SUPPLY CHAIN AND SUSTAINABILITY RESEARCH: SCSR
VOL.3, NO.1; JAN. – MAR.; 2024, ISSN 2822-0412 (Online)

Sustainable Finance Exploration: Analyzing the Impact of Environmental, Social, Governance (ESG) Information Disclosure in the Supply Chain

Angela S.C. Yang *

Received: March 6, 2024 / Revised: March 24, 2024 / Accepted: April 3, 2024
Doi: 10.14456/scsr.2024.8

Abstract

This study explores the challenges and strategies related to Environmental, Social, Governance (ESG) information disclosure within supply chains. Initially, through case studies across various sectors, it was observed that businesses encounter issues such as inadequate energy management, insufficient efforts in energy saving and carbon reduction, and a lack of certified greenhouse gas inventories and certification management concerning environmental protection, sustainable operations, and risk management. Furthermore, addressing the gaps in supplier audits, the study suggests improvements in operational continuity management, supplier selection, and management, energy management and emission reduction initiatives, overtime control, and anti-discrimination practices, and emergency preparedness and chemical management.

From a business benefits perspective, disclosing ESG information can enhance a company's environmental image, mitigate operational risks, foster social responsibility, and support corporate sustainability. Regarding stakeholder interactions, it is recommended that companies enhance their communication with stakeholders, understand their expectations, and establish an effective feedback mechanism. The study identifies the main challenges in ESG information disclosure as the authenticity of the information, stakeholder engagement, and regulatory uncertainties. It offers insights for practitioners, highlighting the critical role of ESG information technology applications, the influence of regulations and policies, and the verification and credibility of ESG information.

The study concludes with suggestions for future research, including cross-industry comparative studies, long-term impact assessments of ESG information, and exploring stakeholder participation and feedback. These recommendations aim to deepen the understanding of ESG information disclosure in supply chains and provide more targeted guidance and advice for businesses.

Keywords: Supply Chain ESG, Information Disclosure, Environmental Image, Operational Risk Stakeholders

* Corresponding, Senior Researcher, Top-Boss Education Technology, Co Ltd, Singapore, E-mail: pearlinself@gmail.com

Introduction

Background

Within the nine pivotal aspects of Corporate Sustainability, trends have been identified, highlighting sustainable finance as a key trend (Schoenmaker & Schramade, 2018). For companies seeking to incorporate sustainable finance into their supply chains, several strategic recommendations are proposed for comprehensive analysis. Firstly, companies should advocate for the adoption of internal carbon pricing, ensuring the full incorporation of carbon emission costs into their financial planning and operational strategies. Secondly, prioritizing biodiversity within environmental management is crucial, emphasizing ecological conservation and eco-friendly practices throughout the supply chain. The push towards a circular economy necessitates that companies explore recycling opportunities within their product life cycles to minimize resource waste. The call for science-based targets and a net-zero trajectory encourages companies to engage in scientific and technological innovation, developing technologies for emission reduction to achieve carbon neutrality. With a focus on new climate technologies, companies are advised to invest in and deploy emerging technologies to tackle climate change challenges. The expectation for sustainable finance suggests that companies integrate Environmental, Social, Governance (ESG) principles within their financial strategies to attract investors towards sustainable finance initiatives. Enhancing collaborations with social innovation organizations calls for stronger partnerships between companies and stakeholders to foster social innovation. Increasing ESG engagement among all employees underlines the significance of internal training and education, ensuring comprehensive participation in ESG initiatives. Moreover, establishing Diversity, Equity, and Inclusion (DEI) as a norm requires companies to champion diversity and equality in their management and culture, weaving DEI principles into everyday operations (Rumyantseva & Tarutko, 2022)

To advance sustainable finance, companies must weave sustainable finance principles and ESG considerations into their overarching operational strategies, including financial planning and decision-making. Establishing a transparent ESG performance and financial information disclosure mechanism is crucial for accountability to shareholders and stakeholders. Exploring sustainable finance instruments, like green bonds and socially responsible investments, can enhance investor participation in sustainable finance projects, supporting sustainability-oriented endeavors. Furthermore, educating and raising awareness about sustainable finance within the company and among supply chain participants ensures that personnel are well-equipped to adhere to sustainable finance standards. Forming partnerships with financial institutions, governmental bodies, and businesses can share best practices and optimize resource use. Companies should also navigate sustainable finance risks, such as climate change, environmental incidents, and social upheaval, by developing robust risk management strategies to maintain resilience against uncertainties. By embedding sustainable finance into their core strategies and promoting ESG practices through disclosure, investment, education, and partnerships, companies can achieve sustainable finance objectives in their supply chains, contributing to broader sustainability goals.

Objectives of the Study

The objectives of this study are outlined as follows:

1. To explore the tangible outcomes of embedding sustainable finance principles into corporate practices and assess the integration of ESG factors into companies' overall strategies. This includes examining the influence of such integration on the financial planning and decision-making processes within organizations.

