Current Science Research Bulletin
Volume 03 (02), February 2026, pp. 39-45
CrossRef DOI: 10.55677/csrb/03-V03I02Y2026
Available on: https://csrbjournal.org/
e-ISSN: 3050-7103
p-ISSN: 3050-709X

Green Supply Chain Management at Permata Pratama Clinic Family

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ABSTRACT: This research is related to the importance of Green Supply Chain Management in the Healthcare sector. Awareness regarding this is increasing, especially in the field of supply chain management. Efficient supply chain management is essential in the healthcare sector. Social and economic benefits are generated through green supply chain management. Supply chain management plays a crucial role in waste management. This research is an exploratory study of the drivers and barriers faced by Permata Pratama Clinic Family in implementing Green Supply Chain Management (GSCM). Data collection was conducted using interviews and questionnaires consisting of 15 questions administered to 6 selected respondents using a purposive sampling technique. Several drivers and barriers were adopted from previous research and adapted to the Healthcare sector at Permata Pratama Clinic Family. The results obtained show that the highest barriers faced by the Healthcare sector are barriers to knowledge and awareness; barriers to technology; and economic barriers. Meanwhile, the drivers with the highest percentage are government regulation; ISO 14001 certification; and reusing and recycling materials and packaging. The discovery of these factors can provide in-depth knowledge for the Healthcare sector at Permata Pratama Clinic Family to improve drivers and prevent existing barriers.

KEYWORDS: Green Supply Chain Management, Primary Healthcare, Barriers.
JEL classification codes: B40, C82

1. INTRODUCTION

Currently, environmental issues and concerns about sustainability encourage the use of energy, water, and materials more effectively and efficiently, ensuring the prevention of all types of waste, carrying out environmentally friendly and sustainable building designs, and environmentally friendly focus on the subject of sustainable development (Permata, Intan. 2025). As a result of environmental damage caused by climate change, pollution, global warming, increased Green House Gas (GHS) emissions and other problems that threaten the world and the existence of the human race (Novitasari, 2021).

Since 1990, awareness of environmentally friendly practices has increased among the public, including among health organizations Wang, Gupta, 2011). Increasing competition in supply chain practices for development in the health sector, especially greener primary clinics, has triggered Permata Primary Clinic Family to operate in a more ethical and responsible manner for the surrounding environmental impact (Nazir et al., 2024).

Such as the existence of health service facilities or health services in Indonesia has produced enormous health care waste because it can create a worrying situation (Verma et al., 2018).Medical waste generated by healthcare facilities can be hazardous, toxic, and even deadly due to the presence of pathogens in each waste, which can lead to the transmission of infectious diseases (Yunus, Maharani, 2022).

This transmission impacts surrounding organisms, which is classified as an environmental issue. Data from 2018 showed that total healthcare facility waste reached 102.65 tons/day (excluding independent clinics), while the national total medical waste could reach 242-290 tons/day, with primary clinics contributing a significant portion. Healthcare waste is generally divided into two groups: medical waste and non-medical waste (Pertiwi et al., 2017). Referring to Appendix I of Government Regulation No. 101 of 2014, medical waste is categorized as hazardous and toxic waste (B3) (Purwanti, 2018). Problems faced in medical waste management include processing capacity and the medical waste that must be managed.

Cite the Article: *Adisthi, P.Y., Nurlaela, S., Setyarini, Q.A., Maghfirah, G.R., Novdilasari, I.K., Herdinatya, Y., Lailiyah, M.S. (2026). Green Supply Chain Management at Permata Pratama Clinic Family. Current Science Research Bulletin, 3(2), 39-45. https://doi.org/10.55677/csrb/03-V03I02Y2026*

Publication Date: *February 09, 2026*

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The medical waste processing capacity of licensed incinerators is still not comparable to the waste generated by healthcare facilities, resulting in a significant amount of untreated medical waste. Furthermore, the distribution of private waste processors is still uneven across Indonesia, with java being the dominant region. Medical waste management is crucial due to its impact on the environment, health, and regulatory compliance. To comply with government regulations regarding waste generation, healthcare facilities in Indonesia need to adopt green practices to address waste issues (Uemura Reche et al., 2022).

Waste management depends on the type and characteristics of each medical waste generated. For example, waste made from environmentally friendly materials can be recycled to reduce additional costs and achieve long-term sustainability. Green practices implemented by healthcare facilities can also influence the supply chain, including suppliers, to adopt a green supply chain. Sustainable systems have been implemented by GSCM (Green Supply Chain Management) to assist waste management (Junita et al., 2019).

