

The Research on the Management and Solution of ESG Issues Based on the Global Supply Chain

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Abstract: The environmental, social, and governance (ESG) issues of enterprises in the global supply chain are increasingly emerging with the continuous deepening of globalization. This research aims to profile the specific performance of ESG issues in the global supply chain and their impact on various stakeholders. It explores relevant management strategies and solutions. First, we clarify the potential environmental problems in the global supply chain, such as resource consumption, pollution emissions, and carbon footprint. Second, this research analyzes social issues, including the protection of labor rights, fair trade, and community development. Third, this research discusses challenges in enterprise governance, such as issues involving commercial morality, transparency, and risk prevention and control. In terms of these issues, this research proposes a comprehensive management framework for ESG issues. It aims to find solutions by enhancing policy guidance, promoting technological innovation, improving supply chain collaborative management capabilities, establishing a multi-participant governance system, and demonstrating the feasibility and effectiveness of these solutions through example analysis.

1. Introduction

Nowadays, with the background of global economic integration, the global supply chain has already become the core bond that connects the links such as production, logistics, distribution, and consumption with increasing complexity and dynamics. However, during this development process, the global supply chain faces not only traditional challenges such as efficiency improvement and cost control but also the severe test of non-traditional responsibilities such as environmental protection, social justice, and good governance, especially the ESG issues in Environmental, Social, and Governance, which profoundly impact the long-term value creation and global sustainable development of enterprises [1].

2. Research Background and Importance

2.1. Trends in Global Supply Chain Development and Their Implications for Sustainability

With the progress of information technology, the change in market demand, and the evolution of international trade rules, the global supply chain presents the development trend of flattening, networking, and intelligence. While pursuing efficiency and economic benefits, supply chain activities have also exacerbated problems such as resource consumption, environmental pollution, and climate change, posing a severe threat to the sustainability of global ecosystems. Therefore, achieving green low carbon, fair and just, and social harmony while ensuring supply chain effectiveness has become a crucial topic for the future development of the global supply chain.

2.2. The Core Position of the ESG Concept in Corporate Social Responsibility and Sustainable Development

As a comprehensive evaluation system, ESG provides a broader social and environmental perspective for business management policy-making. It emphasizes that enterprises must pay

attention to multi-dimensional responsibilities, including environmental protection, employee rights, consumer protection, community relations, governance structure, and economic performance. Introducing and implementing ESG principles in global supply chains can not only effectively reduce operational risks and improve brand reputation but also help promote the overall supply chain transformation towards a more sustainable direction. Therefore, studying how to integrate the ESG concept into supply chain management and put forward targeted and feasible solutions is of great practical value and theoretical significance for promoting a healthy, stable, and sustainable development of the global business ecosystem [2].

3. Analysis of ESG Problem in the Global Supply Chain

3.1. Environmental Problems

The ESG problem of the global supply chain during operations is complex and comprehensive. For the environment, supply chain activities deeply involve the mass consumption and waste phenomenon of resources, including but not limited to over-exploitation and mismanagement of non-renewable resources such as minerals and water resources. These practices exacerbate resource tensions and lead to severe pollution issues. Each sector of the supply chain, especially the logistics transportation and production processes, generates a significant amount of carbon emissions, which profoundly impacts global climate change. In addition, supply chain activities may also directly lead to the destruction of ecosystems and the loss of biodiversity, such as deforestation, water pollution, and soil degradation caused by industrial expansion [3][4].

3.2. Social Problems

For society, the primary challenges of supply chain management include the protection of labor rights and the improvement of working conditions. In many cases, workers in the supply chain face treatment below legal standards, such as low wages, overwork, unsafe working conditions, and even severe human rights violations such as child labor and forced labor. At the same time, enterprises should actively fulfill the social responsibility of community participation and ensure that their business activities are conducive to the development and prosperity of local communities, rather than having a negative impact. Protecting consumer rights and product safety is also crucial, which means that from raw material procurement to product delivery, every step needs to strictly follow international and local health, safety, and environmental protection regulations to ensure that products entering the market are free from quality issues and safety hazards.

