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TOWARD SUSTAINABLE LUXURY: EXPERT CONSENSUS, CONSUMER PSYCHOLOGY, AND ENVIRONMENTAL EDUCATION

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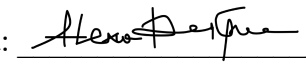
Declaration of Thesis Content

I, Alexia Del Greco, declare that this thesis entitled:
"Toward Sustainable Luxury: Expert Consensus, Consumer Psychology, and Environmental Education" submitted for the degree of Doctor of Philosophy at Università Milano - Bicocca, is my own work.
I further declare that parts of this thesis are based on work that I have authored and submitted for publication in peer-reviewed journals, including:

- *Paper 1: "Consensus-Based Recommendations to Embrace Sustainable Luxury: A Delphi Study", submitted to Sustainable Development, 2026*
- *Paper 2: "Re-evaluating Beauty: Attitudes and Perceptions of Eco-friendly Packaging in Beauty Care Products - A Systematic Review", published on Sustainable Production and Consumption, 2024*
- *Paper 3: "Luxury Meets Sustainability: Investigating Consumer Intentions Toward Eco-Friendly Cosmetic Packaging", in submission to Journal of Consumer Research, 2026*
- *Paper 4: "Experiences and Perspectives of Environmental Educators: a Qualitative Exploration" submitted to Journal of Adventure Education & Outdoor Learning, 2025*

Where material from these publications has been used, it has been clearly indicated, with proper citations and acknowledgments. The thesis also includes original work undertaken specifically for the PhD.
I confirm that this thesis has not been submitted, in whole or in part, for any other degree or qualification at any other university or institution.

In some stages of my work, I used artificial intelligence tools for support activities such as language revision, clarity improvement, and the rephrasing of sentences. All conceptual content, analyses, data interpretations, and conclusions presented in this thesis are entirely my own work.

Signed: 
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Chapter 1: Introduction

"*There is no beauty in the finest cloth if it makes hunger and unhappiness.*"
Mahatma Gandhi

1.1. Background

1.1.1 MUSA Project

This PhD research is funded by the MUSA (Multilayered Urban Sustainability Action) project, developed in Milan through a collaboration led by the University of Milano-Bicocca, in partnership with Politecnico di Milano, Bocconi University, the University of Milan, and a network of public and private stakeholders. This project, in line with the Brundtland Report's definition of sustainable development, addresses the three interdependent pillars of sustainability - environmental protection, economic viability, and social equity - as the foundational framework guiding its actions and evaluation (World Commission on Environment and Development, 1987). The environmental pillar emphasises safeguarding ecosystems and natural resources to ensure long-term ecological resilience. The economic pillar focuses on fostering growth and innovation in ways that remain viable over time and do not compromise environmental or social well-being. The social pillar highlights the importance of fairness, inclusion, and the distribution of opportunities, health, and benefits across present and future generations.
MUSA project seeks to introduce an innovative model of public–private collaboration that may be replicated at both national and international levels and is structured around six thematic spokes: urban regeneration (spoke 1); big data and open data in life sciences (spoke 2); entrepreneurship and technology transfer (spoke 3); sustainable finance (spoke 4); sustainable fashion, luxury, and design (spoke 5); and sustainable and inclusive societies (spoke 6).
This research contributes to spoke 5, which aims to revitalise local enterprises and position Milan as a leader in eco-sustainable fashion by focusing on supporting companies in implementing sustainable practices and technologies, developing circular business models, and strengthening local entrepreneurship. Spoke 5 key activities include assessing companies' sustainability performance, fostering collaboration with start-ups, providing training for sustainability professionals, and promoting awareness through shared resources and educational initiatives. By combining expert-driven recommendations, consumer-focused analyses, and the perspectives

of environmental educators, the present research contributes to the MUSA project by addressing both structural and cultural drivers of sustainability in Milan's luxury, fashion, and design sectors.

1.1.2 Luxury as a complex and fluid concept

The concept of luxury does not have a unique definition. If we investigate different subjects, we will, in fact, find different perspectives on luxury.
From an economic point of view, for instance, luxury goods can be described as highly elastic products, meaning that when a consumer's income rises, they will be in high demand (Kemp, 1998). Luxury goods are therefore more sensitive to changes in income than necessity goods (McClung, 2023). What also characterises a luxury good is that the ratio between functionality and price is low, meaning its value is not linked to its functionality (Kapferer & Michaut, 2016). Sociology defines luxury goods as a set of expensive products aimed at social elites, underlining the role of the social stratification of society in luxury consumption (Schrage, 2012). Following a philosophical approach, luxury could be defined as a form of transgression against rationalising utility (Wiesing, & Roth, 2019).

As said, it is difficult to cage the concept of luxury in a single definition: luxury market and consumers' drivers and preferences also continue to evolve across time, making luxury a fluid concept: research shows for instance, a shift in younger consumers in China towards a more personal orientation towards luxury, whereas older generations still focus on social aspects (Jiang & Shan, 2018). Besides time, luxury standards and expectations are also different across cultures, influenced by socio-economic factors, cultural values, and individual characteristics (Dhaliwal, Singh & Paul, 2020). Moreover, luxury is a multidimensional concept: not only items and goods but also health, good nutrition, services and experiences are perceived on the same level as classic luxury products (Koch, 2012).

As for determinants of luxury consumption, they could be mainly explained by two main motivations: internal motivations, reflecting personal emotions, pleasure, and self-directed values, and external motivations, reflecting status signalling and social distinction (Guido et al., 2020). Three attributes emerge as frequently associated with luxury products by luxury buyers worldwide, which are high quality, expensiveness, and prestige (Kapferer and Michaut, 2016). Yet, as said, cultural and societal differences may largely determine such different drivers in the perception and consumption of luxury products. For instance, purchasing luxury items to show belonging to the

elite of society s is typical for Asian, Arab, Russian and Ukrainian consumers. On the contrary, more internal drivers motivate Americans who derive self-satisfaction from consuming luxury goods. Regarding Europeans, British consumers focus on functional utility, high quality, aesthetic refinement, and originality and Germans prefer technological reliability (Naumova, Bilan & Naumova, 2019). In Brazil, luxury entails hedonistic consumption, whereas Japanese consumers demand tradition and heritage-related goods (Kapferer and Michaut, 2016).

Taken together, these perspectives illustrate how luxury is not a fixed or universal construct but a culturally embedded and continuously evolving phenomenon. Its meaning shifts across time, place, and individual motivations, making luxury a fluid category that resists any single, definitive interpretation.

1.1.3 Luxury and Sustainability: an Oxymoron?

Hume (1752/1882) offers an early recognition of the dual nature of luxury, noting that it can be both beneficial and harmful depending on its expression. He observes that

> *Luxury is a word of an uncertain signification and may be taken in a good as well as in a bad sense. In general, it means great refinement in the gratification of the senses; and any degree of it may be innocent or blameable, according to the age, or country, or condition of the person (p. 299)*

Hume further elaborates

> *We come now to … the second position … that, as innocent luxury, or a refinement in the arts and conveniences of life, is advantageous to the public; so wherever luxury ceases to be innocent, it also ceases to be beneficial; and when carried a degree farther, begins to be a quality pernicious, though perhaps not the most pernicious, to political society. (p.300)*

The philosopher underlines that when luxury is innocent - a refinement in the arts and conveniences of life - it can be advantageous to society; however, when it ceases to be innocent, it loses its social benefit, and if carried too far, may become harmful to political and social well-being.

This dual nature conceptualisation of luxury raises important questions for sustainability: if luxury becomes excessive, wasteful, or focused solely on personal indulgence, it may conflict with

sustainable practices and environmental responsibility. In fact, these two concepts are traditionally viewed as opposite. Luxury is often associated with opulence and excess, with overconsumption and transgression. Sustainability emphasises environmental care and a minimalistic way of living, moderation (Beckham and Voyer, 2014).

Due to the necessity to create pieces that reflect a brand's identity and quality, in fact, luxury brands only employ materials with the highest standards and more easily discard inadequate or lower-quality materials and resources: News exposed several brands for destroying unsold inventory to maintain exclusivity of their collections (Pinnock, 2018); others face criticism from NGOs for their unsustainable practices, such as polluting water basins with hazardous chemicals (Plummer, 2025) or due to animal cruelty for using exotic skins (PETA, 2025). Additionally, Industry benchmarking reports show that luxury fashion brands' overall score poorly on forced labour, transparency, and human rights practices, with major luxury companies scoring well below average on labour protections (Business & Human Rights Resource Centre, 2023).

Yet, despite these tensions and documented shortcomings, the relationship between luxury and sustainability cannot be reduced to a simple opposition. The emphasis on rarity, high-quality materials, and artisanal craftsmanship encourages the preservation of natural resources and limits overproduction, an approach that contrasts sharply with the wastefulness of mass manufacturing (Kapferer, 2010; Arrigo, 2015). Luxury brands often maintain local production, invest in safeguarding artisanal skills, and support long-term training initiatives, reinforcing social and cultural sustainability. Moreover, the inherent durability and longevity of luxury products promote a consumption model based on investment and long-term use rather than disposability. Taken together, these characteristics show that luxury and sustainability are not inherently contradictory; instead, luxury can embody practices that support environmental stewardship, cultural preservation, and responsible consumption.

To further clarify why luxury should not be understood as inherently opposed to sustainability, it is useful to turn to a philosophical perspective. Aesthetic and phenomenological accounts of luxury show that its essence does not lie in material excess, waste, or conspicuous consumption, but in the distinctive kind of experience it enables: an interruption of ordinary utility, a heightened sensibility, and a reflective engagement with beauty (Franceschina, 2025). By examining luxury through the work of contemporary philosophers, it becomes evident that luxury is not defined by opulence or resource-intensive production, but by its capacity to generate aesthetic meaning and

emotional intensity (Mazzocut-Mis, 2025). This shift in focus is crucial: once luxury is understood as an experiential and aesthetic phenomenon rather than a purely material one, its compatibility with sustainability becomes not only possible but conceptually coherent (Rozzoni, 2025).

As Franceschina notes in his essay (2025) luxury goods participate fully in market dynamics yet cultivate an aura akin to that of artworks, generating experiences that suspend the utilitarian rhythms of everyday life and echoing Adorno's insight that eliminating luxury would mean eliminating a mode of experiencing the world otherwise. This affinity between luxury and aesthetic experience has been developed by Wiesing, for whom luxury is not defined by intrinsic properties but by the subject's lived experience of rupture from the ordinary - as Barale (2025) argues, luxury is fundamentally a subjective aesthetic phenomenon rather than a fixed class of objects.

Building on Adorno, Wiesing argues that luxury should be understood not as a category of objects but as an experience grounded in "superfluous and unnecessary effort," something perceived as "irrational" in utilitarian terms yet capable of suspending ordinary functionality (Rozzoni, 2025). Rozzoni develops this view by revisiting Kant and Husserl to propose a more constructive notion of aesthetic rationality: luxury is not an arbitrary caprice but a form of bella techne, an aesthetically grounded aesthetic feeling striving toward heightened grace, refinement, and reflective engagement. This perspective requires distinguishing luxury from adjacent notions such as comfort, prestige, and pomp: luxury is not mere ease, nor a social illusion of status, nor a quantitative intensification of spectacle, but a qualitatively distinct aesthetic experience. Following Wiesing, Rozzoni (2025), argues that luxury cannot be defined by intrinsic properties of objects, since no object is luxurious a priori; rather, luxury arises from the subject's evaluative experience, much like the Kantian judgment of beauty, which depends on the mode of appearance rather than on physical pleasure or material existence. Rozzoni's (2025) view in fact diverges from Wiesing's: whereas for Wiesing luxury is primarily the freedom to "take the liberty of…" engaging in superfluous effort without any necessary connection to beauty, Rozzoni explicitly anchors luxury to an enhancement of beauty itself.

Yet, unlike pure beauty, luxury involves a specific relation to possession - not ownership in the legal sense, but the free ability to dispose of something "for its own sake," a form of non-instrumental engagement described as "possession for the sake of possession." Luxury thus intensifies the individual's vital feeling through an aesthetically motivated excess, an excedere that goes beyond necessity and expresses the highest degree of aesthetic potential. However, when this

excess loses aesthetic measure, it collapses into kitsch: an effort toward beauty that becomes aesthetically irrational and emotionally inert. Rozzoni's phenomenological account also carries ethical implications: debates on luxury, from Hume to Rousseau, have long turned not on luxury itself but on the social and environmental costs associated with its production. If luxury is an aesthetic experience rather than a material privilege, it should not be the exclusive domain of the wealthy but, in principle, accessible to anyone capable of appreciating its qualitative dimensions. For this reason, Rozzoni argues that genuine luxury must become ecological and inclusive, shifting its value from quantitative scarcity and economic exclusivity to qualitative enrichment and the sustainable enhancement of human vitality. In this light, luxury's deepest philosophical structure is not only compatible with sustainability but increasingly dependent on it.

1.1.4 Integrating Sustainability in the Luxury Sector

Regardless of whether luxury manifests in ways that clash with or align with sustainability principles, its inherently fluid and evolving nature makes it essential to articulate a conceptual and operational integration between the two. This necessity calls for a shared vision of what sustainable luxury entails; one that also accounts for the perspectives, expectations, needs and roles of all relevant stakeholders, including brands, consumers, suppliers, and policymakers, providing a foundation upon which subsequent standards and practices can be meaningfully developed.

More restrictive standards and regulatory frameworks, such as the Modern Slavery Act in the UK, are leading to a shift toward integrating sustainable practices in enterprises (Legislation.gov.uk, 2024). Efforts in Europe are going towards putting the EU on a path to become the first climate-neutral continent by 2050. In 2023, the European Union adopted a package of proposals to align climate, energy, transport, and taxation policies to reduce net greenhouse gas emissions by at least 55% by 2030, relative to 1990 levels. (European Commission, n.d.). Beyond Western regulatory frameworks, several non-Western countries have introduced increasingly stringent policies that directly influence how companies operate across global supply chains. China's Environmental Protection Law (2015) has strengthened environmental accountability and imposed stricter controls on industrial emissions, compelling luxury manufacturers to adopt cleaner and more transparent production processes. India's Companies Act (2013), with its mandatory Corporate Social Responsibility requirements, obliges large firms to invest in socially and environmentally responsible initiatives, thereby integrating sustainability into their strategic planning. The United

Arab Emirates' Sustainable Production and Consumption Policy (2016) reflect a strategic, incentive-based approach to sustainability, promoting resource efficiency, waste reduction, and responsible consumption through innovation and public–private collaboration. Similarly, South Africa's National Environmental Management Act (2014) enforces rigorous environmental compliance standards that push companies to adopt responsible sourcing and production practices while also increasing transparency and reporting.

The 12th Sustainable Development Goal proposed by the United Nations also aims at decoupling production from resource use. This goal must be reached by managing resources more efficiently and reducing loss and waste across the supply chains.
Furthermore, a shift in social norms has recently begun, with influential celebrities producing or collaborating on documentaries to address environmental and social issues, such as tackling climate change and promoting renewable energy, or advocating for gender equality. A growing interest has followed this trend in the topics for scholars, but also in consumers' attention (Winston, 2016).

In this context, the recent decades have witnessed the emergence of a new segment in the luxury market known as eco-luxury, which focuses on designing products that minimise environmental impact throughout their entire life cycle (Gibson & Seibold, 2014). Traits typical of luxury goods, such as quality and durability, align with sustainability goals (Kapferer, 2010) that seek to reduce negative impacts on people and the natural environment and go in the direction of an ecological, social, and cultural balance. For instance, some brands opt for eco-friendly resources such as organic cotton and natural dyes, whereas others avoid animal leather and fur by leaning on vegetable-based leather (Dekhili, Achabou & Alharbi, 2019).

The apparent oxymoron between luxury and sustainability seems, however, still difficult to overcome not only practically but also from consumers' perspective, their standards, desires and expectations.

As Kapferer and Michaut (2014; 2015) emphasise, luxury is synonymous with high quality, slower production, the preservation of traditions, local craftsmanship, and durability across generations, leading to waste reduction and being opposed to fast fashion. These characteristics would closely align with environmentally and socially responsible practices, and would make products compatible with the concept of sustainable development, and some consumer segments would positively welcome sustainability features in luxury products, especially younger generations

(Bhagaskara & Sobari, 2023; Rolling & Sadachar, 2018). On the other hand, it is important to consider that buyers perceive the integration of sustainability into luxury varies widely, depending on the type of product and the specific consumption context.
Some luxury purchase decisions, for instance, seem more influenced by quality, brand reputation, past satisfaction, or personal pleasure than by sustainability, which is not a priority (Grauel, Burmann & Schade, 2025; Moraes et al., 2017; Achabou & Dekhili, 2013; Joy et al., 2012). In the case of food, sustainability may be perceived as more authentic (Hartmann et al., 2016), while for other products, sustainability does not alter perceptions (Rolling & Sadachar, 2018), and "green" attributes in apparel may reduce perceived exclusivity or aesthetic appeal (Beckham & Voyer, 2014; Dekhili, Achabou, & Alharbi, 2019). However, sustainability-focused messaging can make a luxury brand appear atypical, paradoxically increasing willingness to buy, especially for consumers with a high need for uniqueness (Amatulli, De Angelis, & Donato, 2021). Furthermore, consumers often tend to assume luxury goods are ethically produced, diminishing active pursuit of sustainable products (Davies et al., 2012; Janssen et al., 2015; Moraes et al., 2017).
Identity is another key factor: luxury consumption signals social differentiation and status (Davies et al., 2012), whereas sustainability can seem incongruent, representing altruism and restraint (Griskevicius et al., 2010; Cervellon & Shammas, 2013). For a smaller segment, sustainable luxury allows ethical distinction and conspicuous virtue (Cervellon & Shammas, 2013), often motivated by self-oriented benefits such as health, prestige, or emotional satisfaction rather than pure altruism (Cervellon & Shammas, 2013).
Despite emerging insights, literature remains fragmented, with few frameworks linking positive drivers (i.e. identity, authenticity, craftsmanship) and negative drivers (i.e. hypocrisy and greenwashing) (Carranza et al., 2023). In general, research on ethical consumption highlights a persistent intention–behaviour gap, where individuals who express strong ethical or sustainable intentions often fail to translate them into actual purchases due to competing priorities, habitual behaviours, and practical shopping constraints (Carrington, Neville, & Whitwell, 2014). This gap underscores the complexity of sustainable consumption, a challenge that is particularly relevant in the luxury sector. Recognising this discrepancy between ethical intent and consumer behaviour helps explain why integrating sustainability into luxury requires strategies that go beyond attitudinal appeals and address structural, cultural, and behavioural barriers.

From an industry perspective, integrating sustainability in the luxury sector extends beyond production processes and affects the entire supply chain, encompassing manufacturing, packaging, operations, and Corporate Social Responsibility initiatives. Implementation, however, can be challenged by complex supply chains, commercial pressures, and power imbalances. Strategically, luxury companies adopt diverse approaches to integrate sustainability. Carcano (2013) identifies four archetypes differing in orientation (internal vs. external) and scope (corporate-wide vs. company-specific), while Cimatti et al. (2017) illustrate how brands can focus on craftsmanship and luxury excellence using recycled materials, demonstrating that sustainability does not necessarily require foregrounding eco-friendly branding.

Sustainability in luxury supply chains is, however, both complex and context dependent. Researchers (Kunz, May, and Schmidt, 2020) note that defining what constitutes sustainable luxury can be challenging, as exemplified by the case of fur: although fur is a natural and theoretically renewable material, its production is resource-intensive and raises serious ethical concerns. Overall, achieving sustainability in luxury supply chains requires balancing environmental stewardship, social responsibility, and economic performance, while acknowledging the ethical, resource-related, and operational challenges inherent in defining and implementing sustainable luxury practices.

Consequently, examining the relationship between luxury and sustainability requires an interdisciplinary approach, drawing on insights from marketing, production and operations, supply chain management, engineering, and business ethics.

While research across multiple disciplines enables a more comprehensive understanding, it also increases the risk of fragmentation and an uneven allocation of research efforts. Athwal et al. (2019) provide a systematic review focused on sustainable luxury marketing, identifying several structural challenges faced by luxury organisations. These include competing pressures arising from widespread counterfeiting, the persistence of global black and grey markets, and criticisms regarding the sector's contribution to social inequalities. In addition, the exposure of unethical practices has generated negative publicity, posing significant threats to brand reputation. At the same time, consumers as final recipients at the end of the supply chain demonstrate high awareness of greenwashing, making it imperative for luxury firms to ensure that sustainability initiatives are perceived as authentic.

The growing requirement for Corporate Social Responsibility and sustainability reporting may enhance consumer awareness of firms' social and environmental practices and increasingly influence their purchasing decisions. Nevertheless, industry actors often express concern that explicit communication about sustainability may dilute or "contaminate" the aspirational and symbolic value that luxury brands seek to convey. In contrast, industry evidence also indicates that certain luxury brands are thriving by embedding sustainability at the core of their brand strategy (Athwal et al., 2019). A literature review by Kunz, May, and Schmidt (2020) provides a comprehensive, systematic literature review that maps the existing academic knowledge on the intersection of luxury and sustainability and Corporate Social Responsibility across multiple business disciplines, complementing the work of Athwal and colleagues (2019). They highlight the critical role of communication in shaping brand value, consumer perception and acceptance of Corporate Social Responsibility initiatives. Evidence collected suggests that well-crafted messaging can enhance brand value without compromising the perception of luxury, particularly among Millennials, that eco-labels and visible Corporate Social Responsibility actions can positively influence consumer evaluations, whereas inappropriate communication risks harming brand reputation.

To explore the transition towards sustainability, Böhnert and colleagues (2023) conducted in-depth interviews with managers from across the German luxury industry, asking them about the concrete measures their companies have taken or are planning to take, as well as their perceptions of industry-wide trends. Authors highlight how sustainability in the luxury sector is becoming both a strategic and marketing asset, as sustainable production and products can justify higher prices while enhancing user experience and brand appeal. Their findings show a clear prioritisation: environmental sustainability dominates corporate efforts, far more than social or economic sustainability dimensions. Environmental sustainability has, in fact, emerged as the most pressing challenge and opportunity for luxury firms, driven by the high carbon footprint of luxury consumers and increasing public awareness of environmental issues, as confirmed by Lynch and colleagues (2019). Even industries that seem very far from environmental considerations, such as superyachts, are exploring alternative fuels, marine-care programs, and other eco-friendly initiatives.

