

Sustainable Practices in the Supply Chain of the Fashion Industry: The Cases of Nike, Adidas, and Puma

Jiayang Xu

Supervisor: Kenneth Amaeshi

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ABSTRACT

In recent years, sustainability has emerged as a high-discussed topic with the rise of environmental concerns. There has been an increase in awareness of the environmental impacts of the fashion industry, which is stimulated by its growing apparel demand, the wide range of pollution, and considerable energy consumption caused by the production process. To examine the efficacy of existing sustainability strategies on environmental issues in the supply chain of the fashion sector, this paper conducts a comparative case study on three cases, which are Nike, Adidas, and Puma, and analyzes their corporate reports to see how companies comprehend their initiatives. This paper discovered that the three companies are converging in their supply chain practices and measurement of sustainable performance, but still face challenges in their sustainability practices. This paper, therefore, concludes that although the fashion industry has begun to respond positively to environmental issues, it still needs further steps in its practices.

Keywords: Supply Chain; Sustainability Initiatives; Institutional isomorphism; the fashion industry;

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LIST OF ABBREVIATIONS

OBM	Original brand manufacturer
ODM	Original design manufacturer
OEM	Original equipment manufacturer
SSCM	Sustainable supply chain management
TBL	Triple Bottom Line
DJSI	Dow Jones Sustainability Indices
FEM	Facility environmental module
GRI	Global Reporting Initiatives
eKPI	Environmental key performance indicators
MSI	Material Sustainability Index
ZDHC	Zero discharge of hazardous chemical
PFC	Poly- and perfluorinated substances
MRSL	Manufacturing Restricted Substances List
VOC	Volatile Organic Compounds
MSI	Material Sustainability Index
SCSI	Supply Chain Sustainability Index

1. Introduction

As environmental issues become more and more serious, based on a report from the World Economic Forum in 2021, the highest probability in the next ten years will be extreme weather, climate control failure, and environmental damage caused by humans (Hidayat, 2022), many international organizations (IO), governments, and non-governmental organizations (NGOs) get involved in tackling global environmental challenges. This high level of concern is due not only to the environmental issues themselves but also to the high relevance of environmental issues to social development. For instance, China has entered the leading ranks of the world economy with the cost of increasing energy consumption, especially coal, which reached 57.7% of primary energy consumption, according to a Reuters report in 2020 (Reuters Staff, 2020). And it steps up greenhouse gas (GHG) emissions.

These energy uses resulting from rapid economic growth can cause environmental degradation, simultaneously affecting agriculture. As one of the economic pillars of the country, agriculture has not only contributed significantly to the economic prosperity of developed countries, but its role in the economic development of developing countries is even more crucial.

The impact on agriculture is a huge economic blow to some countries with low real income per capita. The drought and flood led by climate change will increase countries' economic loss, which needs countries to spend a few years to recover economic growth. Economic activities of the coastal South Central Region (SCR) of Vietnam, for example, were greatly influenced by the severe weather because local factories and transportation were disrupted by the extreme weather condition (Hiep Hoang and Minh Huynh, 2021).

To develop an enviable future and relieve the pressure of possible natural resource shortages, in September 2015, the United Nations (UN) published the 2030 Agenda for Sustainable Development, including 17 Sustainable Development Goals (SDGs),

which guides balancing society, environment, and economy, with the support from the 193 UN member states (United Nations, n.d.). In particular, SDG 13 places a strong emphasis on taking swift action to mitigate climate change and lessen its effects. This sets the main principle for the future development of the different stakeholders. To achieve the goals, there is a general awareness that the importance of the private sector in achieving environmental sustainability, as the private sector can provide resources, knowledge, implementation, and enforcement capacity, and legitimacy (Abbott et al., 2021) and it leads to the severe environmental problems.

The fashion industry, based on the data from the United Nations Economic Commission for Europe (UNECE) in 2018, worth \$2.5 trillion-dollar, produces 20 percent of global water waste. The raw material supply and mass production of the supply chain in the fashion industry generate large amounts of processing by-products that cause irreversible damage to the ecosystem. Based on the estimation of UNECE, the production of apparel causes 10 percent of the global carbon emission. Currently, the rise of fast fashion aims to provide timely fashion at lower prices (Anguelov, 2015), which has also increased the consumption of clothing. This is backed by a fast supply chain cycle. In the future, with the rapid economic development, it is not surprising that more people will be promoted to the middle class in 2030, causing the demand for clothing will increase exponentially and the natural resources needed will also increase.

At the same time, the extreme weather caused by climate change may influence the efficiency of production. It is a vicious circle for the fashion industry. In addition, the growing awareness of sustainability among consumers challenges the old business models of the fashion industry. The fashion industry is pushed by these external and internal pressures to reform its operation to solve the problems caused by its products (Da Giau et al., 2020). Consequently, the highly industrialized fashion industry has begun to shift from an inefficient and energy-intensive development model to sustainable development, especially in tackling the influence of its behavior on the

supply chain on achieving SDG 13.

The fashion supply chain is the main component for the industry to implement sustainable practices against climate change. Because the fashion supply chain spans multiple industries, from agriculture, where natural fibers are made, and petrochemicals, where synthetics are extracted, to manufacturing plants, logistics, and distribution. Almost the vast majority of gas emissions and environmental pollution are generated in this complicated process (Niinimäki et al., 2020).

To show their determination to transform, many fashion companies launched sustainability initiatives to spur a change in their suppliers. For instance, green marketing is being used by well-known worldwide brands like ZARA, H&M, and GAP to influence customer purchasing decisions and foster strategic partnerships with suppliers (Li et al., 2014). RE; CODE, a sustainable fashion brand from South Korea, is noted for its eco-friendly philosophy and innovative designs. It promotes sustainability by transforming discarded textiles and industrial surplus materials into fashion items, which is a strategy to recycle materials manufactured in its supply chain. Companies also coordinated with universities to explore more efficient ways to sustainability.

However, each step in the supply chain is conducted in various countries because of a better economic cost. For the raw material, for instance, China is a critical player in the textile supply. In 2017, China's world textile exports reached 37.1% (Lu, 2018). In recent years, Southeast Asian countries such as Vietnam and Malaysia have also stood out among the supply chain candidates due to their relatively lower labor costs. Although the production processes are located in the Global South, most brands' headquarters are more concentrated in the Global North, such as the United States (US). The long distance in the whole supply chain makes making mistakes easier without prompt identification. These failures are reflected in data that can affect the brand's image and transformation to sustainability and can bring economic loss to the

brand. Fashion companies like C&A, Adidas, and Benetton are accused of developing their supply chains in an unsustainable manner (Seuring and Müller, 2008). In other words, even though the fashion industry has taken action, some of its initiatives are not enough to address the problems brought by the fashion industry to the climate and it might continue contributing damage to the environment by 2030 (Wren, 2022).

SDG 13 (climate action) requires taking urgent actions to combat climate change and its impact (United Nations, n.d.), which is set to be countermeasures to climate change. It is an important goal to push the fashion industry to conduct a fundamental reform in their supply chain management because there has been an increase in the attention of countries to socio-economic problems, and companies will be regulated into a new playfield for them to compete with each other. It also provides an opportunity to build a brand image to attract consumers. Some studies reveal that consumers are willing to pay for sustainable fashion products provided that the material is comfortable (Shen et al., 2014; Ellis et al., 2012).