However, these systems must reduce the quantity or minimize resource recovery. Due to its significant environmental impact, it is necessary to evaluate the extent to which Indonesian healthcare services have implemented GSCM so that non-healthcare sectors can adopt the same approach in the future, creating an Indonesian industry that cares about environmental pollution. This study aims to identify the drivers and barriers faced by healthcare workers. The results of this study can reveal the extent to which Indonesian healthcare services have implemented GSCM. To date, research on GSCM has developed numerous assessment tools to guide green building design, construction, operation, renovation, maintenance, and demolition of buildings related to the green rating system (Nazir et al., 2024).

2. LITERATURE REVIEW

2.1 Green Supply Chain Management (GSCM).

Many previous studies have identified drivers and barriers to the implementation of Green Supply Chain Management (GSCM) in healthcare facilities. According to Yazdanpanah (2018), barriers to knowledge and awareness, technological barriers, and human barriers are factors that still hinder the implementation of GSCM in healthcare. This finding aligns with research by Rezali (2018), which states that barriers to technology are also a hindering factor, with government agencies being another barrier (Muduli & Barve, 2012). In their research (Karamat et al., 2019) on the development of a more sustainable healthcare system, six drivers for GSCM implementation were identified.

These drivers are government regulation, certification, integrating quality and environmental management, reducing energy consumption, 3R materials and packaging, and reverse logistics (Govindan et al., 2014). Research conducted by (Govindan et al., 2014) also supports the assertion that government regulation is a crucial factor in GSCM implementation, coupled with environmental collaboration with suppliers. This also aligns with the role of suppliers in the success of GSCM implementation. Other driving factors, as proposed by (Duque-Uribe et al., 2019), include reducing contamination and financial performance.

Meanwhile, research by (Permatasari, 2025), identifies barriers to GSCM in healthcare as barriers to knowledge and awareness, barriers to technology, and economic barriers. Meanwhile, drivers include government regulation, ISO 14001 certification, and the reuse and recycling of materials and packaging.

2.2 Green Supply Chain Management In Healthcare.

The definition of supply chain management evolves daily as its scope broadens (Parkhi, Joshi, Gupta, and Sharma, 2015). SCM encompasses logistics and commerce while operating between customers and suppliers (Wang, Gupta, 2011). A supply chain is a cycle that begins with suppliers and ends with customers as a flow of products or services (Bachok, Khuzzan, Jaafar, Baharudin, 2004). Another definition is that a supply chain is a network of organizations involved, through upstream and downstream relationships, in various processes and activities that generate value in the form of products and services delivered to end consumers (Wang, Gupta, 2011).

There is no single definition of green supply chain management (GSCM), but we can see the integration of the environment with the supply chain (Zhu et al., 2013). According to Gilbert (2001), greening the supply chain is the process of incorporating environmental criteria or issues into an organization's decisions for long-term supplier relationships using a sustainable environmental, strategic, and logistical approach. According to (Uemura Reche et al., 2022), GSCM also involves design, operation, manufacturing, packaging, waste reuse, and logistics management issues related to the natural environment.

The Green Supply Chain Management flow also reaches a reverse flow that closes the loop with reverse logistics (Zhu & Geng, 2013). The goal of GSCM is to achieve consistent and holistic environmental performance improvements at all levels of management (Nazir et al., 2024). This study defines GSCM as the integration of environmental considerations into the supply chain, encompassing everything from natural resource procurement to end-of-life disposal, including by-products and waste generated at each stage. Environmental issues are one of the main challenges facing contemporary society, meaning an organization's ability to implement "green" policies must be a primary objective of its operations (Tseng et al., 2019).

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The fact that, despite the current literature, many industries face obstacles to implementing GSCM demonstrates the need for further research in the field. Industries that have implemented GSCM need to provide examples of successful GSCM implementation by exploring the factors that encourage the industry to implement GSCM. Both have an impact on each other to create environmentally friendly in an industry by implementing GSCM. The following conceptualization model of GSCM barriers for Health Services is shown in Table 1.