Overall, luxury companies are responding by optimising production processes, reducing CO_2 emissions, minimising water and plastic use, recycling materials, and incorporating upcycled

inputs such as ocean plastics, while also addressing supply chain impacts from long-distance production (Böhnert et al., 2023). The communication of sustainability initiatives varies: B2C campaigns are typically selective and campaign-based rather than reflecting holistic corporate practices, whereas B2B clients demand transparency and adherence to standards, often verified via certifications (Böhnert et al., 2023). However, while some luxury companies integrate sustainability deeply into brand identity and operations, others adopt it more superficially, largely for marketing purposes or media visibility. The luxury industry is increasingly adapting to environmental sustainability expectations, balancing environmental initiatives with profitability, consumer awareness, and strategic differentiation. Social sustainability is becoming an increasingly important dimension, including employee welfare, community engagement, and ethical customer interactions (Böhnert et al., 2023). Luxury firms recognise that providing exceptional products and services is socially acceptable only when accompanied by a return to employees and society: employee satisfaction, long-term loyalty, and opportunities for professional development are critical, particularly in service-intensive luxury segments, as they directly influence customer experience. Common internal measures include flexible work arrangements, work-life balance programs, home-office options, and structured employee training and career development (Böhnert et al., 2023). Externally, companies engage in charitable sponsorships or pro bono work, sometimes motivated by marketing benefits. However, implementation and transparency vary widely: only about half of the firms surveyed by the authors could specify concrete social sustainability initiatives.

Strategically, luxury firms integrate sustainability through varied approaches: some focus internally on employees and governance, others externally on environmental and community impacts, and some combine both across the organisation (Böhnert et al., 2023).

Focusing on communication, Di Leo and colleagues (2023) analysed how companies belonging to the ultra-luxury or super-premium segments communicate and implement sustainability policies. They showed that 94% of the companies reported sustainability according to codes of conduct, 87% through other non-financial documentation, while just over half of the sample published a sustainability report (52%). These findings echo those of Böhnert and colleagues (2023), confirming that environmental sustainability is a primary focus when communicating their efforts. Amongst the most communicated initiatives are monitoring material use, improving energy efficiency, reducing CO_2 emissions, implementing renewable energy, optimising packaging, and

promoting recycling and waste reduction (Di Leo et al., 2023).
On the social side, Di Leo and colleagues reported that luxury companies actively engage in human resource management, emphasising employee training, skills development, leadership programs, equal opportunities, occupational health, and non-discriminatory workplaces. Policies address community support, gender pay gaps, protection of women and children, education, healthcare, and cultural heritage preservation. Platforms for reporting ethical violations and group education programs are also implemented to ensure ethical and inclusive practices along production and manufacturing sites. Luxury firms integrate economic sustainability into corporate governance, leveraging technology and digital platforms to expand market reach, improve production efficiency, and reduce environmental impact.

The most interesting effort by Di Leo and colleagues (2023) is identifying four clusters of luxury fashion firms based on the extent and quality of sustainability reporting. Sustainability Driven companies are leaders in sustainability, maintaining dedicated sections on their websites and producing comprehensive reports. They communicate quantitative and qualitative performance across environmental, social, and economic dimensions, link initiatives to the UN Sustainable Development Goals, and prioritise sustainable materials, circular systems, CO_2 reduction, stakeholder collaboration, and safe work environments. Their governance frameworks support long-term, structured sustainability strategies. Sustainability Newcomers are beginning to integrate sustainability into business models, focusing on environmental, social, and community issues. Efforts include sustainable material sourcing, energy and water efficiency, employee protection, inclusion, training, and community engagement. While formal sustainability programs exist, they are recent, so most reporting emphasises future goals rather than established outcomes. Sustainability Potential companies have limited reporting, often restricted to Codes of Ethics or Codes of Conduct, supplier standards, and isolated initiatives such as gender pay gap reports or membership in sustainable sourcing programs. Commitment is largely institutional, with social initiatives (e.g., worker protection) more prominent than environmental measures. Reporting is fragmented, not holistic, and typically does not reflect a structured sustainability strategy. Sustainability Passive firms are those that provide minimal information on sustainability, often limited to a Code of Ethics addressing worker health, safety, or environmental respect. No dedicated sustainability reports or detailed policies are available. These companies focus primarily on traditional luxury values such as material quality, craftsmanship, and brand heritage, largely

neglecting formal social or environmental responsibility.
Taken together, the growing scholarly and societal attention to sustainability in luxury highlights that its integration is a dynamic and multifaceted process, shaped not only by regulatory pressures and market trends but also by the perspectives and interactions of multiple stakeholders and how they collectively influence sustainable luxury practices.

1.2 Research Gaps and Objectives

Despite the rapid growth of the luxury sector and rising consumer demand for sustainability, research on sustainable luxury remains limited and fragmented. Significant gaps persist regarding how fully sustainable luxury supply chains can be achieved, particularly in integrating small suppliers and clarifying what sustainability in luxury means across the entire value chain, including customers. From a psychological perspective, questions about what constitutes luxury, how its meaning is evolving, and how social, cultural, and ethical dynamics shape this evolution remain largely unanswered. Investigating these questions can illuminate the shifting symbolic and experiential dimensions of luxury, offering a deeper understanding of how consumers interpret, value, and negotiate luxury in a world increasingly attentive to sustainability, ethics, and social responsibility.

The present project aimed to address the need for more comprehensive research on sustainable luxury that considers the different stakeholders and perspectives: managers, designers, supply chain specialists, and institutional stakeholders possess the technical, strategic, and operational knowledge required to translate sustainability demands into concrete and credible practices.

This thesis seeks, therefore, to deepen the understanding of sustainable luxury by bridging multiple disciplinary perspectives and incorporating expert consensus to develop a coherent and actionable framework. The first objective involves engaging a multidisciplinary panel of experts to identify, prioritise, and validate the core factors, methods, and checkpoints essential for operationalising sustainability within the luxury sector. The second objective is to investigate consumers' perception and intention toward sustainable packaging in luxury products, exploring psychological drivers, barriers, and values that may influence eco-conscious decision-making. Lastly, it examines the lived experiences and pedagogical strategies of environmental educators to understand how they shape environmental awareness, motivation, and behaviour change in diverse audiences and what barriers they face to provide such invaluable service to Italian audiences. Together, these

objectives aim to generate a multi-faceted, systemic understanding of how sustainable values are conceptualised, operationalised, and internalised across industry, consumers, and educators.

1.3 Overview of Thesis Structure

This thesis unfolds through a series of interconnected studies that explore the intersection of sustainability, luxury, and consumer behaviour. The core of the thesis is structured around three empirical pillars.

Chapter 2 presents a Delphi study that builds expert consensus on the priorities and operational checkpoints for sustainable luxury, offering a structured framework for industry and policy stakeholders. Involving a two-phase engagement with international experts and Italian stakeholders, this study addresses the persistent fragmentation in how sustainable luxury is understood and implemented. Drawing on multidisciplinary expertise from environmental science to supply chain governance and ethical branding, a generative survey alongside the Delphi method enabled the systematic co-production of critical factors and checkpoints. By doing so, the study provided an actionable map for stakeholders navigating the luxury sector's evolving sustainability landscape. The insights generated here form the analytical and conceptual foundation for the subsequent chapters. The priorities and tensions identified in the Delphi process, such as the challenge of aligning exclusivity with social equity or aesthetic aspirations with environmental responsibility, resonate across the consumer-focused and education-oriented inquiries that follow, grounding the thesis in the willingness to understand and guide sustainable transformations.

In fact, Chapter 3 examines consumer perceptions of sustainable packaging in the cosmetics sector. First, it synthesises the existing literature on consumer attitudes, perceptions, and behaviours toward eco-friendly packaging in beauty and personal care products. Building on these insights, the chapter then presents an empirical study exploring consumers' attitudes, values, and intentions regarding eco-friendly packaging, and reports the key findings.

In Chapter 4, the focus shifts to the perceptions and challenges faced by environmental educators. This chapter extends the inquiry from consumer-facing dynamics to the upstream agents shaping environmental awareness and literacy. Given the earlier findings, particularly the identified gap in environmental education and the critical role of informed consumer choices in the sustainable luxury sector, it becomes essential to understand how sustainability is communicated and

cultivated in educational contexts. By examining the lived experiences and systemic barriers faced by educators, the qualitative investigation reported in Chapter 4 provides a deeper understanding of the structural and cultural factors that influence environmental knowledge dissemination. In doing so, it reinforces the thesis's overarching narrative: that truly sustainable consumer behaviour is not solely a matter of market choices but is embedded in broader socio-educational ecosystems. Chapter 5 offers a concise synthesis of the results emerging from the studies conducted in this thesis, showing how they converge and where they complement one another. It presents an integrated discussion of the empirical overlaps across expert, consumer, and educator perspectives, alongside the conceptual bridges that link operational feasibility, symbolic meaning, and stakeholder needs in sustainable luxury. The chapter also reflects on the broader tensions between luxury and sustainability and suggests future research directions to further investigate the factors identified throughout the thesis.

Chapter 2: Sustainable Luxury through Expert Consensus

2.1 Delphi Method: Rationale

Building on the introduction's discussion of sustainable luxury and its complex environmental, social, and economic dimensions, this chapter focuses on identifying and evaluating the key factors that can guide the sector toward genuine sustainability. The fluidity of luxury, the diversity of stakeholder perspectives, and the variation in practices across firms and regions make achieving consensus a challenging task. To address this, the Delphi methodology has been selected: a participatory, iterative approach that captures and synthesises expert knowledge, reconciles differing viewpoints.

Originally developed by Dalkey and Helmer (1963), the Delphi method is a well-established forecasting and decision-support tool designed to achieve reliable consensus among a panel of experts through iterative rounds of anonymous feedback. This method is particularly well-suited to enable structured consensus in a complex and evolving field such as sustainable luxury, a domain marked by conceptual ambiguity, interdisciplinary intersections, and a lack of universally accepted definitions or standardised practices. In this study, the Delphi method was adopted alongside a generative survey with international experts to co-produce a shared understanding of the critical factors, practices, and checkpoints required to foster sustainability within the luxury sector, an area characterised by competing interests, cultural tensions, and evolving consumer expectations.

The Delphi approach was deemed particularly suited to this research to address Conceptual Ambiguity.

Sustainable luxury is a fluid and contested concept. Traditional qualitative or quantitative methods often fall short in capturing the pluralistic perspectives needed to define and prioritise sustainability in this domain. The Delphi methodology allowed for the integration of diverse and sometimes conflicting expert viewpoints, helping to distil conceptual clarity from fragmentation. Furthermore, the Delphi approach facilitated multidisciplinary input.

The topic demands insight from multiple fields, including environmental sustainability, design, consumer behaviour, ethics, supply chain management, and luxury branding. The Delphi process enabled structured engagement across these domains, offering a platform for cross-sector dialogue that might otherwise be difficult to coordinate. This helped produce a grounded, consensus-based

framework that reflected both scholarly insight and practical feasibility rather than generating abstract theory or top-down prescriptions, aligning with the MUSA project's goals to offer guidance that is both academically rigorous and actionable within real-world design, fashion, and policy environments. Finally, the Delphi approach enabled iterative reflection and convergence. Through its multiple rounds, the Delphi method facilitated informed reconsideration. Experts were exposed to anonymised aggregate feedback between rounds, promoting reflection.

In sum, the Delphi method provided a robust, transparent, and participatory way to elicit and synthesise expert knowledge around a topic characterised by normative ambiguity, cross-sectoral relevance, and high symbolic stakes. It aligns methodologically with the MUSA Spoke 5's aims to generate both conceptual clarity and actionable recommendations for the sustainable transformation of the luxury sector.

2.2 Introduction and Objectives

From this point onward, the content is based on the submitted paper "Consensus-Based Recommendations to Embrace Sustainable Luxury: A Delphi Study".

In order to categorise defining factors and frameworks of sustainable luxury, research has increasingly sought to clarify its core dimensions, moving beyond early debates about the incompatibility between exclusivity and responsibility. Several frameworks converge on three broad pillars. First, environmental dimensions emphasise resource efficiency, responsible materials, durability, circularity, and low-impact production (Achabou & Dekhili, 2013). Second, social and ethical dimensions highlight fair labour conditions, transparent supply chains, craftsmanship, and cultural preservation as key markers of responsible luxury (Joy et al., 2012). Third, symbolic and experiential dimensions focus on authenticity, emotional value, storytelling, and the alignment between luxury identity and sustainability narratives (Sharma, Jain & Maggon, 2024). Multidimensional models integrate these perspectives. Hennigs et al. (2013) provide a robust conceptual foundation for understanding how luxury and sustainability intersect by identifying four core value dimensions: financial, functional, individual, and social. The financial dimension emphasises long-term value, such as durability and resale potential, reflecting the economic sustainability of luxury goods. The functional dimension highlights product quality, craftsmanship, and longevity, which naturally align with environmentally sustainable practices.

The individual dimension captures the emotional and identity-related benefits that luxury consumers derive, including personal satisfaction and status, illustrating how sustainable luxury can resonate with self-oriented motivations. Finally, the social dimension underscores ethical conduct, societal contribution, and transparency, reflecting the social responsibility component of sustainability. Cowan and Conejo (2022) propose a conceptual framework for sustainable luxury, covering the full product life cycle from design, sourcing, and production to retail, usage, disposal, packaging, and transportation. The framework emphasises integrating environmental and social responsibility while maintaining luxury's quality, craftsmanship, and exclusivity. Key principles include durable and circular design, ethical supply chains, reduced waste, and optimised logistics, alongside strategies to communicate sustainability in ways that resonate with both self-oriented and ethical consumer motivations.

Despite increasing scholarly attention, the field remains theoretically fragmented and empirically uncoordinated. Most studies focus either on consumer attitudes or firm-level initiatives, with limited efforts to integrate perspectives across academia, industry, and policy. Furthermore, no consensus exists regarding the relative importance or feasibility of proposed sustainability factors. This highlights the need for integrative approaches that connect the symbolic, ethical, and operational dimensions of sustainable luxury while incorporating diverse stakeholder viewpoints. This study addresses these gaps by employing a Delphi approach in an attempt to gather and synthesise expert knowledge, bridging academic, managerial, and policy perspectives. In this sense, our study directly responds to Carranza et al.'s (2022) calls for integrative models that connect the psychological, institutional, and contextual dimensions of sustainable luxury. By systematically prioritising factors and operational checkpoints for sustainable luxury, the present study extends existing evidence on luxury consumption, corporate social responsibility, and sustainability, and generates evidence that can guide future research, managerial decision-making, and policy development. In particular, this study aims to co-produce a shared understanding of sustainable luxury, informing both research and practice within - and beyond - the MUSA framework.

The objectives are therefore: (i) Identify and prioritise the most critical factors that enable or hinder the implementation of sustainability in the luxury sector; (ii) Determine the relevance and feasibility of specific checkpoints or indicators to assess progress toward sustainable luxury; (iii)

Contribute to the development of a shared framework for sustainable luxury, grounded in expert consensus and actionable in real-world contexts.

2.3 Methods

The Delphi methodology was selected because it is particularly suited to exploring emerging, complex, and interdisciplinary topics where empirical evidence is limited and conceptual boundaries remain fluid (Hasson, Keeney & McKenna, 2025). Sustainable luxury represents such a field, characterised by diverse stakeholder perspectives, evolving standards, and an absence of universally accepted definitions or metrics. The Delphi approach allows for the structured elicitation and refinement of expert judgments through iterative rounds, promoting convergence toward a reasoned consensus while maintaining participant anonymity to minimise the influence of dominant voices or group pressure (Hsu & Sandford, 2007; Okoli & Pawlowski, 2004). This process is particularly valuable for integrating academic, managerial, and policy insights into a coherent framework, as it combines qualitative exploration with quantitative validation of priorities. By systematically aggregating expert knowledge, the Delphi method provides both conceptual clarification and practical guidance for areas such as sustainable luxury where traditional empirical or experimental designs may be premature or infeasible.

To this end, we implemented a two-round Delphi study involving experts and stakeholders. The decision to conduct two Delphi rounds was guided by established methodological recommendations indicating that two to three rounds are generally sufficient to achieve stability of responses and meaningful consensus without inducing participant fatigue (Hsu & Sandford, 2007).

Experts were drawn from the MUSA (Multilayered Urban Sustainability Action) project, in particular from Spoke 5, which focuses on advancing sustainability in fashion, luxury, and design by developing innovative materials, promoting circular business models, and strengthening local entrepreneurship. Our study forms part of this initiative, seeking to produce a shared and actionable understanding of sustainable luxury through expert consensus.

To assist researchers and stakeholders in selecting relevant aspects for achieving sustainable luxury, we developed recommendations based on expert contributions gathered through an online survey (Phase 1 - Generative phase). Spoke 5 members' review via an online two-round Delphi panel was used to reach a formal consensus on the experts' insight.

The Delphi method involves a group-based approach designed to achieve the most accurate and dependable consensus from a panel of skilled and knowledgeable experts through a series of questionnaires administered within a structured feedback process (Dalkey and Helmer, 1963; Keeney, McKenna, & Hasson, 2011). The sample size for both the generative and Delphi phases was determined on a purposive, expertise-driven basis rather than by probabilistic power calculations, following standard practice for Delphi studies where the primary criterion is panellists' knowledge and relevance rather than statistical representativeness (Okoli & Pawlowski, 2004)

The study entailed two phases:

Phase 1 – Generative Phase: A survey on aspects to be considered when tackling sustainable luxury was administered to a multidisciplinary advisory panel

Phase 2 – Delphi Phase: in a two-round Delphi study, a survey was administered to Musa Spoke 5 Members.

The study was approved by the Ethics Committee of University of Milano - Bicocca (Protocol 807 - Meeting of the Ethics Committee held on December 18, 2023)

2.3.1 Phase 1 - Generative Phase: International Experts' contribution

A pool of 62 international experts was invited via email or through social media platforms (such as LinkedIn or Instagram) to provide strategic input on the definitions of aspects to be considered when addressing sustainable luxury. This was done using an online survey that allowed for freely structured comments.

Members of the panel for the advisory group had to be experts in one or more of the following fields:

- Sustainability, including environmental scientists, consultants, social responsibility experts, environmental educators, scientific journalists, and sustainability literacy experts.
- Luxury Industry Professionals, including luxury brand executives, fashion designers or luxury retailers.
- Consumer Behaviour and Marketing Experts, such as market researchers and branding experts.
- Academics and Researchers including sustainability and ethical consumerism scholars.

- NGO Representatives and Activists from organizations focused on environmental conservation and sustainable practices and ethical Fashion Advocates.
- Supply Chain and Manufacturing Experts and Consultants.
- Regulators of areas related to sustainability or luxury.

The inclusion criteria for the advisory panel had been designed to ensure a diverse range of perspectives and expertise, which are essential to generate comprehensive insights and recommendations. No a priori sample size was set, as there are no clear indications of the size of panels in the literature. The major criteria to determine the size for both advisory and Delphi panels are "to include participants who are knowledgeable in the field of study and are willing to commit themselves to multiple rounds of questions or interactions on the same topic" (Grisham, 2009).

After providing demographic information, the 22 experts who completed the survey were asked to suggest factors, methods, processes, technological aspects, and checkpoints that need to be included when talking about sustainable luxury and to rate their level of importance with each suggested element on a 5-point Likert scale ranging from 'Not at all important' to 'Extremely Important (See Supplementary A).

Moreover, respondents 'perception of the relationship between Sustainability and Luxury was asked through two items. One item asked participants to rate their level of agreement with the statement "Sustainability and Luxury are in contrast" on a Likert scale from 0 (strongly disagree) to 4 (strongly agree).

The second item is an adaptation of the Aron, Aron and Smollan (1992)'s Inclusion of other in the self scale. Respondents had to indicate their perception of the relation between Sustainability and Luxury by choosing a graphic representation among seven (Figure 1).

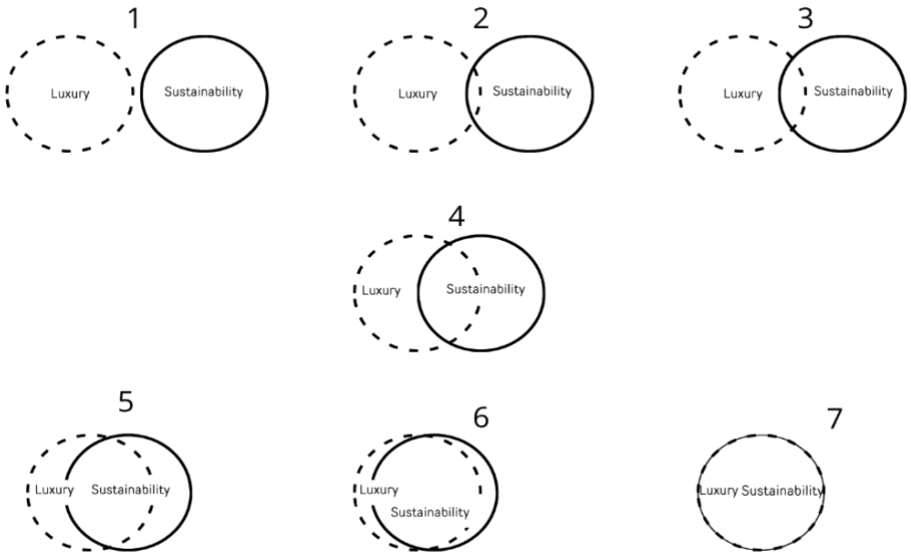

Figure 1. Relationship between sustainability and luxury (adapted from Aron, Aron and Smollan; 1992).

The qualitative clustering of open-ended responses in Phase 1 followed a framework analysis and was conducted collaboratively by two researchers (SR and ADG) who independently reviewed the data, discussed emerging themes, and reached consensus through iterative comparison. A third researcher (MB) independently reviewed the responses and aspects generated. Agreement was achieved through negotiated consensus, a widely accepted approach in exploratory Delphi studies (Hasson et al., 2000).

2.3.2 Phase 2: Two-round Delphi

As the objective of the Delphi study is to provide a common and shared view of sustainable luxury generated within the MUSA project, participants for this phase were recruited exclusively from members of the SPOKE 5 - Sustainable Fashion, Luxury, and Design of the MUSA project. Participants were emailed a web link to the consent form, and once informed consent was provided, participants were presented with the study survey.
In Round 1, respondents were asked to provide demographic and professional information and rate their view on the importance of each of the 24 factors and 5 checkpoints drawn from the generative phase (Tables 2 and 3) using a 5-point Likert scale from '0-not at all important' to '4-Extremely

important'. Then, participants were asked to choose 5 out of the 24 factors as top priority in terms of urgency, and 5 as low priority (Table S1, Appendices). Furthermore, they were asked to add further aspects or factors that they believe are important to consider when achieving Sustainable Luxury, which were not already present in the list. Finally, participants provided their view of the relationship between Sustainability and Luxury through the item adapted from Aron, Aron and Smollan (1992; Figure 1).

