

## **ESG Analysis in China and Korea Using Big Data Analysis - Perspectives on ESG Management in Asian Countries -**

Yun-Pyo Hong\*, Sang-Hak Lee\*\*, Gi-Hwan Ryu\*\*\*

\* *Master's Candidate, Department of Tourism and Food Industry, Graduate School of Smart Convergence, KwangWoon University, Korea*

\*\* *Master's Candidate, Department of Tourism and Food Industry, Graduate School of Smart Convergence, KwangWoon University, Korea*

\*\*\**Professor, Department of Tourism and Food Industry, Graduate School of Smart Convergence, Kwangwoon University, Seoul, Korea*

*E-mail: (yplift,sk89,allryu)@kw.ac.kr*

### **Abstract**

*ESG is currently a global topic, meaning environmental, social, and governance, which are three important measures of socially responsible management. It is also having a great influence on improving competitiveness in the global market and enhancing corporate image. In this study, ESG in Korea was analyzed through big data, and four central keywords of ESG management in China based on Chinese data were derived. These four keywords are environment, management, corporate event, and quality certification. In addition, we want to understand the ESG perspective of China by studying ESG cases in China. Through this, we will be able to compare and analyze the differences between ESG approaches and key points between Korea and China.*

**Keywords:** *ESG, Chinese management, Korean management, big data, ESG management*

### **1. Introduction**

ESG is no longer a problem that only large corporations should pay attention to, but it is time for startups to consider and discuss ESG management in depth to lay the foundation for long-term operations [1]. As Korea and China are considered major economies in Asia, it is necessary to compare how policies and evaluations are being carried out in relation to ESG [2]. As China and South Korea are considered major countries in Asia, it is necessary to look at how policies and evaluations are currently being carried out in relation to ESG, and it is no longer necessary to consider long-term sustainable management rather than short-term performance-oriented management [3]. As China is in proximity, it has many partners, and since exports are as important as Korea, close consultations are needed to overcome the ever-increasing threshold of ESG management, and that Chinese companies need a deep understanding of the ESG management system [4]. Second, this study is

---

Manuscript Received: July. 14. 2024 / Revised: July. 21. 2024 / Accepted: July. 27. 2024

Corresponding Author: allryu@kw.ac.kr

Tel: : \*\*\*-\*\*\*\*-\*\*\*\* Fax: +82-2-940-5443

Professor, Department of Tourism and Food Industry, Graduate School of Smart Convergence, Kwangwoon University, Seoul, Korea

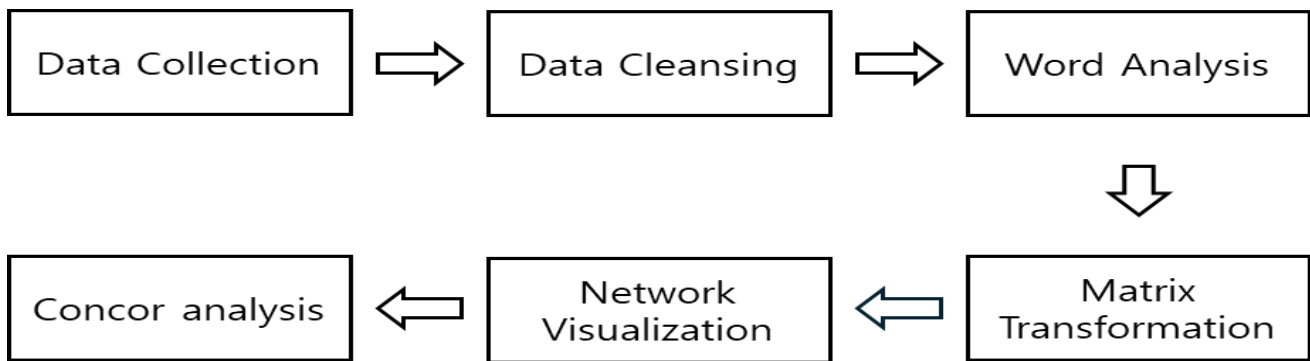
necessary in that we need to prepare for the policy problems that Korean companies face when entering the Chinese market, and on the contrary, when Chinese companies enter the Korean market, we also need to consider reasonable policy responses and measures to counterpart companies [5]. Finally, it is necessary to study how to discuss and respond to our strengths and weaknesses in the current global market situation, as it is easy to guess that the last time we face China in the global market as a competitor rather than cooperation, it will determine success or failure whether we have an understanding of global standards and ESG management [6].