Table 1. Conceptual Model of GSCM Barriers to Health Services

Barriers Factor	Researcher			
	Yazdan Panah, 2018	Reza, 2018	Wiredu, 2024	Permatasari, 2025
Barriers to knowledge and awareness	V			V
Barriers to technology	V	V		V
Human Barriers	V			
Economic Barriers	V			V
Environment Barriers	V			
Goverment Agencies			V	

The following conceptual model of Green Supply Chain Management drivers for Healthcare Services is shown in Table 2.

Table 2. Conceptual Model of Green Supply Chain Management Drivers for Healthcare Services

Barriers Factor	Researcher			
	Gonvinda et., al, 2014	Karamatg et., al, 2019	Duque-uribe et.al, 2019	Permatasari, 2025
Environtmental collaboration with supplier	V			
Environtmental collaboration with customer	V			
Goverment regulation	V	V		V
ISO 14001 Certification		V		V
Integrating quality		V		
Reducing Energy consumption		V		
Financial Performance		V		V

The research instrument used was interview questions, distributed through a questionnaire. The questionnaire consisted of 15 statements, as shown in Table 3.

Table 3. Questionnaire Statements

Code	Questionnaire Questions
1	How long have you worked here?
2	What are you doing to reduce the environmental impact of Pratama Permata Clinic Family?
3	How would you respond if all activities at Pratama Permata Clinic Family could impact the environment?
4	If the activities at Pratama Permata Clinic Family can have a positive impact on the environment, what is your response? Have they been implemented? If so, what are the steps? If not, why not?
5	Do you think your workplace is free from responsibility for the environmental impact of their suppliers?
6	Have this company's suppliers implemented a green supply chain? What can you and your suppliers do to create a green supply chain?
7	How much do you know about where ingredients come from?
8	Do you consider your supply chain green (e.g. suppliers, distributors implement environmentally friendly concepts by reducing metal or plastic materials as packaging)?

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9	How do you incorporate environmental issues into the Pratama Permata Clinic's Family supply chain processes? These include local sourcing, organic ingredients, en1ergy efficiency, etc.
10	Are the products you produce or sell easily recyclable? What products can be recycled?
11	How do you treat leftover materials or products from the Permata Pratama Clinic Family?
12	What obstacles do you face when trying to reduce the environmental impact of Permata Primary Clinic Family?
13.1	What obstacles do you face in reducing negative environmental impacts from a human resource perspective (internal and external)? (e.g., lack of experts who understand the concept of GSCM)
13.2	What obstacles do you face in reducing negative environmental impacts from a technological perspective? (e.g., complex new technologies)
13.3	What obstacles do you face in reducing negative environmental impacts? (e.g. inadequate environment)
13.4	What obstacles do you face in reducing negative environmental impacts from an economic perspective? (e.g., costs are too high)
13.5	What obstacles do you face in reducing negative environmental impacts in terms of Knowledge and Awareness? (e.g., public apathy towards green SCM)
14	What factors motivated you to implement a green supply chain?
15	What can indicate that your supply chain is environmentally friendly?

3. RESEARCH SUBJECTS AND METHODS

The method used in this study was descriptive, with the results of data processing displayed using diagrams.

a. Data Collection Method.

The data collection technique used in this study was a questionnaire. The questionnaire was administered through direct interviews. The questionnaire was compiled based on journals (Rezali et al., 2018; Wiredu et al., 2024; Yazdanpanah, 2018; Duque-Uribe et al., 2019; Govindan et al., 2014; Karaman, 2021; Permatasari, 2025). The questionnaire was adapted to the Health Service factor to facilitate information collection from respondents.

b. Population. The population in this study were workers who manage and understand the supply chain at Permata Pratama Clinic Family. Questions were provided through a questionnaire and delivered through online and face-to-face interviews.

c. Sample. This study used a purposive sampling technique, a deliberate sampling technique. The researcher did not randomly select the sample, but rather determined it by herself. Therefore, the sample size for this study was 6 respondents. Sampling was conducted directly from December 16-19, 2025. Descriptive Analysis: Data processing in this study used descriptive analysis, which provides a description of the object of study through the collected data or samples.