3.3. Governance Challenges

For governance, supply chain transparency and implementation of a traceability system are urgent issues that must be solved. Only by fully revealing the actual situation of each supply chain sector can we effectively identify and correct potential environmental and social issues. At the same time, enterprises are expected to enhance compliance risk management, establish and improve anti-corruption mechanisms, eliminate illegal activities within the supply chain, and uphold a fair and ethical business environment. Finally, building a comprehensive and multi-angle stakeholder communication and cooperation mechanism is crucial. Enterprises must maintain close contact with suppliers and partners and engage with government departments, non-governmental organizations, and diverse consumer groups. Together, they can collaboratively explore and advocate for the implementation of ESG standards, to promote the global supply chain towards a more sustainable, fair, and transparent direction. The analysis of ESG problems in the global supply chain is shown in Figure 1:



Figure 1: The analysis of ESG problems in the global supply chain

4. ESG Problem Management Strategy Based on Global Supply Chain

4.1. Construction of Risk Identification and Evaluation Framework

In the global supply chain's ESG (environmental, social, and governance) problem management strategy, the primary task is to establish a systematic and structured risk identification and evaluation framework. This framework aims to comprehensively sort out the ESG risk factors present throughout the supply chain process, including environmental resource depletion, social labor rights issues, corporate governance loopholes, and more. It quantitatively evaluates the impact of these risks on the long-term value and social reputation of enterprises using scientific methods. In this way, enterprises can identify the source of risks, prioritize high-risk areas, and establish a solid foundation for formulating subsequent improvement measures [5].

4.2. End-To-End Supply Chain Collaborative Management

The key approach to ESG optimization in the supply chain involves implementing end-to-end supply chain collaborative management, requiring enterprises to overcome traditional border limitations. Enterprises establish a close-knit network to exchange ESG information and best practices, share responsibility, and collaborate to enhance the environmental performance, social impact, and governance structure of the entire supply chain with suppliers, manufacturers, distributors, and end users at all levels. In this process, emphasis is placed on information transparency and real-time monitoring to ensure that each link meets the established ESG standards.

4.3. Formulation and Implementation of ESG Policies and Standards in the Supply Chain

Enterprises need to carefully formulate and strictly implement a set of ESG policies and standards that are tailored to the characteristics of their supply chain to ensure the effective implementation of ESG goals. Policies and standards include clear environmental protection requirements, principles of social fairness and justice, and sound corporate governance norms. They are embedded into all aspects of supply chain operations through contract terms, regular audits, and incentive mechanisms. At the same time, relevant policies and standards should be continuously iterated and improved to align with changes in the external environment and the accumulation of internal practical experience.

4.4. Promotion of ESG Performance by Utilizing Technology Innovation

Technological innovation is essential for enhancing the ESG performance in the global supply

chain. Utilizing digital technologies such as blockchain, the Internet of Things, and artificial intelligence can significantly enhance supply chain transparency. Data tracking and reporting processes can be simplified, enabling companies to understand and respond to complex ESG challenges quickly and accurately. Meanwhile, innovative technologies can also help develop more environmentally friendly production processes, optimize logistics distribution efficiency, reduce carbon footprints, and promote the transformation of the entire supply chain system towards green and low-carbon practices.

4.5. The Motivation for Reform by Taking the Multi-Stakeholder Participation Model

A multi-stakeholder participation model is essential for promoting ESG change in the global supply chain. Enterprises should actively invite government regulators, industry associations, non-governmental organizations, investors, consumers, and other essential stakeholders to participate in the decision-making process, brainstorm, and jointly explore solutions to ESG problems. Dialogue and cooperation united all the forces to establish a new ecosystem for a sustainable global supply chain.

5. Solution Strategies and Suggestions

5.1. Improvement Measures at the Policy Level

At the policy level, governments and international organizations should enhance the development of laws and regulations, establish more comprehensive ESG policies and guidelines, and implement stricter environmental, social, and governance supervision on the supply chain activities of enterprises. These policies and guidelines include, but are not limited to, setting mandatory disclosure requirements, establishing ESG compliance thresholds, offering incentives such as tax incentives or financial subsidies, and imposing economic penalties for violations. In addition, policies should encourage and support enterprises to conduct research and practice sustainable supply chain management. They should also guide enterprises to pay attention to and invest in ESG construction from a strategic perspective through public policies [6].