2. To analyze the effects of implementing transparent information disclosure mechanisms on the perception and engagement of shareholders, stakeholders, and other relevant parties. This involves investigating how these mechanisms can effectively convey a company's ESG performance and financial data, aiming to understand the broader implications of transparency on sustainable finance practices within corporations.

3. To evaluate the capacity of corporations to identify, adopt, and utilize various sustainable finance instruments, with a focus on green bonds and socially responsible investments. This includes exploring how these financial tools impact investor engagement in sustainable finance initiatives and their potential to mobilize funds for supporting sustainability projects.

Research Questions

Research questions to be addressed in this study include:

1. On the practical effects of corporate integration of sustainable finance principles:
   - How does incorporating ESG factors into a company's overall strategy yield tangible sustainability benefits?
   - What are the direct consequences of this integration on the financial planning and decision-making processes within the company?
2. Concerning the impact of transparent disclosure mechanisms on stakeholders:
   - Can a transparent ESG disclosure mechanism enhance the relationship between the company and its shareholders, stakeholders, and other relevant entities?
   - In what ways can this disclosure mechanism effectively communicate ESG performance and related financial information externally?
3. On the capabilities of companies to explore and apply sustainable financial instruments:
   - What challenges do companies encounter when attempting to utilize sustainable finance instruments such as green bonds and socially responsible investments? (Bhutta et al., 2022)
   - How do these financial tools influence investors' interest and willingness to engage in sustainable finance initiatives led by the company?
   - Through what means can companies effectively generate funds to back sustainability projects using these instruments?

Literature review

Sustainable Finance

The Concept of Sustainable Finance

Sustainable finance, commonly known as green finance or climate finance, encompasses financial investment solutions aimed at fostering sustainable environmental development. These initiatives are instrumental in propelling a sustainable economy forward, supporting eco-friendly products, and influencing policies in favor of environmental conservation. By embedding sustainability considerations into the operational expenses, risks, and returns of businesses and financial institutions, sustainable finance plays a pivotal role not just in combating climate change but also in unlocking economic opportunities. Essentially, it represents a strategic approach that urges corporations and financial entities to incorporate environmental sustainability into their operational ethos, thereby committing to investments that are beneficial for the planet. B. Literature on ESG Information Disclosure in Supply Chains.

In 2023 is considered a pivotal year for international sustainable development and climate governance. In late April 2022, the European Financial Reporting Advisory Group (EFRAG) released the preliminary version of the first "European Sustainability Reporting Standards" (ESRS), which received approval from the European Union (EU) in November (Eklund & Vaaler, 2023). This new standard is a crucial component of the "Corporate Sustainability Reporting Directive" (CSRD), expanding the scope from the original 11,700 companies to 50,000 companies (Europe, 2022). The EU Commission is expected to formally adopt ESRS by June 30, 2023, and implement corresponding industry-specific standards by June 30, 2024.

At the same time, the U.S. Securities and Exchange Commission (SEC) announced in March 2022 that it would require listed companies to disclose their greenhouse gas emissions data (including Scope 1 to 3) in their annual reports for 2023 or 2024, depending on market capitalization, and to disclose the financial risks that companies may face in response to climate change by Task Force on Climate-related Financial Disclosures (TCFD).

In addition, the International Sustainability Standards Board (ISSB), established by the International Financial Reporting Standards (IFRS) Foundation, published two drafts in 2022 — the General Disclosure Framework (S1) and Climate-related Disclosures (S2) (Ball, 2006). During COP27, the ISSB intensified its focus on Scope 3 Greenhouse Gas (GHG) data and announced in December its intention to release the final version of the standard in the first quarter of 2023. The signing of a memorandum of cooperation between the ISSB and the Ministry of Finance of China, the establishment of an office in Beijing, and plans to discuss the introduction of corresponding standards with more Asian countries mark a new era for global sustainability and financial standards.2.2 ESG Framework A.

ESG Concept and Importance

The Environmental, Social, and Governance (ESG) concept is gaining momentum in both corporate and financial sectors. ESG assessment involves evaluating a company's performance in environmental protection, social responsibility, and good governance. This article explores the impact of ESG on the supply chain, particularly focusing on how ESG disclosure affects companies and the entire supply chain ecosystem.

The importance of ESG is multifaceted. Firstly, ESG assessment serves as a crucial indicator for investors and stakeholders to evaluate the value and risks associated with enterprises. Investors increasingly consider sustainability performance and factor in ESG criteria in their investment decisions. Secondly, ESG practices help companies enhance their corporate image, build brand value, and attract a broader customer and partner base. Moreover, global regulations are becoming more stringent regarding ESG, compelling companies to adhere to corresponding standards and guidelines to mitigate potential legal risks.