Respondents who completed the questionnaire in Round 1 of the Delphi survey were invited via e-mail to complete Round 2. For each of the 24 factors and 5 checkpoints, participants were presented with the rating they provided during Round 1, along with the overall mean and standard deviation from the panel and were asked to rate their importance again using the same 5-point Likert scale. Respondents were also asked to rate the importance of the aspects generated in Round 1.

Moreover, participants were asked to order from 1 to 5 in terms of priority, the 5 aspects that scored the highest priority in round 1 and to indicate whether, among those aspects suggested by MUSA SPOKE 5 members in round 1, there were any they would include in the top 5 priorities. Specifically, participants were asked to rank five factors in order of importance, from 1 (most important) to 5 (least important), using a drag-and-drop interface.

As for the rating of factors and checkpoints, criteria for the level of consensus were defined a priori based on agreement responses on the Likert scale ["very important" or "extremely important"], and included the following categories of consensus: "unanimity or consensus", "majority", and "discrepancy" when 100%-80%, ≥70%, and <70% of participants agreed with a high level of importance. Based on these criteria, three classes of recommendations were created:

- Class I: Factors and checkpoints for which there is unanimity or consensus regarding their importance for industry stakeholders and researchers in the field (80%-100%).
- Class II: Factors and checkpoints for which the majority of MUSA experts agreed on their importance for industry stakeholders and researchers in the field (70%-79%).
- Class III: Factors and checkpoints for which there is a discrepancy among MUSA experts regarding their importance or priority for industry stakeholders and researchers in the field (<70%).

To determine when sufficient agreement had been reached among panel members, a pre-defined consensus threshold of ≥80% agreement was established prior to data collection as this aligns with

methodological guidance in Delphi research, where consensus levels between 70% and 80% are commonly adopted to indicate strong convergence of expert opinion (Diamond et al., 2020: Hasson et al., 2000: Hsu & Sandford, 2007;). Setting the threshold at 80% reflects a conservative standard that prioritizes robustness and clarity of consensus while acknowledging that higher thresholds may reduce the inclusion of minority viewpoints. The chosen level was therefore intended to balance methodological rigor with inclusivity, ensuring that the resulting priorities represent a well-substantiated and credible expert agreement.

2.4 Results

2.4.1 Phase 1: Generative Survey

Out of the 62 experts invited, 40 accessed the questionnaire and 22 completed the survey (response Rate 35.5%). Demographic information of the advisory panel members is reported below in Table 1.

Age	Mean 50,5 (SD= 9,3) range 31-64
Gender	11 males, 11 females
Expertise Field (more answers were allowed)	Sustainability n=7 Luxury Industry N=2 Consumer Behaviour and Marketing n=2 Academia and Research n=12 NGO Representatives and Activists n=1 Supply Chain and Manufacturing n=2 Regulators n=0
Seniority	Less than 10 years n=2; More than 10 years n=20
Perceived Juxtaposition between Sustainability and Luxury *"Sustainability and Luxury are in contrast."* from 0-strongly disagree to 4-strongly agree.	Mean=1.9 SD=1.269 0 (Strongly Disagree) n=3 1 (Somehow Disagree) n=7 2 (Neither Agree nor Disagree) n=3 3 (Somehow Agree) n=7 4 (Strongly Agree) n=2
Relationship between sustainability and luxury	1 n=1 2 n=2 3 n=5 4 n=8 5 n=2 6 n=1 7 n=3

Table 1. Generative Phase Demographics and Relationship between Luxury and Sustainability

The advisory panel provided a total of 311 prompts for aspects and 62 prompts for checkpoints to consider when tackling sustainable luxury. Through a qualitative clustering process, 24 relevant aspects and 5 critical checkpoints were drawn (Tables 2 and 3).

Factors to be taken into account when considering Sustainability and Luxury	**Number of responses**	**Mean Importance 0-4**
Extended Producer Responsibility to ensure the producer's accountability throughout the entire product life cycle, including the post-consumer stage.	1	4
Ensuring that production processes respect human rights and promote safe and fair working conditions.	16	3.7
Promoting local craftsmanship by collaborating with artisans and local communities to preserve traditional techniques.	5	3.6
Adoption of upcycling models and strategies, a reuse process that does not require further material processing (e.g., transforming jeans into a skirt).	7	3.4
Ensuring traceability and transparency across the entire supply chain by leveraging advanced technologies such as blockchain to verify the origin of materials and ensure compliance with ethical practices by suppliers.	10	3.4
Designing high-quality, durable products while optimising resources through techniques that minimise waste, such as modular or custom designs.	7	3.4
Selecting materials and/or extraction or production practices with minimal impact on biodiversity and the environment.	15	3.4
Educational marketing to communicate the product’s story, the materials used, and the positive impact of the purchasing choice on communities and the environment.	7	3.4
Educating consumers on recognising labels and certifications.	7	3.4
Employing techniques or machinery that optimise the amount of raw material (e.g., additive manufacturing; 3D printing) to reduce waste and scraps.	15	3.3

Adoption of Circular Economy models, meaning production and consumption practices involving sharing, lending, reusing, repairing, refurbishing, and recycling materials and products for as long as possible.	12	3.2
Adoption of lean manufacturing practices to reduce water, energy, raw material, and chemical consumption through optimised processes.	14	3.2
Adoption of Closed-Loop Recycling Systems, production models where used materials are recycled and reintroduced into the production cycle to create new, similar products without losing quality.	9	3.2
Adoption of Life Cycle Assessment (LCA) to evaluate the environmental impact at each stage: from design to production, distribution, use, and end-of-life.	16	3.2
Employing bio-based materials composed of renewable resources such as mycelium, synthetic silk, or biodegradable plastics.	16	3.2
Employing recycled materials derived from post-consumer or post-industrial waste, such as recycled PET for fabrics and metal recycling.	16	3.2
Employing renewable energy sources and technologies in production processes, such as solar heating and low-energy systems.	10	3.2
Minimising and optimising logistics and transportation to reduce the carbon footprint.	14	3
Creation of digital twins to simulate and optimise production processes before physical realisation (e.g., virtual collections to reduce physical prototypes).	1	3
Adopting internationally recognised sustainability standards (e.g., GOTS, FSC, ISO 14001, etc.).	14	3
Employing packaging made from biodegradable, sustainable materials.	17	2.8
Employing packaging made from recycled or recyclable materials.	17	2.8
Reducing the amount of packaging used through optimised and functional design.	17	2.8
On-demand manufacturing to reduce production and storage costs and environmental impact.	2	2

Table 2. Aspects identified during the generative phase as relevant for fostering sustainable luxury, including expert ratings of importance. This table presents 24 factors, methods, technological aspects, and processes generated by international experts in Phase 1, along with their frequency and mean importance rating on a 0–4 Likert scale.

Measures and Checkpoints to consider for achieving Sustainable Luxury.	**Number of responses**	**Mean Importance 0-4**
Obtaining recognised certifications (e.g., ISO 14001, GOTS, FSC) to demonstrate compliance with environmental and social sustainability standards. Measurable goal: Percentage of certified products relative to the total (e.g., 75% within 5 years). Checkpoint: Compliance audits by certification bodies; number of certifications obtained annually.	6	3.5
Monitoring and continuous improvement of working conditions along the supply chain, ensuring fairness, safety, and respect for human rights. Measurable goal: Percentage of suppliers verified according to ethical criteria (e.g., 100% of critical suppliers within 2 years). Checkpoint: Regular inspections, anonymous employee reports, implementation of corrective actions, and training programs.	2	3.5
Publication of regular reports that communicate progress in sustainability to stakeholders, including successes and areas for improvement. Measurable goal: Production of a periodic (e.g., annual) sustainability report accessible to the public. Checkpoint: Timely release of reports (e.g., by Q2 each year); increased stakeholder engagement (e.g., feedback received).	14	3.3
Implementation of regular internal or external audits to monitor compliance with sustainability practices and corporate standards. Measurable goal: Percentage of business operations subject to annual audits compared to the total. Checkpoint: Frequency of audits (e.g., quarterly or annual); reports with recommendations and corrective actions implemented.	12	3.2
Reduction of CO_2 emissions, energy consumption, or the use of recycled materials. Measurable goal: Reduction of the carbon footprint within a defined period (e.g., by 25% over 3 years). Checkpoint: Periodic measurement (e.g., annual) of emissions using standard tools (e.g., GHG Protocol); verification of milestone achievements (e.g., -10% after the first year).	13	3.1

Table 3. Aspects and critical checkpoints identified as relevant for fostering sustainable luxury. This table outlines five key checkpoints proposed by experts to ensure the implementation and monitoring of sustainable luxury practices, as proposed by the advisory panel in the generative phase. Frequency and mean importance rating (a 0–4 Likert scale) for each aspect /checkpoint are reported.

2.4.2 Phase 2: Two-round Delphi

In Delphi Round 1, out of the 101 MUSA-SPOKE5 members invited, 77 completed the Delphi survey (76,2% response rate). Following, out of the 77 MUSA-SPOKE5 members invited to participate in Round 2 of the Delphi, 51 completed the survey (66% response rate). In Table 4, respondents' demographic and professional information, along with their views on the relationship between luxury and sustainability, are reported.

	Round 1	**Round 2**
Total	77	51
Age	Mean 42,9 (SD=13) range 25-66	Mean 42,5 (SD=12,4) range 25-67
Gender	27 males, 49 females, 1 other	20 males, 30 females, 1 other
Expertise Field (more answers were allowed)	Sustainability n=23 Luxury Industry n=8 Consumer Behaviour and Marketing n=6 Academia and Research n=65 NGO Representatives and Activists n=0 Supply Chain and Manufacturing n=2 Regulators n=0	Sustainability n=15 Luxury Industry n=5 Consumer Behaviour and Marketing n=4 Academia and Research n=44 NGO Representatives and Activists n=0 Supply Chain and Manufacturing n=2 Regulators n=0
Seniority	Less than 10 years n=29; More than 10 years n=48	Less than 10 years n=18; More than 10 years n=33
Relationship between Sustainability and Luxury	1 n=3 2 n=10 3 n=21 4 n=29 5 n=6 6 n=2 7 n=6	N/A

Table 4. Phase 2- Two-round Delphi: Musa Spoke 5 Members Demographics

Regarding the relationship between sustainability and luxury, the majority of respondents (n = 50) selected ratings 3 and 4, indicating a partial overlap between the concepts of sustainability and luxury. Ten participants perceived only a slight connection between the two, while six considered

them to be fully overlapping. In contrast, three respondents viewed sustainability and luxury as entirely separate and unrelated concepts.

Table 6 reports the percentage of participants rating each factor as "3-Very important" or "4-Extremely important" in Round 1 and Round 2. Means and standard deviations of the ratings in Round 1 for factors and checkpoints are reported in Tables S1 and S2, respectively. The frequency of participants who considered each factor among the top five priorities or the five lowest priorities is also reported in Table S1. Means and standard deviations of the ratings in Round 2 for factors and checkpoints are reported in Tables S3 and S4, respectively.

Respondents in Round 1 produced 23 new prompts of aspects to consider in order to achieve sustainable luxury. Two researchers (ADG and SR) proceeded with a qualitative clustering process of the new aspects suggested, resulting in 13 new aspects. A third researcher (MB) reviewed the list for potential overlap between the newly suggested aspects and those in the original Round 1 list, confirming 13 new aspects (Table 5).

1	Fair resource allocation and distribution to achieve a positive social impact.
2	Fostering sustainable consumption through consumer communities and small circles, while also influencing broader society.
3	Harnessing experiential consumption, emotional engagement, subjective feelings, and social pressure to incentivise sustainable purchases.
4	Improving the aesthetic of sustainable products.
5	Involvement of the company in practical sustainable actions (i.e. reforestation).
6	Equal repartition of profits across the supply chain (suppliers, manufacturers, branders, retailers).
7	Salary cap for top managers, less gap with workers' salaries.
8	Providing benefits for businesses and companies when adopting sustainable practices, while decreasing the costs of adopting such practices.
9	Animal welfare
10	Ensuring fair business practices by preventing large companies from using their bargaining power to impose unfair conditions on smaller suppliers, manufacturers, or other stakeholders in the supply chain.
11	Fair price with limited mark-ups
12	Evaluating how companies act as responsible corporate citizens while navigating ethical dilemmas in the pursuit of sustainable luxury.
13	Rethinking growth and development as distinct concepts within sustainable luxury

Table 5 - The 13 aspects important to consider when tackling Sustainable Luxury suggested by MUSA-SPOKE5 Members in Round 1 of the Delphi.

\The frequency of participants who considered each of the 13 factors suggested in Round 1 among the top five priorities is reported in Table S3. In Figure 2 the average ranking of the 5 factors that had scored the highest in Round 1, scored in round 2 in terms of priority to achieve sustainable luxury is reported. The highest score was obtained by Designing high quality and durable products (average 2.41), followed by guaranteeing human rights and fair working conditions (average 2.76).

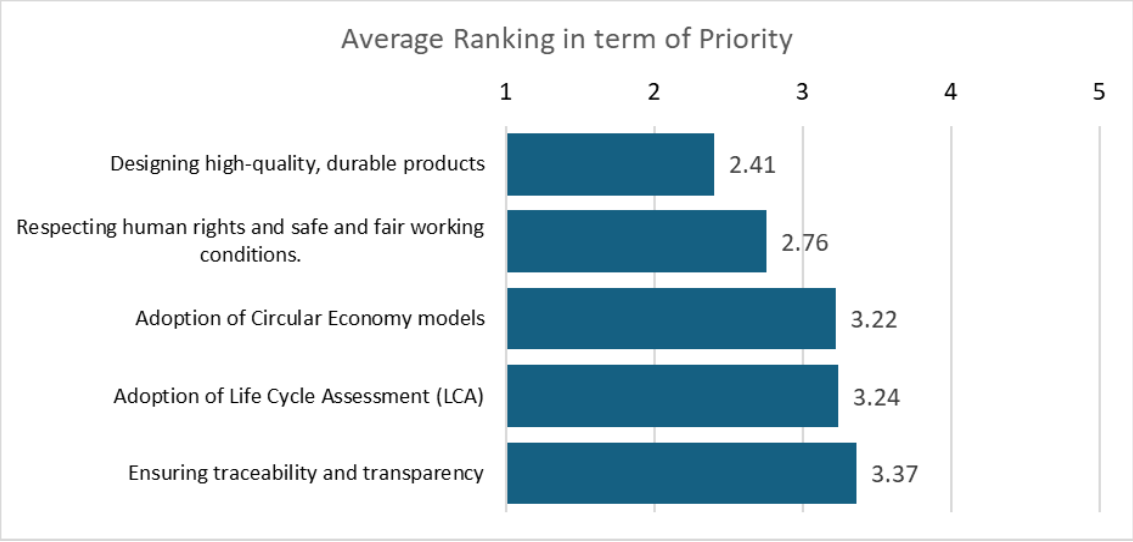

Figure 2. Phase 2- Delphi Round 2 – average ranking in terms of Priority of the 5 aspects emerging from Round 1. A lower number means higher priority.

The percentages of agreement in Round 1 ranged between 44.2% and 94.8%, with the lowest percentage for the use of Digital Twins and the highest percentage for the importance of ensuring that production processes respect human rights and promote safe and fair working conditions.

The percentage of agreement at Round 2 ranged from 25.5% to 98%, confirming the findings of the previous round.

Based on the results of round two of the Delphi survey, factors and checkpoints were organised in the three classes of consensus-based recommendations for considering them during the transition towards sustainable luxury.

A set of Wilcoxon signed-rank tests was conducted to examine whether scores differed between Round 1 and Round 2 for each factor and checkpoint considered. No statistically significant

differences were observed for any item (all $p > .174$), suggesting that participants' evaluations remained consistent across rounds. The convergence of expert opinion suggests that consensus had been reached after the second rounds, suggesting that an additional round would unlikely lead to relevant new insights - thereby validating the two-round design adopted. The percentage shift between Round 1 and Round 2 ranged from less than 1% to approximately 10%, further confirming the stability of panellists' evaluations. This low level of variation across rounds is consistent with the goals of the Delphi process and suggests that consensus had been reached on the relative importance of each factor and checkpoint.

Factors that need to be included when talking about sustainable luxury	**1st Round** (% Very important and Extremely important) Total=77	**2nd Round** (% Very important and Extremely important) Total= 51	**Percentage Shift**[a]	**Class of Recommendation**
Ensuring that production processes respect human rights and promote safe and fair working conditions.	94.8%	98.0%	2.28	I
Adoption of lean manufacturing practices to reduce water, energy, raw material, and chemical consumption through optimised processes.	90.9%	96.1%	0.65	I
Promoting local craftsmanship by collaborating with artisans and local communities to preserve traditional techniques.	84.4%	92.2%	1.25	I
Designing high-quality, durable products while optimising resources through techniques that minimise waste, such as modular or custom designs.	88.3%	90.2%	1.06	I
Adoption of Circular Economy models, meaning production and consumption practices involving sharing, lending, reusing, repairing, refurbishing, and recycling materials and products for as long as possible.	83.1%	90.2%	3.45	I
Adoption of Life Cycle Assessment (LCA) to evaluate the environmental impact at each stage: from design to production, distribution, use, and end-of-life.	80.5%	86.3%	0.82	I
Ensuring traceability and transparency across the entire supply chain by leveraging advanced technologies such as blockchain to verify the origin of materials and ensure compliance with ethical practices by suppliers.	81.8%	86.3%	1.26	I
Reducing the amount of packaging used through optimised and functional design.	72.7%	84.3%	2.25	I
Adoption of Closed-Loop Recycling Systems, production models where used materials are recycled and reintroduced into the production cycle to create new, similar products without losing quality.	75.3%	82.4%	0.65	I

Selecting materials and/or extraction or production practices with minimal impact on biodiversity and the environment.	80.5%	82.4%	0.59	I
On-demand manufacturing to reduce production and storage costs and environmental impact.	63.6%	80.4%	6.25	I
Educating consumers on recognising labels and certifications.	81.8%	80.4%	1.15	I
Employing renewable energy sources and technologies in production processes, such as solar heating and low-energy systems.	76.6%	78.4%	1.13	II
Educational marketing to communicate the product's story, the materials used, and the positive impact of the purchasing choice on communities and the environment.	72.7%	76.5%	1.10	II
Employing techniques or machinery that optimise the amount of raw material (e.g., additive manufacturing; 3D printing) to reduce waste and scraps.	72.7%	74.5%	1.11	II
Employing packaging made from biodegradable sustainable materials.	70.1%	74.5%	0.44	II
Minimising and optimising logistics and transportation to reduce the carbon footprint.	71.4%	72.5%	0.21	II
Adopting internationally recognised sustainability standards (e.g., GOTS, FSC, ISO 14001, etc.).	70.1%	72.5%	3.70	II
Extended Producer Responsibility to ensure the producer's accountability throughout the entire product life cycle, including the post-consumer stage.	75.3%	72.5%	4.58	II
Employing bio-based materials composed of renewable resources such as mycelium, synthetic silk, or biodegradable plastics.	63.6%	66.7%	1.33	III
Employing packaging made from recycled or recyclable materials.	66.2%	66.7%	1.02	III
Employing recycled materials derived from post-consumer or post-industrial waste, such as recycled PET for fabrics and metal recycling.	59.7%	60.8%	1.41	III
Adoption of upcycling models and strategies, a reuse process that does not require further material processing (e.g., transforming jeans into a skirt).	63.3%	51%	6	III

Creation of digital twins to simulate and optimise production processes before physical realisation (e.g., virtual collections to reduce physical prototypes).	44.2%	25.5%	10.53	III
Aspects suggested by MUSA Spoke 5 Members in 1st Round		**2nd Round** (% Very important and Extremely important) Total= 51		**Class of Recommendation**
Ensuring fair business practices by preventing large companies from using their bargaining power to impose unfair conditions on smaller suppliers, manufacturers, or other stakeholders in the supply chain.		80.4%		I
Involvement of the company in practical sustainable actions (i.e. reforestation).		72.5%		II
Equal repartition of profits across the supply chain (suppliers, manufacturers, branders, retailers).		66.7%		III
Salary cap for top managers, less gap with workers' salaries.		64.7%		III
Providing benefits for businesses and companies when adopting sustainable practices, while decreasing the costs of adopting such practices.		64.7%		III
Animal welfare.		62.7%		III
Fostering sustainable consumption through consumer communities and small circles, while also influencing broader society.		58.8%		III
Fair resource allocation and distribution to achieve a positive social impact.		56.9%		III
Improving the aesthetic of sustainable products.		52.9%		III
Evaluating how companies act as responsible corporate citizens while navigating ethical dilemmas in the pursuit of sustainable luxury.		52.9%		III
Fair price with limited mark-ups.		51.0%		III
Rethinking growth and development as distinct concepts within sustainable luxury.		49.0%		III
Harnessing experiential consumption, emotional engagement, subjective feelings, and social pressure to incentivise sustainable purchases.		47.1%		III
Critical checkpoints that are considered necessary to assure a transition towards sustainable luxury	**1st round** (% Very important and Extremely	**2nd Round** (% Very important and Extremely important) Total= 51	**Percentage Shift**[a]	**Class of Recommendation**

	important) total=77			
Monitoring and continuous improvement of working conditions along the supply chain, ensuring fairness, safety, and respect for human rights. Measurable goal: Percentage of suppliers verified according to ethical criteria (e.g., 100% of critical suppliers within 2 years). Checkpoint: Regular inspections, anonymous employee reports, implementation of corrective actions, and training programs.	84.4%	92.2%	0.08	I
Reduction of CO_2 emissions, energy consumption, or the use of recycled materials. Measurable goal: Reduction of the carbon footprint within a defined period (e.g., by 25% over 3 years). Checkpoint: Periodic measurement (e.g., annual) of emissions using standard tools (e.g., GHG Protocol); verification of milestone achievements (e.g., -10% after the first year).	72.7%	88.2%	5.43	I
Implementation of regular internal or external audits to monitor compliance with sustainability practices and corporate standards. Measurable goal: Percentage of business operations subject to annual audits compared to the total. Checkpoint: Frequency of audits (e.g., quarterly or annual); reports with recommendations and corrective actions implemented.	57.1%	60.8%	1.71	III
Obtaining recognised certifications (e.g., ISO 14001, GOTS, FSC) to demonstrate compliance with environmental and social sustainability standards. Measurable goal: Percentage of certified products relative to the total (e.g., 75% within 5 years). Checkpoint: Compliance audits by certification bodies; number of certifications obtained annually.	55.8%	60.8%	4.38	III
Publication of regular reports that communicate progress in sustainability to stakeholders, including successes and areas for improvement. Measurable goal: Production of a periodic (e.g., annual) sustainability report accessible to the public. Checkpoint: Timely release of reports (e.g., by Q2	48.1%	47.1%	0.28	III

each year); increased stakeholder engagement (e.g., feedback received).				