In this context, many scholars have conducted research to understand how business behaviors changed to solve environmental problems theoretically. But most of them focus on how the business model changed and whether sustainable supply chain help companies have a competitive advantage in the market and they analyzed the sustainable practices based on the existing literature review and the ideas of designers. To overcome the environmental problems, in the fashion industry, companies choose to shift their strategy from meeting the need of consumers to leading the purchase preference of consumers (Li et al., 2014) by implementing a circular design, which entails recycling discarded products to become raw materials for a different production cycle (Dragomir and Dumitru, 2022). Some scholars find that green initiatives have a favorable impact on businesses' success (Schrettle et al., 2014; Jacobs et al., 2010). Karaosman et al. (2016) conducted a systematic literature review to analyze environmental and social sustainability management in the fashion industry and categorized the sustainable practices based on the results shown by 3DCE stages.

Palomo-Lovinski and Hahn (2014) also analyzed the challenges of the fashion industry to take efficient actions to achieve sustainability by understanding the awareness of fashion designers. However, little is still understood about how their sustainable supply chain changed after the UN set 17 goals and how the fashion industry incorporates the SDGs into its sustainability practices on supply chain, specifically on SDG 13 from its perspectives.

This paper focuses on introducing the specific practices in sustainable fashion supply chains to better address environmental issues, analyzing it from national policies and learning lessons from the sustainable practices of three fashion companies: Nike, Adidas, and Puma. A comparative study and case analysis were carried out to compare the existing sustainable reports of two companies from 2016-2022 to understand the change in sustainable practices in the fashion companies to answer questions and conduct an analysis based on the findings.

The structure of the rest of the paper is given as follows. Firstly, I will show the related literature review on sustainability and sustainable fashion supply chain in Section 2. Secondly, a comparative case study will be presented in section 3. Next, I will discuss the findings of its supply chain and the lessons learned from the country's perspective. Finally, I will conclude in section 5.

2. Literature Review

Before looking into how fashion companies incorporate sustainability into their practices in supply chain management, some existing researchers have variously discussed that. However, it is important to first understand the impact of the fashion industry in a systematic way. Next, how the supply chain works in the fashion industry should be known as the practice part of the fashion industry. In the end, what sustainability means when it comes to the fashion industry as a theoretical base and how it introduces sustainability into their supply chain practice.

2.1 Fashion's environmental impact

The fashion industry, currently the second largest polluter in the world, is second only to the petrochemical industry in terms of harm. The fashion industry has a very complex operation system, from the production and supply of raw materials to the manufacture, packaging, transportation, and sales of products, each of which generates huge pollution. Cotton is the most commonly used raw material. Even though it is easier to grow, its growth is needed to be controlled strictly to prevent it from becoming the vector of disease or pests to threaten people and other crops (Spurrier, 2013). The product manufacturing process, based on the report of the Waste and Resources Action Programme (WRAP) in 2017, showed that the textile and dyeing process produced around 20% of water pollution. Transportation is one of the major contributors to greenhouse gas emissions. Since fast fashion supply chains are often located in developing countries, such as Vietnam, finished products are flown to various points of sale to provide sufficient supply in a short period, which also contributes to CO₂ emissions.

With the prevalence of fast fashion today, a more prominent problem in the fashion industry is fashion garbage consisting of discarded clothes. 73% of clothes end up in landfills and less than 1% are recycled, which is not only a waste of non-recyclable materials, but also a big economic loss (Moorhouse, 2020). The two ways to dispose

of this fashionable waste are landfill or incineration. Since some clothes are made of non-biodegradable synthetic materials, they may take longer to degrade, and the chemical gases they produce after being degraded can pollute the environment (Saicheua et al., 2012). Due to these huge impacts, sustainability in the fashion industry attracts considerable attention. This study aims to take fashion companies as narrators to examine their sustainable practice in their supply chain.

2.2 The Supply Chain in the fashion industry

The term "supply chain" refers to the processes involved in moving and transforming items from the point of origin to the final consumers, as well as the information flows involved (Seuring and Müller, 2008). It can be seen as a bridge linking suppliers, manufacturers, distributors, and end users. For the fashion industry, the supply chain can be divided into three main players: The manufacturer, who completes the manufacturing process, which includes design, manufacturing, packaging, and transportation; the distributor, who is one of the important channels to sell products; and brand owner, who is used to differentiate the characteristics of different brands. The supply chain also has other components. The agricultural industry, the first element in the supply chain, is responsible for providing the raw material, such as fiber and yarn, used for making clothes and some small and medium companies will make this raw material into fabric through a textile process (Şen, 2008).

Because fashion brands adopt various business strategies, in other words, an apparel company may be two or all of the three key players due to its concern the financial cost such as labor costs, and available sources, the supply chain structures are different. Fund et al.(2021) categorized the fashion supply chain into three main types. One structure is called the vertically-integrated structure, which means that the company has full control of the whole supply chain, from raw material production to the launching. This structure can help companies increase their control over product sales and suppliers, gain more complete information about the market and suppliers,

and make more profit. For instance, ZARA maintains its control over the different stages of its supply chain by using high-degree vertical integration and a just-in-time way, which helps it reduce the cost of time and money (Berbiche et al., 2020). Meanwhile, some brands use a production outsourcing structure. With this structure, companies delivered some production business to an external professional resource to take full advantage of external resources to lower the cost and increase their competitiveness in the global market. This emergence of the structure is led by organizational changes in the fashion industry due to changes in the market environment, such as globalization and changes in the social class of customers. In the traditional approach, the fashion industry has previously adhered to a set schedule of trade exhibits and displays showcasing the upcoming season's trends to lead to customers' preferences (Birtwistle et al., 2003). As the market became more competitive and the increased consumer demand for fashionable and personalized clothing styles and designs, this traditional model is disrupted and replaced by fast fashion. Fast fashion is a business model that offers trendy designs at reasonable rates, regular assortment changes, and quick responses to the market (Caro and Martínez-Albéniz, 2015). The popularity of this model has challenged the vertically-integrated structure because it has strict requirements in terms of time spent in the supply chain. Because the company, which is called the original brand manufacturer (OBM), always finishes design, production, and marketing by itself, which will spend more time than the customers need. In this situation, they need to take more risks of being eliminated from the market. Therefore, in the current fashion industry, this kind of agile, low-cost supply chain structure is gradually becoming mainstream.

Finally, a decentralized structure is used by a company that launches different types of products under its brand, such as clothing, jewelry, and luggage. Under this structure, retail brands will outsource the design and production to trading companies such as Li and Fung and original design manufacturers (ODM). The trading companies later will make the design by themselves first, and connect suppliers and original equipment

manufacturers (OEM) with them to finish the whole process. But since the profits earned by the OEM will be subject to trading companies, it motivates some OEMs to form their design team to turn into ODMs. As the supply chain becomes increasingly complex and the number of players involved increases, The serious threat to the environment by the current supply chain structures has sparked discussions among scholars. Saicheua et al. (2012) described the environmental impact of supply chain operations in detail through secondary studies that analyze energy consumption and gas emissions in raw materials, processes, and retail. Niinimäki et al. (2020) identified and summarized the environmental impacts made through the fashion value chain and called to action on “slow” fashion. Bailey et al. (2022) discovered that the fast fashion industry has adverse environmental effects, including increasing carbon and energy footprints through conducting a systematic literature review. Therefore, to better achieve climate action, it is meaningful to examine the improvement of initiatives made by the fashion industry.