5.2. Enterprise Internal Operation Practice Optimization

In internal operations, enterprises should deeply examine their supply chain management model, incorporate an ESG risk identification and evaluation framework, establish clear ESG objectives, and integrate them into daily operations and decision-making processes. Specifically, enterprises are expected to implement delicacy management and continuously improve from various perspectives, including supply chain source procurement, production process control, energy saving and emission reduction in logistics transportation, and employee welfare protection. At the same time, the enterprise's senior leadership should take the lead in ensuring that the ESG concept permeates the corporate culture, enhancing ESG awareness and execution among all employees through training and education.

5.3. Best Practices for Inter-Industry Collaboration and Sharing

Inter-industry collaboration and sharing best practices are essential ways to promote the overall improvement of the supply chain at the ESG level. By building a cross-industry communication platform, enterprises can share their successful cases and lessons in ESG and learn from advanced management experience and technical means. At the same time, it advocates the establishment of an industry-standard alliance and jointly formulates and promotes the supply chain ESG standard and certification system to promote the industry's overall competitiveness and sustainable development.

5.4. Technological Innovation and the Application of Digital Tools

Technological innovation and digital tools play a key role in solving ESG (environmental, social, and governance) challenges in global supply chains. Firstly, leveraging the Internet of Things (IoT) and blockchain technology enables intelligent monitoring and tracking of the entire supply chain, which ensures the legitimacy of raw material sources, and transparency in supply chain operations,

and effectively prevents environmental harm and violations of labor rights infringement. Secondly, through in-depth analysis of big data and the use of artificial intelligence prediction models, ESG risk factors in all aspects of the supply chain can be accurately detected, which can guide enterprises to formulate targeted pre-control measures.

In addition, a digital system designed specifically for ESG management integrates energy efficiency, waste management, and carbon emission accounting, allowing enterprises to quantify their ESG performance in daily operations and drive continuous improvement. At the same time, an online sustainable procurement platform and connection of the supplier groups that meet ESG standards. It not only optimizes the allocation of resources but also simplifies the compliance audit process and reduces costs.

Furthermore, digital training and educational tools should enhance employees' understanding and practical abilities of ESG concepts and create a sense of social responsibility throughout the supply chain. Finally, enterprises can simulate and analyze production processes and identify and improve high energy-consuming and highly polluting processes, promoting environmental upgrades and technological innovation in production processes using advanced environmental impact simulation and optimization software.

6. Conclusion

6.1. The Main Findings of the Study

Through in-depth discussion and analysis, this study reveals the importance and complexity of ESG issues in the context of global supply chains. The main findings include the following: first, environmental issues involving the impact of supply chain activities on the environment, such as excessive resource consumption, environmental pollution, and climate change; second, social issues involving inadequate protection of labor rights and interests, improper handling of community relations, and inadequate protection of consumer rights and interests; third, governance issues, especially low transparency in the supply chain, high compliance risks, and a lack of stakeholder communication mechanisms, are particularly prominent.

6.2. A Summary of the Solution Path of the ESG Problem in the Global Supply Chain

This study proposes a comprehensive and systematic solution to the global supply chain ESG problem. The initial task is to develop and enhance the risk identification and evaluation system, along with policy guidance, to facilitate the optimization and reform of internal operations and management within enterprises. At the same time, it advocates deep collaboration and resource sharing among industries to collectively enhance the overall ESG level of the supply chain. It is crucial to fully utilize modern technological innovations and digital tools, such as intelligent monitoring, big data analysis, and green supply chain management systems, to enhance supply chain transparency, improve risk management capabilities, and achieve sustainable supply chain development.

6.3. Prospects for Future Research Directions

Although this study has discussed the management and solutions of the global supply chain ESG problem in detail, with the acceleration of the globalization process and the continuous progress of science and technology, many areas are still worth further exploration. Future research should focus on refining and improving the ESG evaluation index system to enhance its universality and operational efficiency. It should also explore ways to promote and implement effective ESG management strategies on a larger scale. Additionally, research should investigate how emerging technologies such as AI and cloud computing can enhance supply chain ESG management intelligence. Furthermore, analyzing the impact of various national and regional policies and regulations on enterprise supply chain ESG management is crucial. This research can provide more robust theoretical support and practical guidance for the sustainable transformation of the global supply chain.

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