In the supply chain, ESG information disclosure has become a pivotal step for enterprises to achieve sustainability goals. By revealing the ESG practices of suppliers and partners, companies can assess the sustainability of the entire value chain, thereby improving transparency and traceability throughout the supply chain. This paper will delve into the actual impact of ESG in the supply chain, specifically exploring the effects of ESG information disclosure on supply chain operations and business decisions, providing valuable insights for enterprises aiming for more sustainable supply chain management.

Definition and Scope of Sustainable Finance

Sustainable finance is a comprehensive concept focusing on how financial activities can concurrently support economic development and promote environmental and social sustainability. This includes practices in the financial sector such as investment, financing, and insurance, with an emphasis on long-term value creation and risk management.

In sustainable finance, special attention is given to integrating ESG factors into the financial decision-making process. This integration helps assess the impact of potential investments and incentivizes investors to choose more sustainable projects. In the supply chain, these green financial instruments also influence the overall environmental performance of the company's operations and supply chain.

Sustainable finance encompasses green finance, concentrating on financial activities that support environmental sustainability. This may involve investing in renewable energy, energy-saving projects, or raising funds through the issuance of green bonds. In the supply chain, these green financial instruments also affect the overall environmental performance of the company's operations and supply chain.

Moreover, sustainable finance also involves social responsibility and governance. This includes the role of companies in society, such as promoting social equity and improving labor conditions. Detailed exploration is needed to understand how these social and governance factors relate to financial activities and impact the sustainability of supply chains.

ESG Elements in the Supply Chain

ESG elements in the supply chain encompass environmental protection, social justice, and good governance. Companies must ensure that every link in the supply chain aligns with the basic principles of sustainable finance by formulating clear policies and taking concrete measures.

Integrating ESG elements into the supply chain is crucial for achieving sustainable finance goals. On the environmental front, companies need to assess the carbon footprint of their supply chains and develop strategies to reduce greenhouse gas emissions. This could include choosing green suppliers, optimizing transportation and logistics, and promoting eco-friendly product design. Through the guidance of ESG standards, companies in the supply chain can holistically consider their ecological footprint, thereby reducing their adverse impact on the environment.

In the social dimension, companies must assess the labor conditions, social responsibility, and human rights of their supply chain partners. This involves ensuring that suppliers provide fair wages and hours, promoting diversity and inclusion, and prohibiting child and forced labor. ESG standards guide companies in building a more just and sustainable supply chain while improving social integrity.

Governance also demands attention in the supply chain. This includes establishing transparent governance mechanisms to ensure fair treatment of all parties in the supply chain. Companies must assess their suppliers' governance structures to guard against corruption risks. ESG standards drive higher levels of ethics and compliance in supply chains.

Research Methods

This article adopts the case study method to conduct an in-depth discussion and analysis of relevant cases.

Results and Discussion

Relevant Standards for Sustainable Finance

The main structure of Sustainable Financial is illustrated in Figure 1.

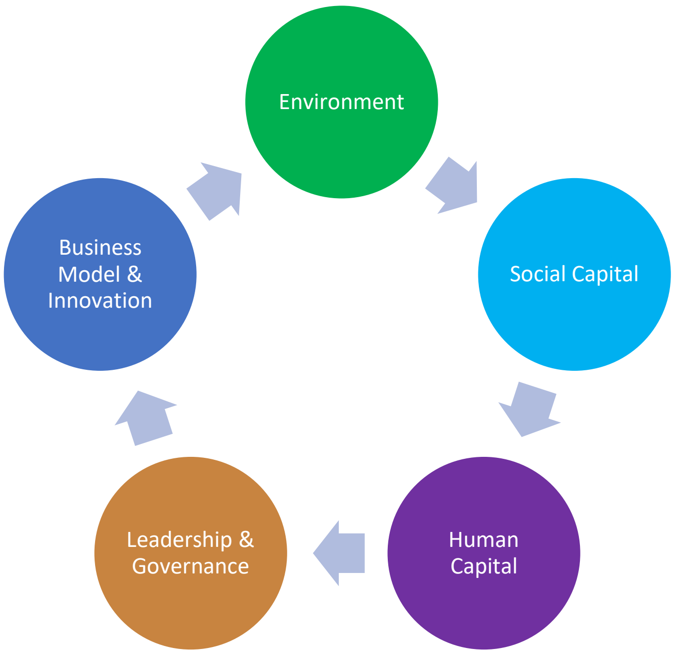

Figure 1 The main considerations of sustainable finance

In order to achieve the goal of sustainable finance, a number of standards related to sustainable finance have been formulated, which are explained below.

ISSB Guidelines

The International Sustainability Standards Board (ISSB) officially published two major international sustainability information disclosure framework standards in June 2023 (de Villiers & Dimes, 2023).

