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An In-Depth Analysis of Sustainable Sourcing Practices and Their Environmental Impact in the Cosmetics Industry: A Case Study of L'Oréal USA and Unilever USA

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ABSTRACT

The pursuit of enhanced appearance has driven the evolution of beauty practices from natural ingredients to processed and packaged products. However, this progression has significantly impacted the environment through pollution and waste. The cosmetics business has a significant environmental impact because it relies on natural resources, energy consumption, and packaging waste. An increasing number of consumers are demanding sustainable products. Thus, significant cosmetics businesses like Unilever and L'Oréal have committed to more sustainable sourcing procedures. This study looks at Unilever and L'Oréal's sustainability activities and ambitions for sourcing cosmetic ingredients in the U.S. between 2019 and 2023. It concludes that both businesses have made significant strides. Unilever has committed to sourcing all of its agricultural raw materials sustainably by 2025 and to using plastic packaging that is fully recyclable or compostable by 2030, while L'Oréal wants to source all of its palm oil sustainably by 2025 and reduce emissions by 25% per finished product by 2030. The study highlights that both companies have implemented various strategies, including partnerships with sustainable suppliers, renewable energy use, reduced packaging waste, and deforestation-free certifications. Despite these developments, problems with waste management, transparency, inefficient corporate social responsibility (CSR), increasing the price of sustainable components, and satisfying consumer demand still exist. The study highlights that despite notable advancements and industry acclaim for their sustainability initiatives, Unilever and L'Oréal still encounter challenges in pursuing more sustainably sourced cosmetic ingredients. Their progress is a benchmark and inspiration for the broader cosmetics industry, demonstrating a commitment to a sustainable future.

INTRODUCTION

The cosmetics industry is a colossal sector that profoundly impacts consumer habits and global perceptions of beauty. Valued in the billions, it holds significant economic sway, shaping trends and expectations across diverse markets. However, the industry's heavy reliance on natural resources, such as water, minerals, and botanicals, has raised concerns about its ecological footprint and long-term sustainability (Turcu & Brancu, 2023). Consequently, the challenges posed by resource extraction, pollution, and waste generation have brought sustainability to the forefront of industry discourse.

In recent years, consumer awareness regarding environmental issues has significantly increased, leading to greater scrutiny of the cosmetics sector's practices (Chin *et al.*, 2018). Consumers are no longer content with products that promise aesthetic enhancement; they now demand brand transparency, accountability, and ethical responsibility (Lee & Jin, 2019; Chen *et al.*, 2021). Governments worldwide are enacting stricter environmental restrictions with this growing knowledge to lessen the detrimental effects of industrial activity on ecosystems and communities.

Cosmetic companies must reevaluate their sourcing and production processes in response to evolving expectations and regulatory pressures. They are being called upon to adopt sustainable practices that minimize environmental damage and contribute positively to ecological preservation. This entails responsibly sourcing raw materials, reducing energy consumption, and minimizing waste throughout the product lifecycle (Ajayi *et al.*, 2024). By integrating these practices, companies can enhance their environmental stewardship while ensuring that their products meet the high standards of quality and efficacy expected by consumers.

The challenge for cosmetic companies lies in balancing sustainability efforts with maintaining consumer satisfaction and brand loyalty (Rocca *et al.*, 2022). Achieving this balance requires innovation, collaboration with stakeholders, and a commitment to transparency in communicating sustainability initiatives. Sustainable practices are becoming increasingly apparent as the industry negotiates this challenging environment and realizes they are both strategically and legally necessary for long-term success.

Sustainability within the cosmetics sector involves comprehensive practices to minimize environmental impact and promote social responsibility (Martins & Marto, 2023). A vital component of this sustainability is the ethical sourcing of raw materials, which ensures that ingredients are obtained in ways that respect biodiversity and preserve natural habitats. This requires collaborating with suppliers who practice sustainable farming and harvesting to prevent resource depletion. In addition

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to ethical sourcing, the industry is focused on reducing carbon emissions associated with product production and distribution (Lim & Kwon, 2023; Martins & Marto, 2023). To reduce their carbon footprints, businesses improve transportation logistics, deploy renewable energy sources, and implement energy-efficient technologies (Oloruntobi *et al*., 2023). Waste reduction strategies are also being implemented, such as recycling packaging materials, using biodegradable alternatives, and designing products with minimal environmental impact (Evode *et al*., 2021). Sustainable sourcing extends beyond ecological concerns to emphasize the well-being of local communities involved in production (Bhandari *et al*., 2022). This consists of ensuring fair labor practices, equitable compensation, and investing in community development. By fostering positive relationships with local populations, companies contribute to social sustainability and create a fairer supply chain.

This shift toward sustainability is not solely driven by ecological concerns but also by increasing consumer demand for transparency and ethical accountability from brands (Jia *et al*., 2023). Conscious and well-informed, today's shoppers look for goods that support their moral principles and meet their standards for ethical business practices. Consequently, companies must demonstrate their commitment to sustainability through clear communication and tangible efforts to address environmental and social issues.

Research and surveys have consistently shown that consumers increasingly prioritize sustainability and ethical practices in purchasing decisions. A 2018 Nielsen report highlighted that 81% of global respondents believe companies should play a role in improving the environment, indicating that sustainability is a crucial factor for consumers (The Evolution of the Sustainability Mindset, 2018). Customers are becoming more conscious of a company's social responsibility and environmental effects, as seen by this report's emphasis on the expectation that companies will adhere to ethical standards. Furthermore, Deloitte's Global Millennial Survey from 2020 provides insight into how younger generations, particularly Millennials and Gen Z, are at the forefront of this shift in consumer expectations (Deloitte, 2020). These demographics increasingly hold companies accountable for their environmental and social impact, demonstrating a clear preference for brands that prioritize sustainability and ethical practices. This suggests that younger consumers are not just passive buyers but actively influence how brands operate by demanding transparency and moral accountability.

Furthermore, 79% of customers have modified their purchase habits due to social responsibility, inclusivity, and environmental effects, according to Capgemini's 2020 Consumer Products and Retail Report (Capgemini Research Institute, n.d.). This shift reflects a more significant trend in which customers seek brands that share their values and expect businesses to operate ethically. This story is reinforced by a 2020 IBM and National Retail Federation (NRF) survey that found that around 70% of American and Canadian consumers prioritize eco-friendliness when selecting products. Furthermore, 57% of consumers are prepared to change their shopping preferences to lessen adverse environmental effects, demonstrating a solid consumer push toward sustainability.

Embracing sustainability allows cosmetic companies to mitigate their ecological impact while enhancing their reputation and building consumer trust (Bom *et al*., 2019; Rocca *et al*., 2022). This approach provides a competitive advantage in a market where ethical considerations are as important as product performance. Martins & Marto (2023) opined that integrating sustainable practices within the cosmetics sector offers a strategic opportunity for long-term success while contributing to the planet's health and the well-being of communities worldwide.

L'Oréal USA and Unilever USA, two leading entities in the cosmetics industry, have emerged as pioneers in incorporating sustainable practices into their supply chains. Both companies have established ambitious goals to enhance sustainability, rendering them exemplary case studies for analyzing the impact of sustainable sourcing on both the environment and their operational frameworks. The "Sharing Beauty With All" campaign is one of L'Oréal's efforts to improve their goods' environmental profile and lessen their carbon footprint. Similarly, Unilever's "Sustainable Living Plan" aims to improve people's lives in its supply chain while halving the environmental effects of its products. This study is critical because it attempts to shed light on how big names in the cosmetics sector are approaching sustainability issues. With a focus on L'Oréal USA and Unilever USA, this study aims to identify and highlight best practices while highlighting areas that require development. Doing so provides a thorough understanding of the environmental impact of sustainable sourcing in the cosmetics business. The primary research question is the study's guide: How do the sustainable sourcing practices adopted by L'Oréal USA and Unilever USA impact the environment and influence their operational strategies? In addressing this question, the study will evaluate the sustainable sourcing practices of both companies, assessing their environmental impacts on biodiversity, resource utilization, and waste management. It will also analyze the challenges and opportunities these companies encounter in implementing sustainable sourcing strategies. It will also propose recommendations for enhancing sustainability in the cosmetics industry based on insights from L'Oréal USA and Unilever USA. Ultimately, this study aspires to contribute to the broader discourse on sustainability within the cosmetics industry, providing stakeholders with actionable insights into practical strategies for reducing environmental impact while ensuring economic viability.

