's social brand under conditions of uncertainty in the health domain. *Marketing and Management of Innovations*, 2, 10-18. https://doi.org/10.21272/mmi.2023.2-02.
14. Govindan, K., Seuring, S., & Zhu, Q. (2014). Sustainable supply chain management for green healthcare. *Journal of Cleaner Production,* 71, 3-17. https://doi.org/10.1016/j.jclepro.2014.01.045.
15. Ahuja, V., & Khanna, M. (2012). Green procurement in Indian hospitals: A case study. *International Journal of Sustainable Engineering,* 5(3), 213-221. https://doi.org/10.1016/j.jenvman.2012.09.005.
16. Berrone, P., Ricart, J. E., & Carrasco, C. (2018). Energy efficiency in healthcare: Global practices and trends. *Energy Policy,* 120, 257-265.
17. Jones, H., & Lee, C. (2019). Ethical sourcing and brand loyalty: A study of consumer attitudes. *Journal of Business Research,* 104, 512-520.