Established by the International Financial Reporting Standards (IFRS) Foundation at the end of 2021, the ISSB announced drafts of two disclosure standards in March of the following year. These drafts, based on the Task Force on Climate-related Financial Disclosures (TCFD) disclosure framework, are named the "General Requirements for Disclosure of Sustainability-related Financial Information" (referred to as S1) and "Climate-related Disclosures" (referred to as S2)(Lyons, 2022). Simultaneously, in 2022, the IFRS incorporated the Climate Disclosure Standards Board (CDSB) and the Value Reporting Foundation (VRF). This development signifies a significant step in the consolidation and evolution of international sustainability and financial standards. B. International Financial Reporting Standards (IFRS) is a set of international financial reporting standards issued by the International Accounting Standards Board (IASB). The goal of IFRS is to provide consistent, transparent, and comparable financial reporting standards globally, allowing investors, analysts, regulators, and other stakeholders to understand and compare corporate financial reporting across different countries and regions more easily.

IFRS replaces the financial reporting standards developed by individual countries and regions, streamlining international trade and investment while enhancing the transparency of global capital markets. This simplifies financial reporting and analysis for multinational companies and investors working under different accounting frameworks. IFRS applies not only to public companies but also to other types of organizations, including private companies and non-profit organizations. As a globally accepted financial reporting standard, many countries and regions have adopted or adapted IFRS to comply with local regulations and environments

Taiwan Version of the IFRS Sustainability Standard

The Taiwan Stock Exchange has completed amendments to the "Regulations Governing the Preparation and Filing of Perpetual Reports by Listed Companies." The main amendments include:

1. Referring to the 2021 update of the Global Reporting Initiative (GRI): Companies should use the latest version of GRI Common Criteria, Industry Guidelines, and Subject Matter Guidelines to prepare sustainability reports.

2. Considering the Sustainability Accounting Standards Board (SASB): Companies should formulate sustainability-related indicators based on industrial significance and investor concern. This includes industries like food, chemicals, finance, insurance, cement, plastics, steel, oil, electricity, gas, semiconductors, computers, optoelectronics, communication networks, electronic components, and channels, all of which need to strengthen the disclosure of industrial sustainability indicators according to specific schedules.

3. For companies with paid-in capital of more than 2 billion yuan but less than 5 billion yuan, the first preparation of a sustainability report may be applicable from 2024, excluding the food, chemical, and financial and insurance industries.

4. Task Force on Climate-related Financial Disclosures (TCFD): Companies are required to disclose nine climate-related information items.

5. Strengthen the quality of sustainability reports: Introduction of relevant regulations for institutions and personnel required to believe in sustainability reports. "Key Points for the Management of Listed Over-The-Counter (OTC) Companies in the Sustainability Report of Confident Institutions" will be released in 2024, effective from that year, and announced in the fourth quarter of 2022.

The International Sustainability Standards Board (ISSB) issued the "Sustainability Disclosure Standards" in June 2023. The Taiwan Financial Supervisory Commission announced its plan to adopt and integrate the Taiwan version of the IFRS Sustainability Standards in response to the domestic industrial environment. In the initial stage, companies with a capital of 10 billion yuan are required to compile sustainable information in 2026 and disclose it to the public in 2027. The measure is expected to apply to all listed companies in 2029.

Task Force on Climate-related Financial Disclosures (TCFD)

Task Force on Climate-related Financial Disclosures (TCFD) is a set of standardized voluntary climate-related financial disclosure recommendations issued by the Climate-related Financial Disclosure Working Group established by the G20 Forum for International Economic Cooperation. Its purpose is to discuss how the financial industry should respond to climate-related issues and help investors and decision-makers understand and assess accurately the climate change risks and opportunities faced by enterprises.

European Sustainability Reporting Standards (ESRS)

The European Commission's Executive Board approved a proposal for the Corporate Sustainability Reporting Directive (CSRD), which would replace existing reporting requirements for ESG. Starting from 2024, 50,000 European companies will be required to prepare sustainability reports. As part of the CSRD, the European Union will publish the first draft European Sustainability Reporting Standards (ESRS). The scope and depth of disclosure requirements are much stricter than the current Non-Financial Reporting Directive (NFRD) Affected companies must disclose hundreds of metrics and targets by the ESRS reporting standards. Companies that have complied with the NFRD will implement CSRD in their 2025 report. Therefore, it is crucial to plan and manage internal organizational data early to ensure the authenticity and completeness of the data support.

Corporate Sustainability Reporting Directive (CSRD)

The Corporate Sustainability Reporting Directive (CSRD) is the new EU legislation that requires all European businesses to publish regular reports on their environmental and social impact activities. It helps investors, consumers, policymakers, and other stakeholders evaluate the non-financial performance of large companies. As a result, CSRD encourages European businesses to develop more responsible business practices.