LITERATURE REVIEW

Over the past few decades, the cosmetics sector has grown significantly due to rising consumer demand

for beauty and personal care goods. However, due to this growth, the industry needs more sustainable methods, especially when procuring ingredients. Sustainable sourcing procedures are essential to ensure economic viability, promote social fairness, and reduce environmental impact. This part looks at pertinent studies on ingredient sourcing sustainability, reviews the literature on the consequences of the cosmetics business on the environment, and highlights knowledge gaps that this study seeks to address.

In the cosmetics sector, sustainable sourcing entails cautious ingredient procurement while considering social, environmental, and economic considerations (Rocca *et al.*, 2022). This strategy is becoming increasingly critical as the business struggles to satisfy consumer demand while lessening its environmental impact. According to Lambrechts (2020), the term "sustainable sourcing" refers to a variety of methods, such as using natural and organic materials, upholding fair trade and ethical sourcing standards, improving traceability and transparency, and adhering to certifications and standards like Rainforest Alliance, Organic, and Fair Trade. By following these guidelines, the industry can reduce its adverse effects on the environment while still advancing social justice and preserving its financial stability. The shift towards using natural and organic materials is one of the most prominent trends in sustainable sourcing within the cosmetics industry. This trend is primarily driven by consumer preferences for healthier and more environmentally friendly products, encouraging companies to adopt sustainable practices to meet these expectations (Martins & Marto, 2023). The demand for natural ingredients has increased the use of botanicals and other plant-based materials, often perceived as safer and more sustainable than synthetic alternatives (Hoang *et al.*, 2021). Furthermore, (Martins & Marto, 2023) opined that this shift reduces the reliance on potentially harmful chemicals and supports biodiversity by encouraging the cultivation of various plant species.

Fairtrade and ethical sourcing initiatives are also integral to sustainable sourcing in the cosmetics industry. These programs prioritize resolving social injustices, upholding human rights, and guaranteeing fair pay and respectable working conditions for workers across the supply chain (Kolling *et al.*, 2022). By upholding fair trade norms, businesses ensure that laborers in developing nations are fairly compensated for their labor, which can help reduce poverty and foster community development (Kolling *et al.*, 2022). Ethical sourcing also encompasses the humane treatment of animals and the reduction of animal testing, which are increasingly important considerations for consumers.

As opined by (Kashmanian, 2017), traceability and transparency are critical components of sustainable sourcing, as they allow consumers and companies to understand ingredients' origins and production processes. This opinion affirms that companies can track the journey of ingredients from their source to the final product, ensuring that they meet sustainability standards at every stage by implementing robust traceability systems. Conversely, transparency entails being upfront with customers regarding sourcing procedures and ingredient provenance, which can increase confidence and improve a brand's reputation (Sansome *et al.*, 2024). According to studies, traceability and transparency are now essential for businesses looking to prove their commitment to sustainability as customers grow more aware of and concerned about the environmental and social effects of the products they buy (Gelderman *et al.*, 2021; Rinaldi *et al.*, 2022).

It is impossible to overestimate the significance of sustainable sourcing in the cosmetics sector, given its heavy reliance on natural resources and its ability to significantly worsen social injustices and the environment if improperly handled (Rocca *et al.*, 2022). Unsustainable practices can cause habitat degradation, biodiversity loss, and adverse effects on local communities. Examples of these practices include deforestation and over-extraction of resources (Sahota, 2013). In light of this, sustainable sourcing is both a critical duty in reducing the environmental and social effects of the sector and a strategic necessity for businesses looking to match their values with those of their customers.

The environmental impacts of the cosmetics industry are multifaceted and include issues such as deforestation, biodiversity loss, pollution, and carbon emissions (Martins & Marto, 2023; Lim & Kwon, 2023). Ingredient sourcing, in particular, can significantly affect the environment through deforestation and land-use changes, resulting in habitat destruction and biodiversity loss (Salmi *et al.*, 2023). Water usage and pollution are also critical concerns, as the cosmetics industry has a substantial water footprint, and the production processes can lead to water pollution (Gkika *et al.*, 2022). Furthermore, the industry's carbon footprint is noteworthy because greenhouse gas emissions result from manufacturing and transporting ingredients (Shabir *et al.*, 2023).

Several approaches are used to evaluate the environmental effects of the cosmetics sector to give a thorough picture of its ecological footprint. Carbon footprint analysis is one such technique that measures the overall greenhouse gas emissions generated by the industry, both directly and indirectly (Gao *et al.*, 2013). This research aids in locating the primary emissions sources in each stage of the supply chain, such as raw material extraction and processing, production, packaging, and transportation. By identifying these sources, businesses can create focused plans to lower their carbon emissions, like using renewable energy sources or switching to more energy-efficient production techniques. Carbon footprint analysis not only assists in meeting regulatory requirements but also aids in aligning with consumer demands for more sustainable products.

Water usage analysis is another critical tool for evaluating the environmental impact of the cosmetics industry. This methodology examines the water consumed throughout production, from ingredient sourcing to product

formulation and packaging (Rocca *et al.*, 2022; Martins & Marto, 2023). Since water scarcity is a growing global concern, understanding the industry's water footprint is essential for identifying areas where water use can be minimized. Companies implement water-saving technologies, optimize production processes, and explore alternative ingredients that require less water. By reducing their water usage, cosmetics companies can contribute to preserving this vital resource and mitigating their impact on local water systems.

Biodiversity assessments are also employed to evaluate the effects of the cosmetics industry on ecosystems and biodiversity. These assessments examine the impact of ingredient sourcing and production on natural habitats and species (Salmi *et al.*, 2023). Studies have reported that cultivating certain plant-based ingredients may lead to deforestation or the displacement of native species. Biodiversity assessments help companies understand the ecological consequences of their sourcing decisions and encourage them to adopt practices that promote conservation and sustainable land use. By preserving biodiversity, companies protect ecosystems and ensure the long-term availability of natural resources critical to their products.

When combined, these approaches—biodiversity assessments, water consumption analyses, and carbon footprint analyses—offer a thorough framework for comprehending and reducing the environmental effects of the cosmetics sector. They give businesses the information they need to decide their sourcing and production methods wisely. This eventually results in more sustainable operations that meet legal requirements and customer expectations for goods that respect the environment (Rocca *et al.*, 2022).

There are still several gaps in the expanding amount of research on environmentally friendly sourcing practices and the effects of the cosmetics sector on the environment. One notable gap is the need for comprehensive data on the specific impacts of individual ingredients or regions. This data is crucial for understanding the nuances of sustainable sourcing and developing targeted strategies for improvement. Additionally, more case-specific studies focusing on individual companies like L'Oréal USA and Unilever USA are needed to understand better how these organizations implement and manage sustainable sourcing practices (Bhatti *et al.*, 2023). There is limited longitudinal research examining the long-term effects of sustainable sourcing practices, which is essential for assessing their effectiveness and impact over time.