## **2. Background of the text**

ESG is currently a global topic, and refers to environmental, social, and governance as three important measures of socially responsible management [7]. Through prior research, China's ESG trend is described in more detail "the current status of China's implementation in the comparison of ESG policies in Korea and China." (Jiyoung Ahn et al., 2023 p86) According to the study, it was described that Korea and China had something in common that it started with the governance of ESG. However, the indicators of ESG in China pointed out that disclosure of ESG information still lacks a standardized ESG evaluation system [8]. However, this does not mean that China is indifferent to ESG management. Construction Bank, one of the four major banks in China's 建设银行 Province, received the best award in 2023 as it was evaluated for innovating through the establishment of a system with the goal of low carbon using the ESG evaluation system [9]. In addition, PICC Insurance Company, one of China's largest insurers, continues to provide research and support in the field of carbon emission reduction, and is making investments in practice through insurance against carbon emission losses and monitoring greenhouse gas emission reduction projects [10]. Through this, it can be inferred that China is also very interested in ESG management. In addition, on April 12, 2024, under the guidance of the China Securities Regulatory Commission, the three major stock exchanges in Shanghai, Shenzhen, and Beijing officially announced the "Sustainable Development Reporting Guidelines for Listed Companies (Tests)" (hereinafter referred to as "Guidelines") to clarify the information disclosure framework of the sustainability report, set 21 specific topics in three aspects, including environment, society, and governance related to sustainable development, and clarify the disclosure principles of listed companies to analyze financially important sustainable development issues focusing on the four core contents of "governance-strategic-impact, risk and opportunity management-indices and goals" and to disclose them in 2026 [11]. Through this, the purpose of this paper is as follows. We would like to collect information on Korean websites using big data and TEXTOM, and to find out through visualization how major Korean keywords are linked to the governance, strategy, risk management, and indicators of China's sustainability report through text mining [12].

## **3. research design**

This study used TEXTOM, a social media big data analysis system. The collection period was from April 1, 2023, to April 1, 2024. As for the word, 'ESG management' is the main keyword, and Naver's blog, news, cafes, web documents, intellectuals, and Daum's blog were collected. News, cafes, web documents, Google's web documents, news, and Facebook were used to derive the results. The analysis procedure is shown in Figure 1.



**Figure 1. Big data analysis Procedure**

## 4. Results of the study

### 4.1 word analysis

For word analysis, 1,7243 keywords were collected because of the keyword collection of 'ESG management' from April 2023 to April 1, 2024. Among them, the top 50 keywords were refined and derived using original text data and refined data and applied to this study. The results are shown in Table 1.

**Table 1. Word analysis**

word	frequen cy	Word	frequenc y	Word	frequen cy	Word	frequen cy	word	frequenc y
Management	27753	business	2593	research	1715	Industries y	1420	Start-up	1186
environment	12934	Global	2322	strategy	1710	Center.	1377	responsibility	1184
enterprise	10487	Practice	1922	Structure	1702	Carbon.	1376	information	1178
society	4748	Activities	1910	quality	1692	Premier Minister	1345	achievement s	1174
Certification	3987	eco-friendly	1894	development	1669	economy	1298	influence	1160
system	3753	small and medium-sized enterprises	1888	improvement	1654	An association	1268	change	1146
support	3747	the future	1830	domination	1486	an institution	1258	finance	1120
Continuing	3638	A deed	1811	international affairs	1476	safety	1246	Response	1091
Selection	3179	administratio n	1725	education	1470	target	1235	An event	1088
Korea.	3046	Seoul	1725	representative	1437	export	1199	Regions	1064



### 4.3 CONCOR Analysis

CONCOR analysis is a method of identifying the associations of major keywords in the text and grouping keywords with high simultaneous appearance frequency into the same group. Through this, the main control appearing in the online text may be classified into a small number of groups [13]. As a result of the analysis, a total of 4 clusters were derived. Each cluster was classified into the following subject areas.