Factors Influencing the Disclosure of ESG Information in the Supply Chain

The Importance of Supply Chain Sustainability Finance

The aforementioned standards, including the ISSB Standard, IFRS Standard, TCFD Climate-related Financial Disclosure, ESRS European Sustainability Reporting Standard, and CSRD Corporate Sustainability Reporting Directive, cover various aspects of corporate sustainability finance and sustainable development. Their importance in supply chain sustainability finance is reflected in several aspects:

1. Disclosure and Transparency: These guidelines and directives encourage companies to make more comprehensive and transparent disclosures about their sustainability and environmental, social, and governance (ESG) performance. Supply chain transparency is crucial for stakeholders to better understand the actions and impacts of businesses in the supply chain, including environmental and social impacts.

2. Risk Management: These standards require companies to assess and disclose risks related to climate change, ESG, and sustainability.

Table 1 Impact of Key Sustainability Decrees/Standards on Supply Chain Management

Decrees/Standards	Aspects of impact	Influence content
ISSB guidelines	Disclosure and transparency, risk management, ESG integration, compliance requirements	Encourage companies to disclose more comprehensive and transparent information on sustainability and ESG, including supply chain transparency, risk management, and compliance with ISSB standards.
IFRS Standards	Disclosure and transparency, risk management, ESG integration, compliance requirements	Providing consistent, transparent, and comparable financial reporting standards and providing comprehensive financial disclosures to companies also affects information related to sustainability and ESG.
TCFD Climate-related Financial Disclosures	Disclosure and transparency, risk management, ESG integration	Provide standardized climate-related financial information disclosure recommendations, emphasizing how companies should respond to climate-related issues, which can help assess climate change risks and opportunities, and affect risk management and ESG integration.
ESRS European Sustainability Reporting Standards	Disclosure and transparency, risk management, ESG integration, compliance requirements	Strengthen the sustainability reporting requirements of European companies, covering hundreds of indicators and targets, to provide a more comprehensive disclosure of companies, affecting the sustainability and compliance of the supply chain.
CSRD Corporate Sustainability Reporting Directive	Disclosure and transparency, risk management, ESG integration, compliance requirements	The mandatory requirement for European companies to comply with specific sustainability reporting standards requires companies to actively assess sustainability in their supply chains to ensure compliance with regulatory requirements, impacting risk management and ESG integration.

In the table above, each ordinance or standard has a different degree of impact on disclosure and transparency, risk management, ESG integration, and compliance requirements. Together, they push companies to consider sustainability and ESG factors more holistically and strengthen relevant disclosure and management measures in supply chain management to ensure business sustainability and long-term value creation.

Stakeholders' expectations for sustainable finance

The following is a table of analysis of the expectations of stakeholders in the above-mentioned decrees. In this table, it shows the expectations and influence of the stakeholders of the enterprise on sustainable finance.

Table 2 Stakeholder Expectations and Influence on Sustainable Finance in Key Sustainability Decrees

Decrees/Standards	Stakeholder expectations	Influence content
ISSB guidelines	- Investors: Expect more comprehensive ESG disclosures and understand the status of corporate sustainability and risk management.	- Companies need to provide more detailed disclosures, including relevant information in the supply chain, to meet investors' demand for ESG information.
IFRS Standards	- Investors, analysts: expect consistent, transparent, and comparable financial reporting standards, including ESG-related information.	- Companies need to incorporate ESG factors into their financial reports and provide more comprehensive financial disclosures to meet investors' detailed understanding of sustainability and risks.
TCFD Climate-related Financial Disclosures	- Investors and regulators: expect standardized climate-related financial disclosures to assess climate risks and opportunities.	- Companies need to provide climate-related financial information, including climate risks and opportunities in their supply chains, in accordance with standards to meet the demand for climate-related information from investors and regulators.
ESRS European Sustainability Reporting Standards	- Investors, Governments, Consumers: Expect more detailed sustainability reporting, including impacts in the supply chain.	- Companies need to provide more comprehensive and massive disclosures, including data from their supply chains, to meet the expectations and demands of multiple organizations for corporate sustainability.
CSRD Corporate Sustainability Reporting Directive	- Investors, governments, regulators: Expect companies to follow specific sustainability reporting standards and increase transparency.	- Companies are required to comply with the Directive and provide standard-compliant sustainability reports to meet various corporate sustainability expectations and regulatory requirements.

These regulations and standards reflect the expectations of stakeholders regarding corporate sustainability and supply chain management. Investors expect more detailed ESG disclosures, governments and regulators expect greater transparency and compliance with specific standards, and consumers expect more detailed sustainability reporting. Businesses need to respond to these expectations in order to build trust, improve competitiveness and ensure sustainable operations.