MATERIALS AND METHODS

For this study, we collected and assessed data using pre-existing sources of information. To guarantee the research process' thoroughness and accessibility, we conducted an extensive analysis of pertinent and reputable academic papers, offering a solid basis of data. The best method for analyzing sustainable strategies in the cosmetics business was found to be practical. This strategy allows for various approaches, but to better comprehend the complicated phenomenon we were studying, we decided to concentrate on qualitative analysis for our research. What best addresses the study issue is highlighted via a flexible qualitative approach (Tenny *et al.*, 2022).

While qualitative research is on comprehending the meaning and processes from the viewpoints of those experiencing the occurrence, quantitative research is concerned with quantifying certain aspects of an event. With less focus on generalization, this method seeks to provide more profound knowledge (Verhoef & Casebeer, 1997). Though occasionally a mix of techniques will be used, qualitative techniques are the primary approach used in this study. Using a qualitative method, we focused on case studies, journals, papers, news, surveys, CSR reports, and non-financial reporting for this study. The approach is systematic but adaptable, enabling the interpretation of results. Continuous comparative analysis is used in tandem with data collection and analysis for grounded theory. Using a grounded theory methodology, this study examines CSR reports and other internal and external materials to perform a preliminary analysis and interpret the behavior of global cosmetic corporations.

This study exclusively employs secondary data to comprehend the development and use of sustainable strategies in the cosmetics business. Ethical approval was acquired to ensure the study complied with ethical guidelines, including protecting the privacy and security of the data. Secondary data is helpful because it provides information about the elements that support, obstruct, and encourage sustainable practices in the cosmetics sector.

Nevertheless, adopting secondary data has its drawbacks. It might not immediately address particular research issues and take a while to understand fully. Additionally, there is a chance that the data contains biases from the people who gathered it, and comparing historical data might be difficult because measurement techniques have changed over time. Despite these difficulties, Secondary data is an essential tool for examining sustainable practices in the cosmetics sector.

RESULTS AND DISCUSSION

This part presents the findings from thoroughly examining the gathered data, followed by the introduction. The investigation employed secondary research techniques to unearth vital information about the study's goals. Two crucial themes emerged from this analysis: the circular economy and corporate social responsibility (CSR), both essential to comprehending the sustainability issues facing the cosmetics sector. These topics form the basis for discussing the findings of the research questions, methodological framework, and literature review because of their close ties to the body of current literature.

The need to solve the climate emergency and the depletion of natural resources is urgent, as was previously mentioned, and the manufacturing sector—which includes the cosmetics industry—consumes a substantial

amount of energy and resources. The importance of sustainability in this field is further highlighted by the United Nations Manufuture Vision 2030. This aligns with the views of Bom *et al.* (2019), who support a Green Transition to improve social and environmental sustainability in the cosmetics business.

Examining the definition of cosmetics in the literature comes first in explaining the findings. Cosmetics, including skincare, cosmetics, personal care, and fragrances, are goods designed to work with the human body to achieve various goals, including beautifying, cleansing, and appearance modification. The FDA and Aranaz *et al.* (2018) have developed definitions emphasizing these items' multiple purposes and legal classifications. Furthermore, "cosmetics" comes from the Greek word *kosmētikos*, which means "arrange or adorn," indicating cosmetics' historical and cultural relevance in human society. These definitions laid the groundwork for a deeper examination of the industry's practices and their sustainability consequences, which are covered in the research's later sections.

Globalization of the Cosmetics Industry

Secondary data analysis on the globalization of the cosmetics business reveals a noteworthy evolution that can be traced back to the technological advancements of the 19th century. Companies such as Colgate and Gillette led the revolution in toothpaste, shaving goods, and soap production, which created the groundwork for the sector. These early developments made the creation of cosmetics, makeup, skin and hair care products, and toilet soaps possible. Between the World Wars, the business saw a significant rise that resulted in a value of $129 million by 1920. During this time, major brands like Maybelline, Max Factor, L'Oréal, and Helene Curtis became prominent, broadening the range of personal care goods and stabilizing the cosmetics industry.

Following World War II, the U.S. beauty industry experienced a dramatic surge, accounting for a significant portion of global consumption—approximately two-thirds of the market. This growth was driven by technological advancements and a keen focus on popular culture and fashion trends, which American companies harnessed to shape and influence global beauty standards. As globalization intensified in the late 20th century, the cosmetics industry became increasingly competitive. Companies recognized the importance of packaging design as a critical factor in attracting consumers in a crowded market. This focus on aesthetics and the global reach of marketing campaigns further entrenched the industry's influence worldwide, making it a key player in the global economy.

The secondary data used in this study demonstrates how innovation, cultural trends, and intelligent marketing have propelled the cosmetics business from its modest origins to its current position as a worldwide powerhouse. This historical trajectory highlights the industry's flexibility and ability to influence and mirror global societal ideals.

Sourcing of Cosmetics Ingredients

According to secondary data, sourcing cosmetic components is an integral part of the cosmetics business, particularly in light of the substantial market presence of skin and sun care products in 2019. Skincare has become an essential component of daily healthcare routines, driven by increasing awareness of aesthetics and the importance of self-care. This rising demand for skincare products, as noted by Svitlana *et al.* (2023), has been a critical factor in the growth of the cosmetics market.

The industry's growth has been highlighted by research, which projects a 4.3% Compound Annual Growth Rate (CAGR) from 2016 to 2022. The U.S. mark*et al*one was expected to reach a valuation of $429.8 billion by 2022. This rapid growth in the cosmetics sector has escalated demand for raw materials, including plant extracts, minerals, and chemicals essential for producing various cosmetic products. However, this increased demand for raw materials has significant environmental implications. The extensive extraction and utilization of natural resources adversely affects ecosystems and biodiversity. The continuous exploitation of plant-based ingredients and minerals disrupts natural habitats, contributing to the degradation of ecosystems and the loss of species diversity.

Thus, this section highlights the dual-edged nature of the cosmetics industry's growth—while it meets the increasing consumer demand for skincare products, it also poses considerable environmental challenges. The industry's reliance on natural resources necessitates a more sustainable approach to sourcing ingredients to mitigate its environmental impact and preserve biodiversity.

The Sustainability Impacts Of Sourcing These Ingredients

In a Trends Barometer press release, Amarjit Sahota, the President and Founder of Ecovia Intelligence, outlined some of the most critical sustainability issues confronting the beauty sector. These include child labor, excessive reliance on single-use plastics, biodiversity loss, and climate change. Procuring raw materials for cosmetics has significant environmental effects spanning several phases, from raw material extraction to product and packaging disposal (Baptista *et al.*, 2024). The procedures involved in producing and distributing natural and synthetic substances used in the beauty business significantly impact waste creation, carbon emissions, and resource depletion.

Bom *et al.* (2019) conducted a thorough analysis of the sustainability policies in the cosmetics sector, paying particular attention to the environmental effects at each phase of a product's life cycle. Their study indicates that choices made at the design stage significantly impact how the product affects the environment during production. The first phase, "Sourcing," involves selecting environmentally friendly raw materials. To achieve this, manufacturers are encouraged to adopt technologies that minimize water, energy, and resource use while reducing waste. At the manufacturing stage, packaging materials are selected to minimize waste and enhance recycling efforts.

Distribution of products requires careful consideration of fuel choices, transportation frequency, and route efficiency.

Resource Depletion

Water is a resource that is getting harder to get by and is used extensively in cosmetics. According to U.N. predictions, 52% of the world's population would reside in water-stressed areas by 2050. Deforestation, soil and water pollution, habitat destruction, and other environmental problems can result from extracting raw materials for cosmetics. For example, deforestation and biodiversity loss have been connected to palm oil production, a prominent cosmetic ingredient.