2.3 The Supply Chain Management

When it comes to the SSCM, many existing literature reviews analyzed the better way for some fashion brands’ to reform their supply chain management. Seuring and Müller (2008) conducted a literature review of the previous research on SSCM to sort out key themes to develop a conceptual framework. They mentioned that a holistic approach to SSCM needs to take environmental, social, and economic impacts into the whole supply chain, from the production of raw materials to the disposal made by consumers. Especially for the production part, it is crucial to use sustainable materials and renewable energy to relieve the environmental pressure made by brands. In the end, the sustainability reports made by brands are also paramount for companies to better improve their practices on the SSCM.

Wren (2022) used H&M and Everlane as cases to discuss their weaknesses in the existing SSCM and raised the new SSCM methods. He divided the supply chain

management into two parts: Upstream and downstream operations. In the upstream operations, he mentioned several strategies for fashion companies to take into consideration. For example, cooperating with partners to invest more in sustainable equipment to decarbonize material production and processing to reduce the environmental impacts. In the downstream activities, brands can invite consumers to join in building effective SSCM by encouraging them to follow the four R principles, which are recycling, rental, repair, and resale. In this approach, it reduces the amount of fashion waste. In addition, the selection of materials and the vision for products should be environmental-friendly.

2.4 Sustainability and Sustainable Practices in the Supply Chain

Sustainability started to catch attention as an important goal of achieving sustainable development. The concept was changed with the evolution of the definition of sustainable development especially after 1987. The concept was first proposed by ecologists in 1972. They brought forward the idea of ecological sustainability, which aims to account for the balance between natural resources and their exploitation. In 1987, sustainability was defined by the United Nations Brundland Commission as a way for meeting the current needs without sacrificing the capability of future generations to meet their needs (United Nations, n.d.). At that time, sustainability was not a pure term to express consideration of the environment. It was regarded as a direction for society to develop in a way that balances economy, environment, and social equity, which is the same as the content of the “Triple Bottom Line” (TBL) now (Elkington, 2013). In TBL, three aspects were explained thoroughly. The economic line relates to how business practices contribute to the growth of the economic system; the social line means that let practices bring benefits back to the society, such as the labor and community; The environmental line refers to adopting behaviors that protect the environment for future generations (Elkington, 1999).

Because of the specialty of the fashion industry, as it is stated above, its complex and

large supply chain requires a lot of labor and its manufacturing process has an impact on the environment, which is highly relevant to TBL. And the relationship between sustainability and fashion pointed out that fashion has a direct link to the environment (Ulasewicz and Hethorn, 2008). Many studies have been conducted on fashion companies' behaviors in relieving the pressure on the environment from two aspects: motivations, and current sustainable practices.

In terms of the incentives of companies, De Brito et al. (2008) mentioned the positive change in companies' attitudes toward contributing to sustainability after the set of SDGs and the proliferation of national regulations; Yang et al. (2010) found that companies can cooperate with suppliers to improve their practices to enhance their competitive advantage in the market by analyzing the meditational regression they built. Paras et al. (2018) conducted a case analysis to conclude that business factors, product factors, and consumer attitudes can be key drivers for companies or organizations to achieve environmental challenges in their existing business models.

When it comes to the current sustainable practice, there are also many types of research exploring the company's sustainable initiatives. The public feels that sustainability within the fashion industry means that the material of clothes is eco-friendly. But for the supply chain, sustainability becomes more complicated.

As it is mentioned above, the supply chain in the fashion industry has experienced a structural transformation as society changes. This shift has had an impact on society and the environment and it stimulates the sustainable practice in the supply chain. To comprehend that, many scholars have performed research. Masunaga (2019) mentioned the practices conducted by some brands such as Adidas and Ralph Lauren, are focusing on reducing inventory to prevent waste and using sustainable materials. Moretto et al. (2018) analyzed the focal company's sustainability. They mentioned that the company focused on the selection of sustainable materials at the beginning stage and then redesigned the manufacturing process with a sustainability perspective.

Turker and Altuntas (2014) focused on the relationship between retail brands and their suppliers. Through their analysis of 9 companies, they concluded that in cases where the various parts of the supply chain are distant, the company will implement remote monitoring and regulations to improve supplier performance in complying with the code of conduct.

Although fashion companies try to show their active attitudes in contributing to addressing their problems, many researchers and the public maintain a negative attitude towards the sustainability initiatives that fashion companies are currently taking and proposed more refined strategies. Bhandari et al. (2022) explored that there are still some barriers, such as an inadequate supply of sustainable raw materials and inadequate awareness, for the fashion industry to fully achieve sustainability; Hur and Cassidy (2019) discovered that in the process of fashion design, there are two aspects of obstacles for companies: internal and external. From the internal perspective, designers usually lack knowledge of sustainable design and difficult to make trade-offs with fashion design criteria. From the external perspective, the complexity of sustainability issues makes companies hard to implement sustainable strategies. And due to the rapid update of fashion trends, the pollution and waste produced during the process make the public feel that it is a big obstacle to achieving sustainability.

2.5 Gaps in the Existing Literature

Based on the existing studies, scholars have already discussed the sustainable practices implemented by fashion companies in different parts of the supply chain, from design to production. But most scholars usually focused on sustainability in one part of the supply chain specifically. In addition, the cases and data they chose are more targeted, more on either luxury brands which have enough budget to invest in sustainability, or fast fashion brands which create more serious environmental impact and attract the main attention. In the interpretation of their data, even though some of

them used the sustainability report, they analyzed it from an academic perspective. To better understand the sustainable practices in the supply chain of the fashion industry, this study will answer three questions:

- (1) How do companies talk about their sustainable practices in the supply chain?*
- (2) How do they measure their sustainable performance?*
- (3) Are their strategies consistent or different, and what can we learn from them?*

To analyze these answers, this study will use companies as the main narrators to examine how they interpret their sustainable performance in the supply chain by checking their results and observing if their interpretations have changed in recent years to analyze the motivations behind them.

3. Theoretical framework

Institutional theory is a theory that is often used to explain the behavior of an organization. With the deep embedded in the environment, organizations are paid attention by the public about their environmental behaviors. Due to this, the change in organizational structures and directions reflects the environmental expectations the public had. The institutional theory, therefore, presupposes that organizations attempt to respond to the requirements of their institutional context to obtain legitimacy (Meyer and Rowan, 1977).

In 1983, DiMaggio and Powell (1983) proposed institutional isomorphism, which provided an interpretation of how institutional pressures led to organizational change based on the convergence of their change. Therefore, institutional isomorphism can be defined as a theory describing how systems or organizations work in a more and more similar way. Instead of predicting this convergence is caused by competition between the same industries in the market, it was pinpointed that coercive mimetic and normative isomorphism were three factors pushing the convergence.

