



Green Supply Chain Management Practices and Effects on Organizational Performance in the Zambian Beverage Manufacturing Industry

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Received: Sept 29, 2023

Revised: Oct 20, 2023

Accepted: Nov 10, 2023

Online: Nov 30, 2023

Abstract

Organizational performance is important because it directly impacts the overall success and sustainability of a business. This study aims to investigate the effects of Green Supply Chain Management (GSCM) practices on organizational performance in the Zambian beverage industry, using an embedded mixed methods model. Quantitative data was collected using a questionnaire from 32 participants out of 37 and analyzed using descriptive and inferential statistics using STATA Version 14. Qualitative data was collected from in-depth interviews with 9 Supply Chain specialists and Industry Experts, selected based on availability, convenience, and volunteering. The results show that Green Purchasing, Green Manufacturing, Green Distribution/Marketing, and Reverse Logistics each had a positive influence on organizational performance. Internal drivers had a significant and positive effect, while internal barriers had a negligible impact. External drivers positively affected organizational performance, while external barriers had a negative influence. Stepwise regression revealed that 14.9% of the variations in organizational performance were explained by the model, with internal drivers being the most significant factor. The study concludes that the major benefits of applying GSCM practices are reduced production costs, good reputation with the municipalities and law enforcers, and long-term savings due to efficiency in production. The study recommends that companies should increase their knowledge of GSCM practices and engage in more sustainable practices to reduce production costs and prevent further environmental degradation. Future studies could include research into factors that can improve GSCM practices in the Zambian beverage manufacturing sector.

Keywords *beverage manufacturing industry, GSCM practices, organizational performance*

INTRODUCTION

Organizational performance is important because it directly impacts the overall success and sustainability of a business or institution (Ahmed et al., 2020). It is defined as the accomplishment of organizational objectives relating to long-term profitability, revenue growth rate, job satisfaction, staff productivity, goodwill, and service or product quality (Terry Kim et al., 2013). It serves as a measure of how effectively an organization achieves its objectives and delivers value to stakeholders (Jensen, 2010). A high level of organizational performance signifies efficiency, competitiveness, and the ability to adapt to changing environments, ultimately leading to improved financial performance, customer satisfaction, employee engagement, and organizational growth (AlTaweel & Al-Hawary, 2021). With the growing concerns about the environment, the adoption of Green Supply Chain Management (GSCM) has gained popularity in the manufacturing industry for both manufacturers and customers in recent years (Ahmad et al., 2022). The idea behind GSCM is

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to include eco-friendly concepts and practices throughout the entire supply chain management process, from procuring raw materials to delivering finished goods. It strives to promote sustainable economic development while minimizing the negative effects of supply chain operations on the environment. Therefore, many firms consider the potential advantages of GSCM, including cost savings, risk management, stakeholder satisfaction, and environmental protection, have been recognized by many businesses (Silva, 2020).

Due to the various institutional, cultural, and economic factors, the adoption of GSCM practices varies across industries and geographical areas (Carter & Liane Easton, 2011). The adoption of Green Supply Chain Management (GSCM) in Sub-Saharan Africa is a topic that has gained increasing attention in recent years (Ogah & Asiegbu, 2022). Considering that the region is home to abundant renewable energy resources such as solar, wind, and hydroelectric power, which can be harnessed to reduce the environmental impact resulting from the activities associated with manufacturing and supply chain (Bugaje, 2006). Many businesses and consumers in Sub-Saharan Africa are becoming increasingly aware of the importance of sustainability and environmental protection, which could create a market demand for GSCM practices (Mabogunje, 1998). However, there are also several barriers to the adoption of GSCM in the region. One of the major challenges is the lack of awareness and knowledge about sustainable supply chain practices, and many businesses in Sub-Saharan Africa may not be aware of the benefits of GSCM practices, or may not have access to the necessary resources and knowledge to implement them (Ogah & Asiegbu, 2022).

Being a country in sub-Saharan Africa, Zambia may face similar challenges that may affect the adoption of GSCM practices among manufacturers. Few studies have been conducted on the adoption of Green Supply Chain Management (GSCM) practices in Zambia. Nevertheless, it has been indicated that there has been low adoption of GSCM practices in the country (Mtonga, 2019). The reasons for this may vary but could include factors such as limited awareness and knowledge about GSCM practices, a lack of financial resources to invest in sustainable practices, and a lack of supportive regulatory frameworks to promote the adoption of GSCM practices (Reddy et al., 2018).

Based on the research question, does the implementation of green supply chain management affect the organizational performance of Zambian beverage manufacturing companies? this study aims to assess the effect of GSCM practices on the organizational performance of Zambian beverage manufacturing companies. Therefore, the findings of this study will contribute to the global understanding of sustainable supply chain management and Organisational performance. The study will provide insights into the factors that influence GSCM adoption and its effects on organizational performance in the African context, which has received relatively less attention in the literature on GSCM and sustainability (Blystad et al., 2020).

LITERATURE REVIEW

In a study conducted in Saudi Arabia, it was observed that strategic agility has a considerable impact on organizational performance and innovation capability. Additionally, innovation capability acts as a mediator to strengthen the link between organizational performance and strategic agility. (AlTaweel & Al-Hawary, 2021). Further, Lee et al., (2012) in a study conducted in the United States of America stated suggested that increasing operational efficiency using GSCM would improve corporate performance.

According to a study conducted in Australia, business strategy, technological prowess, and organizational culture were found to have a significant positive impact on the environmental sustainability performance of construction businesses. It was found that organizational culture and

business strategies have a favorable impact on an organization's social sustainability performance. (Afzal & Lim, 2022). Meanwhile, in a study done by Saeed et al., (2018) in China, it was found that external GSCM procedures significantly improved economic performance.

Another study that was conducted in China demonstrated that GSCM, through green culture and senior management commitment, indirectly influences business performance. The findings show that GSCM and company performance are positively and significantly mediated by green culture and top management commitment (Nureen et al., 2023).