4. RESULTS AND DISCUSSION

This study conceptualized the GSCM model at Permata Keluarga Pratama Clinic, categorized into several factors. Testing was conducted based on the results of questionnaires distributed to respondents.

a. Barriers at Permata Pratama Clinic Family; 1) The results of interviews with respondents in the healthcare industry are shown in Table 4. Each respondent perceived more than one barrier to improving the performance of the healthcare supply chain to be more environmentally friendly. 2) Five respondents identified barriers to knowledge and awareness. On average, respondents stated a lack of attention to the principles of creating environmentally friendly SCM conditions. This lack of attention to the GSCM concept across all company elements was also cited. 3) Technology barriers were the biggest barrier perceived by all respondents. Several respondents had ideas for improving the supply chain to be environmentally friendly, but were limited by the lack of technology to implement these ideas. 4) Human barriers were limitations caused by the workforce's role in the supply chain. Four respondents stated they were experiencing this challenge, due to the lack of experts and a team focused on greening the supply chain. Five respondents experienced economic barriers. They felt that implementing GSCM still required significant capital, while they lacked the authority to propose the project. Four respondents experienced environmental barriers. Their work environment, located near residential areas, increased the potential for environmental pollution from healthcare waste. Three respondents experienced government barriers. These respondents believed it would be difficult to manage new policies regarding GSCM with the government.

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Table 4. Barrier Questionnaire Results

Barriers	Question Code	Respondent Frequency
Barriers to knowledge and awareness	13.4	18,52%
Barriers to technology	13.1	22,2%
Human Barriers	13	14,81%
Economic Barriers	13,3	18,52%
Environment Barriers	13.2	14,81%
Government Agencies	7	11,11%

b. Drivers at Permata Primary Clinic Family. Based on interviews with six respondents, the driver questionnaire results are as shown in Table 5. Each respondent identified more than one driver, analyzed through several drivers from various literature sources in the healthcare sector.

Table 5. Drivers Questionnaire Results

Drivers	Question Code	Respondent Frequency
Environmental collaboration with supplier	6	9,68%
Government regulation	5	19,53%
ISO 14001 Certification	15	19,35%
Reusing and recycling materials and packaging	10	16,13%
Environmental collaboration with customers	4	9,68%
Reverse logistics	9	6,45%
Reducing Contamination	8	9,68%
Financial Performance	13.3	9,68%

Environmental collaboration with suppliers is a driver for green supply chain management in healthcare. It discusses how the environment within the green supply chain is closely related to suppliers. Suppliers also play a role in preserving the environment, both in the materials used and in the production process. Three of the six respondents identified this driver as being related to their circumstances or workplace. Government regulation is a driver identified by six respondents. The government already has regulations governing environmental preservation and corporate responsibility. This government program represents an opportunity for all companies to obtain an operating permit.

ISO 14001 certification is a driver identified by all respondents. ISO 14001 certification indicates that a company adheres to international standards for environmental management. Companies have the opportunity to pursue ISO 14001 certification. Reusing and recycling materials and packaging: Five respondents identified an opportunity to change the packaging and storage of healthcare products, for example, replacing plastic with paper bags. Recycled materials from healthcare products cannot be recycled as they pose a risk to consumers. Environmental collaboration with customers: Three respondents felt that consumer involvement is crucial for GSCM implementation. Consumers who are aware and willing to protect the environment can provide encouragement and ideas that can be implemented by companies. Reverse logistics is closely related to the return of a product or item from the consumer to its initial stage, with the hope that the product can be reprocessed or used as a supporting material for the manufacture of other products, thus preventing waste and environmental pollution. Two out of six respondents felt a
connection to their workplace.

Reducing Contamination: A driver that discusses how a system implements efforts to reduce the environmental impact of contamination from the products or equipment they use. This includes incinerating medical waste. This step is taken to prevent viruses or bacteria from medical equipment from causing further problems for the surrounding community, as it can contaminate the wider community. Three out of six respondents felt a connection to their workplace, with one such effort being incineration of medical waste. Financial performance relates to a system's economic ability to support interconnected green activities between each supply chain stakeholder. These green activities carry higher costs than the supply chain system itself, as they require technology and standardized training, so that each supply chain stakeholder understands green. Three out of six respondents felt this driver needed to be studied, as they stated that implementing green in healthcare requires additional costs.Integrating quality environmental management (QE) can encourage an industry to implement GSCM.

This aspect is a crucial driver, as research on supply chain management in the Chinese automotive, power generation, and electronics industries has demonstrated success in increasing green supply chain activities (Zhu and Sarkis, 2006; Zhu et al., 2007, 2008).

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Furthermore, Chinese companies have stated that this QE requires intersectoral collaboration, which involves increasing the commitment of more experienced management to ensure smooth collaboration on environmental quality. However, this study did not include integration of environmental quality management because the healthcare facility industry that responded to the study did not involve integration of environmental quality, focusing solely on its own environmental quality with assistance from third parties.