3.1 Coercive isomorphism

From the two authors' perspectives, coercive isomorphism, legislation, regulation, and cultural expectations act as external pressure to force organizations to change. This pressure may often come formally or informally from more powerful parties, such as governments and relevant regulators. Once an organization fails to develop its strategy following the standards, it may be penalized. To alleviate this pressure, organizations will tend to start convergent strategy design. Consequently, coercive isomorphism is highlighted that leading organizations use influence on followers in ways that compel desired behavior to gain legitimacy and further advantages (Edwards, 2009).

3.2 Mimetic isomorphism

Organizations tend to imitate the behaviors and conduct similar strategies of some leading organizations in the same field to achieve quick success and legitimacy. This behavior is called a mimetic isomorphism. Organizations inevitably encounter a variety of problems in the course of reform, but the structural peculiarities within the organization make it sometimes difficult for them to find techniques and strategies to solve problems quickly. In this context, the measures taken by leading organizations provide a reference for them to use.

Mimetic isomorphism also brought many benefits to organizations: low cost of time and saved human capital. Because they do not need to spend much time to discover their approaches to solve problems. But this also poses a threat that not all structures are suitable with the existing framework. If organizations are not doing more applicability studies and overly believe in the validity of the framework may backfire.

3.3 Normative isomorphism

Normative isomorphism is related more to the professional background within the specific organizational field. For example, accountants in the organization need to have a strong legal awareness and professional knowledge to help a company avoid some financial issues. Also, because they have standard industry guidelines, most accountants use the same rules and methods when dealing with financial issues.

4. Methodology

4.1 Case selection

To better answer how companies measure their sustainable practices in the supply chain. This paper will choose three companies: Nike, Adidas, and Puma, which are all

sports brands. In the sports industry, innovation is an important element to build a competitive advantage. There has recently been a rise in interest in this sector for ethical concerns like corporate social responsibility (CSR) and environmental management, which has prompted more research on sports ethics with a strategic focus on sustainability initiatives (Ratten, 2018). Against this backdrop, the sports brand begins to integrate the reduction of business impact on the environment and society, such as protecting the natural environment and respecting human rights, into corporate strategy.

Founded in 1962, Nike is one of the biggest global producers of sportswear and footwear, selling in around 25,000 stores throughout the USA and in more than 150 other countries (DeLong, 2009). Nike is considered a global leader in sustainability, and it has been recognized by many external organizations that evaluate sustainability performance. For example, Nike has been recognized by Innovest as one of the top 100 sustainable businesses in the world (DeLong, 2009). At the 2019 Climate Action Summit NIKE announced a series of moves to call action on tackling climate issues. In 2022, Nike launched the Nike Re-Creation Program, which aims to achieve its circular model and zero-waste goals by collecting vintage and stock and reproducing them.

Adidas, founded in 1949 in the small town of Herzogenaurach, is a German sports brand and currently owns over 60 brands and over 1,700 retail stores worldwide. In the sports industry, Adidas can be seen as a pioneer in integrating sustainability into its corporate vision. The Adidas Group was chosen to join the Dow Jones Sustainability Indices (DJSI), which is one of the most famous indexes for sustainable investment, in 2000 for the first time, and starting in 2001 it issued an annual Sustainability Report. It is the only brand to implement that in the sports industry (Sicoli et al., 2019). It was also ranked top 50 brands by the “Best Global Brands” formulated by Interbrand in 2022, which is the first time that quantitative Environmental, Societal, and Governance (ESG) data was included in the ranking

methodology (Interbrand, n.d.).

Puma is also a German sports brand founded in 1948. In the practice of sustainability, Puma not only developed its way to report its environmental impacts and also launched some sustainable product initiatives such as conducting Re: Fiber's recycling process, which transforms textile waste into new textiles to reduce waste and pollution (PUMA, n.d.). The SportLifestyle company Puma was recognized as the sustainability leader in its sector by the DJSI in 2010 (Disko, n.d.). In 2022, it was recognized by the Business of Fashion that PUMA has leading scores in improving the amount of water used in its production and the emission of chemicals and harmful gases (Puma, n.d.).

Consequently, Nike, Adidas, and Puma can be said that they are in the leading position in the sports industry for its effort on achieving sustainability. In this part, to answer research questions, we will mainly focus on their sustainable practices in tackling environmental issues in their supply chain, which are the design process (the materials and vision), the production process, and the transportation, and also present their tools on measuring the achievements on the amount of clean energy they used and the reduced carbon emission through their sustainability reports from 2016-2022 and compare the results.

4.2 data interpretation

Table 1 :Sustainable practices in the supply chain of Nike, Adidas, and Puma summarizes all information about the three companies' supply chain practices on sustainability, their achievement, and their measurement tools for their performances.

	Nike	Adidas	Puma
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Measurement	FEM 3.0; GRI; ZDHC Wastewater Guideline	eKPI2.0 Self-governance model	eKPI; GRI; MSI; FEM 3.0
Sustainable practices	Water: 1. Recycle the treated wastewater 2. Encourage suppliers to evaluate the risk of flooding and develop plans 3. Reduce the water in the dyeing process Carbon emission: 1. Purchase renewable energy 2. Drive energy efficiency in the supply chain 3. Eliminate outdated steam boiler system 4. Optimize the use of air freight Material: 1. Use recycled polyester 2. Source	Water: 1. train the suppliers 2. Standardize the dyeing process 3. Upgrade the water treatment system and machine Chemical footprint: 1. phase out the use of poly- and perfluorinated substances (PFCs) 2. Provide the Manufacturing Restricted Substances List (MRSL) Material: 1. Use sustainable cotton to replace the conventional cotton 2. Reduce the use of virgin plastic 3. Increase the use of	Water: 1. Implement wastewater tests for related suppliers 2. Standardize the industry wastewater 3. Establish the water efficiency program for core suppliers Carbon emissions: 1. Implement large-scale climate change initiatives through the supply chain 2. Decrease carbon footprint from the transportation process 3. Invest in renewable energy 4. Replace the coal-fired at core suppliers Chemical footprint: 1. Phase out the use of

	<p>sustainable cotton</p> <p>3. Use recycled rubber in the footwear</p> <p>Chemical footprint:</p> <p>1. Adopted the Restricted Substance List</p> <p>2. Use the ZDHC Wastewater Guideline</p> <p>3. Reduce the PFCs in finished products</p>	<p>recycled polyester</p> <p>Carbon emissions:</p> <p>1. Track the impact of transport</p> <p>2. Promote environmental initiatives through cooperating with suppliers</p>	<p>PFCs</p> <p>2. Explore alternatives for Volatile Organic Compounds (VOCs) in materials</p> <p>3. Train the suppliers</p> <p>Material:</p> <p>1. increase the use of bluesign-certified polyester</p> <p>2. Increase the sustainable fiber volume</p> <p>3. Maintain the leather usage from LWG</p> <p>4. Increase the use of water-based polyurethane</p>
KPIs	<p>Environment:</p> <p>1. Percentage of renewable energy used in facilities</p> <p>2. Percentage of CO2 emission from Scope 1,2,3</p> <p>Chemicals:</p> <p>1. Percentage of tested material</p>	<p>Environment:</p> <p>1. Percentage of CO2 emission from Scope 1 and 2</p> <p>Chemicals:</p> <p>1. Percentage of materials without PFC</p> <p>Water:</p> <p>1. Percentage of</p>	<p>Environment:</p> <p>1. CO2 emission from Scope 1,2 and 3</p> <p>Chemicals:</p> <p>1. Numbers of pass rate of Restricted Substances List</p> <p>2. Percentage of materials without PFC</p> <p>3. VOC index for</p>