According to research findings in Pakistan, customer collaboration has a negligible impact on the sustainable performance of firms, in contrast to the considerable and beneficial effects of green manufacturing, green purchasing, eco-design, and green information systems. The study also stated that the institutional pressures that are moderated between eco-design, customer collaboration, green information systems, and sustainability performance are notably different from those that are moderated between eco-manufacturing, green buying, and eco-design (Ahmad et al., 2022).

The results of a study conducted in India revealed that the lack of knowledge, top management commitment, high investment costs, a lack of government support, a lack of information technology, and a lack of learning capacity to evaluate GSCM were the most significant factors affecting the implementation of GSCM in the Tech Manora industry (Reddy et al., 2018).

According to a study done in Sub-Saharan Africa, enterprises and governments of different nations must embrace sustainable supply chain methods to lessen the impact they have on their ecosystems while still meeting their immediate economic needs and requirements. In addition to digitization, the supply chain ecosystem's three pillars of economic, societal, and environmental advantages foster SSCM hence, organizations need to hinge their value chains on these pillars (Ogah & Asiegbu, 2022).

In Zambia, literature relating to GSCM and its effect on Organisational performance could not be found, despite some topics on green practices having been conducted addressing construction, tourism, Logistics, and transportation sectors. This study is meant to fill this gap, to investigate GSCM and its effect on organizational performance, specifically in the beverage industry.

Conceptual Framework

Fig. 1 represents the conceptual framework showing the factors perceived to influence the relationship between GSCM practices and organizational performance in the Zambian beverage manufacturing industry.

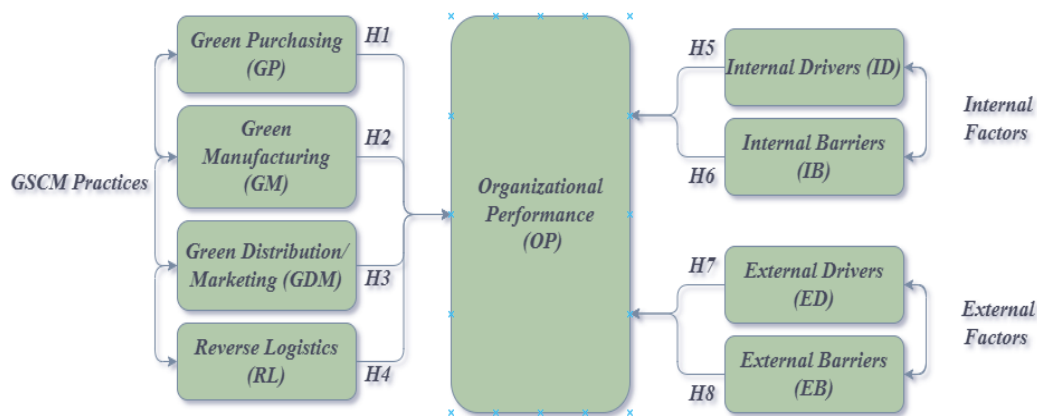


Figure 1. Conceptual framework (developed by the researcher)

METHODOLOGY

The target population for this study was the enterprises in the beverage manufacturing sector, registered with the Zambia Association of Manufacturers (ZAM). Thus, the sampling frame provided by ZAM consisted of 37 beverage manufacturing companies as of 29th September 2022. Based on literature and guidance provided by Stoker, (2011) in Mwanza, (2018) regarding sampling from small populations, a sample of 30 firms is adequate for this type of investigation. Therefore, a sample of 32 firms was chosen and included in this research (Indrayan & Mishra, 2021). The study used an embedded, concurrent mixed method approach where the quantitative data assumed a primary role and qualitative data played a secondary and supportive role (Harrison & Reilly, 2011). This was done to allow for a more complete and holistic investigation of the relationship between green supply chain management techniques and organizational performance in the Zambian beverage manufacturing industry (Tashakkori & Teddlie, 2003).

To meet the objective(s) of this study, data was collected using a questionnaire from employees at the managerial level in the targeted companies. This was done to provide useful insights into the dynamics, difficulties, and opportunities related to green supply chain management techniques in the Zambian beverage manufacturing business. Their thoughts and experiences helped to gain a more comprehensive grasp of the research issue and improve the study's practical relevance and applicability. Therefore, the questionnaire was distributed and completed using an online platform called Google Forms. For the qualitative aspect, to reach the saturation point, a total number of 12 participants was required for this study (Vasileiou et al., 2018). On the other hand, in-depth interviews were conducted with nine managers and experts in the industry which was acceptable for homogenous populations to reach saturation point (Hennink & Kaiser, 2022). This inclusion was based voluntarily, hence the sample size. Despite the sample being small, this study reached a saturation point because no new information emerged from the responses. The interviews aimed at supplementing information collected using questionnaires. The study adopted a concurrent triangulation strategy, where both quantitative and qualitative data were collected and analyzed concurrently (Creswell & Creswell, 2018). In this regard, the GSCM practices, drivers, and barriers were analyzed on how they affect the organizational performance of the beverage manufacturing industry. The particular methods used in this analysis are described as follows;

Quantitative Approach

Based on the sample of 32 study participants, the data that was collected was analyzed using both, descriptive statistics and inferential statistics. That is, the demographic factors of the respondents were analyzed using frequency tables. Secondly, All the variables that were measured on Likert scales (Green purchasing, Green Manufacturing, Green Dist./Marketing, Reverse Logistics, Internal Drivers, External Drivers, Internal Barriers, External Barriers, and Organizational Performance) were tested for internal consistency using the Cronbach alpha to measure how closely related a set of items were as a group that was making up each variable (Bruin, 2021). The items (see table 6 in

annex) on each Likert scale variable were summed up to create the independent and dependent variables that were summarized using descriptive statistics to describe the characteristics of the variables. In this regard, this study was set to test the following specific hypotheses;