Approximately 70% of food and cosmetic products contain palm oil, which is particularly controversial because of its environmental effects. In tropical areas, its cultivation causes deforestation, the destruction of wildlife habitats, and adverse effects on human communities (Meijaard, 2020). According to Murphy *et al.* (2021), the growth of palm oil plantations frequently leads to soil erosion, freshwater contamination, and the loss of vital habitats for endangered species. While the cosmetics business is not the leading cause of palm oil exploitation, sustainability, traceability, and transparency are still significant issues. Although no known health hazards are associated with palm oil used in beauty products, there is rising concern about the oil's adverse environmental effects, such as habitat loss, deforestation, and community exploitation. Manufacturing cosmetics and personal hygiene products account for about 2 percent of the world's palm oil consumption (Bausano *et al.*, 2023).

Packaging Waste

One of the most significant environmental problems facing the cosmetics business is packaging waste. An average family in the United Kingdom produces over 23 kg of waste plastic packaging waste yearly, mostly from cosmetic and personal care products, according to a report from Zero Waste Scotland. The worldwide plastic pollution catastrophe was exacerbated in 2018 when over 7.9 billion units of cosmetic waste were produced in the U.S. alone. This garbage contributed to resource depletion and greenhouse gas emissions (Mitchie, 2022; Raj *et al.*, 2022).

To fight this, many cosmetics brands are switching to recyclable or biodegradable materials, like paper, glass, and recycled plastic, which have a lower carbon footprint than virgin plastic packaging. The sourcing and handling of raw materials account for roughly 10% of the industry's overall emissions, according to a report by environmental sustainability consulting firm Kumar *et al.* (2021). Furthermore, about 20% of the environmental harm caused by the sector can be attributed to the overuse of plastic in packaging. Because of their dependency on energy resources and the resulting carbon emissions, the production and distribution of cosmetic items also present environmental problems. Significant water consumption is necessary during many production processes, from raw material extraction to manufacturing. Poor wastewater management from these processes can contaminate water bodies, adversely affecting aquatic ecosystems.

Carbon Pollution

The cosmetics industry's heavy reliance on plastic packaging exacerbates the problem of plastic pollution, which is likely to worsen with the sector's continued growth. Increased production, transportation, and energy consumption within the cosmetics industry contribute to rising greenhouse gas emissions, a significant driver of climate change, commonly called global warming. The importance of global warming as a pressing environmental concern has grown. It describes the steady rise in the planet's average surface temperature, mainly brought on by the atmospheric buildup of greenhouse gases. Shivanna (2022) claims that deforestation and the burning of fossil fuels by humans are the primary causes of this occurrence.

Environmental changes pose a serious risk of causing irreversible harm to both human populations and natural ecosystems. Extreme weather events, melting glaciers, increasing sea levels, warmer oceans, and increased acidity are all becoming more frequent trends. Temperature and precipitation changes are causing fast changes in habitats. According to international research on aquatic plastic pollution, two-thirds of fish and 90% of seabirds have consumed plastic; the ingestion rate is rising by about 2% yearly (Navarro *et al.*, 2023).

It has been determined that the manufacturing industry, particularly the cosmetics subsector, significantly contributes to emissions and uses energy and resources (Garetti & Taisch, 2011). The cosmetics industry has expanded dramatically in recent years; Statista (2019) estimates that the value of the global cosmetics market will reach approximately 500 billion U.S. dollars in 2019. According to Bom *et al.* (2019), the cosmetics industry's substantial use of natural resources and continuous global expansion necessitates a long-term strategy for managing sustainability issues. They emphasize how critical it is to steer the industry toward a green transition, motivated by the desire to improve its operations and products' environmental and social sustainability.

The scientific data and important variables causing climate change are thoroughly examined in the "Climate Change Evidence & Causes" study from 2020. It draws attention to several signs of climate change, such as warming oceans, retreating glaciers, melting ice sheets, and rising global temperatures. The paper highlights the necessity for alternative theories backed by solid facts and stresses the significance of doing rigorous scientific research to demonstrate human influence on climate change. The results show a notable and ongoing rise in atmospheric gas concentrations, mainly related to greenhouse gas emissions from human activity.

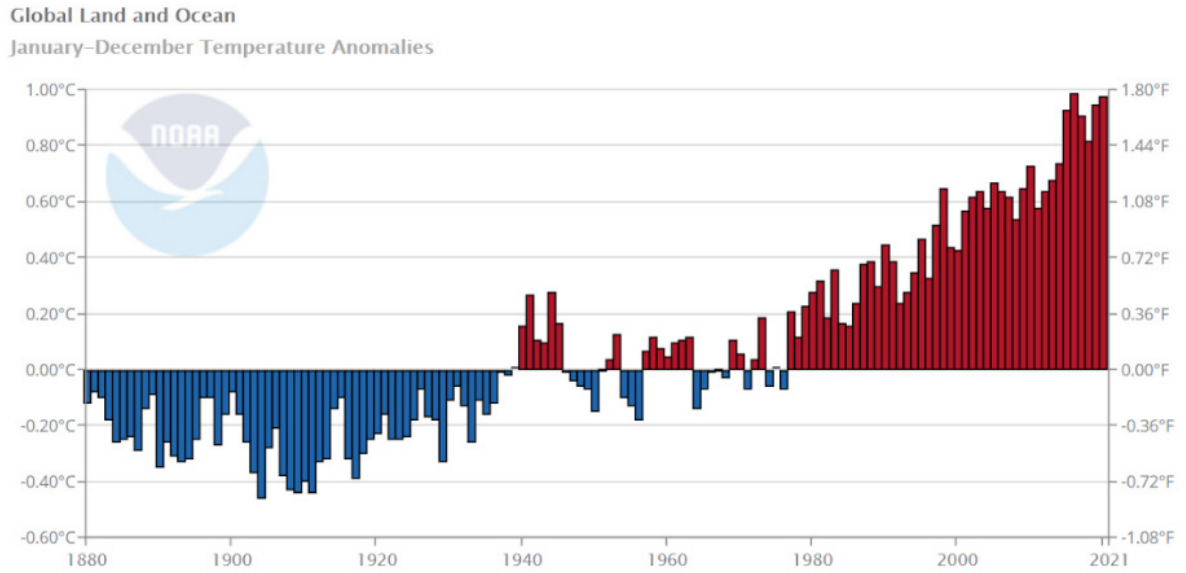

Figure 1: Temperature Anomalies
Source: NASA, (2022)

Figure 1 shows that since 1880, global temperatures have increased by at least 1.1° Celsius (1.9° Fahrenheit), according to NASA's Goddard Institute for Space Studies (GISS). Since 1975, the rate of warming has been roughly 0.15 to 0.20°C every ten years. James Hansen, the former director of GISS, observed that the significant warming trend observed over the previous forty years is probably caused by the shifting relative importance of greenhouse gas effects over aerosol ones, with the latter becoming more prominent after pollution regulations diminished aerosol impacts (NASA, 2022). Therefore, businesses in all industries must evaluate their environmental impact and take proactive steps to lessen any negative consequences they may have on the environment (Newig *et al.*, 2023).

Consumer Perception and Demand for Sustainability

In particular, in the last part of the 20th century, the beauty business experienced tremendous growth. However, as consumers drive the industry, it has now transformed to place a greater emphasis on sustainability and hygiene (Drobac *et al.*, 2020). 60% of consumers worldwide believe sustainability to be essential when making purchases, according to the Global Sustainability Study 2021 carried out by renowned strategy and consulting firm Simon Kucher. In addition, thirty-five percent of these customers are prepared to pay more for goods or services that support sustainability or the environment.