Case studies

Practical case analysis of enterprises

(1) Case 1: Enhancing Supplier Network through ESG Data

Environmental, Social, and Governance (ESG) considerations have been pivotal in corporate consciousness for over a century. In recent years, the escalating pressure on businesses to conduct responsible operations has compelled them to extend this awareness throughout their entire supply chain. In an era marked by ever-expanding regulatory frameworks, any lapses in conduct can swiftly be brought to light through social media channels. Consequently, companies are now compelled to thoroughly evaluate ESG certifications across all nodes in their supply chains.

Supply chains play a central role in ESG performance, accounting for up to 80% of the environmental impact in various industries. Serving as a nexus between businesses and society by connecting with employees, communities, and consumers, the supply chain significantly influences corporate reputation and financial risk management. The recent pandemic has underscored the crucial role of supply chains in ensuring the resilience of a company's operations. This has prompted businesses to recognize that managing ESG impacts within their supply chains is as critical as ensuring product quality, cost-effectiveness, and timely delivery. This extends beyond Tier 1 suppliers to include downstream suppliers. Monitoring the behavior of secondary and tertiary suppliers, often located in different countries with limited direct customer interaction, becomes imperative. Thus, ESG data becomes a vital tool for procurement professionals to enhance visibility in these areas. We have compiled the information above into a structured form for supply chain managers to reference in their procurement and collaboration efforts.

Table 3 Overview of ESG Integration Solutions Inspection in Enterprise Supply Chains

field	Solution/Plan	description
ESG adoption	ESG Sustainability Label	Introduce the sustainability label to prove the company's superior performance in environmental, social and governance aspects.
	ESG Intelligence	Leverage intelligent data analytics to provide deep insights into environmental, social, and governance factors.
	risk management	Comprehensive management of enterprise risks, including data APIs, sustainable risk management platforms, accounts receivable collection and other solutions.
	Enterprise Data API Solution	Provide enterprise data APIs for risk management and decision support.
	ESG sustainable risk management platform	Focus on integrating ESG factors for risk management, emphasizing sustainable risk management.
	Accounts receivable collection	Manage accounts receivable and ensure business liquidity, taking into account social and governance considerations.
	Corporate credit report	Provide corporate credit reports to assess the credit risk of partners.
	Financial risk management	Emphasis is placed on risk management in the financial aspect, while considering the impact of ESG factors.
	Supplier risk management	Manage supplier risks, including environmental and social risks in the supply chain.
other	Marketing & Marketing Outreach	Carry out marketing and marketing development, emphasize the sustainability of the enterprise, and attract more customers with the same values.
	Compliance management	Emphasis is placed on compliance to ensure that businesses operate legally and ethically.
	Smart collection dashboard	Provides an intelligent collection dashboard to help businesses manage and collect payments more effectively.
	Partner Acceleration Program	Accelerate the development of partners, emphasizing shared values and sustainable development.

Table 3 (Cont.)

field	Solution/Plan	description
	Accounts receivable collection	Manage accounts receivable and ensure business liquidity, taking into account social and governance considerations.
	Corporate credit report	Provide corporate credit reports to assess the credit risk of partners.
	Financial risk management	Emphasis is placed on risk management in the financial aspect, while considering the impact of ESG factors.
	Supplier risk management	Manage supplier risks, including environmental and social risks in the supply chain.
other	Marketing & Marketing Outreach	Carry out marketing and marketing development, emphasize the sustainability of the enterprise, and attract more customers with the same values.
	Compliance management	Emphasis is placed on compliance to ensure that businesses operate legally and ethically.
	Smart collection dashboard	Provides an intelligent collection dashboard to help businesses manage and collect payments more effectively.
	Partner Acceleration Program	Accelerate the development of partners, emphasizing shared values and sustainable development.

The table above provides a comprehensive summary of the various solutions, initiatives, and tools discussed in different areas, accompanied by their respective descriptions. These programs and tools play a pivotal role in assisting companies in realizing their objectives related to ESG adoption and risk management, all while underscoring the significance of sustainability.

Effective ESG Disclosure Strategy for the Supply Chain

Wistron employs a robust supply chain sustainability management process that encompasses essential requirements for both existing and new suppliers, ensuring adherence to the Wistron Supplier Code of Conduct. This comprehensive management process spans various aspects, including green product procurement, Conflict Minerals Reporting Template (CMRT) surveys, supplier self-assessment questionnaires, supplier performance management, sustainability audits, and coaching for improvements (Whitelock, 2015).

To guarantee that suppliers possess fundamental sustainability capabilities, Wistron has implemented training programs for supply chain personnel qualifications and supplier management. Procurement and related staff undergo sustainability training covering the Responsible Business Alliance's (RBA) code of ethical conduct, integrity management, corporate governance, as well as general sustainability courses encompassing conflict minerals, green management, green partners, laws and regulations, negotiation skills, and more.