- H1: There is no relationship between Green Purchasing practices and Organizational performance
 H2: There is no relationship between Green Manufacturing practices and Organizational performance
 H3: There is no relationship between Green Distribution practices and Organizational performance
 H4: There is no relationship between Reverse Logistics practices and Organizational performance
 H5: There is no relationship between internal drivers and Organizational performance
 H6: There is no relationship between internal barriers and Organizational performance
 H7: There is no relationship between external drivers and Organizational performance
 H8: There is no relationship between external barriers and Organizational performance

Qualitative Analysis

To gain insights into the phenomenon of green supply chain management and its effect on organizational performance, qualitative data analysis was employed which used the thematic analysis method to analyze that qualitative data. Data was collected from a sample of nine participants. The analysis involved the following steps. (1) Familiarization with the demographic characteristics of the experts in the beverage manufacturing industry and gaining a comprehensive understanding of the data. This helped with contextualization of the responses and identifying any patterns or trends that may emerge from the data collected. (2) Determination of the key themes of the study. These themes served as the main categories for organizing and analyzing the data. (3) Importing the collected data into NVivo 12 software, a popular tool for qualitative analysis. (4) Creating codes that represent the identified themes and apply them to relevant segments of the data. (5) Grouped the coded data based on the assigned codes to visualize and compare responses. (6) Analyzing each theme individually, looking for patterns, commonalities, and differences in the data. identifying sub-themes and patterns within each main theme to provide more granular insights. (7) Interpreting the findings in the context of the research objectives, considering the experts' demographic characteristics. (8) Presenting the key findings for each theme and sub-theme, using quotes or excerpts from the experts' responses to illustrate important points.

Triangulation of the embedded mixed methods approach

Fig. 2 shows the triangulation of the embedded mixed methods approach. This mixed method approach of the study has a major focus on quantitative data and a secondary role for qualitative data which allowed for a thorough data collection process. This method combines quantitative data's statistical evidence and numerical measurements with qualitative data's deeper insights, explanations, and contextual knowledge. The method improves the validity and reliability of the findings by triangulating numerous data sources and methods while capturing the multidimensional character of green supply chain management strategies. The quantitative data gave quantifiable measures for benchmarking and data-driven decision-making, whereas the qualitative data provided significant insights into the complexities, problems, and possibilities associated with implementing green practices in Zambia's beverage manufacturing business.

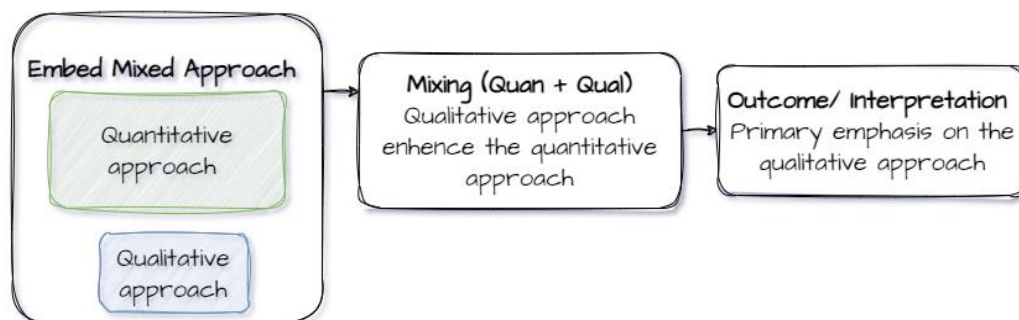


Figure 2. Triangulation of the embedded mixed methods approach

FINDINGS AND DISCUSSION

Quantitative Analysis

Social Demographic Characteristics of the Respondents

Table 1 presents the social demographic characteristics of the study participants. The majority of participants were male, accounting for 93.75% of the sample. Regarding age distribution, the highest proportion was observed in the age groups of 31 to 45 years (31.25%) and 46 to 50 years (31.25%). In contrast, the age group of 26 to 30 years comprised a minority of participants (9.38%). Regarding work experience, the largest percentage of participants reported having 1 to 5 years of experience (31.25%), while a smaller proportion had less than 1 year of experience (6.25%). Regarding firm size, the majority of participants reported working in firms with fewer than 100 employees (37.50%), while only a minority indicated their firm's employee count between 301 and 400 (3.13%). In terms of education levels, the majority of participants reported holding a degree as their highest educational attainment (46.88%), whereas a smaller percentage had secondary school as their highest level of education (12.50%).

Table 1. Social demographic characteristics of the respondents

Variable	Count (n)	Percentage (%)
Sex		
<i>Male</i>	30	93.75%
<i>Female</i>	2	6.25%
Age group		
<i>25 years and below</i>	0	0.00%
<i>26 – 30 years</i>	3	9.38%
<i>31 – 45 years</i>	10	31.25%
<i>46 -50 years</i>	10	31.25%
<i>51 years and above</i>	9	28.13%
Experience		
<i>Less than 1 year</i>	2	6.25%
<i>1 – 5 years</i>	10	31.25%
<i>6 - 10 years</i>	9	28.13%
<i>10 – 15 years</i>	5	15.63%
<i>More than 15 years</i>	6	18.75%
Number of employees		
<i>Less than 100</i>	12	37.50%
<i>100 – 200</i>	6	18.75%
<i>201 – 300</i>	3	9.38%
<i>301 – 400</i>	1	3.13%
<i>More than 400</i>	10	31.25%
Education Level		
<i>Secondary</i>	4	12.50%
<i>Diploma</i>	6	18.75%
<i>Degree</i>	15	46.88%
<i>Masters</i>	7	21.88%

