

Original Research Article

The fast fashion cross-border e-commerce faces great challenges to environmental sustainability and ESG governance strategy: Taking the Shein model as an example

Shiyu Guo

Minnan University of Science and Technology, Quanzhou, Fujian, 362021, China

Abstract: Fast fashion cross-border e-commerce brings significant changes to world garment consumption via ultra-short cycle products, demand capture by algorithms and highly divided supplier network. The Shein model can be viewed as representing "ultra-fast fashion", providing extremely diverse SKUs while fulfilling them in record time; however, it also raises grave risks around ESG and the environment. This paper finds structural sustainability challenges arising from fast fashion.

Keywords: fast fashion; cross-border e-commerce; Shein model; green environment; ESG governance; supply chain due diligence

1. Introduction

The fashion cross-border e-commerce is characterized by escalating absolute emissions, rising textile waste quantities, escalated impacts of packaging and air freight, chemical and wastewater risks, expanding microfiber pollution, and governance challenges in the Tier 2 and 3 supply chain. It is generally accepted that about 8-10% of global emissions are accounted for by the fashion industry. When fast fashion capitalizes on increased volume and reduced product use cycles, carbon, water, and waste burdens increase. In the business world, the public and media frequently report negative aspects of company operations or products, especially when perceived business practices are potentially malpractices. Concerns arise when scale expansion is accompanied by similar growth in absolute emissions. As such, reporting about firm expansion often questions a company's "greenwashing" liability.

In order to address these problems, the article puts forward an ESG governance framework for cross-border e-commerce platform: (1) Establish environmental targets that are in line with verifiable Scope 3 reduction pathways; (2) Implement supplier ESG Due Diligence mechanisms and corrective actions; (3) Manage product and materials; (4) Redesign logistics and packaging to maximize carbon efficiency; (5) Act on circularity, extended responsibilities, including resale, repair and takeback; (6) Provide disclosure to consumers that reduces the information asymmetry among all stakeholders. Furthermore^[1], the study recommends feasible measures for Shein-like platforms, focusing on data traceability, supplier capability enhancement and incentive-based culpability allocation to shift emphasis of sustainability improvement from only reputation management to metrics of tangible accomplishment.

Cross-border e-commerce breaks down market access obstacles for fashion businesses by way of digital marketing reach and distribution logistics. Used in tandem with fast fashion, the model produces high-frequency purchasing patterns and short fashion life cycles that capitalize on trend moments, transforming garments into high-volume, high-waste commodities. Environmental concerns arise as a result of carbon emissions associated with producing fibres and dyeing/finalising fabrics, manufacturing energy usage, transporting goods around the globe and disposing throughout the lifespan. A commonly quoted statistic places the industry's contribution at roughly 8-10% of global greenhouse gas emissions while transport and synthetic fibers magnify this impact on both the climate and on smaller scales by contributing a vast amount of microplastics^[2].

The Shein model relies heavily on fast-moving product iterations and A/B tests via mass-shipped small batches, frequent restocks of "winners" and extensive utilization of digital traffic to drive sales. Although it results in lower inventory risk, higher system throughput and increased packaging utilization along with higher logistics intensity is needed. Also, ESG governance issues arise as a result of multi-tiered suppliers, unclear subcontractors, and cross-border regulatory fragmentation^[3]. Recently, there has been an observation that Shein's emissions are

increasing significantly from 2022 to 2023 in the company's report which indicates that ESG discourse may not be keeping pace with growth.

The cross-border e-commerce of fast fashion presents many sustainability-related problems which need to be considered as we develop governance measures appropriate for platform models.

2. Overview of Shein model and ESG relevance

"Shein model" is characterized by: (1) digital demand sensing; (2) ultrafast design to shelf cycle time; (3) a network of small and medium-sized garment factories; (4) cross-border direct delivery to consumer; (5) continuous A/B testing of styles and pricing, which maximizes the system's efficiency but shifts environmental stress from retail product use stage to manufacturing, logistics, and market development stages.

From the perspective of ESG, environmental issues mainly involve three aspects.

(1) Carbon and energy: high production volume and international distribution, possibly reliant on air freight during peak seasons.

(2) Water usage and chemicals application for dyeing and finishing, wastewater control, restricted substances control.

(3) One of the problems in fashion is low garment longevity, short usage time and a high textile waste rate.

Other dimensions of social issues and good governance are vital, but our paper concentrates on environmental sustainability and the measurable and enforceable governance mechanisms.