	<p>following Nike RSL</p> <p>2. Percentage of material meeting MRSL</p> <p>3. Percentage of suppliers meeting the Wastewater Quality Requirements</p> <p>Water:</p> <p>1. Percentage of freshwater use</p> <p>Material:</p> <p>1. Percentage of usage of sustainable materials in apparel and footwear</p> <p>2. Percentage of sustainable cotton</p>	<p>water saving in Tier1 supplier facilities and Tier 2 apparel material facilities</p> <p>Material:</p> <p>1. Percentage of sustainable cotton sourcing</p> <p>2. Percentage of recycled polyester</p>	<p>shoes</p> <p>Water:</p> <p>1. Percentage of wet processing</p> <p>2. Percentage of suppliers meeting standards for water</p> <p>Material:</p> <p>1. Percentage of each material</p>
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Table 1 :Sustainable practices in the supply chain of Nike, Adidas, and Puma

Based on their description of sustainability in their annual reports, in terms of their sustainable practices in their supply chain, all three brands mainly focus on four main elements to tackle environmental issues, which are chemical usage, energy consumption, water usage, and waste by reducing the water usage and recycling wastewater, increasing the use of recycled and sustainable materials in the apparel and footwear to replace the conventional materials, standardize suppliers' choice on categories of chemical substances through releasing their guideline or MRSL set by ZDHC group and investing renewable energy and focusing on energy efficiency. To present their sustainable achievement, in the period between 2016 and 2022, each

company set two targets, target for 2020 and 2025, to encourage and measure suppliers' actions. From the results of their progress towards the target, all of them are on the right track to achieve sustainability in their supply chain.

Although all three companies made good progress in incorporating sustainability into their supply chain management, compared with another two brands, Adidas did not interpret its approaches to achieve goals in a detailed way before 2020. For instance, in terms of improving emissions from energy and emission, the three companies are working in the same direction. However, Nike broke it down into its specific actions on working on each target. For example, Nike's 2018 impact report, stressed the importance of accelerating the use of renewable energy in the facilities. It proposed three actions to achieve this target: increasing the use of solar PV in the factories, engaging more with governments and policymakers to discuss relevant policy, and improving the steam boiler system. Puma has not refined his practice to this level, but Puma has very clear goals and initiatives to reach two broad objectives, which are targets for 2020 and 2025. But for three companies, all expressed a growing interest in integrating sustainability into the company's philosophy from 2016 to 2020.

To achieve their targets in four main parts, three companies used tools to measure their supplier's performances to understand their current stages and improve their strategies in a targeted way. 2020 was more like a turning point, as three companies begin to think more about innovation in achieving sustainable development. For example, in 2020, Puma starts to research biodegradable polyester to use in products; Adidas develop its first guidelines called "Sustainable Events" to guide their market in working more sustainably; Nike focused on innovating low-carbon material to reduce CO2 emission.

To achieve their targets in four main parts, three companies use tools to measure their supplier's performances to understand their current stages and improve their strategies in a targeted way. In 2016, Adidas upgraded its tool, the eKPI program which is created in 2014. The enhanced program is a performance-driven tool that provides

increased transparency into our suppliers' real use of energy, water, and waste to assist them understand the existing performance of suppliers and the areas they still need to improve. This program used a scorecard to show suppliers' achievements in its strategy. It set the baseline for the percentage their suppliers should reduce on energy, water, and waste (See figure 1). This tool is also used by Puma.

eKPI 2.0 Supplier Scorecard	
Chemical Management Audit	25%
Energy reduction target	25%
Water reduction target	25%
Waste reduction target	25%

figure 1: Adidas eKPI 2.0

Source from: Adidas 2016 sustainability progress report

After 2020, to establish a more comprehensive regulatory approach, Adidas began to implement a self-governance model to let suppliers evaluate, monitor and report their performances on achieving the targets for 2025 and Adidas will monitor and track their practices simultaneously.

Compared with Adidas, another two brands combined internal and external tools to measure suppliers' performances. Nike and Puma both followed the guideline of Global Reporting Initiatives (GRI) to design the content of sustainability reports. This framework gives companies a good way to organize and present the economic, environmental, and human impact of their current actions, thus making their contributions to sustainable development transparent and credible to the public. In addition, they also used Facilities Environmental Module (FEM), which is set by the Higg, to measure their practice.

Except for the index set by an external agency, Puma also used eKPI programs to measure and Nike created several indices to measure its achievement on carbon and

chemical footprint, such as Material Sustainability Index (MSI) assessing the use of sustainable materials and Supply Chain Sustainability Index (SCSI) assessing the carbon emission produced during the transportation. Thus the three companies have some similarities in measuring the sustainable performance of their suppliers.

5. Analysis

5.1 comparison of sustainable practices of Nike, Adidas, and Puma

Through observing their specific practices, they are highly similar to each other and they did work towards sustainability. Because they are not just expanding the scale of investment in these basic sustainable practices, they are also focusing on increasing supplier awareness of sustainability and cooperating with researchers and universities to design sustainable materials by themselves. And in their interpretation of their initiatives, even though Adidas did not follow the guideline of GRI, it still broke down its environmental actions into four main parts as they are mentioned above.

In addition to their necessary sustainability practices in the four major areas, Adidas, for example, holds regular meetings to allow some of its top performers to share their experiences for other suppliers to follow. Puma, after becoming a member of the fashion pact, also mentioned that it works with other partners who have joined the pact to discuss and explore innovation on sustainability. Nike is working with climate leaders and lawmakers in other sectors to explore how to accelerate improvements of environmental issues involved in the supply chain. Their similarities in their actions and measurement tools can be explained by three aspects of institutional isomorphism.

5.1.1 Policies and regulation

Firstly, the entire fashion industry is under huge external pressure. Particularly in recent years, as environmental protection issues have become more important, more and more countries are paying attention to the attitudes and practices of private companies in sustainable development. As a major player in the global economy and one of the major contributors to environmental pollution, it is not surprising that the fashion industry would attract regulatory attention. The ability of these three brands to

take the lead in sustainable reform in the sports industry is closely linked to the strict regulation in their countries.

The European Union has been a policy pioneer in the implementation of sustainable development in the world. And since a large number of fashion brands are based in EU member states, such as Adidas, Puma, and Inditex Group, the EU is more stringent in regulating the sustainability of the fashion industry than other countries. Following the removal of textile restrictions, the EU has seen a significant increase in its imports of clothes, textiles, and associated goods from developing countries. Therefore, new policies and legislative proposals have been introduced to directly address environmental issues in recent years. The EU has proposed a new strategy for textiles that aims to ensure that textiles placed on the EU market are more durable, free of toxic substances, reusable and recyclable. In addition to the high requirements for raw materials, the EU also requires manufacturers to be responsible for their products along the value chain. And the EU is calling on companies to reduce their carbon footprint by reducing the total number of collections per year and calling for incentives for the reuse sector in each member state.