Table 6. Consensus-Based Recommendations at the Two Rounds of the Delphi Method

[a] Percentage shift for each factor and checkpoint was calculated as the absolute difference between the average scores assigned in Round 1 and Round 2, divided by the Round 1 average and multiplied by 100. This metric provides a descriptive indication of how much the panellists' ratings changed across rounds.

2.5 Discussion

This paper aims to provide a structured, consensus-driven framework for redefining and addressing sustainable luxury. Through the collective input of multidisciplinary experts and key stakeholders from the luxury and fashion ecosystem, we gathered insights into which operational principles and strategic priorities should be considered most critical for aligning luxury with sustainability, thus guiding this transition.

Specifically, to develop our recommendations, a survey of international experts and a Delphi methodology were employed, a structured technique designed to achieve consensus among experts on complex topics.

This process enabled the identification of the most critical and widely supported strategies for integrating sustainability into luxury, based on stakeholder consensus. The results were synthesised into three priority classes according to their perceived importance and feasibility, thereby guiding both academic reflection and strategic decision-making in the sector.

When considering the prioritisation of sustainable luxury practices emerging from our Delphi study through the lens of stakeholder theory (Freeman, 1984; Mitchell, Agle, & Wood, 1997), meaningful interpretations emerged. Stakeholder theory posits that organisations must account for the interests of multiple parties, ranging from consumers and employees to suppliers, regulators, and society at large, whose power, legitimacy, and urgency influence managerial decision-making. Although we need to consider that our Delphi panel was composed of experts and therefore

consumers' perspective is not fully included, our Class I–III categorisation may reflect not merely feasibility or technical priority, but the salience of stakeholder expectations across the luxury ecosystem.

Our classification, furthermore, aligns closely with other established conceptual models. For instance, Hennigs et al. (2013) identify four core value dimensions of sustainable luxury, which are financial, functional, individual, and social; our classification into Classes I–III well reflects a similar integrated perspective. Class I (e.g., traceability, fair labour, durable materials) corresponds primarily to functional and social values, Class II (e.g., renewable energy, certifications, storytelling) reinforces functional and individual dimensions, while Class III (e.g., emotional engagement, post-material values) maps onto individual and social values. Similarly, Cowan and Conejo (2022) emphasise sustainability across the full product life cycle, integrating operational and symbolic strategies; our Classes mirror this structure, with Class I recommendations corresponding to core operational priorities such as traceability, fair labour, and circular production; Class II reflecting enabling mechanisms like renewable energy, certifications, and storytelling; and Class III encompassing emergent dimensions, including consumer engagement and post-material values. These alignments demonstrate that the expert-prioritised factors do not exist in isolation but reflect an integrated model of sustainable luxury value creation.

The panel's evaluation suggests that effective strategies must balance ethical rigour, environmental stewardship, economic viability, and emotional resonance. The high consensus on traceability and equitable working conditions is consistent with increasing demands for social justice and transparency in global supply chains (Boston Consulting Group, & Altagamma, 2019; Gazzola, P., Colombo, G., Pezzetti & Nicolescu, 2017; Connell & Piccirilli, 2021). The study also revealed an emerging awareness of the economic implications of sustainability in the luxury context: items related to cost-benefit trade-offs and redistribution of value along the supply chain (e.g., fair pricing, supplier equity, reduced executive pay gaps) reflect the tension between exclusivity and equity. This underscores the need to address not only the environment but also the socio-economic dimensions of sustainability (McCormick & Ram, 2022), paving the way for a more holistic paradigm of luxury that transcends traditional boundaries. Meanwhile, the emphasis on emotional and aesthetic aspects confirms the distinctiveness of luxury consumption and the opportunity to channel aspirational and identity-driven motivations into more sustainable behaviours (Bhutto et al., 2022; Cao, Qiu, & Morrison, 2023; Qasim et al., 2019).

Sustainable luxury sits at the intersection of competing paradigms: exclusivity vs. equality, permanence vs. novelty, authenticity vs. commodification, and ethical legitimacy vs. status symbolism. These tensions reflect enduring contradictions in luxury: premium pricing and scarcity, which create exclusivity, often conflict with the democratisation of access and environmental justice ideals. Therefore, "green" luxury must negotiate these trade-offs. In doing so, our study confirms existing literature (Carrigan, Moraes & McEachern, 2013) arguing that sustainable luxury discourses must attend to institutional legitimacy (standards and certifications), cultural meaning (symbolic authenticity), and performative credibility (actual environmental and social impact) - not just consumer psychology. In other words, sustainable luxury is not simply about adding "green" features to high-end products, but about reconfiguring the luxury regime itself: how status is signalled, how value is judged, and how trust is built.

These insights help sharpen the conceptual ambiguity we face: is sustainable luxury a reform of luxury (keeping status but greening operations), a transformation (rethinking luxury's core meanings), or an alternative domain altogether? Many empirical studies settle for enumerating "green attributes", without engaging the deeper structural tensions. Our Delphi approach was not merely an exercise in ranking sustainable features but a method that surfaces expert judgments about how to navigate and reconcile those tensions. By eliciting consensus among diverse experts, we aimed to stabilise contested boundaries and map which tensions are resolvable, and which remain irreducible. In doing so, the consensus is positioned to contribute to the broader academic debates about reconciling sustainability and luxury: it offers empirically grounded insights on how luxury's symbolic, institutional, and operational dimensions can be aligned.

2.5.1 Class I Recommendations

Class I recommendations represent practices with high stakeholder salience, meaning they are widely regarded as critical by multiple stakeholders. These encompass supply chain transparency and traceability, respect for human rights and working conditions, lean manufacturing, and the use of sustainable materials and processes based on a circular economy model, such as closed-loop recycling, LCA, low-impact sourcing, and packaging reduction. Moreover, ensuring fair business

practices by preventing large companies from using their bargaining power to impose unfair conditions along the supply chain is also included in Class I Recommendations.

Initiatives such as supply chain transparency, fair labour practices, and circular economy-based operations address concerns of both regulatory bodies and consumers while mitigating reputational and operational risks for brands. These practices align with stakeholders' demands for ethical, accountable, and environmentally responsible operations. From a stakeholder-theoretical perspective (Freeman, 1984; Mitchell, Agle, & Wood, 1997), the convergence of expert consensus on Class I priorities signals that firms cannot ignore these factors without risking legitimacy, trust, and competitive advantage. Moreover, consumer education and labelling initiatives empower end-users as active stakeholders, reinforcing the co-creation of value and transparency in luxury markets.

Improving traceability in the luxury sector requires a systemic and relational approach that extends beyond technological solutions or isolated compliance mechanisms. As Holmqvist and Kowalkowski (2023) argue, enhancing traceability depends on the quality and governance of business-to-business relationships across the supply chain, where trust, information sharing, and value alignment between brands, suppliers, and resellers become central. Luxury firms should embed traceability requirements within supplier and distributor selection criteria, contractual agreements, and ongoing relationship management processes, ensuring that ethical practices are co-created rather than externally imposed. While digital tools such as blockchain and RFID technologies can facilitate data transparency, their effectiveness relies on strong relational foundations and governance structures that promote openness and accountability. Integrating traceability into the managerial and cultural fabric of the supply chain not only supports ethical integrity but also enables continuous improvement and internal learning, allowing luxury brands to reconcile traditional values of craftsmanship and exclusivity with contemporary expectations of transparency and sustainability (Holmqvist & Kowalkowski, 2023).

Elevating supply-chain transparency and traceability is foundational to ethical luxury production, also in terms of human rights. For example, the report by Business & Human Rights Resource found that 77% of companies source from countries with elevated risks of forced labour, and only 8% provide detailed disclosures on these risks beyond the first tier of their supply chains. Engagement of luxury and apparel firms with trade unions and worker representatives is limited with only 22% of companies reporting it. This figure unveiled a broader deficiency in traceability

mechanisms that would allow brands to monitor and support fair labour practices throughout their supply networks. Similarly, although nearly half of benchmarked firms have been linked to instances of forced labour, only 22% disclosed tangible remediation outcomes for affected workers, suggesting that information on labour conditions often remains opaque or fragmented (Business & Human Rights Resource Centre, 2023). Strengthening traceability systems, through transparent data sharing, supplier mapping, and multi-tier monitoring, becomes essential for ensuring ethical accountability and upholding decent work across the global luxury supply chain.

Furthermore, research shows that power asymmetries in supply chains allow dominant firms to influence decision-making processes in ways that can disadvantage weaker suppliers. Nurhayati, Rezaei, and Tavasszy (2021) highlight that firms with greater bargaining power often shape pricing, sourcing, investment, and operational decisions, which can force smaller partners to bear disproportionate costs, accept unfavourable terms, or compromise on sustainability practices. In the context of luxury supply chains, such imbalances are particularly relevant because brands frequently rely on specialised suppliers for craftsmanship and high-quality materials, giving dominant brands leverage to impose conditions along the chain. These dynamics underscore the importance of ensuring fair business practices, including transparent contracting, equitable terms, and ethical monitoring, to prevent exploitation and maintain both supply chain integrity and brand legitimacy. Strongly linked to transparency and traceability, educating consumers on recognising labels and certifications also emerged as Class-I recommendations. This aligns with recent research on the importance of traceability (Wang, 2025), showing that luxury consumers are increasingly demanding transparency about "where their luxury goods come from" and brands must implement mechanisms such as certifications, audits, and traceability systems to monitor supplier practices and material origins. Educating consumers by presenting accessible information about sourcing, certifications, and supply-chain practices is a strategic way for luxury brands to strengthen their value proposition and build deeper loyalty and trust. Emerging literature suggests that authentic sustainability claims and transparent production chains significantly enhance consumer trust and brand value, informing that transparency and traceability are no longer optional but are central to stakeholder trust and competitive advantage in sustainable luxury markets (Chekima & Wafa, 2022; Holmqvist & Kowalkowski, 2023; Karaosman et al., 2020). Despite growing awareness around sustainability, luxury consumers in fact often lack the information, access, and motivation needed to make sustainable choices. Research shows that even ethically

minded consumers feel that seeking sustainable luxury is too time-consuming and costly, and at the same time, widespread scepticism about the authenticity of sustainability claims by luxury brands is reported (Athwal et al., 2019).

On-demand production, high-quality and durable products, along with promoting local craftsmanship, have also been indicated as fundamental factors. A McKinsey & Company report (Amed et al., 2019) shows how start-ups are pioneering on-demand manufacturing, while larger players are experimenting with micro factories, speed factories, and digital knitting technologies to facilitate customisation and rapid prototyping. Key technological innovations include 3-D knitting, digital and laser printing, semi-automated sewing, automated logistics, and body-scanning tools, which allow for personalised garments at scale. Overall, these innovations are enabling reduced lead times and greater responsiveness to market trends but also improved sustainability through small-batch production, and enhanced opportunities for consumer personalisation.

The convergence of ethical, environmental, and operational criteria in this class aligns with prior findings in the literature on sustainable luxury (Kapferer & Michaut-Denizeau, 2014; Cervellon & Shammas, 2013), confirming that measurable and externally validated practices are central to stakeholder trust and legitimacy in the luxury sector. Adopting lean manufacturing and circular economy models, along with designing durable products, aligns with long-standing values in luxury, such as exclusivity, craftsmanship, and quality, but reframes them in environmental terms. The convergence of these aspects suggests that experts see a clear overlap between traditional luxury values and sustainable innovation. The emphasis in Class recommendations on traceability, fairness in business practices, and consumer education on recognising labels may reflect growing expectations from consumers and regulators for transparency and ethical conduct.

2.5.2 Class II Recommendations

Class II Recommendations are of medium priority and reflect moderate stakeholder salience. They represent areas that are important but less immediate or coercive, therefore, where firms may invest progressively, balancing feasibility constraints with the need to maintain stakeholder engagement. While these actions may not carry the same urgency as Class I recommendations, they contribute to relational and moral legitimacy and signal long-term commitment to sustainability.

These include the implementation of recognised sustainability certifications, standards, and audits, and consequently educational marketing to communicate the product's story and the positive impact of the purchasing choice on communities. Operationally speaking, reducing transportation and optimising logistics, employing renewable energy sources and technologies in production processes, such as solar heating and low-energy systems or machinery that optimises the use of raw materials and reduces waste and scraps, has also reached a medium consensus. Symbolic or experiential actions, such as corporate reforestation, extended producer responsibility, and packaging made from recyclable materials, have been highlighted as important aspects. Class II initiatives require organisational adaptation and long-term investment. Businesses may face technological constraints, inconsistent supplier standards, or resistance from creative teams concerned about aesthetic compromise. Managers should approach these as phased innovations, piloting new materials or processes in capsule collections before scaling. Embedding energy and material-efficiency targets into operational KPIs can help institutionalise these practices and ensure continuous improvement. Responsible packaging and logistics play a complementary role in reducing environmental impact throughout the supply chain. Luxury brands should transition to biodegradable or certified sustainable packaging materials and redesign logistics networks to minimise transportation distances and reliance on carbon-intensive modes. Reduction of employee travel through the introduction of digital structure and prioritising low-emission transport solutions further reduces emissions. Policymakers can reinforce these efforts through regulatory frameworks for Extended Producer Responsibility, subsidies and incentives (particularly supporting pilot projects that test low-waste production systems or implementation of post-consumer programmes such as take-back, recycling, or reforestation initiatives), and advertising standards that promote truthful communication, while NGOs and certification bodies can monitor corporate participation, facilitate partnerships, educate stakeholders about standards, and act as watchdogs against misleading claims.

Collectively, these changes indicate the relevance of visible and tangible commitments, although their implementation might require more time, resources, or structural change. Their classification may reflect the dual nature of luxury sustainability: the need for credibility and action, balanced with consumer expectations of storytelling and emotional value (Joy et al., 2012; Chekima & Wafa, 2022).

2.5.3 Class III Recommendations

Class III Recommendations reflect practices with emerging or latent stakeholder salience, such as enhancing emotional engagement, emphasising aesthetic sustainability, and redefining growth in post-material terms. These factors may be important to evolving consumer and societal expectations but currently exert limited direct pressure on luxury firms. Stakeholder theory (Freeman, 1984) helps explain their lower prioritisation: these stakeholders may possess legitimacy in principle but lack sufficient power or urgency to drive immediate implementation. Nevertheless, attention to these emergent concerns prepares firms for future shifts in stakeholder expectations and potential competitive advantage in a cultural landscape increasingly sensitive to sustainability narratives.

Class III recommendations include product aesthetics, emotional engagement, peer influence, and redefining growth and consumption in post-material terms. Although less central from an implementation standpoint, these dimensions provide insight into evolving consumer values and societal discourses. They echo the growing body of research that positions sustainability as a cultural and affective challenge, not merely a technical or regulatory one (Aggarwal et al., 2024). Class III priorities demand cultural transformation and consumer education. These can be advanced through collaborations with artists, museums, or sustainability ambassadors who reinterpret luxury as a vehicle for cultural and environmental stewardship (Joy et al., 2012). It is also of fundamental importance to communicate sustainability without diluting the prestige of products or services. Effective communication should emphasise timeless design, enduring craftsmanship, and social legacy. Storytelling should occur through immersive experiences (e.g., atelier visits, digital traceability storytelling) that enhance symbolic capital while conveying ethical credibility (Kapferer & Michaut-Denizeau, 2014). Transparency and discretion must coexist; sustainability becomes an extension of excellence, not its replacement. At the same time, Class III recommendations suggest that luxury brands should promote socio-economic equity by implementing profit-sharing mechanisms across the supply chain, reviewing executive compensation to reduce wage gaps, offering internal incentives for sustainable practices, and embedding social impact metrics into decision-making. In materials and product design, brands are encouraged to adopt bio-based, recycled, and cruelty-free materials, develop upcycling programmes, improve packaging recyclability, and uphold animal welfare standards. Digital innovations, including digital twins and virtual prototyping, can optimise production processes,

reduce waste, and enhance product aesthetics while maintaining sustainability. Together, these measures enable luxury firms to align ethical, environmental, and technological practices with consumer expectations and supply-chain realities, fostering legitimacy, innovation, and long-term sustainability.

2.5.4 Checkpoints and Priorities

In addition to the prioritisation of factors, the Delphi panel also evaluated the relevance of specific checkpoints - that is, concrete indicators and operational milestones to guide and monitor progress. Checkpoints serve as tangible measures of progress toward addressing stakeholder concerns and maintaining legitimacy. Under stakeholder theory, they can be interpreted as management tools for monitoring the fulfilment of stakeholder expectations, particularly those with high salience. For instance, among the most relevant checkpoints identified were: Guaranteeing ethical working conditions along the supply chain, ensuring fairness, safety, and respect for human rights; and the achievement of measurable environmental goals (such as carbon footprint reduction) (Class I). These checkpoints suggest that among the crucial milestones to reach are not only tools for accountability but also actual drivers of cultural and organisational change within companies.

The frequency of internal or external audits, the timely release of sustainability reports (e.g., by Q2 annually), and the adoption of recognised certifications (e.g., GOTS, ISO 14001) with defined coverage targets were in Class III recommendations. These relate to emerging or latent-salience practices. These checkpoints allow firms to anticipate shifts in expectations, aligning strategy with stakeholders' demands and expectations, which may gain influence over time. By tracking these indicators, companies can position themselves proactively for future competitive and reputational advantages.

To further validate the Delphi classification, participants were also asked to identify the top five most critical and the five least critical items to tackle when promoting sustainable luxury. The resulting ranking showed strong alignment with the class-based categorisation. The majority of top-priority items selected by panellists belonged to Class I, reinforcing their centrality and perceived feasibility. These included factors such as traceability, fair working conditions, sustainability certifications, production based on circular economy principles, and life-cycle assessments. On the other hand, the items most frequently ranked as less critical corresponded

predominantly to Class III, including abstract concepts like redefining growth, subjective emotional engagement, and aesthetic improvements. While not dismissed, these were generally seen as less actionable or urgent in the short term, thus confirming the layered structure of sustainable luxury interventions.

The consensus hierarchy offered here provides a roadmap for businesses to sequence interventions according to urgency and feasibility and help to translate sustainability aspirations into actionable priorities.

For a more detailed, stakeholder-oriented guide translating the detected priorities into practical actions, we provide a schematic table (Table S5) in the Appendices. This guide is presented as a draft: while it offers general recommendations for luxury brands, policymakers, and NGOs, each organisation should tailor these actions to the specificities of their supply chain, stakeholders, operational context, and strategic objectives. These recommendations are presented as literature-informed implications that align with the priorities identified through the Delphi consensus, rather than as empirically validated outcomes. As they represent conceptual proposals developed within this thesis, future research could empirically test their feasibility, effectiveness, and potential impact within luxury supply chains.

2.6 Conclusions and Limitations

This study contributes to policy debates on aligning economic competitiveness with social and environmental responsibility, core objectives of the UN Sustainable Development Goals, offering a three-class hierarchy of recommendations to prioritise sustainable luxury practices. Class I recommendations include supply-chain transparency, fair labour practices, circular design, traceability, and consumer education, and ask for immediate managerial action to secure legitimacy, trust, and operational compliance. Class II initiatives cover renewable energy, eco-certifications, and responsible logistics, and involve phased organisational adoption and long-term investment. Class III priorities, such as emotional engagement and post-material values, demand cultural transformation and consumer education.

Future research may build on these results by empirically testing the identified priorities and checkpoints within specific organisational and cultural contexts, thereby validating and refining the proposed framework. Comparative studies across luxury sub-sectors could reveal how industry-specific structures influence the feasibility and salience of sustainability priorities.

Likewise, cross-cultural research could deepen understanding of how socio-cultural values shape the reconciliation of exclusivity and responsibility, considering that meanings of luxury vary significantly across cultural settings. Further inquiry into consumer perceptions and emotional responses to sustainability initiatives could illuminate how authenticity, moral satisfaction, and aesthetic pleasure interact in sustainable luxury consumption.

While this study provides structured recommendations for integrating sustainability and luxury through expert consensus, several limitations should be acknowledged. While our panel size and retention are consistent with Delphi best practice, the sample is limited and affiliated with the MUSA project; therefore, results represent expert consensus within this network and should be generalised with caution. Although participants represented diverse sectors, including academia, industry, and policy, this composition may have introduced contextual bias reflecting European or project-specific perspectives on sustainability and luxury. Furthermore, the generative phase employed purposive and snowball sampling through professional networks, social media, and email invitations. While this approach is consistent with qualitative exploratory research aimed at identifying expert insights, it may introduce self-selection bias (Magnani, et al., 2005), as participation was limited to individuals already engaged with sustainability and luxury discourse. Future research should expand the geographic and cultural scope of expert participation, incorporating voices from regions where luxury markets and sustainability priorities may differ significantly.

Furthermore, the majority of Delphi participants were from academia, which may have biased the consensus findings toward academic perspectives. Although academics provide deep conceptual and methodological knowledge, their views may not fully reflect industry realities, consumer concerns, or regulatory priorities. Future studies should seek greater diversity in professional backgrounds, including industry executives, NGOs, regulators, and practitioners, to enhance the validity and generalisability of the recommendations. Additionally, item classification into three consensus-based categories followed a conceptual logic aligned with agreement thresholds rather than statistical similarity. Although exploratory multivariate techniques (e.g., cluster analysis) were not appropriate in the context of this study due to the limited sample size and underlying statistical assumptions, they can be useful to empirically examine item groupings in future research aiming at tool development or hypothesis generation. Although the decision to include only experts in the Delphi panel was intentional and aligned with

the aim of the study, to achieve a broader and more empirically grounded understanding, future research is advised to include consumers and acquire their perspective through consumer surveys, experiments, or ethnographic research.

An additional limitation of the present work is that it did not differentiate between luxury categories (e.g., fashion, jewellery, hospitality, or automotive), which may entail distinct sustainability challenges and stakeholder dynamics. Comparative analyses across sectors would allow testing the robustness and transferability of the three-class hierarchy, identifying category-specific drivers or constraints.

Finally, the Delphi method itself has inherent limitations. Potential issues include groupthink, conformity pressures, and anchoring effects, whereby early responses or dominant opinions influence subsequent ratings. The Delphi method emphasises convergence and agreement, which may downplay areas of controversy or theoretical plurality.

Future research could adopt complementary methods (such as Q methodology, cross-case analysis, or mixed-method triangulation) to capture divergent viewpoints and contextual nuances in sustainable luxury practice. Similarly, longitudinal designs could assess how consensus priorities evolve over time as sustainability standards, consumer expectations, and regulatory pressures change.