The first cluster is 'strategy', and this cluster is composed of keywords related to the organization's long-term plans and goals setting, and specific strategies to achieve them. This cluster is centered on various strategic approaches and initiatives that companies adopt for sustainable development. For example, innovative business models to improve sustainability, resource efficiency measures, and long-term economic and environmental goals may be included.

The second cluster is 'risk management', which includes keywords related to how to identify and effectively manage various risk factors that an organization may face. In this cluster, the main content is how to evaluate and respond to various risk factors that may affect sustainability, such as environmental risk, social risk, and economic uncertainty. This also includes risk mitigation strategies and crisis management plans.

The third cluster was classified as an 'indicator', which consists of keywords related to various indicators used to measure and evaluate an organization's performance. In this cluster, various indicators set up to monitor sustainability performance, their measurement methods, and how these indicators contribute to achieving the organization's sustainability goals are centered. For example, carbon emissions, energy consumption, and social impact indicators may be included.

Finally, the fourth cluster is 'governance', which contains keywords related to the organization's governance structure. In this cluster, content related to the organization's structural and institutional system for realizing sustainability is addressed. This may include the composition of the board of directors, the role of the sustainability committee, a transparent decision-making process, and ethical management practices.

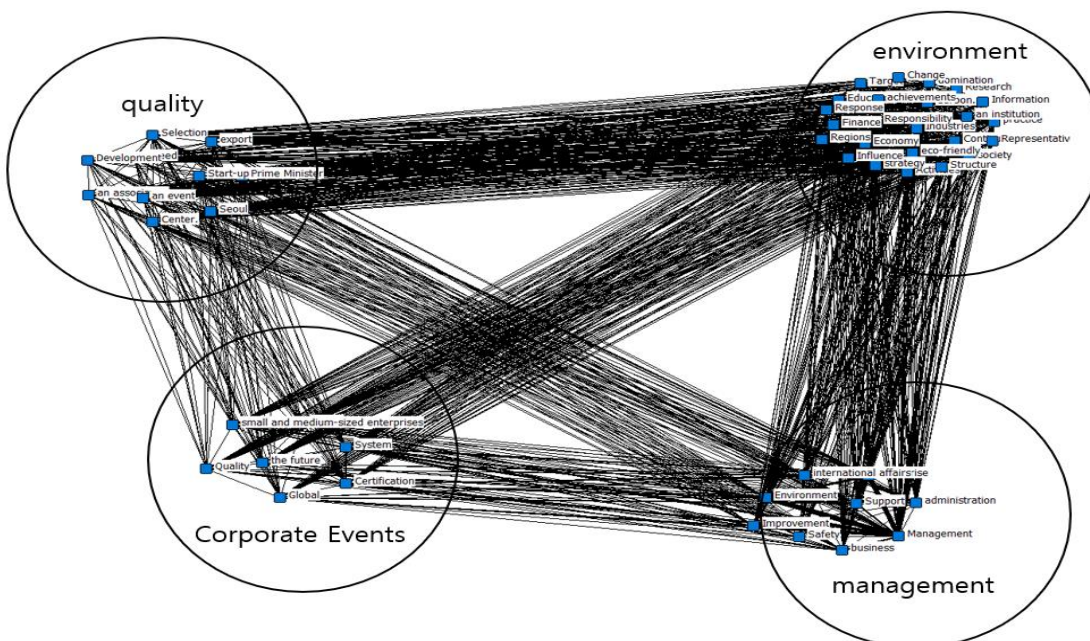


Figure 3. CONCOR Analysis

## 5. Conclusion

In this paper, we analyzed ESG keywords in Korea using big data collection, and through this, we performed the work of clustering important topics in sustainability reports in Korea and China. The purpose of this study is to clearly understand the core topics related to the sustainability strategies of the two countries, and to visualize and analyze the interconnectivity between keywords in each topic area. Through this, we want to evaluate how companies reflect various aspects such as establishing strategies for sustainable development, risk management, performance measurement, and organizational governance. ESG is positioned as an important indicator of a company's non-financial performance. ESG factors include various aspects related to environmental protection, social responsibility, and corporate governance. Proper understanding and analyzing these factors is essential to securing long-term performance and sustainability of a company. This study aims to compare how companies in the two countries deal with ESG factors by analyzing sustainability reports published by companies in Korea and China. This study extracted key keywords from sustainability reports in Korea and China using text mining and big data analysis techniques. The collected data were classified by subject through cluster analysis, and the interconnectivity between keywords within each subject was visualized. Through this, we identified which topics are important in the sustainability strategy of the two countries and how the keywords are related