5.CONCLUSION

Based on the results of the questionnaire distributed both online and offline, it was found that the most significant barrier to Green Supply Chain Management implementation in the healthcare industry perceived by respondents was barriers to technology, at 22.22%. This barrier was perceived as being due to the limited use of technology closely related to GSCM implementation. Furthermore, the most common drivers cited by respondents were government regulation and ISO 14001 certification, at 19.35% each. The government's role in the success of Green Supply Chain Management implementation is key, encouraging stakeholders involved in the healthcare supply chain to make it a reality. Suggestions for improving drivers and reducing barriers include: Opening opportunities for the public to share ideas and concepts, balancing them with local technology resources to enable these ideas to be realized. Implementing equalization, namely environmental collaboration with customers, that focuses on greening the supply chain. Not only experts and teams, but also the surrounding community have a role in implementing Green Supply Chain Management. Conduct financial performance monitoring by preparing a periodic financial plan to determine revenue by implementing Green Supply Chain Management. This will estimate capital and balance it with generated revenue. Reduce waste contamination, which increases the potential for environmental pollution. Reduce contamination from used healthcare goods/materials by more carefully sorting non-medical and medical waste. Furthermore, conduct regular filter inspections on liquid waste. Implement government regulations to address new policies regarding Green Supply Chain Management with the government. It is hoped that the existence of new regulations and policies will facilitate opportunities to implement the Green Supply Chain Management concept.

Author Contributions:

Pretty Yanuar Adisthi, Siti Nurlaela, Queen Analisa Setyarini, Ghaida Ramadhania Maghfirah, Isma Khurria Novdilasari, Yesicha Herdinatya, Mas Sofiatul Lailiyah. Siti Nurlaela: Conceptualization, Writing - original draft, Introduction, Discussion. The authors have read and approved the final manuscript.

Institutional Review Board Statement: Not applicable.

Funding: This research received no external funding.

Acknowledgements:

The authors appreciate the editors and reviewers for reviewing and publishing this manuscript. Informed Consent

Statement: Not applicable.

Availability of data and materials: Not applicable. Conflict of Interest: The authors declare that they have no conflicts of interest.

REFERENCES

1. Bachok S, Khuzzan SMS, Jaafar S, Baharudin H, 2004, Construction Supply Chain Management and Coordinated Design Drawings: An outlook of the construction industry and sustainable urban planning‘ In: 9th International Symposition on Planning & IT, Vienna, Februray, pp. 67-84.
2. Christopher Martin L. [1992] Logistics and Supply Chain Management. London: Pitman Publishing.
3. Chopra, Sunil dan Peter Meindl. (2007). Supply Chain Management: Strategy, Planning and Operations, 3rd Edition. Prentice Hall.
4. Duque-Uribe, V., Sarache, W., & Gutiérrez, E. V. 2019. Sustainable supply chain management practices and sustainable performance in hospitals: A systematic review and integrative framework. In Sustainability (Switzerland) (Vol. 11, Issue 21). https://doi.org/10.3390/su11215949
5. Govindan, K., Azevedo, S. G., Carvalho, H., & Cruz-Machado, V. 2014. Impact of supply chain management practices on sustainability. Journal of Cleaner Production, 85. https://doi.org/10.1016/j.jclepro.2014.05.068
6. Green Jr, K.W., Zelbst, P.J., Meacham, J. and Bhadauria, V.S., (2012), “Green supply chain management practices: impact on performance” Supply Chain Management: An International Journal, 17(3), pp.290- 305, year 2012.
7. Jacobs, F.R., Chase, R.B. and Lummus, R.R., (2011), “Operations and supply chain management” (Vol. 567). New York: McGraw-Hill Irwin, year 2011. Govindan, K., Azevedo, S. G., Carvalho, H., & Cruz-Machado, V. 2014. Impact of supply chain management practices on sustainability. Journal of Cleaner Production, 85. https://doi.org/10.1016/j.jclepro.2014.05.068