In addition to the regulation of the EU, Germany also published German Supply Chain Act in 2021. The Act defines the environmental standards that companies need to comply with and sets out the necessary measures to be taken by three subjects: the company's business areas, direct suppliers, and indirect suppliers. Although in 2023, to reduce the economic impact on small and medium-sized companies, the act was determined to apply to large companies with more than 3,000 employees, the emergence of this act still brings great risk and external pressure on companies because it will increase the company's time costs and internal monitoring cost. In addition to implementing sustainable practices within the company, the company also needs to put efforts into the selection of direct suppliers to examine whether the supplier's initiatives in its supply chain meet the standards.

Adidas and Puma, as two famous German sports brands, need to follow the acts. After

the act was issued, new market rules emerged. For Adidas and Puma, the country is the organization they rely on. To still occupy a priority position in the market and decrease the risk of being punished, they need to be cautious in the selection and supervision of suppliers and insist on measuring various environmental indicators involved in the subsequent supply chain.

Nike, as a brand from the U.S., faces external stress as well. *Fashion Sustainability and Social Accountability Act* which was proposed by the senates, Alessandra Biaggi and Anna Kelles, was adopted. The Fashion Act requires fashion companies operating in New York State with global sales of more than \$100 million to be socially responsible and disclose the environmental impact of their operations and it aims to stop their threats to the environment by setting mandatory due diligence for companies. As the world's largest sports brand, Nike needs to strictly abide by this act. To quickly adjust the company model with the introduction of policies and maintain the company's industry position, companies will tend to choose companies of the same scale to observe their sustainable practices and achievements to evaluate the effectiveness of their initiatives, and then choose to work in the same direction. For example, Adidas did not use GRI guidelines to report its performance. When Adidas wants to confirm the key themes for its report, one of its solutions is to use the sustainability concerns or benchmarks created by other businesses or addressed throughout the industry as a reference (Sicoli et al., 2019). But it is also this pressure that has forced the fashion industry to find more effective ways to meet regulatory standards while remaining profitable.

5.1.2 Measurement tool

In addition, the convergence of their sustainable strategies can also be explained by the indexes they used for measuring their suppliers' performances. For instance, Nike and Puma both used GRI guidelines.

GRI is a global reporting organization established by Coalition for Environmentally Responsible Economics (CERES) and United Nations Environment Programme (UNEP) in 1997 in the US. GRI aims to become the first accountability mechanism to monitor companies' compliance with the responsible environmental conduct principles, which later included the social, economic, and governance principles (GRI, n.d.). As the targets increased, GRI revised its guidelines several times. In its first version released in 2000, the guideline provided a framework with six parts: 1. EO statement: a statement from the head of the organization to summarize the report; 2. overview of the organization: the basic information, such as sales, of the organizations; 3. executive summary the abstract of the report; 4. vision and strategy: organization's business model and their ESG targets; 5. management system: the governance structure of the organization; 6. performance: covers the ESG performances separately (Hedberg and Von Malmborg, 2003).

In 2016, GRI achieved the transition from offering guidelines to companies to becoming the first global standard for sustainability reporting, which means it went from being an advocacy organization to one with legitimacy. GRI also has several indexes for different categories, such as GRI 301 is materials. With the indexes, GRI has independent standards for each of them. GRI's Reporting Guidelines represent almost the best practice in the field of sustainability reporting.

The difference between GRI and other disclosure frameworks is that it combines principled frameworks and indicators, and it also provides specific guidance through detailed guidance definitions to explain the key performance indicators that ESG should disclose. And GRI can also help the disclosed companies gain a good reputation. With these benefits, for companies like Nike and Puma, choosing GRI can not only increase their brand awareness to attract consumers but also increase credibility and attract more investors by following the indicators mentioned in GRI to conduct supplier performance assessments. In other words, companies always choose an approach to make it easy to gain a competitive advantage and avoid risks in the

industry.

5.2 Challenges

Even though the three companies present many good achievements in their reports, there are still many challenges existing in their practices in the supply chain.

5.2.1 the sustainability initiatives in the supply chain and own sites

Although Nike, Adidas, and Puma interpreted their sustainable practices by dividing them into a few aspects, their sustainability initiatives are more detailed within the company than in the supply chain. In Adidas's 2017 report, its achievement in water saving is calculated by counting the amount of water used by employees. Additionally, Adidas has conducted 'Green Company' projects since 2008, which aim to save water, and energy and reduce waste in the own sites of Adidas in the world. But at the same time, based on its estimation of the environmental impacts it had in general, only 4% of those impacts were caused by its core operations, including the operations in the administration offices and their production sites. Adidas has already realized that most problems have come from the upstream supply chain. But it continues to adopt very decentralized sustainable practices in its upstream supply chain and its operations. Such fragmentation may hinder progress toward its sustainable targets.

Adidas also has deviations in the choice of indicators. Taking reducing carbon emissions as an example, Adidas has recorded changes in the choice and number of means of transport for the process of transporting goods annually since 2017. But it did not take any actions to reduce carbon emissions in this aspect, even though transportation is one of the major contributors to the carbon emissions within the supply chain.

Puma and Nike, because of the choice to combine external and internal measurements,

appear to be more successful in their sustainable practices than Adidas. But both have the problem of putting the cart before the horse in allocating practices at the supply chain and within the company as well. They all mentioned training programs for suppliers to increase their awareness of sustainability. However, it is not always for all suppliers. Some of the meetings or standards are only applicable to their core suppliers, such as China and Vietnam. While these major suppliers play a key role in the supply chain, and their failures in the supply chain can contribute to a large portion of the environmental pollution problem, those smaller suppliers also have certain social and environmental hazards. Selective regulation may cause companies to miss very important situations.

5.2.2 Innovation

Three companies all started to be innovative in the materials after 2020. In Nike's report, Nike is committed to focusing on study innovating, low-carbon, and recycled materials, such as Nike Flyknit which is a fabric that saved around 60% waste in the manufacturing process than traditional fabric. Later, Nike is promoting its commitment to sustainability by incorporating these materials into new designs and introducing new sustainable products. The same approach is used by Puma and Adidas. They are also working on reducing waste. For example, Adidas has designed the futurecraft. loop, a sneaker that can be recycled. It solves the waste problem by recycling old shoes and remaking them with recycled materials. But the fact is that this innovation requires the cooperation of the supply chain, the brand, and the consumer to accomplish and Adidas did not report detailed information about the shoes. It cast doubts on if this innovation is a breakthrough in the supply chain for circular production or is just a sustainable concept made for promoting a new collection.

5.2.3 Regulation

For governments, the biggest obstacle to the transformation of the fashion industry is the lack of strong cooperation on regulation to govern its behavior. Despite the above-mentioned measures in Germany, the US, and the EU that have restrictions and requirements on the points of operation in the fashion industry where the supply chain may cause environmental impact, the complexity and remoteness of the current supply chain structure make it very difficult for companies to implement effective remote supervision. This is especially true for multinational companies, whose sustainable practices and requirements for supplier standards in different countries change depending on the country in which they are located. Different standards in different countries can make it more difficult for companies to develop sustainable initiatives. Companies may take advantage of regulatory differences to reduce improvements and monitoring of suppliers in sustainability.

6. Conclusion

6.1 Discussion

This paper has filled the gap in the existing literature review on sustainable practices in the supply chain. Most studies are conducted around sustainable supply chain management (SSCM) and they mainly discuss the motivations for companies to conduct SSCM rather than the specific actions they took in the supply chain.