According to Mohammed *et al.* (2022), consumers increasingly demand that brands prioritize sustainable sourcing, production, and packaging. Sustainability is becoming a worldwide necessity rather than just a "nice-to-have" fad. Nowadays, the creation of products affects the cosmetics and personal care sector at every step, from concept and ingredient procurement to formulations, packaging, distribution, and product end-of-life. Demand for ethical and environmentally friendly products has shifted due to consumer understanding of sustainability issues (Tamboli *et al.*, 2023). Customers are more likely to select certified goods like organic, fair trade, or cruelty-free options and seek greater transparency in sourcing ingredients (Ajayi *et al.*, 2024). To keep the trust of their customers, cosmetic companies are under pressure to implement sustainable practices (Rocca *et al.*, 2022).

The environmental effect of the beauty business is becoming more widely recognized due to trends like conscious consumerism and the demand for clean and green beauty products. Furthermore, customers are pushing to remove microplastics from beauty products, emphasizing the necessity for sustainability in the sector. The COVID-19 epidemic has brought sustainability to public discourse, raising awareness and highlighting the significance of taking action. Sustainability in the beauty sector encompasses more than just employing renewable energy sources; it also involves ethical practices, fair trade, transparency, and cruelty-free sourcing. Because of this, more and more customers are choosing products to reduce their adverse effects on the environment, society, and economy (Leal Filho *et al.*, 2022).

Transparency

A growing number of customers are actively looking for organic and natural cosmetics since they are more conscious of the hazards included in synthetic chemicals. This change has increased consumer demand for goods that are seen as safe and natural. Companies can reap tremendous benefits if they adjust to these shifts by adopting sustainable practices and upholding open communication. However, committing to proper environmental stewardship is imperative to minimize the danger of greenwashing. According to Simon Kucher's Global Sustainability Study 2021, 35% of consumers are

prepared to pay more for sustainable goods or services, and 60% of consumers globally view sustainability as a critical component in their purchasing decisions (Pope, 2021). In their study, Ajayi *et al.* (2024) highlighted that consumers are influencing the choice of certain ingredients. They pointed out that the debate between natural and synthetic ingredients continues and that while many believe natural products are inherently safer, this assumption is not always accurate. Using natural ingredients in industrial formulations can sometimes lead to hazardous outcomes.

The cosmetics industry's adoption of the sustainability movement

The cosmetics industry has adopted more environmentally friendly practices in response to growing consumer awareness and concern about environmental and societal effects. These practices encompass various sustainability-related topics, such as sourcing raw materials, production techniques, packaging, distribution, corporate social responsibility (CSR), and green beauty or better environmental management (Bom *et al.*, 2019). As the environmental effects of plastics become more widely known, several businesses have been actively working to reduce their reliance on harmful plastics and include post-consumer recycled (PCR) plastic in their operations. By 2025, L'Oréal hopes to have reached its lofty target of 50% PCR plastic use. This pledge demonstrates L'Oréal's commitment to environmentally beneficial practices and aligns with the industry's more significant trend of using eco-friendly materials. L'Oréal hopes to decrease plastic waste and encourage a circular economy in the beauty industry by establishing this goal (L'Oréal, 2022; Dena *et al.*, 2023).

Businesses prioritize using shorter supply chains and domestic production to lessen their environmental impact. For example, L'Oréal achieved an outstanding 80% reduction in carbon dioxide (CO2) emissions at its manufacturing and distribution sites between 2005 and 2020, a commendable accomplishment. In addition, the company's goal is to become carbon neutral by 2050. The time record of the evolution of greenhouse gas emissions from L'Oréal distribution centers and plants between 2005 and 2020 is shown in Figure 2. As illustrated in Figure 2, the operations of L'Oréal released 46 kilotons of CO2 in absolute terms in 2020. The group's CO2 emissions dropped by 81% between 2005 and 2020, surpassing the 60% reduction pledged to accomplish by that year.

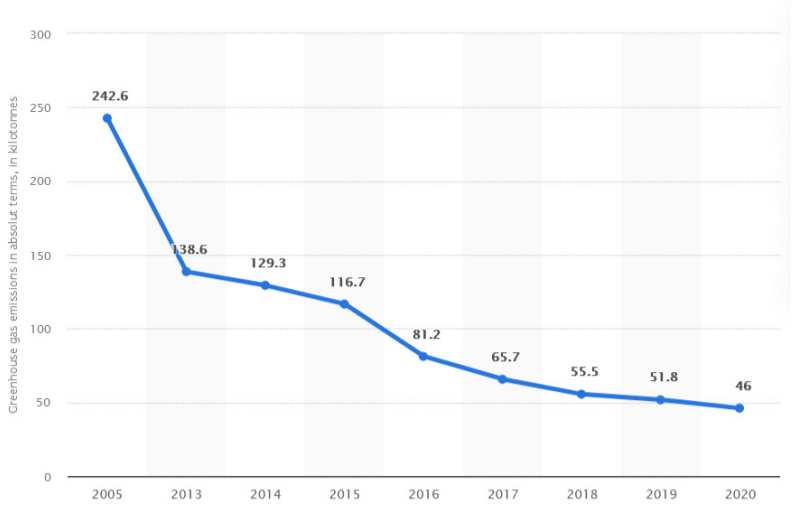

Figure 2: Annual greenhouse gas emissions from factories and distribution centers of L'Oréal from 2005 to 2020
Source: Statista, (2024)

L'Oréal and Terracycle, a program that recycles cosmetic containers, have partnered. This project addresses the 20% of packaging currently not recyclable in France by designating public collection locations where customers may quickly dispose of non-recyclable waste.

Sephora has also promoted recycling by placing recycling bins in its locations. Four hundred tons of perfume bottles were recycled by Sephora in 2019, saving 184 tons of CO2 emissions. Sephora is being even more proactive by installing energy management systems (EMS) in its U.S. and Canadian locations. As a result, all of its locations, distribution hubs, and corporate offices are powered entirely by renewable energy (Sephora, 2023). Sephora is setting the standard for producing cruelty-free and eco-friendly cosmetics. Their "for you" line of products has at least 90% naturally sourced ingredients; the "good for a better planet" line of products uses ingredients sourced responsibly; the "good for vegans" line of products excludes animal-derived ingredients; and "good for recycling" line of products features recyclable or repurposed packaging.

Seventh Generation has become a well-known brand for green home goods in recent years. They aim to provide environmentally friendly cleaning and personal care products that work well. Seventh Generation uses plant-based products, avoids dangerous chemicals, and only uses recyclable and biodegradable packaging to meet environmental goals. Furthermore, they have

made it a priority to lessen their carbon footprint and have pledged to operate with zero waste. Since plastic waste has led to environmental disasters, environmental sustainability must be brought up about plastic waste. A novel approach to environmental preservation that closes the gap between the economy and the environment is the Circular Economy (C.E.) idea. Therefore, businesses need to approach plastic packaging waste from a C.E. perspective.

Other major international firms, such as P&G with its Pure Cycle program, are vying with each other for recycling innovation. Others restock on products such as MAC Cosmetics' Estée Lauder beauty line. Its 'Back-to-C Program' invites customers to bring back empty leading packaging to retail locations. Subcontractors handle recycling, and customers receive free eye shadow in return for six returned cosmetics. Austria employs similar strategies: each returned Vichy packaging unit is stamped in a recycling passport, and a free Vichy shower gel is given for six stamps.

In order to buy recycled plastic, The Body Shop has established a new Community Fair Trade partnership in Bengaluru, India. Through this partnership, waste pickers will obtain more hygienic working conditions, fair compensation, and the respect and recognition they deserve. The 250-milliliter bottles of shampoo and conditioner are made of recycled plastic, and the company soon intends to utilize it in all of its packaging. The plastic is collected, sorted, and sterilized in waste segregation centers. It is then put into bales and transported to Europe, undergoing further transformation, thorough cleaning, and sterilization. The resultant resin is evaluated before being granulated and recycled into product bottles to ensure that it satisfies food quality standards (Ncube *et al.*, 2021).