Chapter 3: Consumers and Sustainable Packaging

3.1 Rationale: The Packaging Problem

The environmental impact of packaging represents a severe ecological problem. In 2023, packaging waste generated was estimated at 177.8 kg per inhabitant in the EU, leading to a total volume of packaging waste of 79.7 million tonnes (Packaging Waste Statistics, 2025). Packaging's primary function is that of protecting its content, which has intrinsically sustainable aims and benefits. For instance, in the case of food, packaging improves food quality, safety, life extension, therefore decreasing food waste (Barage et al., 2022). Given its properties of durability, hygiene, light weight, low cost, and low permeability for gas and moisture, the most employed material in the packaging industry is plastic. Therefore, the packaging industry utilizes the biggest share of plastic generated globally, being the primary source of plastic pollution in the natural environment, thus representing a threat to biodiversity and contributing to climate change. Data shows that 30% of plastic-based packaging items such as multi-layered materials and small sachets/wrappers, are impossible to recycle, whilst just 2% of plastic packaging is recycled back into packaging (Defruyt, 2019). Research interest for more environmentally friendly materials is growing and becoming a priority.

Environmentally friendly packaging may be recyclable, reusable or made with environmentally friendly materials and less limited resources, also limiting non-degradable waste, and space in landfills. Some of the most eco-friendly solutions include reducing the amount of resources in terms of materials and energy used in the packaging production phase, either by thinning it or designing it in order to use the least amount of materials, using recycled materials, designing and implementing re-usable packaging, and employing biodegradable and bio-renewable materials (Barage et al., 2022). One example of biodegradable options could be biobased plastic, which is synthesised from organic macromolecules. These biopolymers can be made from natural resources directly, for instance from proteins and polysaccharides, or by polymerizing monomers such as lactic acid from biomass (Barage et al., 2022). A transition towards eco-friendly packaging is still at an early stage, which is why it is important to explore consumers' perceptions, expectations, and barriers.

3.1.1 Functions of Packaging

Packaging may have many features that serve different functions along the whole supply chain, meeting the needs of various stakeholders while also contributing to sustainable development. Packaging development and design is, in fact, a complex process that must positively influence the efficiency and effectiveness of the product moving through the supply chain, primarily protecting and preserving the product until its consumption; meet legal obligations and logistical criteria; convey brand-related and other important messages to consumers (Singh & Pandey, 2018). One of the main functions of packaging is protecting its content; this allows it to prolong its shelf life by assuring hygiene, thus preventing contamination from outside as well as ensuring safety, therefore preventing contamination of the surrounding environment by the product. Another important function provided by packaging design is to facilitate handling during its production, transportation, storage, usage by consumers, and disposal (Lindh et al., 2016). As Lindh and colleagues (2016) explain, packaging has the potential to promote social, economic, and environmental sustainability: for instance, through protection and prolonged product shelf life, as well as optimizing cost-efficacy of handling, storing, and transportation, and resource use. Protection of the surrounding environment from spillage of substances, waste reduction, recyclability, and second use are important functions of packaging to reduce environmental impact. Also, protection from the spillage of hazardous or risky products responds to consumers' and workers' occupational health. Packaging design and communication functions also assure consumers' safety, satisfaction, and inclusive access to products, including vulnerable consumers, whilst protecting access from children. At a consumer level, packaging has many functions, including communicating in terms of promotion as well as brand identity, and identification and traceability of its content (Lindh et al., 2016). Additionally, packaging heavily impacts the perceived quality of products and is often considered to be as important as the product, inducing a wide variety of stimuli: visual, tactile, olfactory, and textual elements (Cosentino et al., 2013).

3.1.2 The Cosmetic Industry and Packaging: Balancing Aesthetics and Sustainability

Beauty has always represented a goal for humans, who are social and visual beings. People have been using makeup and cosmetics since the Egyptian age, mostly for hygienic and health purposes. More recently, an increasing concern about physical beauty and in fighting against aging, busy

schedules, changes in sleep and eating habits, have made cosmetics essential in people's lives; interest in beauty has increased in younger and older people as well as men. It is not surprising that the global cosmetics market is a huge sector which produced a revenue of 108.97 billion U.S. dollars in 2024. Looking ahead, revenue is projected to rise steadily by 30.32 billion U.S. dollars between 2024 and 2030, indicating a clear and sustained growth trend. (Statista, 2025) .

In the US, the Skin Care share market and the Cosmetics one represents respectively the 23% and 15% by revenue, among the whole Beauty Industry Segment, which comprises services and products. Cosmetic and personal body care products are widely used in our everyday life; therefore, their frequent usage causes leakage of products and waste into the natural environment in massive quantities, representing a hazard to natural ecosystems and human health (Juliano & Magrini, 2017). Highly pollutant materials present in cosmetics are mostly UV filters, preservatives, and microplastics that have the potential for persistence and bioaccumulation (Fortune Business Insights, 2021; Ketabchi, n.d.). Due to the urgent environmental crisis, consumers seem more and more interested in natural ingredients, sustainable packaging, and other green elements in cosmetics (Amberg & Fogarassy, 2019). Even though the relative impact of packaging considering the whole life supply chain, processes, and consumptions for products depends on many variables (Golsteijn et al., 2018; Navarro et al., 2018), it surely represents a heavy footprint on the environment, given that it is designed and built to be later discarded.

Circular economy is a new paradigm of production and consumption that expects sharing, leasing, reusing, repairing, refurbishing, and recycling existing materials and products as long as possible in order to extend their life cycle to reduce the consumption of raw resources as well as waste.

The specific case of cosmetic packaging represents a particular challenge. Re-use of cosmetic packaging can rarely be applied since chemical and mechanical recycling are often not feasible due to difficulties in both the collection of post use packaging and the fact that such packaging is often strongly contaminated by residues from cosmetic products, which are hard to wash off completely. Cosmetic products are highly valuable but also easily perishable, thus strongly dependent on proper conditions of packaging, transport, storage, and distribution. Petrochemical-based plastics, such as PET, polyvinylchloride, PE, PP, polystyrene, and polyamide, represent an optimal solution for both flexible and rigid packaging, displaying many desirable properties for the scope such as: availability and low cost, transparency, softness, heat seal ability, good strength-to-weight ratio, and impermeability to UV rays, water, gases and aroma compounds. (Cinelli et

al., 2019). The use of sustainable solutions, such as bio-based and biodegradable polymers that still guarantee cosmetic preservation, would be very beneficial for the environment. Specifically, polyhydroxyalkanoates, polylactic acid, and polysaccharides derived from cellulose and starch are being tested to become a valuable alternative to plastics (Cinelli et al., 2019).

3.1.3 Consumers' and eco-friendly packaging

In recent decades, environmental protection and green marketing trends resulted in the change of consumer demands and behaviours not only considering environmental protection perspectives, but due to growing interest in the benefits of green products (Amberg & Fogarassy, 2019). Many studies have already been carried out to explore packaging eco-friendliness perceptions in consumers (Herbes et al., 2018; Ischen et al., 2022; Ketelsen et al., 2020; Prakash & Pathak, 2017; Steenis et al., 2017).

Magnier & Crié, (2015) well summarize the categories of cues that may be present on packaging that convey eco-friendliness on so-called eco-designed packaging. Cues can refer to intrinsic or extrinsic characteristics of the product, or to intrinsic or extrinsic attributes of the packaging itself. The latter, more relevant for this study, can be divided into three categories:

- ecological cues implied by the packaging structure and materials (e.g., over-packaging removal, reusability, refilling options, shape, and so on)
- graphical cues that evoke eco-friendliness, including dull colours, logos, photographs, and images
- informational cues aimed at educating consumers (e.g., labels, licenses, environmental or scientific claims).

The main focus of green marketing research is the food and drink sector and that of daily commodities (Grunert et al., 2014; Ketelsen et al., 2020; Koutsimanis et al., 2012; Magnier & Schoormans, 2015). As very well illustrated in a review, by Ketelsen and colleagues (2020) in order to design, develop, and implement sustainable packaging that is also effective in communicating its eco-friendliness value, many aspects have to be taken into account, in particular: whether consumers are familiar with the general concept of sustainability, what aspects of sustainability they are aware of, and how they define environmentally friendly packaging: and

how consumers expect eco-friendliness-related features to be shown on packaging, and what their preferences and attitudes towards environmentally friendly packaging are.

Ecological knowledge and environmental concern remain two of the major factors investigated when exploring purchase intentions towards green products and green packaging (Koenig-Lewis et al., 2014; Shimul & Cheah, 2022).

Findings show that many people have limited knowledge and understanding of the sustainability concept in general: familiarity with and benefits attributed to the general concept of sustainability vary between age, education level, and even country (Grunert et al., 2014; Herbes et al., 2018; Jerzyk, 2016; Scott & Vigar-Ellis, 2014).

Consumers greatly rely on material and graphics such as labels, logos, and colours; thus product labelling is of huge importance to enable people to grasp packaging sustainability (Ketelsen et al., 2020). However, more than four hundred eco-labelling scheme exists, though they are supposed to enable consumer make more informed and sustainable choices, not only consumers lack of knowledge to fully understand their meaning, but they may also get confused and skeptic, possibly considering such labels misleading or even deceptive (Atkinson, 2014; Jerzyk, 2016; Sijtsema et al., 2016). Misunderstanding or lack of understanding and/or non-credibility of labels could limit the effectiveness of such labels; in fact, even though consumers hold positive attitudes toward sustainability and some labels result self-explaining or are well-known (Grunert et al., 2014), they will not always recognize the best objective environmentally friendly choice (Lindh, Olsson & Williams, 2016; Steenis et al., 2017). Moreover, environmental cues used in isolation, such as dull colour but no environmental-related logo, reduce the perceived credibility of eco-friendliness, evoking on the contrary, ambiguity and hence deleterious effects on purchase intentions (Pancer et al., 2017). Cues designed to signal sustainability therefore have the potential to make sustainable options more visible, but on the other hand, to mislead consumers.

Consumers are also unfamiliar with the concept of bio-based products (Sijtsema et al., 2016). When it comes to sustainability specifically referred to packaging, consumers are not fully aware of what environmentally friendly packaging is, how to identify it, and the environmental impact of different types of packaging in terms of materials and production stages. In fact, as literature shows (Herbes et al., 2018; Jerzyk, 2016; Steenis et al., 2017), the majority of consumers in Western countries place their focus on the sustainability / eco-friendliness of the end of the life cycle of packaging, thus its recyclability or reusability, whilst ignoring the impact of the beginning

of the cycle, such as its production in terms of resources and energy consumption, transport, and retail use.

Moreover, consumers are mostly shown to make assumptions about packaging materials' sustainability that are almost opposite to what life-cycle assessments show: dry carton sachets and mixed material packaging, which according to LCA are the most sustainable options, are ranked as the least sustainable. Likewise, the most-sustainable packages in consumer perceptions (bioplastic and glass) are actually low when assessed through LCAs (Herbes et al., 2018; Steenis et al., 2017).

Environmental concern when buying also plays an important role, though not sufficient, as shown in a cross-cultural study (Grunert et al., 2014). High interest or concern in sustainability at a general level does not in fact necessarily translate to the same level of interest at a product level, nor does it lead to sustainable behaviours in terms of choices when purchasing. Even though packaging may significantly contribute in consumer choice (Rokka & Uusitalo, 2008), sustainability labels, even when perceived as salient and understood, seem to be ranked as less important compared to product quality, freshness, price, and look, which are generally consumers' priorities (Sijtsema et al., 2016).

Perceptions of consumers have been investigated by Magnier & Crié, 2015 and reported through a cost-benefit approach; the main benefits of eco-designed packaging are related to consumers' health, convenience in terms of price and perceived social utility. Other research confirms this analysis as eco-friendly packaging might make consumers even consider paying a price premium: Singh and Pandey (2018) shows that unique properties offered to Indian consumers by green packaging, such as novelty, multiple uses, monetary benefits, and its symbolic, altruistic, and biospheric value, may lead them to pay more. Consumers in a study by Jerzyk, (2016) show to be interested in packaging safety for their own health. Findings in South Africa reveal a similar focus on personal benefits, specifically monetary benefits (Scott & Vigar-Ellis, 2014). Literature shows that sustainability labels even tend to "spill-over," suggesting consumers to imply other products' features such as higher price, quality, or health and freshness (Steenis et al., 2017).

Furthermore, research highlights how product choices are multi-attribute choices and not only rational ones. Consumers in fact, not only act with rationality and logic when making ecologically responsible purchases, but on the contrary, implicit attitudes and emotions have a significant influence (Koenig-Lewis et al., 2014; Shimul & Cheah, 2022; Songa et al., 2019). Even though

packaging plays an important role in product choice (34%; Rokka & Uusitalo, 2008) the role of sustainable packaging in particular could be of little importance during the buying decision process (Jerzyk, 2016; Sijtsema et al., 2016).

Positive emotions associated with packaging, however, seem to have a large effect in mediating purchasing behaviour (Koenig-Lewis et al., 2014) and these may be elicited, along with ecological benefits, by perceived personal benefits, such as leading to a healthy lifestyle. Negative feelings on the other hand may be triggered when packaging sustainability is perceived as being inconsistent with poor ecological practice elsewhere in the product's supply chain or the brand's reputation, or in the case of by hybrid products (i.e., partially bio-based) being this associated with distrust and greenwashing (Koenig-Lewis et al., 2014; Sijtsema et al., 2016). Fear about the purity of materials used, risks about new technologies, similarity with plastic, or worry about broader effects on food supply chains could also be associated with negative emotions (Koenig-Lewis et al., 2014; Sijtsema et al., 2016). Loss of pleasure in terms of aesthetics found instead in more sophisticated and rich packaging can also elicit negative emotions (Magnier & Crié, 2015).

Message framing may also influence purchasing choice of consumers, though in interaction with their environmental responsibility: guilt appeals seem more effective when consumers have higher levels of environmental knowledge, whereas consumers with lower levels of environmental knowledge are more willing to buy an eco-friendly packaged product when the message has a pride appeal (Shimul & Cheah, 2022). Labels can have a role in increasing positive emotional reactions only in people already holding positive attitudes towards recyclability, suggesting that they cannot represent a valuable tool to turn negative attitudes into positive attitudes (Songa et al., 2019).

3.2 Literature Review: Re-evaluating Beauty: Attitudes and Perceptions of Eco-friendly Packaging in Beauty Care Products

(*The content is based on the submitted paper "Re-evaluating Beauty: Attitudes and Perceptions of Eco-friendly Packaging in Beauty Care Products - A Systematic Review"*)

To provide a comprehensive understanding of sustainable packaging in the luxury cosmetics sector, this study was conducted in two complementary stages. First, a systematic review of the

existing literature was carried out to map current knowledge on consumer perceptions, eco-friendly materials, and design strategies, highlighting both established findings and gaps in research.

3.2.1 Methods

A systematic literature review is a rigorous approach to identify, evaluate, and interpret available literature relevant to the research topic of interest, in order to synthesise findings and identify research gaps and limitations. We followed the PRISMA checklist for systematic reviews (Page, M. J. et al, 2021). The systematic review protocol was recorded in the Open Science Foundation register (https://osf.io/s3rhd/). The main steps include question formulation, search and selection, evaluation and analysis of the studies, and results reporting.

Research Question

Our aim was to find all the relevant literature exploring psycho-social variables such as perceptions, attitudes, intentions, and behaviours related to eco-friendly packaging of beauty-care products.

Search Strategy and Study Selection

The systematic review was conducted in January 2024, by extensively examining three prominent databases: Web of Science, Scopus, and ProQuest. These three databases are the largest and most comprehensive sources of multidisciplinary literature, encompassing a wide array of disciplines. The selection of these three databases was guided by the overarching aim to encompass all relevant literature about the topic. Given the multidisciplinary nature of the subject matter, this approach was adopted to ensure a thorough exploration of diverse research fields and perspectives.
After a preliminary exploration of the literature to identify the suitable terminology, we developed a specific string combining three strings of keywords related to the topic, namely:

- Psychological dimensions (perception* OR effect* OR attitude* OR behavio?r* OR evaluation* OR belief* OR intention* OR willingness-to-pay OR choice* OR preference* OR understanding OR impact* OR decision* OR concern* OR barrier* OR driver* OR

consumption* OR purchas* OR motive* OR experiment* OR investigation* OR exploration*)

- Environmental sustainability (sustainable OR green OR eco-friendly OR environmentally friendly OR bio-based OR organic)
- Specific sector of interest (cosmetic* OR beauty OR skin-care OR personal-care OR beauty-care) AND (packaging)

Three versions of the string were created to adapt it to the specific language and keywords of each selected database (see Table S6, Appendices).

All detected articles were screened according to the following inclusion criteria: original studies; English language; studies that include the measurement of at least one psycho-social variable, such as perceptions, attitudes, intentions, and behaviours towards eco-friendly packaging of skin-care and beauty-care products. No limitations regarding publication year were set.

The results of the systematic search are summarised in Figure 3 in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA; Moher et al., 2009).

All studies (n=1049) gathered from the databases mentioned above through strings and keyword combinations were uploaded to the platform Rayyan. Then, all the duplicates were identified and deleted (n=351). The remaining articles (n=698) were independently screened and assessed for relevance to the selection criteria through their titles and abstracts by three reviewers (ADG, SR, and MB). Articles were then labelled “Included”, “Excluded” or “Maybe”. Articles coded by both reviewers as “Included” were included in the next stage of study selection. Articles coded “Excluded” by both reviewers were excluded. Those articles coded as “Maybe” by either of the reviewers proceeded to the next phase, in which reviewers discussed them and reached a consensus about whether these fell within the scope of our research. A fourth reviewer (PG) was consulted when a consensus had not been reached.

The vast majority of studies (n=675) were deemed irrelevant to the scope of this review and were consequently excluded. These studies predominantly focused on packaging or personal care products from a chemical and/or biological point of view. Some others pertained to psychology, but their focus was outside the scope of this review. As a result of this screening, the number of pertinent articles was narrowed down to 23. Unfortunately, two studies proved inaccessible despite attempts to retrieve it from the authors, leading to a final count of 21 articles included in the review.

Even though this review focuses on packaging, research papers involving cosmetic and personal care products evaluated as a whole were included, as packaging appraisal was covered. Packaging is the first element consumers see, assess, and use to identify and judge brands and labels. Therefore, we concluded that studies investigating product attitudes and preferences necessarily would include assessments of packaging or at least packaging elements, either implicitly or explicitly.

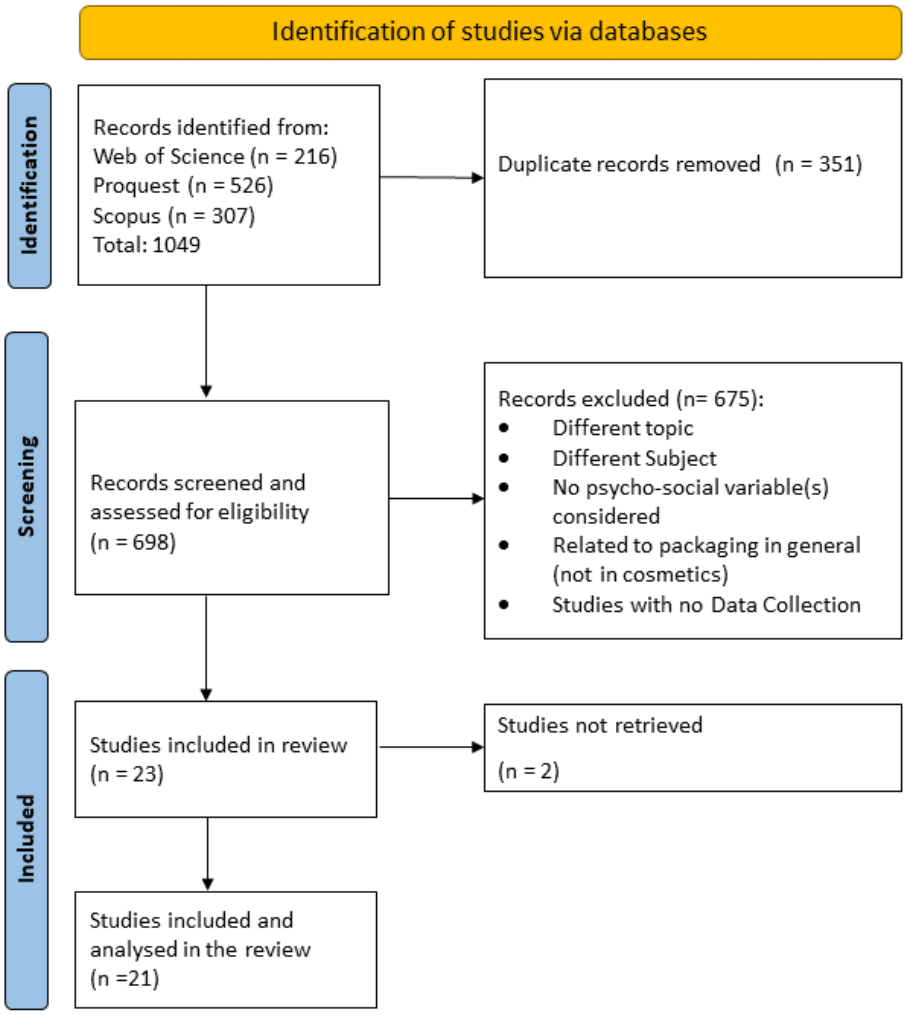

Figure 3. PRISMA Diagram From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews.

Study Evaluation and Analysis

The quality of the quantitative studies was evaluated independently by two researchers (GR and SA) with the *Joanna Briggs Institute Critical Appraisal Checklist for Qualitative Research*. This instrument is underpinned by a multi-dimensional concept of quality in research, and the 10 items assess quality according to several domains, including quality of reporting, methodological rigour, and conceptual depth and breadth. Discordances and scoring in the quality rating were resolved through discussion between the researchers.

A data extraction form was developed based on the Centre for Reviews and Dissemination templates (Dissemination, C.F.R.A., 2009). Two reviewers independently extracted the data from the included studies. Disagreements in data extraction were resolved through discussions between the authors until an agreement was reached. Relevant articles were then selected by cross-examining the articles and reviewing them. Data collected included publication date, country of investigation, study design, sample type, conceptual frameworks, psycho-social variables investigated, and outcomes.

3.2.2 Results

Characteristics of the studies and the definitions of packaging employed in the studies are hereby reported. Following, the findings are organised based on the psycho-social variables that emerged: Beliefs and Attitudes, Awareness and Knowledge, Preferences, Intentions to Purchase, and Behaviours. Finally, Socio-Demographic Characteristics and the Industry Perspectives are presented.

Studies Characteristics

The 21 studies included were published between 2012 and 2023 (for more details see Table S7, Appendices).

More than half of the studies (n=11) have been carried out in Europe. Eight studies (38%) were conducted in Asia, whereas one study was conducted in North America (Grappe et al., 2022) and one in South America (Andrade et al., 2020). Thirteen studies were published in the last three years, namely n=4 in 2021 and n=5 in 2022, n=4 in 2023.