Summary Statistics of the variables

Table 2 is the summary statistics and the results for internal consistency of the Likert scale variables which were tested using the Cronbach alpha. The results were based on 32 observations who completed and submitted the questionnaire. The results show that green purchasing (GP) consisted

of 9 items that yielded an average score of 31.94 (SD = 8.74) with a minimum score of 15 and a maximum score of 45 and the internal consistency was 0.88. Green manufacturing consisted of 6 items that yielded an average score of 24.69 (SD = 5.49) with a minimum score of 9 and a maximum score of 30 and the internal consistency was 0.89. The distribution/marketing had 8 items that yielded an average score of 31.53 (SD = 6.17) with a minimum score of 15 and a maximum score of 40 and the internal consistency was 0.81. Reverse logistics had 7 items yielded an average score of 23.47 (SD = 9.10) with a minimum score of 7 and a maximum score of 35 and the internal consistency was 0.93. Furthermore, the internal drivers consisted of 7 items that yielded an average score of 25.97 (SD = 7.09) with a minimum score of 14 and a maximum score of 35, and the internal consistency was 0.90. External drivers also consisted of 7 items that yielded an average score of 26.25 (SD = 5.53) with a minimum score of 16 and a maximum score of 34 and the internal consistency was 0.83. Internal barriers had 8 items that yielded an average score of 24.16 (SD = 7.91) with a minimum score of 10 and a maximum score of 38 and the internal consistency was 0.91. External barriers had 8 that yielded an average score of 25.09 (SD = 8.33) with a minimum score of 11 and a maximum score of 20 and the internal consistency was 0.92. Lastly, the outcome variable, the organizational performance had 8 items that yielded an average score of 28.78 (SD = 7.38) with a minimum score of 16 and a maximum score of 40 and the internal consistency was 0.92.

Table 2. Summary statistics on the study variables

SN	Variable	No. of Items	Cronbach Alpha	Obs.	Mean	SD	Min	Max
1	Green purchasing	9	0.8782	32	31.94	8.74	15	45
2	Green Manufacturing	6	0.8906	32	24.69	5.49	9	30
3	Green Dist./Marketing	8	0.8112	32	31.53	6.17	15	40
4	Reverse Logistics	7	0.9259	32	23.47	9.10	7	35
5	Internal Drivers	7	0.9033	32	25.97	7.09	14	35
6	External Drivers	7	0.8278	32	26.25	5.53	16	34
7	Internal Barriers	8	0.9052	32	24.16	7.91	10	38
8	External Barriers	8	0.9206	32	25.09	8.33	8	40
10	Organizational Performance	8	0.9227	32	28.78	7.38	16	40

Regression Analysis

In this study, to test the relationship between GSCM practices, internal and external factors, and organization performance, regression analysis was performed at a 95% confidence level and the results are shown in Table 3. Among the GSCM practices, green purchasing explained 3% of the variations in organizational performance of which a unit increase in green purchasing increased the mean value of organizational performance by 0.146. Green manufacturing explained 0.2% of the variations in organizational performance of which a unit increase in green manufacturing increased the mean value of organizational performance by 0.056. Green distribution and marketing explained 0.1% of the variations in organizational performance of which a unit increase in green distribution and marketing increased the mean value of organizational performance by 0.035. Reverse logistics explained 3% of the variations in environmental performance of which a unit increase in reverse logistics increased the mean value of organizational performance by 0.141.

Among the internal factors, internal drivers explained 14.9% of the variations in organizational performance of which a unit increase in internal drivers increased the mean value of the organizational performance by 0.402. The relationship between organizational performance and internal drivers was statistically significant ($p = .029$, CI = 0.044, 0.760). Internal barriers explained 0.1% of the variations in organizational performance of which a unit increase in internal barriers increased the mean value of the organizational performance by 0.029

Among the external factors, external drivers explained 5.4% of the variations in organizational performance of which a unit increase in external drivers increased the mean value of the

organizational performance by 0.31. external barriers explained 13% of the variations in organizational performance of which a unit increase in external barriers reduced the mean value of organizational performance by 0.32. The relationship between organizational performance and external barriers was statistically significant ($p = .043$, CI = -0.628 -0.012).

Table 3. Regression analysis results of organizational performance and GSCM practices

SN	Organizational Performance	Coef.	R ²	P>t	95% CI	Decision Rule
1	Green purchasing	0.146	0.030	0.346	-0.165, 0.456	Failed to reject H ₀
2	Green Manufacturing	0.056	0.002	0.823	-0.446, 0.557	Failed to reject H ₀
3	Green Dist./Marketing	0.035	0.001	0.873	-0.410, 0.481	Failed to reject H ₀
4	Reverse Logistics	0.141	0.030	0.342	-0.157, 0.439	Failed to reject H ₀
5	Internal Drivers	0.402	0.149	0.029**	0.044, 0.760	Reject H ₀
6	External Drivers	0.310	0.054	0.201	-0.174, 0.794	Failed to reject H ₀
7	Internal Barriers	0.029	0.001	0.866	-0.319, 0.377	Failed to reject H ₀
8	External Barriers	-0.320	0.130	0.043**	-0.628 -0.012	Reject H ₀

** *significant p-value at 95% CI (p ≤ .05)*

Multiple regression results

Stepwise regression was performed to test the combined effect of the GSCM practices, and internal and external factors on organization performance. The summary results of the model shown in Table 4 showed that 14.9% of the variations in the organizational performance were explained by the changes in the independent variables in the model and 85.1% of the variations in the organizational performance were explained by other factors that are not in the model. This finding was statistically significant at a 95% confidence level ($p = .029$).

Table 4. Model summary

Model	Obs.	Prob > F	R ²	Adj R-squared	RMSE
OP	32	0.029**	0.149	0.121	6.923

***Significant at 95% CI*

Table 5. Coefficients of the model

Organizational Performance (OP)	Coef.	P>t	95% Conf. Interval
Internal Drivers	0.401	0.029**	0.044, 0.760
_constant	18.344	0.001	8.709, 27.979

***Significant at 95% CI*

Regarding our findings, various studies have also found that organizational performance can be significantly impacted by both internal and external factors (Islam and Anis, 2018) (Dorothy Chebichii et al., 2021b) (Masudin, 2019). About organizational performance, one of the most vital internal drivers is the commitment that management possesses. This implies that enhancing internal drivers such as top management taking high responsibility and investing in GSCM practices, committing to sustainability aspects of the industry, and increasing employee engagement and training can highly contribute to organizational performance (Fahimnia et al., 2015). External barriers have also been discussed by other studies that have indicated that they affect organizational performance in the beverage manufacturing industry. These external barriers include weak stakeholder pressures, a lack of legal and regulatory frameworks, and supplier readiness. For instance, in some countries, there may be a lack of government regulations or incentives that encourage companies to adopt GSCM practices (Rauer and Kaufmann, 2015). Additionally, stakeholders, including customers, investors, and NGOs, may not prioritize environmental considerations when evaluating companies, which can reduce the incentives for beverage manufacturers to invest in GSCM practices. Finally, suppliers may not be ready or willing

to adopt GSCM practices, which can limit the ability of beverage manufacturers to implement such practices across their supply chains (Kuwornu et al., 2023).