Bamboo is used to make the entire line of packaging items for the French cosmetic company ZAO Makeup. Bamboo is incredibly resilient and renewable, which has allowed designers to develop a sleek, modern style that embodies luxury and the natural world. Bamboo packaging can only be bought once because all ZAO products are manufactured from natural, vegan ingredients and can be replenished.

Unilever thoroughly analyzed its greenhouse gas (GHG) emissions in 2022. The company's goal of reaching net zero prompted the conduct of this study. According to the study's conclusions, Unilever's greenhouse gas emissions increased by 2% in 2022 over the year before. Unilever's GHG reduction initiatives have advanced considerably in several domains, including operations, packaging, shipping, and retail. While acknowledging these developments, greater attention should be paid to reducing the rise in emissions from the production process (Unilever PLC, 2024).

UN Sustainable Development Goals

The United Nations' 2030 Agenda, which provides a thorough worldwide framework for sustainable development, was endorsed by world leaders in 2015. One of the 17 Sustainable Development Goals (SDGs) included in this framework is prioritizing protecting the environment by encouraging more sustainable production and consumption practices (United Nations, 2022). Nevertheless, several crises, including the COVID-19 epidemic, the conflict in Ukraine, and the ongoing climate disaster, threaten the advancement of these objectives.

The COVID-19 pandemic has resulted in millions of deaths and has severely disrupted essential health services. The Ukraine war has further destabilized the global landscape, leading to increased food and energy prices and displacing millions of people. Meanwhile, the climate emergency has intensified, with heatwaves, droughts, and floods becoming more frequent. These disasters are destroying property and infrastructure and displacing populations, thereby hindering the achievement of the SDGs.

As seen in Figure 3, the 17 SDGs seek to end poverty, safeguard the environment, and guarantee peace and prosperity for all. Addressing the underlying causes of these difficulties is crucial to achieving these objectives. This calls for a concentrated effort to mitigate climate change, promote sustainable development, and promote world peace (United Nations, 2022).

Figure 3: U.N. Sustainable Development Goals
Source: United Nations, (2020)

Cosmetics Company's Contribution To United Nations SDG

L'Oréal SDG Strategies

In line with the U.N. Sustainable Development Goals (SDGs), L'Oréal has made great strides in establishing sustainable policies to lessen the environmental effect of obtaining components for cosmetics. The business has started implementing several initiatives, such as encouraging sustainable farming methods, procuring from sustainable sources, and cutting down on packaging waste.

Bio-based components, which are sourced from renewable resources like plants, algae, or microorganisms and have a smaller environmental impact than typical petrochemical-based products, are prioritized by L'Oréal. Additionally, the organization works with environmentally and socially conscious suppliers that follow ethical guidelines.

L'Oréal collaborates closely with farmers and suppliers to create and execute techniques that maximize water use, minimize pesticide application, and safeguard biodiversity as part of its mission to advance sustainable farming practices. According to L'Oreal (n.d.), these procedures enhance the supply chain's sustainability. Additionally, The organization prioritizes cutting down on water usage and getting rid of dangerous pesticides and herbicides to improve the sustainability of its farming methods. L'Oréal is dedicated to encouraging recycling and the use of recyclable materials in order to reduce packaging waste. To reduce the environmental impact of packaging waste, the company uses materials derived from recycled and bio-based sources and designs reusable packaging (L'Oreal, 2022).

"Sharing Beauty with All," L'Oréal's sustainability initiative, highlights the company's commitment to sustainable development, innovation, and production. The corporation has substantially invested in its sustainability roadmap and plans to employ 95% renewable components by 2030. By 2030, the main objective is to guarantee that 95% of materials come from plentiful minerals, renewable plant sources, or circular processes (L'Oreal, 2019).

Unilever's SDG Strategies

In order to reduce the environmental effect of obtaining components for cosmetics, Unilever has put in place extensive sustainability practices, which are in line with the Sustainable Development Goals (SDGs) of the United Nations. The company lowers packaging waste, enhances farming methods, and obtains sustainable ingredients.

Unilever strongly emphasizes collaborating with vendors who uphold stringent ethical and environmental standards and sustainable business practices. In order to develop and promote sustainable agriculture techniques that reduce environmental impact and preserve biodiversity, the firm works closely with these suppliers. Unilever hopes to lessen its reliance on conventional petrochemical-based components and lower its overall environmental footprint by giving preference to using bio-based products produced from renewable sources, such as plants, algae, or microorganisms (Unilever PLC, 2021).

In line with SDG 6, Unilever has set aggressive goals to decrease water use across its supply chain to enhance farming practices. In order to support SDG 13, the company has also installed water-efficient irrigation systems. In order to lessen the environmental impact of its agricultural operations, Unilever is also encouraging integrated pest management (IPM) approaches and gradually eliminating hazardous pesticides and herbicides from its ingredient supply chain. By collaborating with farmers to preserve natural ecosystems, encourage pollinator conservation, and prevent deforestation, the corporation is dedicated to preserving biodiversity (Unilever, 2023).

Unilever is using more recycled and bio-based packaging materials, such as paperboard, plastic derived from sugarcane, and recycled plastic, to combat the problem of packaging waste. The company is also creating refillable and reusable product packaging choices to reduce packaging waste even more. Furthermore, Unilever is making a concerted effort to improve its recycling capacity and motivate consumers by clearly labeling its packaging with recycling information and endorsing recycling programs across various markets (Unilever, 2023).

Environmental Activity performance and assessment

Assessment of Companies' Environmental Activities

According to a study by Lim and Kwon (2023), big firms that impact the personal care and cosmetics sectors have implemented environmental measures. The Procter & Gamble Company (P&G) (Cincinnati, OH, USA), L'Oréal Group, Unilever Group, Estée Lauder Companies Inc. (New York, NY, USA), Shiseido Company (Tokyo, Japan), LVMH Moet Hennessy Louis Vuitton (Paris, France), Beiersdorf (Hamburg, Germany), Kao Corp. (Tokyo, Japan), Coty (New *et al.*), and Johnson & Johnson (New Brunswick, NJ, USA) are among the top ten companies in these sectors, according to Statista.

Company's Main Environmental Issues

The CDP, a worldwide climate change project operating in 90 countries, was used to analyze the cosmetics and personal care industries. Over 18,700 businesses globally disclosed their carbon management plans, problems,, and adjustments connected to climate change and greenhouse gas (GHG) emissions through CDP in 2022. Table 1 presents the data, with a focus on L'Oréal and Unilever.

Table 1: The environmental targets, goals, and commitments based on each company's standards

Company	Sources	Targets, Goals, Commitments	Standards
L'Oreal Group	2022 Universal Registration Document	Climate (GHG, Energy), Water (Water, All Aquatic Ecosystems), Biodiversity (Sourcing, Deforestation), Resources (Formula, Package, Store, Waste)	GRI, TCFD, SASB
Unilever Group	Annual Report and Accounts 2022; Sustainability Performance Data	Climate Action (GHG), Protect and Regenerate Nature (Deforest, Sourcing, Water, Formula), Waste-Free World (Plastic Package, Waste)	TCFD
Estee Lauder, New York, NY, USA	Fiscal 2022 Social Impact and Sustainability Report	Climate and Energy, Water, Sourcing (Biodiversity), Packaging, Ingredient Transparency	GRI, TCFD, SASB
P&G, Cincinnati, OH, USA	Fiscal 2022 Social Impact and Sustainability Report	Climate and Energy, Water, Sourcing (Biodiversity), Packaging, Ingredients Transparency	TCFD
Shiseido, Tokyo, Japan	Sustainability Report 2021	Reducing Our Environmental Footprint (CO2, Water, Waste), Developing Sustainable Products (Packaging, Formula/Ingredients), Promoting Sustainable and Responsible Procurement (Palm Oil, Paper)	TCFD

Source: (Lim & Kwon, 2023)

As shown in Table 1, L'Oréal has established a broader range of environmental targets, goals, and commitments compared to Unilever. These targets encompass deforestation, biodiversity, and resource management, including formulas, packaging, store operations, and waste management. L'Oréal Group also employs a more extensive standard, such as the GRI standards, to monitor and report its progress.