3. Key environmental sustainability challenges

3.1. Carbon growth under volume expansion

Fast fashion is built around sales volumes. If unit emissions fall, total emissions still increase if volumes expand faster than productivity gains. Commentators point to Shein's ESG performance as showing how fast revenue and outputs might be able to outstrip decarbonization measures to such an extent that absolute emissions go up, generating major reputational risk^[4]. Cross-border e-commerce suffers from heavy Scope 3-international transport & last-mile delivery that cannot be optimized without tackling entire supply chains rather than tweaking the operations.

3.2. Textile waste and short product life

Fast fashion leads to a desire to frequently purchase, and styles change quickly, with a corresponding decrease in the amount of time products are kept before being thrown away. Broad studies show that waste is generated from landfills that are simply too full and lots of textiles end up in these. Textiles specifically. When items are designed not for longevity but rather for the lowest possible production costs, it pushes people into having to continually repurchase. This means greater upstream resource extraction and greater amounts of waste heading to downstream destinations.

3.3. Pollution caused by microfiber and plastic fiber

Synthetic fabrics like polyester enjoy wide use in inexpensive quick fashion^[5]. A large portion of microfibres in aquatic environments is derived from the release of synthetic textiles during washing, estimated at around 35 percent. Microplastic governance in general and notably concerning microplastics stemming from synthetic textile sources is an essential focus of sustainable sourcing.

3.4. Chemicals and wastewater risks in multi-tier supply chains

Dyeing, printing, and finishing all involve the usage of chemicals and the emission of wastewater. With a supplier base consisting of numerous small manufacturers, compliance loopholes could arise due to a lack of capability, weak supervision, or hidden subcontracts. Environmental risks entail restricted substances, wastewater pollution, and occupational exposure that can turn into an industry-wide issue if not addressed in due diligence, audits, and follow-up actions.

3.5. Packaging and logistics impacts in cross-border fulfillment

Cross-border fulfillment tends to ramp up shipping demands to suppliers. Whether or not the packaging is small, large numbers of parcels create a lot of waste and emission. Logistics operators need to weigh as many factors for packaging reduction, and require more recycled content, while still looking to right-size packages and look for the most appropriate low-emission methods for delivering goods.

4. ESG governance concerns of fast fashion cross-border e-commerce facing problems

4.1. The discrepancy between the speed/price incentive and sustainability

Platform competition focuses on things like speed, newness, and low prices metrics which reward high volume and rapid cycling. Sustainability investments bring higher costs and a longer cycle time, in opposition to how these companies operate today.

4.2. Weak visibility and accountability in Tier 2/3 suppliers

Many environmental impacts occur upstream. Yet data visibility is weakest in Tier 2/3. Without traceability and standardized reporting, platforms may only manage Tier 1 factories, leaving major emissions and pollution sources ungoverned.

4.3. "Greenwashing" risk under rapid growth

If sustainability claims aren't backed up by quantitative evidence, stakeholders take ESG claims to mean greenwashing, and media analysis is likely to call into question if Shein's sustainable initiatives can compensate for the environmental footprint it leaves during its rapid growth. This issue will come to the fore if disclosures are made selectively or if they lack third-party verification.

5. ESG governance strategies for the Shein-like platform model

5.1. Build measurable climate targets and scope 3 pathways

Set aligned targets to science with specified baselines and boundaries, along with annual milestones for scope 3 supplier emissions as this is the area of greatest impact; Shein related reporting indicates that the company has set an emissions-reduction target to 2030, but focuses more on specific measurable actions in the supply chain and materiality of climate actions rather than aspirational statements about efforts.

5.2. Supplier ESG due diligence and corrective action system

Set up a due diligence procedure to screen the suppliers on board, as well as doing regular monitoring on suppliers based on risk factors; drawing up remedial action plan when applicable. There is much academic research showing that firms evaluate their upstream suppliers more frequently through ESG due diligence because irresponsibility will likely only be revealed within deeper tiers of the supply chain, while for platforms, digitizing due diligence involves using supplier scorecard, real-time data check, or penalize companies if they forge documents^[6].

5.3. Chemicals, water and waste water management

Implement restricted substance list and wastewater discharge standard together with the compulsory testing for high-risk products and categories. Prioritize upgrading finishing suppliers and require third-party lab verification, while utilize capacity building programs for small medium enterprises.

5.4. Low carbon logistics and package redesign

Use smaller packages where appropriate, raise recycled content in your materials, remove void fill and standardize packaging so that it's easier to recycle. Optimize your shipping mode choices and improve inventory location decisions to limit your use of air freight, disclose logistics carbon hotspots to guide continual improvement efforts. Since cross border transportation contributes to a lot of the GHG emissions of your business, logistics redesign is a high-leverage way to decarbonize your value chain.