Qualitative Analysis

Gender and Age range

The qualitative part of the study involved 9 participants, all of them aged above 40 years with 3 respondents aged between 45-50 years old, 5 of them indicated to be in the range of 50-55 years old, and 1 indicated to be above 60 years. All the study participants were males. The study had no female representation as the ones approached were either not available or were unwilling to participate.

Job role, experience, and number of employees in the institutions

All the study participants were at least at the management level. Among the respondents, there was a General Manager, two Production Managers, one logistics supervisor, a Workshop Supervisor, two Assistant Production Managers, and one Quantity and Food Service Coordinator. Most of the study participants had more than five years of work experience and they were managing at least 15 people. Overall, the companies where participants were drawn had more than 400 employees.

Understanding of GSCM

Study participants were asked to state their understanding of GSCM. Most of them mentioned that it was mainly about environmental pollution through carbon emissions and that an organization would try to reduce pollution through ways of operation. Others mentioned that GSCM was environmental sustainability through recycling products.

*“Green supply chain management is ensuring that everyone involved in the production and supply process has measures in place that help with reducing emissions, reducing waste and reducing pollution whether it’s land, water or whatever resources we may be talking about.” **General Manager***

Additionally, respondents believed that the environment was slowly getting degraded. Therefore, as production companies, they needed to change packaging material to arrest the situation. It seemed that most respondents related GSCM more to recycling and Reverse Logistics than to the other practices involved such as Green Purchasing, Green Manufacturing, Green Production, and eco-friendly design.

This finding showed that most of the participants had a moderate understanding of GSCM, perceiving it mainly as a means of reducing environmental pollution through carbon emissions and recycling products. This was mainly attributed to the low adoption of the GSCM practices in the country (Mtonga, 2019), besides the SCM experts being knowledgeable about the production processes in the beverage manufacturing industry. Research studies have shown that understanding of Green Supply Chain Management (GSCM) varies among individuals and organizations (Luthra et al., 2014). While other studies support the notion that GSCM is primarily associated with environmental pollution reduction and sustainability, others highlight a broader understanding that includes various environmental practices throughout the supply chain. However, research has also indicated that there can be variations and similarities in understanding and emphasis placed on different GSCM practices most of it is subject to the importance attached to GSCM (Shahriarpour & Tabriz, 2017). Some studies have shown that organizations tend to prioritize certain practices, such as green purchasing or eco-design, over others (Carter & Liane Easton, 2011). Factors influencing this variation include industry sector, organizational culture, stakeholder pressures, and regulatory requirements (Saeed et al., 2018).

GSCM practices are being practiced by production companies.

When asked about green supply chain management practices, most of the respondents mentioned that they were in the process of changing their production packaging to recyclable material. Others mentioned that they had changed their energy sources in their production plants to the use of diesel as opposed to coal. Further, others submitted that GSCM practices were being implemented at the packaging stage. All these practices were aimed at reducing emissions during production and preventing further environmental degradation.

*"We're embarking on 2025 sustainability goals. That's what we call them. So, there are four pillars amongst these sustainability goals. So, the first one, I'll share with you is on having a net carbon 0 emission. So, with that at hand, we have embarked on installing a new boiler because the old boilers that we were using were a major contributor to carbon emissions. So, in our view of reaching that net carbon 0 by 2025 as part of the sustainability goals we are in the process of installing a new thermal boiler as opposed to the current ones that we had in which we were using coal, they were coal-fired boilers". **Logistic supervisor***

Stages of manufacturing at which companies practice GSCM

When asked about the stages at which GSCM was practiced, respondents had different reviews with some submitting that they practiced GSCM at the start of production, before packaging, with most stating that they practiced GSCM at the packaging point while a few mentioned that it was an on-going process, meaning at all stages.

*"Well, you could say all stages of our production, pretty much from procurement we try and procure our raw materials from suppliers who are also conscious, and they've got some sort of...look everyone is at a different stage, but you have to have some sort of green supply management policy in place to do business with us, that's one."- **Assistant production manager***

In line with our findings, past research indicated that production companies are actively exploring alternative energy sources to reduce their carbon emissions. By shifting to cleaner energy sources, these companies aim to minimize their carbon footprint and contribute to the overall reduction of greenhouse gas emissions (Ahmad et al., 2022; Feng, Lai, and Zhu, 2022).

Motivating factors for integrating green supply chain management practices.

Among the motivating factors mentioned, the common ones were because of a push from institutional authorities such as ZEMA and ZABS. Others mentioned that the companies were operated as a franchise hence the push was mainly from other branches in other countries such as Europe where environmental factors were of serious concern and received a lot of attention. In addition, respondents mentioned that their Directors and Leadership had a strong passion for environmental sustainability hence they ensured sustainable practices were championed and integrated in the Supply Chain. Further, most of the respondents mentioned the aspect of cost relating to the integration of GSCM practices. Respondent mentioned that it may seem costly to implement GSCM practices, but the long-term effect is a cost reduction. Most respondents stated that the implementation of GSCM is initially costly to the organization. For instance, as a company keeps on recycling, the cost of production of packaging is reduced, and there is no need to produce

new packaging material such as bottles.