The population investigated has been mainly consumers and the general population, (n=18), while 3 studies involve industry stakeholders. Specifically, Andrade and colleagues (2020) explored the interest towards green logistics of five Brazilian enterprises. Skackauskiene and Vilkaite-Vaitone (2022) provided the perspective of 9 marketing managers of different kind of enterprises about challenges of green marketing; Suphasomboon and Vassanadumrongdee (2023) interviewed industry and policy stakeholders of the cosmetic industry in Thailand.

One study (Lofthouse et al., 2017) involved designers who developed ideas for refillable packaging systems and consumers who tested them. Ten studies focused on packaging specifically, eleven studies included packaging-related aspects but focused on cosmetic products (Drăgan & Petrescu, 2013; Lavuri et al., 2022; Lin et al., 2018; Moharam, 2023; Pop et al., 2020; Simão et al., 2022; Singhal & Malik, 202; Skackauskiene & Vilkaite-Vaitone, 2022; Šniepienė & Jankauskienė, 2021; Suphasomboon & Vassanadumrongdee, 2023; Zollo et al., 2021).

Regarding the methodology of the studies, the majority of them (n=12) employed a cross-sectional design administering online or in-person questionnaires. Six studies were qualitative, employing semi-structured interviews (Andrade et al., 2020; Hanss & Böhm, 2012; Kahraman & Kazançoğlu, 2019; Skackauskiene & Vilkaite-Vaitone, 2022; Suphasomboon & Vassanadumrongdee, 2023) or focus groups (Lin et al., 2018). Two studies described an experimental design. Grappe et al. (2022) conducted a randomised between-subject experiment, and Simão et al. (2022) employed a single-factor between-subjects experimental design. One study by Lofthouse et al., (2017) used a mixed methodology collecting both quantitative data through a questionnaire and qualitative data through workshops and focus groups.

The studies included in this review built upon a wide range of theoretical frameworks drawn from psychology, consumer behaviour, and marketing (summarised in Table 7). Some studies employed more than a single theoretical framework. Grappe and colleagues (2022) integrated the theory of planned behaviour (Ajzen, 1985) with the framing theory (Tversky & Kahneman, 1981) to test the effect of differently framed claims on products. Lavuri (2022) explored the mediating roles of trust and attitude on consumers' purchase intention using the Stimulus-Organism-Response (SOR) paradigm (Jacoby, 2002) and the dual-factor theory (Herzberg, 1966). Moslehpour et al. (2021) drew their hypotheses from contributions of the theory of planned behaviour and the value attitude behaviour hierarchy model (Homer & Kahle, 1988). Najm et al. (2023) and Moharam (2023) based their research on the theory of planned behaviour and the value-belief-norms theory (Stern, 2000).

Zollo et al. (2021) built on the social proof theory by Cialdini (1993) and the theory of planned behaviour. Six studies did not explicitly mention their conceptual framework and/or were exploratory in nature, whereas 5 are segmentation studies (Amberg & Fogarassy, 2019; Drăgan & Petrescu, 2013; Singhal & Malik, 2021; Šniepienė & Jankauskienė, 2021; Vázquez et al., 2023). Lofthouse and colleagues (2017) carried out a feasibility applied testing.

As for the overall quality of the studies included in the review, 11 studies were evaluated as high quality, 7 as medium, and 3 as low (see Table S7, Appendices).

Theoretical Framework	Description	Studies
Theory of Planned Behaviour	Intentions to engage in a behaviour include attitudes toward the behaviour, perception of subjective group norms concerning the behaviour, and degree of perceived control concerning the behaviour.	(Grappe et al., 2022); (Moharam, 2023); (Moslehpour et al., 2021); (Najm et al., 2023); (Pop et al., 2020); (Zollo et al., 2021)
Framing Theory	Changes in the presentation of an issue or an event produce changes of opinion.	(Grappe et al., 2022)
Stimulus-Organism Response (SOR) Paradigm	Environmental aspects (S) influence an individual's internal state (O), which subsequently causes the individual's behavioural response (R).	(Lavuri, 2022)
Dual Factor Theory	Two factors can influence consumers' resistance to attempting a new activity or changing a current one.	(Lavuri, 2022)
Value Attitude Behaviour	Consumer values indirectly influence behaviour through the mediating role of attitudes.	(Moslehpour et al., 2021)
Value-Belief-Norms Theory	Values influence pro-environmental behaviour via beliefs and personal norms.	(Moharam, 2023; Najm et al., 2023)
Perceived Value Theory	Perceived value is often conceptualised as the consumers' overall assessment of the utility of a product or service based on perceptions of what is received and what is given.	(Suphasomboon & Vassanadumrongdee, 2022)
Social Proof Theory	The idea that people copy the actions of others in an attempt to emulate behaviour in certain situations.	(Zollo et al., 2021)

Table 7 - Theoretical Frameworks employed in the studies included

Packaging Definition or Labels

Sustainable packaging and cosmetic products have been investigated through the use of multiple and vague definitions. Some authors use more than one interchangeably (Table S7, Appendices). The most employed attributes to define sustainable packaging were eco-friendly or environmentally friendly (Drăgan & Petrescu, 2013; Grappe et al., 2022; Pop et al., 2020; Singhal & Malik, 2021; Suphasomboon & Vassanadumrongdee, 2023; Zollo et al., 2021) and green (Lin et al., Moharam, 2023; 2018; Moslehpour et al. 2021; Pop et al. 2020; Suphasomboon & Vassanadumrongdee, 2022). Natural refers to packaging, products or ingredients have been used by Amberg and Fogarassy (2019), Kahraman and Kazançoğlu (2019), Najm et al., (2023) and Simão et al., (2022). Organic products as labels have been used in three studies (Lavuri et al., 2022; Šniepienė & Jankauskienė, 2021; Zollo et al. 2021). The attribute of recyclability has been employed in two studies (Andrade et al., 2020; Grappe et al., 2022;) as well as that of biodegradability (Drăgan & Petrescu, 2013; Moslehpour et al., 2021). Refillable as indicative of sustainable options, have been discussed by Lofthouse et al. (2017). Two studies (Hanss and Böhm, 2012; Vàzquez et al., 2023) employed existing logos issued by independent third-party bodies to define and indicate sustainability.

Beliefs and Attitudes

A great proportion of studies (n=18) explored consumers' attitudes. Attitude can be defined as "a relatively enduring and general evaluation of an object, person, group, issue, or concept on a dimension ranging from negative to positive." "Attitudes provide summary evaluations of target objects and are often assumed to be derived from specific beliefs, emotions, and past behaviours associated with those objects" (American Psychological Association, 2024).

The studies explored attitudes towards many different aspects of green cosmetics.

Hanss & Böhm (2012) carried out a qualitative study to investigate what attributes related to sustainability in cosmetics are relevant to Norwegian consumers. They found that the protection and distribution of resources (comprising both environmental sustainability as "Low energy production" and social sustainability as "Fair payment of producers") was considered the most important attribute. That was followed by natural pureness and animal protection. Economic sustainability-related attributes were considered least important. In 2013, Drăgan and Petrescu

conducted a study in Romania exploring participants' trust in organic certifications and their attitudes towards organic products' price and performance. Consumers' trust in certified organic products was high, and almost all were convinced that organic products have better performance and increased health benefits than conventional ones. However, consumers did not justify the higher organic product prices.

Only a few years later, Lin and colleagues (2018) found general low interest and neutral attitudes towards natural cosmetics among UK female consumers, despite most participants being emotionally supportive of green products. The main drivers of attitude formation were reported to be lifestyle and values, perceived consumer effectiveness (i.e., "the extent to which an individual consumer could be effective in pollution reduction"), and recommendations from peers and social media. Participants with greater environmental concern and with higher knowledge of ingredients and standards reported more positive attitudes towards green cosmetics.

Kahraman and Kazançoğlu (2019) explored consumers' attitudes towards natural-claimed personal care products among Turkish women. Their findings reveal that sixty percent of the participants believed that natural products were safer for the environment. Higher positive attitudes were driven by the reputation of a brand, and whether the brand had been involved in the natural product sector since the beginning. A similar result is reported by Lavuri (2022), who shows how a green brand image has a fundamental role in trust and attitudes towards luxury green beauty products. According to Lavuri (2022) green ads have a positive impact on consumer trust (i.e., reliability of purchases of luxury organic products and acceptance of the concept of luxury organic products) and attitudes (i.e., beliefs of their health-related benefits and naturalness compared to conventional food) towards luxury organic beauty products.

Interestingly, in the study by Kahraman and Kazançoğlu (2019) most participants reported higher trust towards the naturalness of cosmetics if these have higher prices; on the other hand, more than half of the subjects reported to doubt naturalness claims. Participants reported to be particularly sceptical of "100% natural" claims, as perceived as false and purely linked to marketing strategies.

When compared with environmental benefits, health benefits have been found to play a primary role in driving organic product selection in some studies (Moharam, 2023; Šniepienė & Jankauskienė, 2021). Pop and colleagues (2020), on the other hand, found that a more positive attitude towards green cosmetics is driven by higher environmental concern but not by health

concern. Environmental knowledge and concern alongside awareness of green marketing claims have been found to positively affect attitudes towards green packaging (Moslehpour et al., 2021; Najm et al., 2023). According to Grappe and colleagues (2022) both health and environmental concerns contribute to forming positive attitudes towards green products, along with the credibility of health- or environmental-related claims. Specifically, the strongest impact on attitudes towards products has been determined by absence-claims (i.e., "paraben free" and "reduced environmental impact") compared to presence-claims (i.e. "with avocado oil" and "recycled plastic"). Natural claims have also been found to trigger the halo effect, positively influencing products' perceived safety, sensory expectations, and perceived efficacy (Simão et al., 2022). Social media have been found to be an effective means to positively impact environmental concern and thus positive attitudes towards green products (Pop et al., 2020).

Positive attitudes towards luxury organic beauty products are also influenced by the consumers' perception of their own Consumer effectiveness. Moreover, consumers' tendency towards a lifestyle of health and sustainability, and trust towards luxury beauty products, have both a statistically significant negative impact on the attitude towards luxury beauty products.

It has to be noted that the attitude towards luxury beauty products in Lavuri's study were rated as opposed to traditional food. Specifically, as higher perceived naturalness compared to conventional food ("I believe that luxury organic beauty products contain more natural ingredients than conventional food"), higher perceived healthiness than conventional food ("I believe that luxury organic beauty products are better for my health than conventional food"), and the general consideration of health aspects in beauty products selection ("The health aspect is very important in my beauty products choice").

Awareness and Knowledge

Awareness could be defined as whether you consciously see a stimulus. Knowledge could be described as information and skills, acquired through experience or education, leading to the theoretical or practical understanding of a subject.

Knowledge of and awareness about eco-friendly beauty care products and their packaging have been explored in 9 papers, although considering different aspects of sustainability and sustainable products. Hanss and Böhm (2012) explored the knowledge of the concept of sustainability in a Norwegian sample, showing that environmental, social, and developmental dimensions were all

included in their understanding of the concept. They also found a positive correlation between familiarity with sustainability-related labels and perceived sustainability of products. In 2013, Drăgan and Petrescu explored Romanian consumers' knowledge of ingredients of organic beauty care products. Their findings revealed a limited understanding: fewer than 20% of respondents reported familiarity with the meaning of the ingredients, while the great majority (almost 84%) admitted to lacking knowledge about them. Lin and colleagues (2018) researched consumers' understanding of green cosmetics, revealing that participants possessed a general awareness but exhibited limited knowledge of specific standards for natural ingredients and how to discern ingredient origin and processing. Consumers also reported low awareness of green labels and occasional scepticism, perceiving them as mere marketing strategies. Similar findings were observed by Kahraman and Kazançoğlu (2019), who explored scepticism and perceived greenwashing among 20 Turkish women. They reported an overall confusion about the risks of natural products, with 25% of participants describing product information as vague and asymmetric. To decrease scepticism, participants sought information mostly by searching on the internet (Lin et al., 2018). Šniepienė & Jankauskienė (2021) found that incomplete or unclear information on labels was considered one of the most important reasons not to choose organic products. Most recently, Vázquez and his colleagues (2023) categorised Spanish consumers based on their awareness and attitudes towards sustainability labels across various sectors. They observed that about half of consumers showed familiarity with a significant percentage of certified labels and consequent trust in their usefulness. Interestingly, three other kinds of consumers identified in the study were characterised by their low levels of recognition of certified sustainability labels and neutral or negative attitudes towards them.

Preferences, Intentions to Purchase, and Behaviours

According to some theoretical frameworks, in particular the theory of planned behaviour (Ajzen, 1985) the relationship between attitude and behaviour is mediated by intentions. However, sometimes these predictions fail, resulting in the so-called intention-behaviour gap (Echegaray & Hansstein, 2017).

Different behaviours and preferences have been extensively investigated across the papers included in the review. Drăgan and Petrescu (2013) offer a thorough picture of Romanian consumers' cosmetic-buying behaviours, revealing that the majority prefer conventional (44.18%)

and natural (31.4%) skin care products over ecological and biological alternatives. Most respondents reported reading the ingredients of cosmetic products only sometimes, while less than 20% always read them. Interestingly, eco-friendly, biodegradable packaging was a preference for about one-third of respondents, particularly when paired with certified organic products. Amberg and Fogarassy (2019) investigated the correlation between attitudes towards a healthy lifestyle, biological food and environmental protection with intentions to buy cosmetics featuring natural ingredients and eco-friendly packaging among Hungarian consumers. The study identified three consumer clusters: one with heightened health and environmental awareness interested in natural ingredients and packaging; a second cluster preferring chemical cosmetics over natural ones and avoiding bio-food; and a third cluster in the middle, showing moderate avoidance of bio-food but being more open to natural products and packaging. Green packaging has also been mentioned by Lithuanian consumers as an important attribute they consider when purchasing (Šniepienė & Jankauskienė, 2021). Lofthouse and colleagues (2017) explored preferences for eco-friendly packaging, identifying essential attributes for choosing refillable packaging, including high quality, a fun experience, economic incentives, and ease to use. Findings revealed the importance of clear communication through labels about: refill procedures, packaging materials, disposal instructions, product availability, and environmental benefits of refillable options. Attitudes towards green packaging have been demonstrated to directly affect purchase intentions amongst young consumers in Thailand, having a stronger influence than their environmental knowledge (Moslehpour et al., 2021). Furthermore, Moslehpour and colleagues (2021) showed that the importance of green packaging surpasses the influence of price, indicating that consumers prioritise packaging sustainability over cost considerations.

Green cosmetics may be, in fact, associated with expensiveness and luxury, with higher prices positively affecting people's trust and perception of naturalness, since natural products are considered to be more costly due to prices of raw materials and natural production (Kahraman & Kazançoğlu, 2019; Lin et al., 2018).

Consumers expressed, in some studies, a willingness to pay extra for eco-friendly features (Amberg & Fogarassy, 2019; Moslehpour et al., 2021). For instance, according to Amberg & Fogarassy (2019) 70% of participants expressed a willingness to pay extra for packaging made of natural materials. Other research instead indicates that higher prices can be a deterrent (Drăgan & Petrescu, 2013); Lin et al., 2018; Moharam 2023; Šniepienė & Jankauskienė, 2021). Nevertheless,

contradictory findings emerge regarding the impact of price on green cosmetic choices. When labelling is not clear, for instance, price (Lin et al., 2018; Moharam, 2023), along with mistrust, are the main criteria for not choosing green cosmetics (Šniepienė and Jankauskienė, 2021). According to consumers in the study by Drăgan and Petrescu (2013), lower price, packaging attractiveness, and brand popularity outweigh the importance of eco-friendly packaging alone. As mentioned before, scepticism about natural claims and perceived greenwashing have been reported as the main reasons not to purchase by Kahraman and Kazançoğlu (2019) and Lavuri (2022). Conversely, trust and positive attitudes emerge as strong predictors of buying behaviour (Lavuri, 2022; Pop, 2020; Singhal & Malik, 2021).

Other factors that have been found to influence intention to purchase green cosmetic products are: subjective norms, perceived behavioural control, perceived value, and ethical concerns. Pop and colleagues (2020) found that, along with positive attitudes, subjective norms positively influence purchase intentions. Social media affects these factors influencing environmental concern, which has a positive impact on attitudes, hence consumers' intentions to buy. Assessing and evaluating others' online reviews and comments about products have been found to be the most important variable in defining the intention to purchase organic personal care in Spanish and Italian consumers (Zollo et al., 2021). Subjective norms have an impact on purchase intentions in the study by Grappe and colleagues (2022), along with attitudes and perceived control, the latter only in products presenting presence-framed claims (i.e., "with avocado oil" and "with recycled plastic") in contrast to absence-claims (i.e., "paraben free" and "reduced environmental impact"). The presence of natural claims has been found to increase consumers' purchase intentions: according to Simão, Rohden and Pinto (2022), they do so by increasing perceived efficacy and sensorial expectations of products. Packaging design and its printed information, such as brand labelling, logo, and writing pattern, also have a significant impact on purchase intentions (Najm et al., 2023). Consumers who have the ability to recognise more labels and have more positive attitudes towards them are also those who tend to purchase more certified products (Vàzquez et al., 2023). As for the perceived behavioural control, Moharam (2023) found that it has a positive and significant effect on purchasing behaviour. Suphasomboon and Vassanadumrongdee (2022) found that ethical concerns including animal testing and ethical sourcing were a strong predictor of green purchase intention. The perceived functional value (i.e., product benefits obtained from its functional, utilitarian, or physical purposes) influenced both ethical concerns and intentions to

purchase. Also, emotional value (i.e., emotional states, feelings, affection, and reactions against the product) shows a statistically positive influence on ethical concern, even though not directly on purchase intentions.

Socio-demographic Segmentation

As for the role of socio-demographic factors on consumers' choices in organic and green cosmetics, several studies have explored them in diverse cultural contexts. Drăgan and Petrescu's insights from Romania (2013) reveal that income and gender impact preferences for organic skincare, with higher income and being female linked to greater interest. Knowledge about ingredients, however, did not seem to be correlated with age or educational level. Similarly, in Hungary, Amberg and Fogarassy (2019) found that female consumers are more receptive to natural cosmetics. Šniepienė and Jankauskienė, (2021) showed that among Lithuanian consumers, women aged 26-35 commonly use natural products. However, unlike in Romania, income did not affect the choice to buy such products. In India, Singhal and Malik (2021) found that attitudes toward green cosmetic products were not significantly influenced by age or education among female consumers, although attitudes toward price and recommendations varied across income groups. On the other hand, Bahraini and British female consumers' higher education and income correlated with the purchase of green cosmetics (Lin et al., 2018; Moharam, 2023). According to Vàzquez et al. (2023) the most effective consumers in using certifications are women under 35 with a university background who are concerned about the environment. On the other hand, males over 45 who are less concerned about the environment and do not have university studies tend to have difficulties in recognising, evaluating, and using sustainability-related labels.
In Thailand, Suphasomboon and Vassanadumrongdee (2022) discovered that age, income, and profession played no role in controlling consumer purchase intention toward green cosmetics.

The Industry Perspectives

Three studies, all qualitative in nature, explored industry stakeholders' perspectives. Andrade and colleagues (2020) involved members of five companies within the Cosmetics, Personal Hygiene and Perfumery industry in Brazil. While the majority of respondents displayed limited interest in greener packaging, two companies acknowledged the potential pressure to adopt such practices in the future. Despite the overall lack of enthusiasm, the interviewed employees

recognized Quality Function Deployment and Quality Deployment as valuable strategies for incorporating Green Logistics concepts in the supply chain and to address customer needs. Skackauskiene and Vilkaite-Vaitone (2022) explored marketing managers' perspectives on implementing green marketing practices in Norway and Lithuania. Challenges in the cosmetic industry included supply chain and resource constraints, insufficient government support, and consumers' lack of awareness.
Similarly, lack of public awareness and understanding, and scarce support from government and policies have been highlighted by Suphasomboon & Vassanadumrongdee (2023), who interviewed 12 Industry and policy stakeholders in the cosmetic industry in Thailand. Specifically, they identified three kinds of barriers. Operational barriers include a lack of professional knowledge and expertise on sustainability, a lack of direct involvement in production processes, and a lack of clear sustainability performance metrics. Structural barriers include a lack of sustainability assessments and standards. Policy barriers include a lack of financial support and incentives, and a lack of public awareness and understanding.

3.2.3 Discussion

Given the growing need for more eco-friendly solutions in the field of cosmetics, it is crucial to understand both consumers' and industry stakeholders' perspectives. As suggested by Ketelsen et al. (2020), in order to design, develop, and implement sustainable packaging that is effective in communicating its eco-friendly value and is socially desirable, many consumer-related aspects have to be taken into account. For instance, whether consumers are familiar with the general concept of sustainability, what they expect eco-friendliness-related features, and what their preferences and attitudes are.
My review aimed at collecting existing evidence regarding consumer perceptions, attitudes, and behaviours towards green packaging options in the field of cosmetics.
The absence of a clear and shared definition for eco-friendly, green, or natural packaging emerges and leads to practical and methodological challenges when exploring the relationship of consumers with eco-friendly beauty care products. These terms are used interchangeably or are attributed by third-party certification and inspection bodies, each with its specific, and at times, divergent regulations, resulting in distinct operational definitions (Drăgan & Petrescu, 2013). This could lead

to the emergence of claims, messages, logos, and labels that are confusing and overwhelming for consumers who do not have resources for effectively assessing products, and therefore sometimes are even deterred from purchasing (Atkinson, 2014; Brach et al., 2018; Jerzyk, 2016; Kahraman & Kazançoğlu, 2019; Sijtsema et al., 2020; Šniepienė & Jankauskienė, 2021; Vázquez et al., 2023). A need for guidance in navigating information regarding sustainable features has, in fact, been well highlighted (Grunert et al., 2014; Lindh et al., 2016; Steenis et al., 2017). In fact, even consumers holding a high interest in sustainability still struggle to recognise the most environmentally friendly products (Grunert et al., 2014; Lindh et al., 2016; Steenis et al., 2017). Health-related standards are also of high interest to consumers when purchasing (Ratajczak et al., 2023).

As for the public awareness of cosmetic impact on health and the environment, our review confirms low levels of awareness about the health impact of ingredients and low levels of knowledge about standards regarding environmental sustainability. These findings also align with the literature about consumers' awareness of food impact (Van Bussel et al., 2022). Our findings also highlight that to promote positive attitudes towards natural cosmetics, both perceived health and environmental benefits have shown to be effective. These same factors affect intention to buy, since both health and environmental concerns can act as drivers for developing intentions to purchase. Our results, however, do not allow us to determine whether and to what extent one of these factors is predominant in shaping attitudes and in driving purchasing behaviours. When exclusively considering the packaging, being perceived as eco-friendly plays a central role in consumers' willingness to buy and pay a premium price. However, only a few investigations explored the isolated role of green packaging in directing the consumers' choice; therefore, conclusions should be drawn with caution.