within each topic. As a result of the study, common important topics in the sustainability reports of Korea and China included management, environment, enterprise, society, certification, system, support, and continuity. These topics reflected various aspects related to strategy establishment, risk management, performance measurement, and organizational governance for sustainable development. Management and environment were the main topics in the Korean report, and business and society were the main topics in the Chinese report. The results of this analysis can provide useful guidelines for Korean and Chinese companies to develop and implement sustainable management strategies. For example, considering the core topics derived from each cluster, companies will be able to more clearly set the direction for their sustainability strategy. It can play an important role in achieving economic performance at the same time while fulfilling environmental protection and social responsibility. In addition, this study provides the core contents of the report that companies in other countries or regions as well as Korea and China can refer to when establishing strategies for sustainability. Therefore, this study can contribute to fulfilling social responsibility by presenting important indicators and directions for companies in pursuing sustainable management. For example, keywords and topics derived from the study can be important data for companies to refer to when reducing environmental impact, strengthening social responsibility, and establishing a transparent governance structure. However, the limitations of this study should also be considered. First, the results can be affected by the range and quality of the data used in the analysis. A sustainability report is a document that each company prepares autonomously, and the writing method or content may be different. Therefore, the diversity of samples and the quality of data can affect the results. Second, due to the limitations of text mining technology, it can be difficult to accurately classify all keywords. Text mining techniques have limitations in natural language processing, and in particular, they may not fully understand the meaning of keywords according to the context. Therefore, care should be taken when interpreting results. In addition, this study only dealt with comparative analysis of reports from Korea and China, and comparisons with sustainability reports from other countries or regions were not considered. This can be a factor that limits the scope of the study. To overcome these limitations, more in-depth research is needed through data collection and analysis. For example, the results of this study can be expanded by conducting more comprehensive comparative studies, including reports from various regions. This study provided an in-depth understanding of how companies in the two countries are dealing with ESG factors by comparing and analyzing sustainability reports from Korea and China through big data analysis techniques. Research results can provide useful

guidelines for companies to develop and implement sustainable management strategies and can further contribute to fulfilling their social responsibilities. Future studies will be able to more clearly understand and present sustainability strategies at the global level by expanding comparative analysis including more data from countries and regions.