"This comes from a high-level Management. Decisions are best for all the countries that our parent company is embarking on so they are doing this not only in Zambia but South Africa, Tanzania, Nigeria, and essentially the whole region. It is part of policies set by the CEO in New York..." – Production Manager

To complement this finding, other studies have shown that the impact of institutional authorities, the impact of franchised operations in environmentally conscious nations, the passion and leadership of directors, and the potential cost savings associated with sustainable practices are some of the driving forces behind the adoption of GSCM practices in businesses (Feng et al., 2022; Maqsood et al., 2022; Masudin, 2019). These elements work together to encourage businesses to adopt GSCM techniques and include environmental sustainability in their supply chains (Maqsood et al., 2022).

Challenges of integrating GSCM

Despite the intervention being cost-effective in the long run, respondents mentioned that the set-up cost was high. This had been a challenge for some companies, especially companies that were fully local and not running as a franchise since their main concern was to make profits. The other challenges mentioned were the low buy-in from some Senior Managers. It was submitted that a company could have policies relating to sustainable practices, but Senior Management support was low. Some respondents also revealed that other competing Agencies have been stealing their ideas, hence this was attributed to weak patent rights from relevant Authorities.

"In the initial stage, I think it was before the machinery that was meant for recycling was procured, we used to generate quite a lot of wastage managing it was also another aspect. Number two, the buyers of the wastage that was being generated sometimes could not meet the cost of how much the company was demanding to get some return." – Production Manager

Research studies indicate that common motivating factors for adopting Green Supply Chain Management (GSCM) practices include institutional pressures and franchise influences, as well as strong leadership commitment to environmental sustainability. Despite the initial costs, companies recognize the long-term cost-reduction benefits associated with GSCM practices, such as recycling and eliminating the need for new packaging materials (Feng et al., 2022). It can be difficult to integrate GSCM into an organization's processes, in part because of expensive setup expenses, a lack of support from senior managers, and lax patent protection. However, these obstacles can be overcome with strategic planning, organizational dedication, and encouraging governmental legislation, allowing businesses to successfully integrate sustainable practices throughout their supply chains (Feng et al., 2022; Gajendrum, 2017)

Benefits to the organization as a result of applying GSCM practices

Most respondents submitted that the major benefits have been reduced production costs. Most production companies have sustainability issues in their company policies as this has become a global issue. Additionally, some respondents mentioned that the other benefit has been a good reputation with the Municipality, the laws of the country as enforced by the law enforcers, as well as long-term savings due to efficiency in production.

*“Good reputation of course good standing with the Council, the law, the enforcers as well as the building on aspect where you are supposed to spend too much on materials, you save by recycling” - **Quantity and food service coordinator.***

Reduced production costs, adherence to sustainability policies, a positive reputation with stakeholders, and long-term savings through production efficiency are all advantages of incorporating GSCM for manufacturing organizations. These advantages not only boost the bottom line of the business but also show a commitment to environmental responsibility and foster goodwill among authorities and local communities. Companies can gain a competitive edge and contribute to a more sustainable future by making use of these advantages (Gajendrum, 2017).

CONCLUSIONS

In conclusion, this study aimed to assess the effect of GSCM practices on the organizational performance of Zambian beverage manufacturing companies. The results from this study found that there is a low adoption of GSCM practices among beverage manufacturing companies. Furthermore, the results showed that green purchasing, green manufacturing, green distribution and marketing and reverse logistics, each had a positive influence on organizational performance but did not impact Organisational performance significantly. Internal drivers had a significant and positive effect on organizational performance, while external barriers had a negative influence. It was also found that institutional pressures, franchise influences, leadership commitment, and the possibility of long-term cost savings are what drive the incorporation of GSCM techniques that GSCM methods must be integrated into business operations if businesses are to embrace environmental responsibility, cut costs, and maintain a favorable reputation in the face of growing environmental concerns and improve Organisational performance. Therefore, companies should consider adopting GSCM practices which will allow them to contribute to a more sustainable future while also boosting their competitiveness in the market by overcoming obstacles, implementing sustainable practices, and benefiting from the effects of integrating GSCM practices in their businesses.

LIMITATIONS AND FUTURE RESEARCH

This study has potential limitations. The voluntary participation of the technocrats from the beverage manufacturing industries may introduce voluntary bias as it may skew the results in favor of the businesses with particular traits and backgrounds. In addition, the focus on the beverage manufacturing industry may introduce generalization bias because the results from this study might not apply to other industries, and generalizing without additional research could induce biases. In this regard, future studies should attempt to broaden the scope of the sample and the variety of enterprises represented, take into account various manufacturing industries for comparison, apply random sampling techniques, and guarantee participation from a diverse range of industries. Additionally, replication studies and frequent updates should be carried out to guarantee the validity and applicability of the results in a sector that is changing quickly.

REFERENCES

- Ahmad, A., Ikram, A., Rehan, M. F., & Ahmad, A. (2022). Going green: Impact of green supply chain management practices on sustainability performance. *Frontiers in Psychology*, 13. <https://www.frontiersin.org/articles/10.3389/fpsyg.2022.973676>
- Ahmed, T., Khan, M. S., Thitivesa, D., Siraphatthada, Y., & Phumdara, T. (2020). Impact of employees engagement and knowledge sharing on organizational performance: Study of HR challenges in COVID-19 pandemic. *Human Systems Management*, 39(4), 589–601. <https://doi.org/10.3233/HSM-201052>
- AlTaweel, I. R., & Al-Hawary, S. I. (2021). The Mediating Role of Innovation Capability on the Relationship between Strategic Agility and Organizational Performance. *Sustainability*,