Supplier auditors at Wistron are required to undergo supplier audit course training, achieving a subject score of 80 or above to earn auditor accreditation and conduct supplier audits. Internally, Wistron provides relevant supply chain training courses. A total of 260 auditors participated in training on integrity management, corporate governance, and related topics, while 883 individuals underwent 609 hours of sustainability management training. Additionally, 28 auditors received 97 hours of training. Wistron conducts thorough risk factor assessments, as illustrated in the table below.

Table 4 Wistron suppliers' main sustainability risk sharing factors in 2022

face	risk
environmental protection	- There is no mechanism for energy management, energy conservation and carbon reduction - Management of uncertified greenhouse gas inventory certification - No use of green electricity or renewable energy
Sustainability & Operational Risk Management	- Failure to manage contingency plans for business continuity - Not participating in the Carbon Disclosure Initiative

Table 5 Wistron Supplier Sustainability Management Improvement Action Plan

face	Issues	Improve actions
Sustainability & Operational Risk Management	Operational continuity management	- Promote corporate social responsibility, employee care, corporate governance, environmental protection and social welfare - Focus on complying with government regulations, protecting the right to work, and promoting health and safety at work - Develop green products, reduce environmental impact, and take social and environmental responsibility - Prevent disruptions to operational activities by incorporating prevention and recovery controls and procedures to minimize disruptions to operations due to disasters and management failures
Supply chain sustainability management	Supplier selection/management	- Establish a robust supply chain risk management program - Identify risks at all stages of the supply chain - Improve the accuracy of demand forecasts and establish safety stock
environmental protection	Energy management/emission reduction programs	- Formulate energy policies and combine relevant emission reduction actions, formulate emission reduction plans and emission reduction targets - Conduct energy monitoring, establish relevant regulations to identify and have clear quantitative indicators, formulate energy and resource control procedures, and implement carbon reduction in accordance with the procedures
Human rights and labor security	Overtime control overtime/anti-discrimination	- Establish an electronic overtime application control system, which requires overtime application in advance, and the system will automatically generate an early warning signal when the overtime hours are exceeded - Regularly organize anti-discrimination education and training programs for anti-discrimination issues, and include them in annual training plans, conduct employee training, and implement record-keeping management

Table 5 (Cont.)

face	Issues	Improve actions
Occupational health and safety	Lack of knowledge of emergency preparedness/chemicals management	- Strengthen the awareness of the protection of operating staff - Escape routes are marked - Safety Escape Education and Training - Posting warning signs and control measures on relevant facilities and areas - Appropriate security and improvement facilities - Chemical Safety Data Sheets (SDS) for spot-checking

Conclusions

Key Findings and Results

Business Benefits

The study reveals that implementing corresponding improvement actions in supply chain sustainability management can bring various business benefits. Key findings include:

1. Environmental Protection and Energy Conservation: Establishing energy management mechanisms, implementing energy conservation, carbon reduction initiatives, and using green or renewable energy contribute to reducing environmental impact, meeting sustainable development goals, and enhancing corporate image.

2. Sustainability & Operational Risk Management: Engaging in operational continuity management, participating in the Carbon Disclosure Program, and creating operational continuity contingency plans can reduce operational risks and enhance the company's resilience to emergencies.

3. Supply Chain Sustainability Management: Developing a comprehensive supply chain risk management plan improves demand forecasting accuracy, enhances supply chain stability, and reduces the risk of potential operational disruptions.

4. Human Rights and Labor Protection: Controlling overtime work, addressing anti-discrimination issues, and strengthening occupational safety and health contribute to protecting employees' rights, improving the working environment, and enhancing employee satisfaction.

5. Environmental Initiatives: Developing energy policies, conducting energy monitoring, establishing emission reduction plans, and emphasizing chemical management aid in reducing a company's environmental footprint and complying with relevant regulations.

Overall, these actions not only help companies achieve sustainability goals but also yield practical business benefits, including improved brand image, risk reduction, enhanced supply chain stability, and a safer, healthier, and fairer working environment, thereby improving overall competitiveness.

Stakeholder Interaction

The investigation and analysis of stakeholder interaction in supply chain sustainability management yield the following main findings:

1. Increased Transparency: Establishing mechanisms for environmental protection, sustainability, and operational risk management, as well as supplier sustainability management, increases transparency for external stakeholders. Clear disclosure of environmental policies, risk management plans, and supply chain sustainability fosters better understanding of the company's sustainability policy.

2. Active Participation in Sustainability Initiatives: Actively responding to sustainability initiatives by participating in carbon disclosure programs and establishing operational contingency plans aligns with societal expectations, strengthens the company's leadership position in sustainability, and earns stakeholders' trust.

3. Employee Training and Participation: Implementing measures like overtime work control and training courses enhances internal employees' awareness and participation in sustainability management. This fosters positive sustainability culture and recognition of corporate values.

4. Supply Chain Collaboration: Promoting collaboration with suppliers through a supply chain risk management program helps jointly address risks and establishes stronger partnerships in the value chain.