Other drivers that need to be better explored are the ethical-related aspects. Although our findings collectively suggest that consumers consider ethical issues before purchasing, data cannot be easily compared as the studies considered either focused on different deontological aspects (i.e., testing on animals; social sustainability of ingredients) or used different assessment tools. More research could be addressed at better profiling consumers' motivations with respect to deontological dimensions and social norms. As a matter of fact, our findings highlight that subjective norms among peers, and through social media in particular, seem to trigger or reinforce interest in choosing natural options. Literature shows how social media marketing activities significantly

enhance green values, environmental concerns, and brand image, which positively influence brand involvement, influencing purchase intention (Hu, Chao & Lin, 2024). However, even though social media can contribute to promoting sustainability consciousness and stimulate the demand for sustainable products, their role could also be problematic. For instance, Simeone and Scarpato (2020) point out that often the most available information to users is related to the least sustainable practices (Simeone & Scarpato, 2020).

Price represents a relevant challenge and criterion that consumers consider when purchasing cosmetics and personal care products. On the one hand, price seems to be considered as a synonym of quality and actual naturalness, given the awareness of extra costs of harvesting natural substances and manufacturing products with a lower environmental footprint (Kahraman & Kazançoğlu, 2019; Lin et al., 2018). On the other hand, price is considered a barrier to purchase behaviour (Drăgan & Petrescu, 2013; Lin et al., 2018; Moharam, 2023). Younger consumers seem to better accept the burden of a higher price, but at the same time, these represent the population group with less means to pay for the extra price (Moslehpour et al., 2021). Young people's interest in investing in natural products and their greater awareness and acceptance of higher prices could be partially influenced by higher use of social media, which has been demonstrated to increase environmental concern, positive attitudes towards green cosmetics, and intentions to buy (Pop et al., 2020; Zollo et al., 2021). This is in line with the most recent reports, stating that 67% of consumers in the beauty industry look at influencers on social media before purchasing a new product (Pulse Advertising, 2024).

As for socio-demographic factors, the studies analysed in the present review collectively underscore the multifaceted nature of consumer preferences influenced by factors such as income, gender, education, and cultural context, with no clear indication on how those factors shape preferences, intentions, and purchasing behaviour. These results challenge the classical assumption that female consumers with greater financial resources are the only ones receptive to natural cosmetics (Chirilli et al., 2022; Panzone et al., 2016) and call for a further clarification of the role of those factors in shaping attitudes, motivation to buy, and purchasing behaviours in the natural cosmetic sector. Furthermore, our findings echo those of Harun and Moury (2019), who showed how elements of packaging design can be perceived and valued differently depending on consumers' age, occupation, and gender, resulting in differential behaviours. Younger consumers, particularly those from Generation Z and Millennials, tend to be more environmentally conscious

and place significant value on eco-certifications as indicators of a product's sustainability. As highlighted in several studies, these consumers are more likely to positively evaluate products with eco-friendly packaging and are heavily influenced by social media campaigns and peer opinions (Pop et al., 2020; Zollo et al., 2021). However, they are also more sceptical of greenwashing, demanding greater transparency and clarity in certifications. In contrast, older consumers, while appreciative of eco-certifications, tend to prioritise other factors such as price, brand reputation, and personal health benefits. For this group, certifications related to health (e.g., "organic" or "natural") may carry more weight than purely environmental labels (Drăgan & Petrescu, 2013). As a result, marketing strategies should be tailored to respond to these generational differences, emphasising transparency and authenticity for younger consumers, while combining eco-certifications with messaging about product quality and health benefits for older consumers.

Also, shifts in society must be taken into account. For instance, a more complex set of gender identities, such as genderfluid and genderqueer, must be taken into account not only in research but also in terms of practical implications.

When focusing on industry stakeholders, only a few authors explored their perspectives and challenges (Andrade et al., 2020; Lofthouse et al., 2017; Skackauskiene & Vilkaite-Vaitone, 2022; Suphasomboon & Vassanadumrongdee, 2023). Awareness in consumers seems important for managers and industry stakeholders, along with supply chain challenges, lack of expertise, and metrics to assess impact, and of support from the government. These studies reveal global challenges and varying degrees of industry engagement in adopting sustainable practices in the cosmetics sector.

Our findings collectively stress the need to better profile consumers' drivers and detect motivations to green cosmetic packaging and products. Consumer preferences for sustainable packaging materials are key drivers in shaping decisions regarding product labelling and the adoption of eco-certifications. As sustainability becomes a central concern, clear and widely recognised eco-certifications not only signal environmental responsibility but also help build consumer trust, particularly in younger, more environmentally conscious demographics. To respond to this demand, brands should prioritise the development of clear, standardised labelling systems that highlight packaging attributes such as recyclability, biodegradability, or reusability, thus promoting transparency and reducing the risk of greenwashing. Our findings suggest that eco-certifications can significantly influence consumer purchasing behaviour, particularly when labels

are perceived as credible and easy to understand. This underscores the need for consistent labelling practices across different markets to ensure that consumers are empowered to make informed decisions. Future research should further explore the role of eco-certifications across various consumer segments and geographic regions, focusing on how innovations in sustainable packaging can address both environmental concerns and consumer expectations. Additionally, understanding the long-term effectiveness of these certifications in shifting consumer behaviour will be critical for brands looking to stay competitive in an increasingly eco-conscious market.

Several aspects could be considered as limitations and hinder the generalisability of results. Given the impact of cultural aspects on consumers' attitudes and choices, it is difficult to compare studies. As for the samples of the studies analysed, in many studies it was small, thus, most likely not representative of a general population or industries (Andrade et al., 2020; Lofthouse et al., 2017; Skackauskiene & Vilkaite-Vaitone, 2022; Suphasomboon & Vassanadumrongdee, 2023). Furthermore, the field of cosmetics, and in particular of green ones, is rapidly and continuously growing alongside consumers' awareness thus the ten-year range of this review can only provide us with some hints of how research has evolved through time and give us some suggestions for future questions. Also, the qualitative appraisal shows that only 11 studies were evaluated as of high quality; moreover they mostly focused on cosmetics in general rather than packaging specifically. The variables and constructs investigated were several, and even in the cases of same construct, different scales and measures were employed (e.g., "environmental concern" in Grappe et al., 2022; Moharam, 2023; Moslehpour et al., 2021; Najm et al., 2023; Simão et al., 2022; Zollo et al., 2021) with some studies not reporting items or questions employed to assess constructs which makes comparing results difficult. Socio-demographic factors' impact on preferences and behaviours remains unclear and a more in-depth analysis concerning the diversity among consumer cohorts and their packaging preferences is warranted.

Our considerations built upon the collected evidence, highlight the need for future research employing representative samples, clear theoretical frameworks and validated scales to measure constructs, in order to allow replicability and the possibility to carry out cross-cultural comparisons. Longitudinal studies could be advised, to explore differences across time and across generations given the growing efforts by companies in the field as well as by consumers and the aforementioned shifts in society and gender norms. Also, a more in-depth analysis concerning the diversity among consumer cohorts and their packaging preferences is warranted.

In terms of industry stakeholders, cost implications, technological feasibility, and supply chain management concerning sustainable packaging are some of the areas to be further investigated. Eventually, research focused on luxury sustainable beauty goods should be carried out to better understand consumers' perceived contradictions.

3.2.4. Conclusions

Overall, our findings highlight a few main actionable recommendations for policymakers and industry leaders to drive meaningful change in consumer behaviour toward sustainable cosmetic packaging including established clear standards and enhance eco-label awareness; encourage transparent and standardised communication from brand; leverage social media and cultural sensitivity for effective engagement; promote and support eco-friendly options.

A first step in the direction of better guiding consumers could be for the government to set precise standards for eco-labels and, therefore, increase awareness about ingredient health and environmental standards. Governments can implement regulations requiring clear labelling of ingredients and packaging materials, helping consumers make informed choices. For instance, at the European level, governments can increase efforts to increase people's awareness of the European Union EU Ecolabel, which is the ecological quality mark established in 1992 and regulated since 2010. The government, furthermore, could encourage the adoption of eco-friendly solutions by providing tax breaks or subsidies for companies that use sustainable practices.

As for firms, companies, and brands, they could direct their efforts towards achieving international and global certifications rather than pursuing unclear logos and labels. From a survey in Italy, consumers demand that every product should clearly indicate its environmental impact (76% of respondents agree); the information provided must be standardised, easy to understand, and not left to the discretion of manufacturers (71%); moreover companies that misrepresent the sustainability of their products should face strict penalties (82%) (Metta, 2022).

Once standards have been established, firms, policymakers, and organisations should educate consumers about such eco-labels. Also, companies' marketing and communication strategies need to be transparent and clear in order to elicit trust in consumers. For instance, efforts towards developing a positive brand reputation in terms of interest in pursuing certification and selling sustainable products could increase trust and decrease scepticism. Firms can enhance consumer

trust and familiarity with sustainability through authentic social media campaigns and influencer partnerships, which are perceived as personal and engaging. Additionally, marketing strategies should consider cultural nuances and evolving societal values, such as inclusivity for genderfluid and genderqueer consumers, tailoring communication strategies and advertising to resonate broadly yet authentically.

Besides a lack of awareness among consumers and insufficient support and incentives from the government, companies underline their difficulties in facing resource constraints. Cosmetic companies can address the cost barrier related to sustainable packaging by adopting a circular economy approach, which can also help lower expenses. Providing incentives, such as discounts for returning used containers or loyalty programs for sustainable purchases, can motivate consumers to choose eco-friendly options despite higher upfront costs. Additionally, partnering with universities and research institutions to identify cost-effective, sustainable materials can make eco-friendly packaging more accessible.

A method for shifting the behaviours of more sceptical or unmotivated consumers and even to overcome economic barriers, especially affecting young people, could be to "nudge". Nudging means altering the choice architecture surrounding the desired behaviour – i.e., the physical, social, and psychological aspects of the contexts. This can be achieved through interventions designed to make specific consumer choices easier or encourage alternative actions, for instance, through legislation, regulations, financial incentives, infrastructure enhancements, and the implementation of technological solutions.

However, many questions remain to be answered by research. What aspects should packaging communicate to consumers specifically? For instance, is it better to highlight a product's efforts to tackle sustainability issues that consumers care about most, or those that consumers believe they can influence more easily? Additionally, what are their concerns regarding sustainability—are they focused on their own health, social inequalities, ethical dilemmas, or quality considerations?

3.3 Empirical Study: Investigating Consumer Intentions Toward Eco-Friendly Cosmetic Packaging

(Based on Publication *"Luxury Meets Sustainability: Investigating Consumer Intentions Toward Eco-Friendly Cosmetic Packaging" Submitted*)

3.3.1 Introduction and Objectives

Building on the insights provided by the systematic research reported in the 3.2 section, an empirical study was designed to explore consumers' attitudes, preferences, and willingness to engage with sustainable packaging solutions in the luxury context. In this section the methods and the outcomes of the empirical investigation are presented and discussed highlighting the implications of sustainable luxury packaging.

Taken together, the findings of the systematic review reveal a fragmented and methodologically heterogeneous body of evidence, in which key psychological drivers of sustainable cosmetic packaging are often examined in isolation, measured inconsistently, or embedded within broader constructs that limit comparability and cumulative knowledge. While the literature clearly indicates that perceived environmental and health benefits, social influence and price-related trade-offs are central in shaping consumers' responses to green packaging, it remains unclear how these forces interact to produce purchase intentions and actual decision-making, and how different sustainability concerns are weighted by consumers. In response to these gaps, this study adopts the Theory of Planned Behaviour as a coherent and validated psychological framework to explore how attitudes, subjective norms, and perceived behavioural control jointly shape consumers' intentions toward sustainable cosmetic packaging, while explicitly integrating environmental concern, health concern, and social sustainability concern as distinct but related motivational dimensions. By operationalising these constructs through established and psychometrically validated scales, the empirical study directly addresses the methodological limitations identified in the review, namely the lack of standardised measures, weak theoretical integration, and limited replicability, while providing a focused, packaging-specific analysis of consumer decision-making. In doing so, this study advances the field by moving beyond descriptive insights toward a theory-driven,

comparable, and empirically robust understanding of how and why consumers engage with sustainable packaging in the cosmetics sector.

3.3.2 Theoretical Underpinning and Hypotheses Development

From this point onward, the content is based on the submitted paper "Luxury Meets Sustainability: Investigating Consumer Intentions Toward Eco-Friendly Cosmetic Packaging".

Theory of Planned Behaviour

The Theory of Planned Behaviour (TPB; Ajzen, 1985; 1991) is a psychological model that explains how people's behaviours are guided by their intentions. These intentions are shaped by three core components: attitude toward the behaviour, subjective norm, and perceived behavioural control (Figure 4).

Attitude toward the Behaviour refers to a person's overall evaluation of the behaviour, namely whether they see it as positive or negative. Subjective Norm refers to the perceived social pressure to perform or not perform the behaviour.Perceived Behavioural Control (PBC) is the perceived ease or difficulty of performing the behaviour — similar to a sense of self-efficacy. Behavioural Intentions are a person's motivations or plan to perform the behaviour.

Intentions are considered the most immediate predictors of actual behaviour and are influenced by the three factors above: attitude, subjective norm, and perceived behavioural control.Generally, the more favourable an individual's attitude toward a behaviour, the stronger the perceived social pressure to perform it, and the greater the perceived control over its execution, the stronger their intention to engage in that behaviour is likely to be (Ajzen, 1991). However, the relative influence of attitude, subjective norm, and perceived behavioural control on intention may vary depending on the specific behaviour and context. In some instances, intention may be predominantly shaped by attitudes alone; in others, a combination of attitudes and perceived behavioural control may adequately predict intention. In yet other cases, all three components may contribute independently and significantly to the formation of behavioural intention (Ajzen, 1991). This theoretical framework is one of the most established frameworks for predicting and explaining consumer decision-making and has been widely employed in literature for investigating many sustainable-related behaviours including energy saving (Scheller et al., 2023), sustainable consumption (Magwegwe & Shaik, 2024), and food choices (Alam et al., 2020; Pandey et al., 2021).

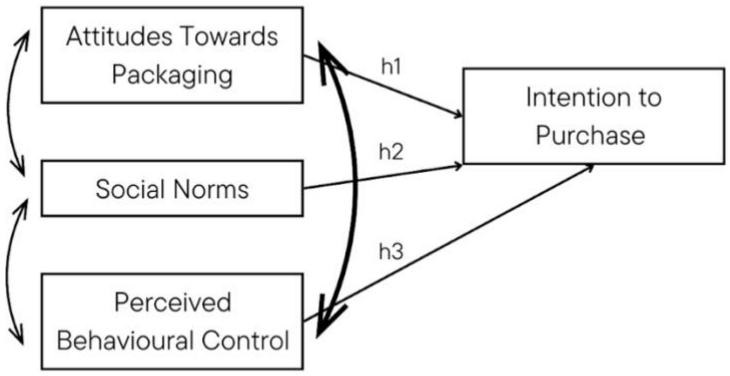

Figure 4. Theory of Planned Behaviour (Ajzen 1985; 1991)

Hypotheses and Study's objectives

Based on the TPB theory, the following hypotheses have been derived:

H1 Positive attitudes towards eco-friendly packaging are positively related to intentions to purchase sustainable packaging
H2 Higher social norms related to eco-friendly packaging are positively related to intentions to purchase sustainable packaging
H3 Higher perceived behavioural control in purchasing eco-friendly packaging is positively related to intentions to purchase it

A further aim of the present study was to deepen our knowledge about values and beliefs affecting attitudes towards eco-friendly packaging for cosmetic and beauty products. While some studies have shown that health benefits tend to be the dominant driver in consumers' choices of organic products (Moharam, 2023; Šniepienė & Jankauskienė, 2021), other research highlights the stronger influence of environmental concern. For instance, Pop and colleagues (2020) reported that positive attitudes towards green cosmetics are more closely linked to environmental concern than to health motivations. Similarly, environmental knowledge, concern, and awareness of green marketing claims have been shown to enhance consumer attitudes towards green packaging (Moslehpour et al., 2021; Najm et al., 2023). The study by Grappe (2022) has provided further nuance by demonstrating that both health and environmental concerns play a role in shaping

positive attitudes towards green products, especially when such products carry credible claims. The present study, therefore focused on both health and environmental concerns in exploring consumer perceptions and behaviours toward sustainable products. Health concern was conceptualised in this study as an individual's attentiveness and perceived vulnerability regarding health-related risks, behaviours, and outcomes; environmental concern refers to the endorsement of an ecocentric worldview, encompassing a set of beliefs that express awareness of the planet's ecological limits, the fragility of natural balance, and the negative consequences of human activity on the natural environment (Dunlap et al., 2000). Social concern was also investigated due to scarce evidence regarding that as a motivation to choose sustainable packaging. It was considered as a sense of responsibility and empathy toward societal issues, including equity, justice, and collective welfare that reflects an individual's orientation toward improving social conditions and reducing harm to others.

An extended model (Figure 5) was thus developed, and the following hypotheses were formulated.

H4 Social Concern is positively related to positive attitudes towards sustainable packaging

H4 (b) Social Concern is positively related to intentions to purchase sustainable packaging

H5 Environment Concern is positively related to positive attitudes towards sustainable packaging

H5 (b) Environment Concern is positively related to intentions to purchase sustainable packaging

H6 Health Concern is positively related to positive attitudes towards sustainable packaging

H6 (b) Health Concern is positively related to intentions to purchase sustainable packaging

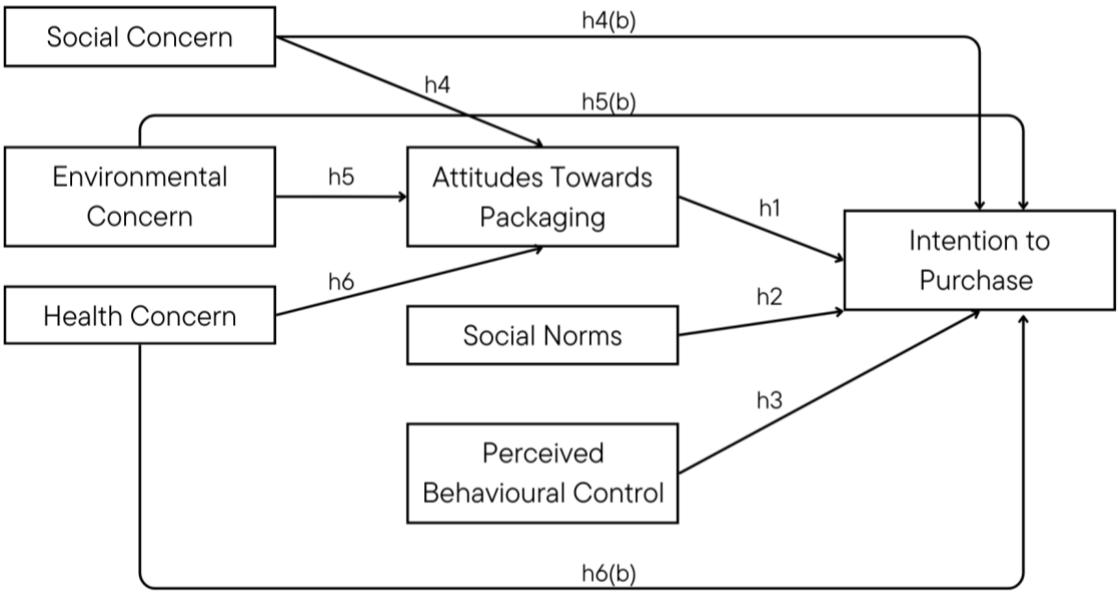

Figure 5. Adapted model of the Theory of Planned Behaviour used in the present study, based on Ajzen's original model (Ajzen 1985; 1991)

3.3.3 Methods

Study design

An online survey was developed by the research team comprising clinical and health psychologists. The questionnaire was built on Qualtrics. Before starting the survey, participants were asked to sign the informed consent form digitally. The average time to complete the questionnaire was 10 minutes. To deal with social desirability bias the questionnaire's introduction and consent form stressed on anonymity, confidentiality, and independence of the respondents. The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and the Helsinki Declaration of 1975, as revised in 2008. Ethical approval was obtained from the University of Milano - Bicocca Ethics Committee (Protocol 807 - Meeting of the Ethics Committee held on December 18, 2023).

The online survey comprised questions investigating:

- Demographic information: gender, age, annual income, educational level, employment status, area of residence

- Consumers' willingness to spend: to segment consumers, a multiple answer question investigated the amount of money the participants are willing to spend on an anti-age face cream. The options included: up to 30 euros, between 30 and 50 euros, between 50 and 80 euros, between 80 and 100 euros, more than 100 euros.
- The location of the usual purchase of face cream was asked by providing some options as well as allowing free text responses. The options provided were pharmacy either physical or online, official brand stores either physical or online, beauty Stores either physical or online, supermarket, home and personal care store and beauty salons.
- Preferences regarding cosmetic packaging: to investigate the preferences regarding packaging of luxury cosmetics participants were asked to rank in order of importance a set of criteria related to what they look for in the packaging / product when purchasing luxury cosmetics. The options included price, brand reputation, quality, environmental efforts replicating choice criteria investigated by Achabou & Dekhili (2013); also, aesthetics, rarity and exclusivity and creativity were added, from the luxury scale theorised by De Barnier et al (2012) being those attributes better applicable to a packaging.
  - To investigate the importance of environmental sustainability of packaging a question asking "How important is the environmental sustainability of the packaging when purchasing luxury cosmetics / beauty products?", to be rated on a Likert scale from 1=not at all, to 5=extremely.
- Needs for Educational Material:

  The perceived need and interest in educational material about sustainable packaging was asked as well as in which format they would prefer to receive such information (paper format, video, podcast etc). Participants were asked "What format would you like educational material on sustainable packaging to be in?"
- Extended Model of Theory of Planned Behaviour: in particular, attitudes towards ecofriendly packaging, subjective norms and Perceived behavioural control were investigated through 5, 4 and 6 items respectively. All items were adapted from (Moharam, 2023). Participants were asked to "Select how much each statement represented them" on a Likert scale ranging from 1=not at all to 7=extremely. The items are reported in the Appendices (Table S8).

Intentions to purchase were measured by randomly showing one of three pictures of a sample disc made from materials derived from plant based as a potential packaging material (see Appendices, Table S8). The image reported the caption “From plant waste (cauliflower waste, parsley waste, or carrot waste), this material – as shown in the photo – can be obtained and this can be used to create packaging whose production causes lower carbon emissions and requires less energy compared to traditional plastic and other bioplastics” then asking "Would you buy a face cream with packaging made from plant waste?" to be answered on a Likert scale ranging from 1=not at all to 5=extremely. Participants were also asked how the material in the picture was appropriate to produce skincare packaging and medical devices.

Social concern was measured by reporting the level of agreement with one ad hoc item, “When I purchase cosmetic products, it is important to me to consider their social sustainability." Agreement was expressed on a Likert scale ranging from 1=strongly disagree to 5=strongly agree.