- 13(14), Article 14. <https://doi.org/10.3390/su13147564>
- Blystad, A., Moland, K. M., Munsaka, E., Sandøy, I., & Zulu, J. (2020). Vanilla biscuits and lobola bridewealth: Parallel discourses on early pregnancy and schooling in rural Zambia. *BMC Public Health*, 20(1), 1485. <https://doi.org/10.1186/s12889-020-09555-y>
- Bugaje, I. M. (2006). Renewable energy for sustainable development in Africa: A review. *Renewable and Sustainable Energy Reviews*, 10(6), 603–612. <https://doi.org/10.1016/j.rser.2004.11.002>
- Carter, C. R., & Liane Easton, P. (2011). Sustainable supply chain management: Evolution and future directions. *International Journal of Physical Distribution & Logistics Management*, 41(1), 46–62. <https://doi.org/10.1108/09600031111101420>
- Feng, Y., Lai, K., & Zhu, Q. (2022). Green supply chain innovation: Emergence, adoption, and challenges. *International Journal of Production Economics*, 248, 108497. <https://doi.org/10.1016/j.ijpe.2022.108497>
- Gajendrum, N. (2017). Green Supply Chain Management – Benefits Challenges and Other Related Concepts. 3(8).
- Harrison, R. L., & Reilly, T. M. (2011). Mixed methods designs in marketing research. *Qualitative Market Research: An International Journal*, 14(1), 7–26. <https://doi.org/10.1108/13522751111099300>
- Hennink, M., & Kaiser, B. N. (2022). Sample sizes for saturation in qualitative research: A systematic review of empirical tests. *Social Science & Medicine*, 292, 114523. <https://doi.org/10.1016/j.socscimed.2021.114523>
- Indrayan, A., & Mishra, A. (2021). The importance of small samples in medical research. *Journal of Postgraduate Medicine*, 67(4), 219–223. https://doi.org/10.4103/jpgm.JPGM_230_21
- Jensen, M. C. (2010). Value Maximization, Stakeholder Theory, and the Corporate Objective Function. *Journal of Applied Corporate Finance*, 22(1), 32–42. <https://doi.org/10.1111/j.1745-6622.2010.00259.x>
- Lee, S. M., Tae Kim, S., & Choi, D. (2012). Green supply chain management and organizational performance. *Industrial Management & Data Systems*, 112(8), 1148–1180. <https://doi.org/10.1108/02635571211264609>
- Luthra, S., Garg, D., & Haleem, A. (2014). Green supply chain management: Implementation and performance – a literature review and some issues. *Journal of Advances in Management Research*, 11(1), 20–46. <https://doi.org/10.1108/JAMR-07-2012-0027>
- Mabogunje, A. L. (1998). The Environmental Challenges In Sub Saharan Africa. <https://web.mit.edu/africantech/www/articles/EnvChall.htm>
- Maqsood, S., Zhou, Y., Lin, X., Huang, S., Jamil, I., & Shahzad, K. (2022). Critical success factors for adopting green supply chain management and clean innovation technology in the small and medium-sized enterprises: A structural equation modeling approach. *Frontiers in Psychology*, 13, 1008982. <https://doi.org/10.3389/fpsyg.2022.1008982>
- Masudin, I. (2019). A Literature Review on Green Supply Chain Management Adoption Drivers. *Jurnal Ilmiah Teknik Industri*, 18(2), Article 2. <https://doi.org/10.23917/jiti.v18i2.7826>
- Mtonga, S. (2019). A REVIEW OF THE IMPLEMENTATION OF GREEN LOGISTICS IN ZAMBIA [Thesis, Cavendish University]. <http://192.168.1.248:8080/xmlui/handle/123456789/149>
- Mwanza, B. G. (2018). An African reverse logistics model for plastic solid wastes—University of Johannesburg. https://ujcontent.uj.ac.za/esploro/outputs/doctoral/An-African-reverse-logistics-model-for/9912824607691?skipUsageReporting=true&recordUsage=false&institution=27UOJ_I NST
- Nureen, N., Liu, D., Irfan, M., & Sroufe, R. (2023). Greening the manufacturing firms: Do green supply chain management and organizational citizenship behavior influence firm performance? *Environmental Science and Pollution Research*, 30(31), 77246–77261. <https://doi.org/10.1007/s11356-023-27817-1>
- Ogah, M., & Asiegbu, G. (2022). Sustainable Supply Chain Management in Sub-Saharan Africa. In K. Ogunyemi, O. Atanya, & V. Bursal (Eds.), *Management and Leadership for a Sustainable Africa, Volume 2: Roles, Responsibilities, and Prospects* (pp. 87–113). Springer International Publishing. https://doi.org/10.1007/978-3-031-04923-1_6
- Reddy, J., Jagadish, Charanraj, N., Praveen, M. N., Rohith, Y. D., & Kumar, B. (2018). Factors affecting

- implementation of Green supply chain management in Tech Manora Packing: A case study. *International Journal of Engineering and Technology(UAE)*, 7, 171–174. <https://doi.org/10.14419/ijet.v7i3.12.15912>
- Saeed, A., Jun, Y., Nubuor, S. A., Priyankara, H. P. R., & Jayasuriya, M. P. F. (2018). Institutional Pressures, Green Supply Chain Management Practices on Environmental and Economic Performance: A Two Theory View. *Sustainability*, 10(5), Article 5. <https://doi.org/10.3390/su10051517>
- Shahriarpour, M., & Tabriz, A. A. (2017). The Importance of Green Supply Chain Management and Its Role in Marketing Management. 7(3).
- Silva, C. (2020, April 29). The Impact of Green Supply Chain Management Practices on Operational Performance and Customer Satisfaction.
- Tashakkori, A., & Teddlie, C. (2003). *Handbook of Mixed Methods in Social & Behavioral Research*. SAGE.
- Terry Kim, T., Lee, G., Paek, S., & Lee, S. (2013). Social capital, knowledge sharing and organizational performance: What structural relationship do they have in hotels? *International Journal of Contemporary Hospitality Management*, 25(5), 683–704. <https://doi.org/10.1108/IJCHM-Jan-2012-0010>
- Vasileiou, K., Barnett, J., Thorpe, S., & Young, T. (2018). Characterising and justifying sample size sufficiency in interview-based studies: Systematic analysis of qualitative health research over a 15-year period | *BMC Medical Research Methodology* | Full Text. <https://bmcmedresmethodol.biomedcentral.com/articles/10.1186/s12874-018-0594-7>

Annex: Green Supply Chain Management practices implementation in the beverage manufacturing industry in Zambia.