By conducting comparative case studies on three leading brands in the sports industry: Nike, Adidas, and Puma, this paper showed the interpretation of the sports companies on their sustainable practices by presenting how they implement sustainable practices in their supply chain activities and how they measure their suppliers' performances.

Through the summary, there is a trend toward convergence among the three companies, both in terms of sustainability initiatives and measurement methods. In terms of sustainability initiatives, all three companies focus mainly on controlling water usage, material selection, chemical footprint, and carbon emission. And for measurement, Adidas uses internal tools while Nike and Puma combined internal and

external tools to measure suppliers' performances. All of them are working on two targets, target 2020 and 2025, and understanding their sustainability progress by comparing the result of measurement with targets. In this article, this convergence of firm operations is attributed to coercion and mimetic isomorphism brought about by national regulatory policies and firms' motivations to gain competitive advantage.

Because of the convergence of operations demonstrated by the three companies, they are essentially representative of the fashion industry's sustainable operations in the supply chain. Although the results proved that the three companies are closer to their targets, which means that they are conducting effective actions on relieving environmental problems. However, the challenges existing in their operations on their supply chain may make them fail at the successful transformation. Therefore, this paper has reservations about the effectiveness of sustainable practices in the fashion industry.

6.2 Recommendations

The recommendations will be divided into two perspectives: the fashion industry and countries.

6.2.1 The Fashion Industry

In the case of Nike, Puma, and Adidas, they all manage their internal operations and supply chain practices at the same time. But even so, the reduction in carbon emissions from one of their supply chain initiatives is approximately the same as the total reduction in carbon emissions from the company's internal programs. And the main environmental problems arise in the operation of the supply chain, such as dyeing and production. Therefore, the fashion industry should place more emphasis on the improvement of supply chain operations, and all suppliers should be trained, managed, and audited in the same way.

6.2.2 Countries

State regulation is the biggest driver of the industry toward sustainable development. Although the EU's policies and thinking on green transition are more developed and mature, policies tend to appear in the face of some transnational industries. For the fashion industry, which has a large supply chain involving countries, the lack of policy convergence between countries can make it more difficult to select direct suppliers. Also, if multinational companies operate in the country of establishment of the subsidiary based on their national guidelines, it may greatly limit the development of the brand in other countries. Therefore, to ensure the consistency of policies operating in each country, countries should strengthen the dialogue and cooperation related to this.

6.3 Conclusion

As environmental issues become urgent, the engagement of the fashion industry is essential for tackling the crisis. The impact of the fashion industry on environmental sustainability is the most familiar to the public. Environmental pollution, resource waste, and other topics are always accompanied by the fashion industry. Consequently, the fashion industry can be called one of the major contributors to environmental issues. With the emergence of the SDGs and the Paris Agreement, a growing number of initiatives on sustainability have been proposed, also elevating the issue of sustainability to the priority agenda of the fashion industry and policymakers. In 2019, the CEO of H&M suggested that not only do individual companies need to take action, but the government should also drive this change by pushing for appropriate regulations. To address the problems, some leading companies, such as Nike, Adidas, and Puma combined a few sustainable practices in their supply chain. They work with suppliers to integrate sustainability concepts through innovative and transformative approaches to the use of water and chemicals, the reduction of carbon emissions and energy, and the selection of materials. After that, they used different tools in

measuring sustainable performance. Through the process, it was discovered that the initiatives of the companies are highly convergent, which means they also shared the same problems. Although companies have invested in monitoring and transforming their supply chain, the complex supply chain decrease their motivation to reform completely on that. Different sustainability policies in various countries have also made it difficult to drive the fashion industry to transform its supply chain operations.

There are still limitations in the data because the cases chosen for the comparative studies are from the same industry. Since the customers of the sports industry will have special characteristics, for example, Nike will manufacture shoes for professional athletes, they have some special requirements in terms of materials to wear it for competition, so it may be different from other fashion brands. If in the future, this topic could add more cases from fast fashion brands and luxury brands, it would make the comparison results more clear and accurate.

In summary, if the fashion industry could focus more of its investment dollars and R&D on improving the supply chain practices, it might make a breakthrough more quickly. But while the fashion industry should play an important role in solving the environmental crisis, collaboration is equally critical. In addition to the fashion industry's need to improve its sustainability strategies, governments should also discuss and collaborate on policies to maintain consistency in policy directions to better regulate the practices of multinational brands around the world. While the fashion industry is starting to react, the way to sustainability is still long.

7. References

- Abbott, K. W., Levi-Faur, D., & Snidal, D. (2021). Theorizing regulatory intermediaries: The RIT model. In *The Spectrum of International Institutions* (pp. 213-232). Routledge.
- Anguelov, N. (2015). *The dirty side of the garment industry: Fast fashion and its negative impact on environment and society*. Vi-19. CRC Press.
- Bailey, K., Basu, A., & Sharma, S. (2022). The Environmental Impacts of Fast Fashion on Water Quality: A Systematic Review. *Water*, 14(7), 1073.
- Berbiche, N., Hlyal, M., & El Alami, J. (2020, April). Exponential success through integrated supply chain optimization, ecomotional intelligence and reputation-based leadership: Zara model. In *IOP Conference Series: Materials Science and Engineering* (Vol. 827, No. 1, p. 012058). IOP Publishing.
- Bhandari, N., Garza-Reyes, J. A., Rocha-Lona, L., Kumar, A., Naz, F., & Joshi, R. (2022). Barriers to sustainable sourcing in the apparel and fashion luxury industry. *Sustainable Production and Consumption*, 31, 220-235.
- Birtwistle, G., Siddiqui, N., & Fiorito, S. S. (2003). Quick response: perceptions of UK fashion retailers. *International Journal of Retail & Distribution Management*, 31(2), 118-128.
- Caro, F., & Martínez-de-Albéniz, V. (2015). Fast fashion: Business model overview and research opportunities. *Retail supply chain management: Quantitative models and empirical studies*, 237-264.
- Da Giau, A., Foss, N. J., Furlan, A., & Vinelli, A. (2020). Sustainable development and dynamic capabilities in the fashion industry: A multi-case study. *Corporate Social Responsibility and Environmental Management*, 27(3), 1509-1520.
- De Brito, M. P., Carbone, V., & Blanquart, C. M. (2008). Towards a sustainable fashion retail supply chain in Europe: Organisation and performance. *International journal of production economics*, 114(2), 534-553.
- DeLong, M. (2009). Innovation and sustainability at Nike. *Fashion Practice*, 1(1), 109–113.
- DiMaggio, P. J., & Powell, W. W. (1983). The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *American sociological review*, 147-160.
- Disko. (n.d.). *PUMA becomes Industry Leader in Dow Jones Sustainability Index*. Retrieved from <https://www.kering.com/en/news/puma-becomes-industry-leader-in-dow-jones-sustainability-index>
- Dragomir, V. D., & Dumitru, M. (2022). Practical solutions for circular business models in the fashion industry. *Cleaner Logistics and Supply Chain*, 4, 100040.
- Edwards, J. R., Mason, D. S., & Washington, M. (2009). Institutional pressures, government funding and provincial sport organisations. *International Journal of Sport Management and Marketing*, 6(2), 128-149.
- Elkington, J. (2013). Enter the triple bottom line. In *The triple bottom line: Does it all add up?* (pp. 1-16). Routledge.
- Elkington, J., & Rowlands, I. H. (1999). Cannibals with forks: The triple bottom line of 21st century business. *Alternatives Journal*, 25(4), 42.
- Ellis, J. L., McCracken, V. A., & Skuza, N. (2012). Insights into willingness to pay for organic cotton apparel. *Journal of Fashion Marketing and Management: An International Journal*, 16(3), 290-305.
- Fung, Y. N., Chan, H. L., Choi, T. M., & Liu, R. (2021). Sustainable product development processes in fashion: Supply chains structures and classifications. *International Journal of Production Economics*, 231, 107911.
- GRI. (n.d.). *GRI - Mission & history*. Retrieved from <https://www.globalreporting.org/about-gri/mission-history/>