However, the Unilever Group has established higher standards for combating climate change and reducing plastic waste. L'Oréal has set its goal for 2050, while Unilever wants to reach net zero by 2039. Both Unilever and L'Oréal have pledged to make all their plastic packaging recyclable, reuse, or compostable by 2030.

Table 2 illustrates that Unilever is focused on creating products with 100% biodegradable ingredients, ensuring they can naturally break down by microorganisms. L'Oréal, on the other hand, is dedicated to assessing the environmental impact of their products at every stage of their lifespan, from the extraction of raw materials to production, distribution, usage, and disposal. This shows that L'Oréal is taking a more all-encompassing strategy to minimize its environmental footprint, while Unilever focuses primarily on reducing its impact on ecosystems.

Table 2: The targets, goals, and commitments for formulas and pollution

Company	Targets, Goals, Commitments
L'Oreal, Clichy, France	2030: Evaluate all formulas thanks to our environmental test platform
Unilever London	2030: 100% of our ingredients will be biodegradable
Estee Lauder, New York, NY, USA	2025: Develop a glossary and provide information about the uses of ingredients
Shiseido, Tokyo, Japan	Reduce our environmental and social impact by using sustainably sourced raw materials
Beiersdorf, Hamburg, Germany	2023: Eucerin 100% free of microplastics 2021: Nivea 100% free of microplastics 2025: 100% biodegradable polymers in our European product formulations
Kao, Tokyo, Japan	2025: 100% of factories that disclose VOC and COD emissions
COSMAX, Seongnam, South Korea	2030: Microplastics-free suspension of production of existing products; discontinuity of raw materials
Intercos, Agrate Brianza, Italy	Create products that are qualified based on the environmental and ethical profile, strengthening compliance with new formulations with our Clean List.

Source: (Lim & Kwon, 2023)

Table 3's data demonstrates the aggressive goals that L'Oréal and Unilever set for themselves in terms of lowering their greenhouse gas (GHG) emissions and their advancements in achieving them. Although both businesses have achieved significant progress, there are apparent differences in their strategies and timetables.

Table 3: The goals, basis, progress, and data to reduce greenhouse gas (GHG) emissions

Company	Targets, Goals, Commitments	Basis	Progress	Data
L'Oreal, Clichy, France	2025: Scopes 1, 2-carbon neutrality (vs. 2016)2030: 25% reduction per finished product (tCo, eq/kg of formulas sold) (vs. 2016)	SBTI	2022: 65% 2022: -24%	Scopes 1, 2, 3
Unilever Group	2030: Scopes 1, 2-zero (vs. 2015) 2039; Scopes 1, 2, 3-net zero (vs. 2015)	SBTI	2022: 34.31 2022: -68%	Scopes 1, 2, 3
Estee Lauder, New York, NY, USA	2030: Scopes 1, 2-50% reduction (vs. 2018) Scopes 3-60% reduction (vs. 2018)	SBTI	FY2022: 54%	Scopes 1, 2, 3
P&G, Cincinnati, OH, USA	2030: Scopes 1, 2-50% reduction (vs. 2010) 2039: Scopes 3-net zero	SBTI	FY2022: 57%	Scopes 1, 2, 3
Shiseido, Tokyo, Japan	2026: Carbon neutral 2030: Scopes 1, 2-46.2% reduction (vs. 2019)2030: Scopes 3-55% reduction	SBTI	Plans to disclose in 2023	Scopes 1, 2, 3

Source: (Lim & Kwon, 2023)

By 2025, L'Oréal wants to be carbon neutral for Scopes 1 and 2, and by 2030, it wants to cut its GHG emissions per completed product by 25% from 2016. The organization ensures its objectives align with international efforts to mitigate climate change by basing its targets on the Science Based Targets Initiative (SBTI) framework. In 2022, L'Oréal achieved a 24% decrease in Scopes 1, 2, and 3 emissions and a 65% reduction in GHG emissions, demonstrating significant progress towards its 2025 and 2030 targets.

On the other hand, Unilever has set a more ambitious timeframe, hoping to reach zero emissions for Scopes 1 and 2 by 2030 and net zero for Scopes 1, 2, and 3 by 2039. Unilever's targets, which demonstrate a dedication to all-encompassing climate action, are likewise based on the SBTI framework. Unilever has demonstrated a strong trajectory towards its ambitious long-term targets, as seen by the 34.31% decrease in its overall GHG emissions by 2022, which included a remarkable 68% reduction in emissions from Scopes 1, 2, and 3.

While both companies are making significant progress, Unilever's approach is characterized by a more aggressive reduction timeline and a broader scope, encompassing net zero targets for all scopes by 2039. L'Oréal, although also committed to substantial reductions, appears to be taking a more incremental approach, focusing on achieving specific reductions per product rather than a complete net zero target in the immediate future.

As shown in the table, the strategies of Estee Lauder, P&G, and Shiseido offer additional context. Estee Lauder and P&G have set targets for significant reductions by 2030, while Shiseido plans to disclose its progress in 2023. Unilever's approach stands out for its ambitious scope and timeline, positioning it as a leader toward net zero emissions. L'Oréal's strategy, while also impactful, suggests a more measured approach with a strong emphasis on product-specific emission reductions.

By the Science Based Targets Initiative (SBTI), L'Oréal Group has pledged to cut emissions per completed product by 25% by 2030. Businesses, investors, and environmental organizations are working to support enterprises in reaching their targets for reducing emissions. The L'Oréal Group has reduced its emissions by 65% by 2022, making notable progress toward this goal. On the other hand, using the SBTI framework, Unilever Group plans to reach net zero emissions for its whole company by 2039. This is one of the most ambitious goals that big businesses have set. As seen in Table 4, Unilever Group has made significant strides, cutting its emissions by 34.31% in 2022.

Table 4: The targets, goals, progress, and data for packaging

Company	Targets, Goals, Commitments	Progress	Data
L'Oreal, Clichy, France	2030: 100% of the plastic package from recycled or biobased sources (50% by 2025) 2030: 20% reduction in intensity of the quantity of packaging used for our products (vs. 2019) 2025: 100% refillable, reusable, recyclable, or compostable plastic packaging	2022: 26% 2022: - 3% 2022: 30%	Recycled material
Unilever, London, UK	2025: 25% recycled plastic 2025: 50% virgin plastic reduction by 2025 2025: 100% reusable, recyclable, or compostable plastic packaging 2025: collect and process more plastic than we sell	2022: 21% 2022: -13% 2022: 55% 2022: 58%	Recycled plastic

Source: (Lim & Kwon, 2023)

The findings displayed in Table 4 demonstrate L'Oréal and Unilever's aggressive objectives, efforts, and aims in lowering the waste generated by plastic packaging. Both businesses have made explicit promises, with Unilever establishing an incredibly demanding schedule. Unilever's commitment to being a leader in sustainable packaging is demonstrated by its target of having all plastic packaging be 100% recyclable, reused, or compostable by 2025. This objective is five years ahead of L'Oréal's corresponding commitment, demonstrating Unilever's more pressing approach to the problem of plastic waste.

L'Oréal, while equally committed to sustainability, is focusing on a broader range of packaging innovations. These include the development of materials that not only meet sustainability criteria but also incorporate cutting-edge solutions like paper-based and reusable formats. By 2030, L'Oréal aims to have all its plastic packaging derived from recycled or biobased sources, with an interim target of 50% by 2025. This indicates a more gradual approach than Unilever's rapid timeline.