Corresponding Author: Pretty Yanuar Adisthi

8. Karamat, J., Shurong, T., Ahmad, N., Afridi, S., Khan, S., & Khan, N. 2019. Developing Sustainable Healthcare Systems in Developing Countries: Examining the Role of Barriers, Enablers and Drivers on Knowledge Management Adoption. Sustainability (Switzerland), 11(4). https://doi.org/10.3390/su11040954
9. Lee, S.M., Lee, D. and Schniederjans, M.J., "Supply chain innovation and organizational performance in the healthcare industry" International Journal of Operations & Production Management, 31(11), pp.1193-1214, year 2011.
10. Muduli, K., & Barve, A. 2012. Barriers to Green Practices in Health Care Waste Sector: An Indian Perspective. International Journal of Environmental Science and Development. https://doi.org/10.7763/ijesd.2012.v3.254
11. Nazir, S., Zhaolei, L., Mehmood, S., & Nazir, Z. 2024. Impact of Green Supply Chain Management Practices on the Environmental Performance of Manufacturing Firms Considering Institutional Pressure as a Moderator. Sustainability (Switzerland) , 16(6). https://doi.org/10.3390/su16062278
12. Parkhi S, Joshi S, Gupta S, Sharma M. [2015] A Study of Evolution and Future of Supply Chain Management. Supply Chain Management, 9(2):95-106.
13. Rezali, Ali, .H., & Idris, F, 2018. Empowering Green Healthcare Supply Chain Management Practices Challenges And Future Research. International Journal of Supply Chain Management, 7(5).
14. seng, M. L., Islam, M. S., Karia, N., Fauzi, F. A., & Afrin, S. 2019. A Literature Review On Green Supply Chain Management: Trends And Future Challenges. In Resources, Conservation and Recycling (Vol. 141). https://doi.org/10.1016/j.resconrec.2018.10.009
15. Uemura Reche, A. Y., Canciglieri Junior, O., Szejka, A. L., & Rudek, M. 2022. Proposal for a Preliminary Model of Integrated Product Development Process Oriented by Green Supply Chain Management. Sustainability (Switzerland), 14(4). https://doi.org/10.3390/su14042190
16. Verma, K., Bharti, S. K., & Singh, A. D. (2018). Late Glacial–Holocene record of benthic foraminiferal morphogroups from the eastern Arabian Sea OMZ: Paleoenvironmental implications. Journal of Earth System Science, 127(2). https://doi.org/10.1007/s12040-018-0920-9
17. Wiredu, J., Yang, Q., Sampene, A. K., Gyamfi, B. A., & Asongu, S. A. (2024). The effect of green supply chain management practices on corporate environmental performance: Does supply chain competitive advantage matter? Business Strategy and the Environment, 33(3). https://doi.org/10.1002/bse.3606
18. Yazdanpanah, A. (2018). Identification And Prioritization Of Barriers To Implement The Green Hospital Standards At Imam Hassan Mojtaba Hospital In Darab. Universal Journal of Pharmaceutical Research, 3(1), 43–49. https://doi.org/10.22270/ujpr.v3i1.R8
19. Verma, K., Bharti, S. K., & Singh, A. D. 2018. Late Glacial–Holocene record of benthic mineralogical morphogroups from the eastern Arabian Sea OMZ: Paleo-environmental implications. Journal of Earth System Science, 127(2). https://doi.org/10.1007/s12040-018-0920-9
20. Wiredu, J., Yang, Q., Sampene, A. K., Gyamfi, B. A., & Asongu, S. A. 2024. The effect of green supply chain management practices on corporate environmental performance: Does supply chain competitive advantage matter? Business Strategy and the Environment, 33(3). https://doi.org/10.1002/bse.3606
21. Yazdanpanah, A. 2018. Identification And Prioritization Of Barriers To Implement The Green Hospital Standards At Imam Hassan Mojtaba Hospital In Darab. Universal Journal of Pharmaceutical Research, 3(1), 43–49. https://doi.org/10.22270/ujpr.v3i1.R8
22. YZhu, Q., & Geng, Y. 2013. Drivers And Barriers Of Extended Supply Chain Practices For Energy Saving And Emission Reduction Among Chinese Manufacturers. Journal of Cleaner Production, 40. https://doi.org/10.1016/j.jclepro.2010.09.017
23. Zhu, Q., Geng, Y., & Sarkis, J. (2013). Motivating Green Public Procurement in China: An individual level perspective. Journal of Environmental Management, 126. https://doi.org/10.1016/j.jenvman.2013.04.009
24. Wang H, Gupta S, (2011) Green Supply Chain Management, Product Life cycle approach, McGraw Hill.

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