Overall, these stakeholder strategies and actions not only meet societal expectations but also bring positive business-level benefits. Close collaboration with stakeholders enables companies to achieve sustainability goals, gain marketplace support, and promote overall business development.

Challenges in ESG Information Disclosure in the Supply Chain

Implications for Practice

This study identifies challenges in supply chain ESG disclosure and provides suggestions for the practice community. Overcoming these challenges requires cross-departmental collaboration and global consensus. Practitioners should actively address these challenges to better achieve Sustainable Development Goals and improve overall supply chain sustainability.

1. Transparency and Standardization Needs: Establishing a more transparent and standardized disclosure mechanism is crucial. Developing common standards and guidelines can enable consistent ESG information reporting across supply chains, reducing complexity.

2. Data Collection and Monitoring Technologies: Strengthening data collection and monitoring technologies, especially in environmental protection, sustainability, and operational risk management, is essential. Introducing advanced technologies like the Internet of Things (IoT) and big data analytics can enhance accuracy and real-time ESG information collection.

3. Training and Awareness-Raising: Practitioners should strengthen internal staff training to raise awareness and understanding of ESG disclosures. Regular sustainability-related training programs are essential to equip employees with sufficient knowledge for the disclosure process.

4. Partner Collaboration: All parties in the supply chain should establish closer collaboration to promote ESG information disclosure. Sharing information and collaborative problem-solving ensure the completeness and accuracy of disclosure.

5. Government-Industry Cooperation: Closer collaboration between governments and industry associations is necessary to develop more binding regulations and standards. This can increase companies' willingness to disclose and ensure that disclosed information accurately reflects supply chain ESG practices.

Recommendations for Future Research

While this study explores challenges in supply chain ESG disclosure, future research can further deepen the understanding of this topic and propose concrete solutions. Recommendations for future research include:

1) Cross-Industry Comparative Research: Conduct cross-industry comparative studies on supply chain ESG information disclosure to analyze challenges faced by different industries and identify industry-specific best practices.

2) ESG Information Technology Applications: Explore the application of advanced technologies like blockchain, artificial intelligence, machine learning, etc., to enhance ESG information disclosure in the supply chain.

3) Stakeholder Participation and Feedback: Conduct in-depth studies on stakeholder participation and feedback mechanisms in ESG information disclosure in the supply chain.

4) Impact of Regulations and Policies: Analyze regulations and policies on ESG information disclosure in different countries and regions, evaluating their impact on corporate disclosure.

5) Verification and Credibility of ESG Information: Examine existing ESG information verification mechanisms to propose comprehensive standards ensuring credibility and authenticity of disclosed information.

6) Long-Term Impact Assessment: Conduct long-term impact assessments of supply chain ESG information disclosure, evaluating corporate performance, shareholder value, social impact, etc., for a comprehensive understanding of disclosure effectiveness and long-term impacts.

Reference

Ball, R. (2006). International Financial Reporting Standards (IFRS): pros and cons for investors. Accounting and business research, 36(sup1), 5-27.

Bhutta, U. S., Tariq, A., Farrukh, M., Raza, A., & Iqbal, M. K. (2022). Green bonds for sustainable development: Review of literature on development and impact of green bonds. Technological Forecasting and Social Change, 175, 121378.

Daszyńska-Żygadło, K., Marszałek, J., & Piontek, K. (2018). Sustainable finance instruments' risk-green bond market analysis. European Financial Systems, 78.

de Villiers, C., & Dimes, R. (2023). Will the formation of the International Sustainability Standards Board result in the death of integrated reporting? Journal of Accounting & Organizational Change, 19(2), 279-295.

Eklund, M., & Vaaler, J. A. (2023). The Transition to CSRD and ESRS (Master's thesis, University of Agder)

Europe, A. (2022). Corporate Sustainability Reporting Directive (CSRD). Accountancy Europe.

Lyons, S. (2022). General Requirements for Disclosure of Sustainability-Related Financial Information: Response to ISSB Public Exposure Draft. ISSB Public Exposure Draft: IFRS S1 General Requirements for Disclosure of Sustainability-related Financial Information.

Rumyantseva, A., & Tarutko, O. (2022, November). Impact of the ESG Principles on the Corporate Financial Strategy. In Challenges and Solutions in the Digital Economy and Finance: Proceedings of the 5th International Scientific Conference on Digital Economy and Finances (DEFIN 2022), St. Petersburg 2022 (pp. 309-318). Cham: Springer International Publishing.

Schoenmaker, D. & Schramade, W. (2018). Principles of sustainable finance. Oxford University Press.

Whitelock, V. G. (2015). Environmental social governance management: A theoretical perspective for the role of disclosure in the supply chain. International Journal of Business Information Systems 6, 18(4), 390-405.