In terms of progress, Unilever has achieved notable milestones, particularly in reducing the use of virgin plastic by 13% as of 2022, a significant step toward its 2025 goal of a 50% reduction. The company also reported that 58% of its plastic packaging comes from recycled materials, showing a solid commitment to closing the loop in its packaging cycle. L'Oréal has also made progress, with 30% of its plastic packaging made from recycled materials by 2022 and a 26% rate for achieving its 100% recyclable, reusable, or compostable packaging target. Additionally, L'Oréal has reported a modest 3% reduction in packaging intensity, suggesting a more incremental approach than Unilever's faster pace.

While both companies are making significant strides, Unilever's more aggressive targets and faster progress suggest a leading position in the push for sustainable packaging. L'Oréal's approach, though more gradual, reflects a comprehensive strategy focused on long-term sustainability and innovative solutions.

Table 5: The findings of the three-year CDP evaluation (climate change, forest, and water)

Company	Climate Change			Forests			Water Security		
	2020	2021	2022	2020	2021	2022	2020	2021	2022
L'Oreal, Clichy, France	A	A	A	AAA	AAA	AAA	A	A	A
Unilever, London, UK	A	A	A	AAA	AAA	AAA	A	A	A-
Estee Lauder, New York, NY, USA	A	A	A	A-B	A-B	A-B	A	A-	A
P&G, Cincinnati, OH, USA	B	A	A	No response	BA	BA-	B	B	B
Shiseido, Tokyo, Japan	B	A	A	No response	BA	BA-	B	B	B
LVMH, Paris, France	B	A	A	No response	A-A-A-	AAA	B	A-	A

Source: (Lim & Kwon, 2023)

As shown in Table 5, the results of the CDP evaluation for water security, forests, and climate change over three years demonstrate the solid environmental performance of top cosmetics companies. L'Oréal and Unilever consistently received high marks, demonstrating their commitment to sustainability.

L'Oréal maintained an "A" rating in climate change across all three years, reflecting its effective strategies in reducing greenhouse gas emissions. The company also achieved a perfect "AAA" score in forests, excelling in managing deforestation risks. It consistently received an "A" rating in water security, underscoring its efforts to protect water resources. Similarly, Unilever also sustained an "A" rating in climate change, indicating strong performance in this area. It matched L'Oréal's "AAA" rating for forest management, indicating a robust approach to sustainable sourcing and deforestation prevention. However, Unilever's water security rating in 2022 slightly dipped to an "A-," suggesting a need for improvement in this area, though it remains commendable.

Other companies like Estée Lauder and P&G showed notable improvements in climate change, with both companies upgrading from "B" to "A" over the years. However, their performance in forest and water security varied, with Estée Lauder achieving consistent "A" ratings in climate change but showing lower scores in forests and water. P&G, on the other hand, improved its climate change score but lagged in forest management, with a mix of ratings from "B.A." to "B.A.-" and consistent "B" ratings in water security.

Shiseido and LVMH also demonstrated progress, particularly in climate change, where they improved from "B" to "A." However, both companies showed gaps in their forest and water security efforts, with fluctuating ratings and a need for more response in specific years, indicating areas where further efforts are needed.

L'Oréal and Unilever lead the industry in comprehensive sustainability efforts, consistently earning top ratings across climate change, forests, and water security. Other companies are making progress but still have areas requiring further attention.

As a result, the L'Oréal Group is dedicated to lowering its greenhouse gas emissions and boosting its usage of renewable energy. Additionally, the corporation wants to ensure that by 2030, 100% of its plastic packaging is compostable, recyclable, or reusable. Similarly, the

Unilever Group is committed to using more renewable energy sources and lowering greenhouse gas emissions. Additionally, the business seeks to obtain all of its agricultural inputs from sustainable sources. It has also established a goal of having 100% of its packaging recyclable or biodegradable by 2025.

Discussion

The beauty and cosmetics industry substantially impacts the global economy and leaves a significant environmental footprint. Hence, it is imperative to research cosmetic chemicals' environmental impact and sustainable sourcing procedures. This chapter critically analyzes the sustainability efforts of Unilever and L'Oréal, exploring their broader implications for the industry and beyond. As the sector grows, its environmental impact, primarily through packaging waste and raw material sourcing, becomes increasingly apparent. The United Nations Environment Programme estimates that the business produces 120 billion packaging trash units annually.

L'Oréal and Unilever have acknowledged this difficulty and established challenging sustainability goals. By 2030, Unilever wants to obtain all agricultural raw materials responsibly, while by 2023, L'Oréal wants to cut its greenhouse gas emissions by 65%. Both businesses have employed various tactics to achieve these objectives, such as enhancing logistical operations, collaborating with suppliers who uphold sustainable standards, and using certification schemes like the Roundtable on Sustainable Palm Oil (RSPO). They have also embraced renewable energy sources to lower carbon emissions and eliminate packaging waste.

L'Oréal's dedication to sustainability has been globally recognized, with the company earning a triple "A" rating from the CDP for seven consecutive years. Similarly, Unilever has been named the top corporate sustainability leader in the GlobeScan-Sustainability survey for ten years, and the S&P Dow Jones Sustainability Index has recognized it as the industry leader in personal products. These accolades underscore their leadership in integrating sustainability into their business models, setting a benchmark for the cosmetics industry. Their efforts protect the environment and drive business success, inspiring other companies to adopt sustainable practices in an increasingly environmentally conscious market.

Companies need to set clear and quantifiable objectives related to ingredient sourcing, packaging, and overall environmental impact to further promote sustainability in the cosmetics industry. Collaboration toward sustainable practices can be fostered by trust-building techniques such as regular progress tracking and open communication of successes and difficulties. Investing in alternative energy sources, like solar and wind power, and reducing packaging waste with concentrated products, recyclable and compostable materials, and efficient transportation are crucial.

Sourcing ingredients from suppliers that adhere to deforestation-free certifications, like the RSPO, and developing stringent sourcing guidelines to avoid deforestation-prone areas are crucial for sustainability. Innovation in the sector can be fueled by expanding the use of renewable elements, such as plant-based and recycled materials, and by funding studies into novel sustainable techniques. Offering environmentally friendly product options and educating customers about the advantages of sustainable operations are also crucial.

Collaborating with non-profit organizations, sustainability initiatives, and governmental bodies can raise awareness and support sustainable sourcing. Investing in research to discover efficient and scalable sustainable practices is vital for ongoing progress. To strengthen the industry's commitment to environmental stewardship, businesses like Unilever and L'Oréal should keep growing their alliances with sustainable suppliers and enlightening customers about sustainable sourcing processes.

CONCLUSION

Unilever and L'Oréal have emerged as leaders in sustainable cosmetic ingredient sourcing in the United States, setting ambitious goals and implementing initiatives to reduce their environmental impact. Their efforts include partnerships with suppliers who follow sustainable practices, the adoption of renewable energy, and the use of certification programs to ensure responsible sourcing.

While they have made significant progress, there is room for improvement in expanding the use of renewable ingredients and making sustainable practices more cost-effective. As demand for eco-friendly products grows, scalability and economic viability become increasingly important. Both companies must continue to innovate, ensuring that sustainability is integrated into their core business, not just used as a marketing tool.

Additionally, while large companies can manage the costs of sustainable sourcing, smaller firms may struggle, slowing industry-wide progress. Therefore, it is crucial for industry leaders to advocate for policies that make sustainability accessible to all.

In conclusion, Unilever and L'Oréal's efforts are commendable, but true leadership will require ongoing innovation and a focus on making sustainable practices both scalable and economically viable for the entire industry.

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