5.5. Circularity: Resale, repair, take-back, and durability

Circular strategies lower lifecycle emissions by stretching out the product's utility life and cutting down on virgin materials. Fast fashion must add resale, repair, and take-back pilot programs; and in parallel better its product longevity measures so that it counts towards suppliers' evaluation metrics. Prior analyses have found that waste and overconsumption issues are fundamental and cannot be mitigated via circular approaches thus, circularity is non-negotiable and critical.

5.6. Governance, transparency, and communication: Disclosure, assurance, and stakeholder engagement

Publish the ongoing ES-G information regularly to reach third parties to reduce the possibility of greenwashing. Publish consumer-facing disclosure statements in order to minimize information discrepancy and

protect responsible consumer behavior^[5].

6. Case-oriented implementation path for Shein model

To make these suggestions feasible, a phased plan can be put in place as shown below:

Phase 1 (0-12 months), baseline and control.

Set up the supplier mapping table, prioritize risk-related supplier onboarding processes, set up the minimum compliance criteria and commence the data collection of carbon, water and chemical indicators.

Phase II (1-3 years): Capability building and incentives

Deliver training on supplier platforms, extend financing options for them, use order allocation linked to ESG ratings, adopt more renewable energy sources in your partners' operation sites, and introduce digital tracking of key materials.

Phase 3 (3–5 years): Circular scaling and verified performance.

Scale take-back and resale, integrate durability KPIs, increase third-party assurance and publish verified progress against targets.

This road map combines possibility and timing so as to prevent any risks of ESG no longer being rooted into real business decisions.

7. Conclusion

Cross-border e-commerce fast fashion creates an apparel production and consumption fast flow that increases carbon emission, textile waste, microfibers pollution, chemical and wastewater risks, and packaging and logistics impacts. The Shein model suggests digital efficiency and quick iteration could coexist alongside considerable environmental pressures and ESG governance gaps in platforms operated with multi-tier supply chains. Fashion's great emission and fast fashion's waste highlights the importance of the environment for the legitimacy of platform apparel models.

The paper puts forward an ESG governance scheme compatible with the Shein style of operating measurable climate targets with Scope 3 pathways, supplier ESG due diligence and corrective action, chemicals and wastewater governance, low-carbon logistics and repackaging, circularity schemes and third-party verified transparency. Given public attention and emission growth concerns reported by Shein, credible execution will be accountable to trackable data, enforceable supplier rewards and verification of disclosure.

About the author

Shiyu Guo (1998-), female, a native of Yuncheng, Shanxi Province, is a full-time faculty member in the E-commerce program, School of Economics and Management, Minnan University of Science and Technology. She is a graduate student in Journalism and Communication, and her research interests focus on e-commerce.

References

- [1] Deng Qi, Hu Dan. The Impact of Virtual Community Knowledge-Sharing Mechanisms on Consumers' Purchase Decision-Making: Evidence from Taobao.com [J]. *Management & Administration*, 2014, (11): 129–131. DOI: 10.16517/j.cnki.cn12-1034/f.2014.11.051.
- [2] Zhang Qilin, Wang Xuhui. Research on Governance Models for Transaction Disputes on Cross-Border E-Commerce Platforms: From the Perspective of Matching Governance Demand and Governance Supply [J]. *China Industrial Economics*, 2021, (12): 166–184. DOI: 10.19581/j.cnki.ciejournal.2021.12.008.
- [3] Li Na, Wu Jinghua. The Current Status, Problems, and Countermeasures of Corporate ESG Report Disclosure [J]. *Economist*, 2025, (12): 15–16.
- [4] Bao Shuchen, Zheng Ziyi, Jiang Ting. True Green or Greenwashing: The Formation Process of Green Behavior in Coal Enterprises—A Case Study of China Shenhua [J]. *Accounting Research*, 2024, (08): 70–80.
- [5] Liu Riwen, Zhang Ke. An Analysis of the Effectiveness of ESG Report Assurance for Greenwashing Enterprises Under the "Dual-Carbon" Context: A Case Study of China Shenhua [J]. *Metallurgical Finance and Accounting*, 2024, 43(07): 68–70.
- [6] Xiao Junjiang, Li Yanhui, Ding Kun. Study on a Dissolution and Separation Process for Waste Ammonia/Cotton Blended Textiles [J]. *Synthetic Fiber*, 2025, 54(04): 31–33, 48. DOI: 10.16090/j.cnki.hcxw.2025.04.018.