- Hedberg, C. J., & Von Malmborg, F. (2003). The global reporting initiative and corporate sustainability reporting in Swedish companies. *Corporate social responsibility and environmental management*, 10(3), 153-164.
- Hidayat, N. M. (2022). ANALISIS PENGARUH ENSO 1997 TERHADAP CURAH HUJAN 1981-2010 DI PALEMBANG, BANJARMASIN DAN TABING. *Jurnal Manajemen Bencana (JMB)*, 8(1).
- Hiep Hoang, H., & Minh Huynh, C. (2021). Climate change, economic growth, and growth determinants: Insights from Vietnam's coastal south central region. *Journal of Asian and African Studies*, 56(3), 693-704.
- Interbrand. (n.d.). *Interbrand releases Best Global Brands 2022*. Interbrand. Retrieved from <https://interbrand.com/newsroom/interbrand-launches-best-global-brands-2022/>
- Jacobs, B. W., Singhal, V. R., & Subramanian, R. (2010). An empirical investigation of environmental performance and the market value of the firm. *Journal of Operations Management*, 28(5), 430-441.
- Karaosman, H., Morales-Alonso, G., & Brun, A. (2016). From a systematic literature review to a classification framework: Sustainability integration in fashion operations. *Sustainability*, 9(1), 30.
- Li, Y., Zhao, X., Shi, D., & Li, X. (2014). Governance of sustainable supply chains in the fast fashion industry. *European Management Journal*, 32(5), 823-836.
- Lu, S. (2018). *Changing trends in world textile and apparel trade*. Retrieved from: just-style. com https://www.just-style.com/analysis/changing-trends-in-world-textile-and-apparel-trade_id134353.aspx.
- Macchion, L., Da Giau, A., Caniato, F., Caridi, M., Danese, P., Rinaldi, R., & Vinelli, A. (2018). Strategic approaches to sustainability in fashion supply chain management. *Production Planning & Control*, 29(1), 9-28.
- Masunaga, S. A. M. A. N. T. H. A. (2019). *Does fast fashion have to die for the environment to live*. LA Times, November, 3, 2019.
- Meyer, J. W., & Rowan, B. (1977). Institutionalized organizations: Formal structure as myth and ceremony. *American journal of sociology*, 83(2), 340-363.
- Moorhouse, D. (2020). Making fashion sustainable: Waste and collective responsibility. *One Earth*, 3(1), 17-19.
- Moretto, A., Macchion, L., Lion, A., Caniato, F., Danese, P., & Vinelli, A. (2018). Designing a roadmap towards a sustainable supply chain: A focus on the fashion industry. *Journal of cleaner production*, 193, 169-184.
- Niinimäki, K., Peters, G., Dahlbo, H., Perry, P., Rissanen, T., & Gwilt, A. (2020). The environmental price of fast fashion. *Nature Reviews Earth & Environment*, 1(4), 189-200.
- Palomo-Lovinski, N., & Hahn, K. (2014). Fashion design industry impressions of current sustainable practices. *Fashion practice*, 6(1), 87-106.
- PUMA. (n.d.). *PUMA ranked most sustainable brand on Business of Fashion Sustainability Index 2022*. PUMA SE. Retrieved from <https://about.puma.com/en/newsroom/corporate-news/2022/06-01-2022-bof-puma>
- PUMA. (n.d.). *RE:FIBRE*. PUMA SE. Retrieved from <https://about.puma.com/en/sustainability/re-fibre>
- Ratten, V. (2018). *Sport entrepreneurship: Developing and sustaining an entrepreneurial sports culture*. Springer.
- Reuters Staff, 2020. (2020, February 28). *Coal's share of China energy mix falls to 57.7% in 2019—Stats bureau*. Reuters. <https://www.reuters.com/article/china-energy-idAFB9N2A2084>
- Saicheua, V., Knox, A., & Cooper, T. (2012, June). Sustainability in clothing supply chain: Implications for

- marketing. In *Proceedings of the 37th annual macromarketing conference* (pp. 284-307).
- Schrettle, S., Hinz, A., Scherrer-Rathje, M., & Friedli, T. (2014). Turning sustainability into action: Explaining firms' sustainability efforts and their impact on firm performance. *International Journal of Production Economics*, 147, 73-84.
- Şen, A. (2008). The US fashion industry: A supply chain review. *International Journal of Production Economics*, 114(2), 571-593.
- Seuring, S., & Müller, M. (2008). From a literature review to a conceptual framework for sustainable supply chain management. *Journal of cleaner production*, 16(15), 1699-1710.
- Shen, B., Zheng, J. H., Chow, P. S., & Chow, K. Y. (2014). Perception of fashion sustainability in online community. *The Journal of the textile institute*, 105(9), 971-979.
- Sicoli, G., Bronzetti, G., & Baldini, M. (2019). The importance of sustainability in the fashion sector: Adidas case study. *International Business Research*, 12(6), 41-51.
- Spurrier, J. (2013). *Cotton plants: You can grow your own, but there is a wrinkle—Los Angeles Times*. Retrieved from <https://www.latimes.com/home/la-xpm-2013-jun-25-la-lh-cotton-plants-growing-california-20130624-story.html>
- United Nations. (n.d.). *THE 17 GOALS | Sustainable Development*. Retrieved from <https://sdgs.un.org/goals>
- Turker, D., & Altuntas, C. (2014). Sustainable supply chain management in the fast fashion industry: An analysis of corporate reports. *European Management Journal*, 32(5), 837-849.
- Ulasewicz, C., & Hethorn, J. (2008). Sustainable Fashion: Why Now. A conversation about issues.
- United Nations (n.d.). *Goal 13 | Department of Economic and Social Affairs*. Retrieved from <https://sdgs.un.org/goals/goal13>
- United Nations. (n.d.). *Sustainability*. United Nations; United Nations. Retrieved from <https://www.un.org/en/academic-impact/sustainability>
- Wren, B. (2022). Sustainable supply chain management in the fast fashion Industry: A comparative study of current efforts and best practices to address the climate crisis. *Cleaner Logistics and Supply Chain*, 4, 100032.
- Yang, C. L., Lin, S. P., Chan, Y. H., & Sheu, C. (2010). Mediated effect of environmental management on manufacturing competitiveness: an empirical study. *International Journal of Production Economics*, 123(1), 210-220.