## References

- [1] Garam Kim and Sooyoung Cho, "Exploring the Relationship Between ESG Reports and ESG-related Media Coverage Using Text Mining : Centered on the Network Agenda Setting Model," *The Korean Journal of Advertising and Public Relations*, Vol. 26, No. 3, pp. 55-95, 2024  
DOI: <https://doi.org/10.16914/kjapr.2024.26.3.55>
- [2] Bi Qian Zhao and Young Gyu Ahn, "The Impact of Chinese Company's ESG Management on Corporate Financial Performance," *The e-Business Studies*, Vol. 23, No. 6, pp. 303-317, 2022,  
DOI: <https://doi.org/10.20462/tebs.2022.11.23.6.303>
- [3] Seo, Mun-Sung, "A Study on ESG Management Strategies of Port Enterprises for Sustainable Ports: Focusing on Port Authority," *Journal of Korea Port Economic Association*, Vol. 39, No. 4, pp. 309-324, 2023,  
DOI: <https://doi.org/10.38121/kpea.2023.12.39.4.309>
- [4] Kang, Donghoon, Yu, Jihyun, and Ryu, Taekyung, "Reviewing ESG Introduction through University Member Perception Survey: At the Center of S University," *Journal of Business Convergence*, vol. 9, no. 1, pp. 123-129, 2024,  
DOI: <https://doi.org/10.31152/jb.2024.02.9.1.123>
- [5] Lee Chang-won and Shin Yun-cheol, "Investigating ESG Research and Policy Trends in China", *Journal of the Korean Society of Social Quality*, Vol. 7, No. 2, pp. 113-145, 2023.  
DOI: <https://doi.org/10.29398/kjsq.2023.7.2.113>
- [6] Nam, Nu – Ri and Yoo, Tae – Yong, "Effect of Perceived ESG Management on Voice Behavior: Mediating Effect of Organizational Trust and Organizational Identification and Moderating Effect of ESG Authenticity," *Korean Business Education Review*, Vol. 38, No. 6, pp. 47-65, 2023,  
DOI: <https://doi.org/10.23839/kabe.2023.38.6.47>
- [7] Nam, Nu - Ri and Yoo, Tae - Yong, "Effect of Perceived ESG Management on Voice Behavior: Mediating Effect of Organizational Trust and Organizational Identification and Moderating Effect of ESG Authenticity," *Korean Business Education Review*, Vol. 38, No. 6, pp. 47-65, 2023,  
DOI: <https://doi.org/10.23839/kabe.2023.38.6.47>
- [8] Jiyoung Ahn, Yunji Heo, 程曩孀 Lee, Junyoung Lee, Kihwan Kim and Dahae Chu. "The current status of China's ESG promotion and the direction of Korea-China policy comparison and response." *Comprehensive Chinese Study*, vol. 23, no. 5, pp. 1-221, 2023  
[https://www.kiep.go.kr/gallery.es?mid=a10101010000&bid=0001&list\\_no=11195&act=view](https://www.kiep.go.kr/gallery.es?mid=a10101010000&bid=0001&list_no=11195&act=view)
- [9] "Case of Construction Bank's ESG Rating System receiving Outstanding Ratings" *Xinhua Network*, 2023 12/19 <http://www.xinhuanet.com/money/20231219/2c18da64d5f3498b93829d98fcb56da6/c.html>
- [10] "2023 Best Practices for ESG Green Finance" selected by *Xinhua Network*, December 15, 2023  
<http://www.xinhuanet.com/money/20231215/82a3ebd2b0284723a753f594fcd5c003/c.html>.
- [11] "All media platforms for the carbon industry." *Low carbon networks*, 202404/15  
<https://www.ditan.com/carbon/esg/3613.html>.

- [12] Lee, Chae-Eun, "A Study on the ESG Management of Food Service Corporation Using Big Data Analysis," *Korean Journal of Hospitality & Tourism*, Vol. 32, No. 2, pp. 35-50, 2023,  
DOI: <https://doi.org/10.24992/kjht.2023.4.32.02.35>
- [13] Lee Young-seok. "The Analysis of the Frequency of Appearance of Keywords and the Analysis of ICT Education Trends Using CONCOR Techniques." *Industrial Convergence Research* Vol. 21, No. 1 pp. 187-192. 2023.  
DOI: <https://doi.org/10.22678/jic.2023.21.1.187>