Table 6. GSCM practices implementation in the beverage manufacturing industry in Zambia

1. Green Manufacturing						
	Below are practices that influence green purchasing in supply chain management	Not at all	Very small extent	Small extent	Average	Large extent
GP1	Purchasing recycled material from suppliers for use in manufacturing	1	2	3	4	5
GP2	Purchasing non-toxic materials for manufacturing purposes	1	2	3	4	5
GP3	Requiring suppliers to adopt Environmental Management Systems (EMS)	1	2	3	4	5
GP4	Educating suppliers on the importance of cleaner production and technology	1	2	3	4	5
GP5	Requiring suppliers to have prior experience in the supply of green materials	1	2	3	4	5
GP6	Providing design specifications to suppliers that include environmental requirements for supplies	1	2	3	4	5
GP7	Environmental audit of suppliers' internal management	1	2	3	4	5
GP8	Preferring production materials that consume fewer natural resources	1	2	3	4	5
GP9	Considering the various environmental impacts of raw materials over their life cycle - from extraction of raw materials to disposal during raw material sourcing	1	2	3	4	5
2. Green Manufacturing						
	Below are practices that influence green manufacturing in supply chain management	Not at all	Very small extent	Small extent	Average	Large extent
GM1	Using machines or tools that consume less energy, water, and fuel	1	2	3	4	5
GM2	Conducting life-cycle assessment to evaluate the environmental load of products	1	2	3	4	5
GM3	Producing products that are free from hazardous substances such as lead, mercury, and chromium	1	2	3	4	5
GM4	Integrating efficient processes to reduce solid waste, and air emissions and conserve energy and water	1	2	3	4	5
GM5	Ensuring Process Design, Modifications and Upgrades	1	2	3	4	5
GM6	Producing products with reused and recycled contents	1	2	3	4	5
3. Green Distribution/Marketing						
	Below are practices that influence green distribution /marketing in supply chain management	Not at all	Very small extent	Small extent	Average	Large extent
GDM1	Eco-labeling of products	1	2	3	4	5

GDM2	Environment-friendly packaging and transportation	1	2	3	4	5
GDM3	Providing information to customers on environment-friendly products	1	2	3	4	5
GDM4	Re-using and recycling of product packaging materials	1	2	3	4	5
GDM5	Energy-saving techniques in the warehouse, e.g using eco-friendly lighting	1	2	3	4	5
GDM6	Using compact packaging that reduces space requirement	1	2	3	4	5
GDM7	Scheduling transportation routes to reduce emissions (route management)	1	2	3	4	5
GDM8	Improving vehicle fill (consolidating trips)	1	2	3	4	5
4. Reverse Logistics						
	Below are practices that influence Reverse logistics in supply chain management	Not at all	Very small extent	Small extent	Average	Large extent
RL1	Waste collection for proper disposal	1	2	3	4	5
RL2	Recycling, re-use, and recovery of useful parts of the products	1	2	3	4	5
RL3	Collection of packages for proper disposal	1	2	3	4	5
RL4	Recovery of hazardous parts for proper disposal	1	2	3	4	5
RL5	Arrangement with customers to return used packages	1	2	3	4	5
RL6	Easy availability of information about returning products	1	2	3	4	5
RL7	Designing packages that can be re-used	1	2	3	4	5
1. Internal drivers						
	Below are internal drivers that influence the implementation of green supply chain management	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
ID1	The company's environmental collaboration with suppliers	1	2	3	4	5
ID2	Integrating total quality environmental management into planning and operation processes	1	2	3	4	5
ID3	Reducing energy consumption and confining wastes	1	2	3	4	5
ID4	Reusing and recycling materials and packaging	1	2	3	4	5
ID5	Establishing the company's green image locally and globally	1	2	3	4	5
ID6	Green product design	1	2	3	4	5
ID7	Company policy for exports to fit external market	1	2	3	4	5
2. External Drivers						

	Below are external drivers that influence the implementation of green supply chain management	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
ED1	Competition with other players in the industry	1	2	3	4	5
ED2	Investor interest in green products	1	2	3	4	5
ED3	Government Regulatory and Legislation	1	2	3	4	5
ED4	Stakeholder pressure	1	2	3	4	5
ED5	Marketing/image building	1	2	3	4	5
ED6	Export country regulations	1	2	3	4	5
ED7	Certification of suppliers' environmental management system (mainly ISO 14001)	1	2	3	4	5
1. Internal Barriers						
	Below are internal barriers that hinder the implementation of green supply chain management	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
IB1	Lack of training	1	2	3	4	5
IB2	Lack of top management support	1	2	3	4	5
IB3	Lack of engagement with suppliers	1	2	3	4	5
IB4	Lack of environmental awareness	1	2	3	4	5
IB5	Lack of energy management and waste management in the organization	1	2	3	4	5
IB6	Poor implementation of green practices within a supply chain	1	2	3	4	5
IB7	Cost of implementation for GSCM	1	2	3	4	5
IB8	Lack of internal sustainability audits within the organization	1	2	3	4	5
2. External Barriers						
	Below are external barriers that hinder the implementation of green supply chain management	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
EB1	Lack of environmental regulation and law enforcement	1	2	3	4	5
EB2	Lack of government support	1	2	3	4	5
EB3	Lack of benefits for environmental sustainability	1	2	3	4	5
EB4	Customer's unawareness towards GSCM products and services	1	2	3	4	5
EB5	Supplier's flexibility to change towards GSCM	1	2	3	4	5
EB6	Lack of sustainability certification like ISO 14001	1	2	3	4	5
EB7	Lack of external sustainability audits for suppliers and contractors	1	2	3	4	5
EB8	Lack of government initiatives system for GSCM practitioners	1	2	3	4	5