Environmental Concern was investigated through the Italian validated version New Ecological Paradigm Scale (NEP; Dunlap et al., 2000; Prati & Zani, 2013). The NEP Scale was chosen because it measures general beliefs about the human–environment relationship rather than issue-specific concerns that may become outdated. Its broad, ecocentric focus has made it the most widely used and validated measure of environmental attitudes. Participants had to rate their agreement with 15 items on a 5-point Likert Scale from 1-strongly disagree to 5-strongly agree.

Health Concern was measured by employing the fitness subscale from the Lifestyle of Health and Sustainability (LOHAS) scale by Choi & Feinberg (2021) that is made of 5 items. For further details about the questionnaire, see Table S8 in the Appendices.

Sample and Recruitment

Italian consumers were recruited both online and in person. The recruitment message was posted on social media, and additional participants were reached through snowball sampling. They received a short message containing information about the research topic and a link to access the online survey (Supplementary B and C). Anyone 18 or older was eligible to participate.

Using the standard formula for estimating a population proportion with a 95% confidence level and a ±5% margin of error,

$$n = \frac{Z^2 \cdot p \cdot (1-p)}{e^2}$$

with $Z = 1.96$, $p = 0.5$ (maximum variability) and $e = 0.05$ yields.

For SEM, widely cited guidelines (Hair et al., 2010; Kline, 2016) recommend between 5 and 10 participants per observed indicator; given the 30 indicators included in this model (5 for Health Concern, 5 for Attitudes, 4 for Subjective Norms, 6 for Perceived Behavioural Control, 8 for Environmental Concern, 1 for Social Concern, and 1 for Intention), the minimum required sample ranges from 150 (5:1 ratio) to 300 (10:1 ratio). Furthermore, SEM complexity-based recommendations indicate that models with multiple latent variables and several structural paths typically require at least 200 participants to ensure stable parameter estimates and proper model fit (Kline, 2016). Wolf et al. (2013) similarly suggest that models of moderate complexity generally require 200–400 cases to achieve adequate power and avoid improper solutions. In the present study, most constructs demonstrated strong loadings, while the reduced NEP factor showed moderate loadings (.41–.52) across eight indicators. Under these conditions, prior simulation studies (Wolf et al., 2013), indicate that sample sizes around 300 cases are necessary to ensure adequate power, minimal parameter bias, and proper solutions. The sample size employed in this study therefore meets recommended thresholds for Confirmatory Factor Analysis models with mixed strong and moderate loadings.

3.3.4 Results

Demographic information

Five hundred and sixty-four people accessed the survey, but a total of 393 consumers completed it. This final sample of 393 participants was large enough both for estimating proportions and for Path Analysis.

Of these, 75 (19.1%) were men, 313 (79.6%) were women, 3 respondents did not identify with a binary gender, and 2 preferred not to disclose their gender (Table 8). The mean age is 39.4 years (sd= 13.6), and the range is 18-80 years old. Regarding annual income, 121 participants (30.8%)

reported earning less than 15,000 euros; 158 (40.2%) reported an income between 15,000 and 29,000 euros; 88 (22.4%) reported earning between 29,000 and 55,000 euros; and 23 respondents (5.9%) reported an annual income above 55,000 euros. The majority of respondents (36.4%) hold a high school diploma as the highest education level (n=143) followed by (n=132, 33.6%) respondents who have a master's degree. Sixty-five participants (16.5%) have a bachelor's degree, 32 hold a PhD (8.1%), and 19 participants (4.8%) have a certificate of secondary education. Most participants live in Northern Italy (n=293, 74.6%), followed by 11.7% (n=46) living in the South and Islands. 10.7% live in the centre (n=42). 10 respondents worked abroad.

Gender	Men n= 75 (19.1%) Women n= 313 (79.6%) Nonbinary n= 3 (.8%) Preferred not to say n= 2 (.5%)
Age	Mean=39.4 years old (Sd= 13.6, range 18-80 years old)
Income	< 15000 euros/year n=121 15000 – 29000 euros/year n= 158 29000-55000 euros/year n= 88 > 55000 euros/year n= 23 (3 missing responses)
Education	PhD n=32 Master's Degree n=132 Bachelor's Degree n= 65 High School Diploma n=143 Secondary School Diploma n= 19
Location	Northern Italy n=293 Centre of Italy n=42 South Italy and Islands n=46 Abroad n=10

Table 8 – Demographic information of the sample

Psychological constructs

Data Screening and Missing Values

All variables were inspected for missing data, scale ranges, and distributional properties prior to model estimation. Missing values were minimal across all constructs (< 2% per item), with Social Concern and Intention showing no missing responses. Given the negligible proportion of missingness, no imputation procedures were applied, and analyses proceeded using maximum likelihood estimation. All items fell within their expected Likert scale ranges, and univariate distributions showed no problematic skewness or kurtosis. The composite intention variable, created by mapping product-specific intention items to the corresponding experimental condition, displayed an appropriate range (1–7) and only one missing value. Overall, the data met the assumptions required for CFA and Path Analysis.

Initial CFA and NEP Refinement

The initial CFA indicated excellent performance for Attitudes, Perceived Behavioural Control, Subjective Norms, and Health Concern, with all loadings significant and within acceptable to strong ranges. In contrast, the NEP factor exhibited substantial heterogeneity, with several items showing weak (< .30) or negative loadings. Based on theoretical and empirical considerations, a reduced 9-item NEP structure was retained. The selected items represented three theoretically coherent NEP subdimensions: Fragility of Nature's Balance, Possibility of an Eco-Crisis, and Anti-Anthropocentrism. This revised scale demonstrated moderate to strong loadings (β = .408 – .731), indicating good convergent validity. This refined structure improved the conceptual clarity and psychometric adequacy of the environmental concern construct, and the CFA of the revised measurement model showed that all constructs were adequately represented by their indicators (Table 9).

Scale Reliability

Internal consistency was evaluated using Cronbach's α and McDonald's ω. Attitudes (α = .847, ω = .856), Perceived Behavioural Control (α = .851, ω = .857), and Health Concern (α = .856, ω = .862) demonstrated strong reliability. Social Norms showed acceptable reliability (α = .738, ω = .743). The full 15-item NEP scale showed acceptable internal consistency (α = .751, ω = .768), consistent with its known multidimensionality. However, item-level diagnostics revealed several weak or problematic indicators, prompting further refinement during the CFA stage.

Scale	**X^2 (df)**	**p-value**	**TLI**	**CFI**	**SRMR**	**RMSEA**

SOCIAL NORM	0.07 (1)	0.79	1.000	1.000	0.000	0.000
ATTITUDES	3.90 (4)	0.42	1.000	1.000	0.011	0.000
HEALTH CONCERN	2.41 (3)	0.49	1.000	1.000	0.007	0.000
ENV CONC	49.2 (22)	< .001	0.931	0.958	0.036	0.056
PBC	14.6 (8)	0.067	0.987	0.993	0.020	0.046

Table 9 - CFA fit indices for each scale

Notes: correlated residuals for each questionnaire: SOCNORM (item1 - item4), ATTITUDE (item4 - item5), HEALTH CONC (item4 - item5; item1 - item4), ENVC (all reverse-scored items), PBC (item1 - item5).

Regarding the NEP scale (Environmental Concern) we employed the items regarding the subscales: Fragility of Nature's Balance (items 3, 8R, 13), Possibility of an Eco-Crisis (items 5, 10R, 15), and Anti-Anthropocentrism (items 2R, 12R, and 7). Factor scores were used in the subsequent analyses. The decision to retain a reduced set of NEP items was grounded in both theoretical coherence and in the results of confirmatory factor analysis of the original questionnaire.

Willingness to spend, purchase locations, and the importance of packaging sustainability

Results regarding the budget allocated to anti-aging cream are presented in Table 10. Two hundred and fifty-one (63.9%) respondents indicated they would spend up to €30 on an anti-aging cream, while 92 participants (23.4%) reported a willingness to spend between 30 and 50 euros. Thirty participants (7.6%) indicated a budget between 50 and 80 euros, and only 5 (1.3%) respondents reported spending more than 100 euros. Consumers spending between 80 and 100 euros, as well as those spending over 100 euros, represent mid-to-high and premium purchasing profiles, respectively, and may therefore be classified as luxury consumers. Overall, these consumers represent less than 5% of the sample. To examine whether the willingness to spend on an anti-aging facial cream differs by gender, a Mann–Whitney U test was conducted. The results showed a statistically significant difference between men and women ($U = 9328$, $z = -3.19$, $p = .001$), indicating that women tend to allocate a higher budget than men. A set of Spearman's rank-order correlation was conducted to examine the relationship between the amount participants are willing to spend on an anti-aging facial cream and annual income, education level, and age. The analyses revealed positive and statistically significant correlations between willingness to spend and income

(r_s (387) = .269, p < .001), as well as between willingness to spend and age (r_s (387)= .328, p < .001), indicating that higher income and older age were associated with a greater willingness to spend. In addition, a positive but weak statistically significant correlation emerged between education level and willingness to spend (r_s (388) = .111, p = .028).

Price	N=participants	Percentage of Participants	Importance of packaging sustainability in purchasing luxury cosmetics (1 - not at all to 5 - extremely important) (mean, SD)
Up to 30 euros	251	63.9%	3.35 (1.15)
Between 30 and 50 euros	92	23.4%	3.58 (.94)
Between 50 and 80 euros	30	7.6%	3.67 (1.06)
Between 80 and 100 euros	14	3.6%	3.64 (1.4)
More than 100 euros	5	1.3%	3.40 (1.5)
Total	392		3.44 (1.1)
Missing	1		

Table 10. Budget participants would be willing to allocate for a face anti-age cream

The usual purchase locations for creams is illustrated in Table 11. Most respondents purchase face anti-age cream in pharmacies (39.7%) and brand stores (32.6%) followed by 30.5% who buy in beauty stores (either physical or online).

Place of purchase	N=participants	Percentage of Participants
Pharmacy either physical or online	167	42.5%
Official Brand stores either physical or online	126	32.1%
Beauty Stores either physical or online	120	30.5%
Supermarket	108	27.5%
Home and Personal Care Store	105	26.7%
Beauty Salons	29	7.4%
Other	27	6.9%

Table 11. Place of usual purchase for face anti-age cream

Across the different spending ranges, clear differences emerged in the preferred purchase locations for anti-aging face creams. Among respondents with the lowest budget (up to 30 euros), pharmacies represented the most frequently chosen channel, accounting for 39.4% of purchases within this spending group. In the 80–100 euros range, the highest proportion of respondents reported buying their creams in perfumery stores (including online), indicating a shift toward more specialised and premium retail environments. Finally, among those willing to spend more than 100 euros, the dominant purchase channel was brand-specific stores, either physical or online. An ordinal logistic regression was conducted to examine whether environmental concern, health concern, and social concern predicted the budget allocated for anti-aging face cream, while controlling for gender and age. The overall model was statistically significant, X2 = 75.7 (df = 20), $p < .001$, and explained approximately 10% of the variance ($R^2 = .098$). Among the predictors, health concern ($p = .033$), age ($p < .001$) and gender ($p = .028$) emerged as significant contributors. In contrast, environmental concern ($p = .262$) and social concern ($p = .091$) did not show significant effects.

When asked how important environmental sustainability of packaging is when choosing a luxury beauty product, respondents' mean was 3.44 (range from 1=not at all, to 5=extremely on a Likert Scale), with a standard deviation (SD) of ±1.11 (Table 10). Within the subgroup reporting spending more than 80 euros on anti-aging face creams (N = 19), the average importance rating was 3.58 (SD = 1.39), indicating a moderately high level of concern. In terms of distribution, 36.8% rated sustainability as "extremely important" (score 5), and 15.8% as "very important" (score 4). Only 21% gave low ratings (scores 1 or 2), while 26.3% selected the midpoint (score 3). These results suggest that consumers with higher spending intentions tend to value sustainable packaging more than lower budget consumers. To explore gender differences in importance attributed to environmental sustainability of packaging, a Mann-Whitney U test was carried out, and no statistically significant difference emerged ($U = 10571.00$, $z = –1.34$, $p = .180$). Similarly, Kruskal–Wallis tests were run to explore possible differences in the importance attributed to packaging sustainability across income groups and levels of education. No statistically significant difference in the importance attributed to packaging sustainability was found for income ($\chi^2(3) = 5.21$, $p = .157$) or educational levels ($\chi^2(4) = 1.51$, $p = .824$ $p = .824$). A Spearman's rank-order correlation revealed a small but significant positive association between age and the importance

attributed to environmental sustainability of packaging when purchasing luxury cosmetics, ρ = .155, p = .002, suggesting that older participants tend to value sustainability slightly more. A multiple linear regression was conducted to examine whether environmental concern, health concern, and social concern predicted the importance attributed to environmental sustainability in luxury cosmetic packaging, while controlling for gender and age. The overall model was statistically significant, $F(5, 377) = 29.2$, $p < .001$, and explained a substantial portion of the variance ($R^2 = .270$). Two theoretical predictors contributed significantly to the model: social concern ($\beta = .404$, $p < .001$) and environmental concern ($\beta = .170$, $p < .001$). In contrast, health concern ($\beta = .086$, $p = .067$), gender ($\beta = -.067$, $p = .554$) and age ($\beta = .057$, $p = .218$) did not show significant effects.

Preferences regarding Packaging

To investigate the preferences regarding packaging of luxury cosmetics, participants were asked to rank in order of importance seven criteria related to what they look for in the packaging/product when purchasing luxury cosmetics. Figure 6 presents the average ranking of the packaging attributes considered when purchasing luxury cosmetics (1 = most important to 7 = least important). *Quality* received the highest priority with an average rank of 1.72, followed by *Price* at 2.56. *Environmental protection efforts* ranked fourth, with an average score of 3.54.

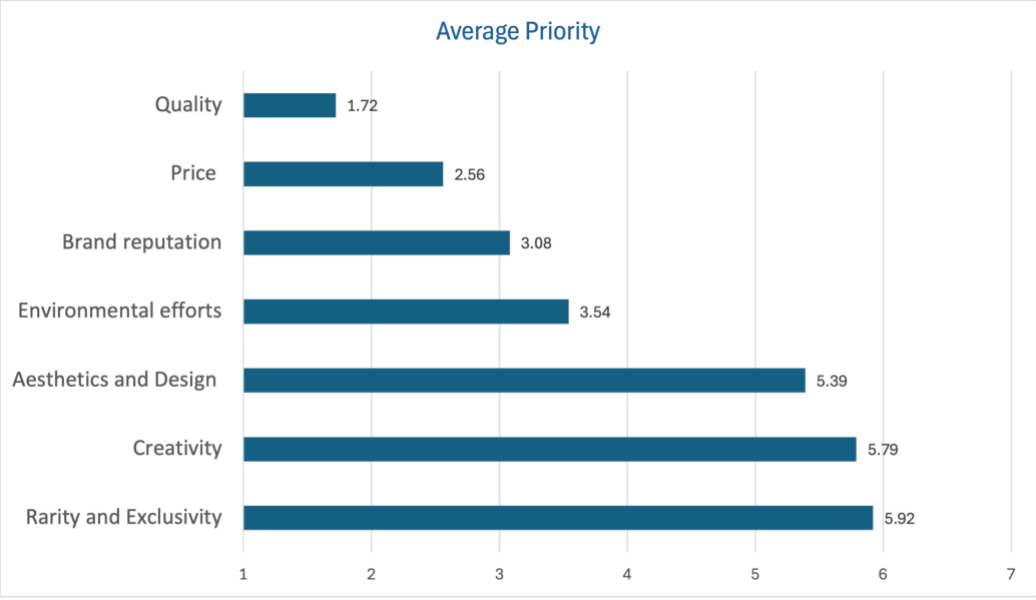

Figure 6. Average ranking of the importance of 7 attributes of packaging when purchasing luxury products. A lower number means higher priority.

Among high-spending consumers (those spending €80–100 and >€100), product quality emerged as the top priority when evaluating luxury cosmetic packaging (M = 1.26), followed by brand reputation (M = 2.74) and environmental efforts (M = 3.21). Price was considered less important (M = 3.63), while aesthetics, exclusivity, and creativity ranked lowest (see figure 7). These results suggest that high-budget consumers prioritise substance and ethical credibility over visual appeal or novelty.

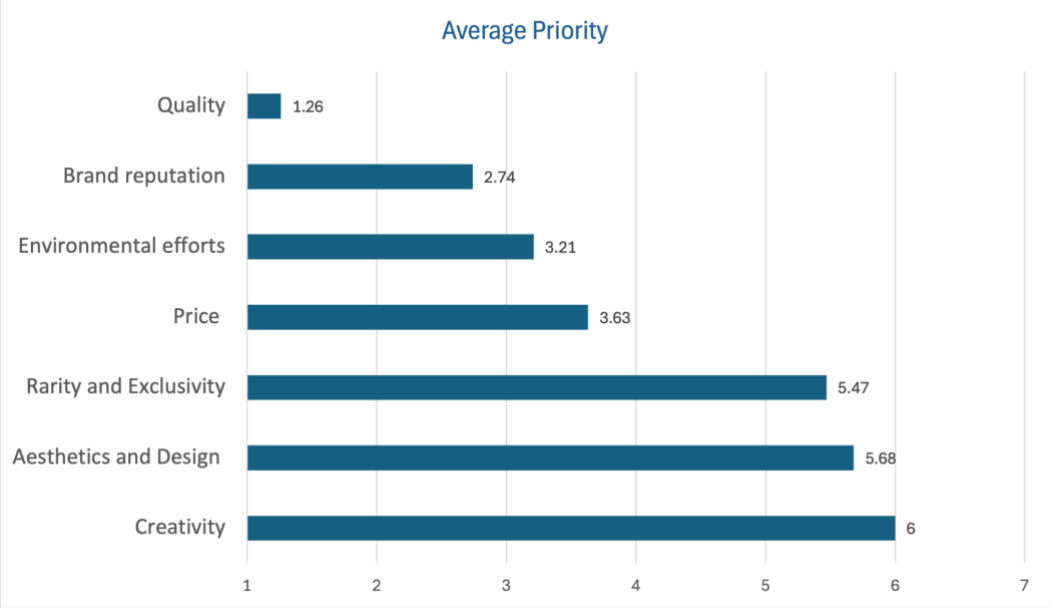

Figure 7. *Average ranking of the importance of the 7 attributes of packaging when purchasing luxury products amongst higher spending consumers. A lower number means higher priority.*

Needs for Educational Material

The perceived needs and interest in educational material about sustainable packaging were asked, as well as respondents' preferences for the educational material format (paper format, video, podcast, etc.). Two hundred seventy-eight (70.7%) respondents stated that they were interested in having access to educational material regarding sustainable packaging options; 113 (28.8%) declared not to be interested.

When asked about the preferred format to access information about sustainable packaging, the most appreciated formats among our participants were digital articles (39.2%) and videos (28.2%). More details are presented in Table 12

Format	N=participants	Percentage of Participants
Digital Articles	154	39.2%
Videos	111	28.2%
Digital Infographics	105	26.7%
Podcasts	76	19.3%
Printed Infographics	33	8.4%
Printed Text	27	6.9%
Other formats	5	1.3%

Table 12. Preferred educational format to get information about sustainable packaging.

Among low spenders (i.e., those allocating less than €30 for anti-aging face cream), the most preferred format for educational material on sustainable packaging was digital articles (N = 102), followed by video content (N = 69) and digital infographics (N = 69). Podcasts (N = 50) were moderately appreciated, while printed formats such as written text (N = 15) and infographics (N = 19) were less frequently selected. Only two participants indicated a preference for other formats. Among mid-range spenders (i.e., those allocating between €30 and €80 for anti-aging face cream), the most preferred format for educational material on sustainable packaging was digital articles (N = 46), followed by video content (N = 37) and digital infographics (N = 32). Podcasts (N = 22) received moderate interest, while printed formats such as infographics (N = 13) and written text (N = 9) were less frequently selected. Among luxury consumers (those spending €80–100 and >€100), the most preferred format for educational material on sustainable packaging was digital articles (N = 6), followed by video content (N = 5) and podcasts (N = 4).

Appropriateness and Intention to purchase plant-based packaging

Willingness to buy a face cream with a packaging made from plant waste, and how such material is appropriate to produce skincare packaging and medical devices, was asked. Participants evaluated one of three photographs depicting discs of biodegradable film made from cauliflower, parsley, or carrot waste (see Table 13 below). Furthermore, participants were asked about the appropriateness of the material for packaging of skincare products and for medical devices.

Plant Waste Option	Intention to purchase for skin care products packaging (1 to 5) - Mean (SD)	Appropriateness for Packaging for Skincare Products (1 to 5) - Mean (SD)	Appropriateness for Medical Devices (1 to 5) - Mean (SD)	N
 Cauliflower	4.34 (±.93)	4.03 (± 1.0)	3.8 (±1.11)	122
 Carrot	4.39 (± .89)	4.1 (± 1.03)	3.9 (± 1.09)	123
 Parsley	4.37 (± .81)	4.13 (±.94)	3.7 (± 1.11)	147

Table 13 - Mean, standard deviation, and sample size for purchase intentions, skincare and medical appropriateness across the three plant waste options.

Kruskal–Wallis tests were conducted to assess whether purchase intention as skincare products packaging, perceived appropriateness for skincare use, and appropriateness for medical devices, differed across the three plant waste conditions (cauliflower, carrot, parsley). Normality tests (Shapiro–Wilk) indicated a violation of the normality assumption for all variables across all groups, justifying the use of non-parametric procedures. The Kruskal–Wallis tests revealed no

statistically significant differences between the plant waste conditions for any of the dependent variables: intention to purchase ($\chi^2(2) = 0.41$, p = .817); skincare appropriateness ($\chi^2(2) = 0.720$, p = .698); medical appropriateness ($\chi^2(2) = 2.249$, p = .325). Therefore, responses were collapsed across conditions for subsequent analyses.

A Mann–Whitney U test was conducted to examine whether purchase intentions for sustainable packaging differed between men and women. The results indicated no statistically significant difference, U = 12477.00, Z = 1.001, p = .317, r = .051. A set of Spearman's rank-order correlation was also conducted to examine the relationship between the participants' intention to purchase products with sustainable packaging and annual income, education level, and age. Very weak and non-significant negative associations emerged with annual income (r_s (387) = −.077, p = .131), as well as with education (r_s (387) = −.017, p = .731). No statistically significant association, r_s (387) = .000, p = .996, was also found with age. Spearman's rank-order correlations were computed between perceived skincare appropriateness, medical appropriateness, and purchase intention (specific to packaging for skincare products). All three variables were significantly and positively correlated. Specifically, skincare appropriateness was positively correlated with medical appropriateness, $r_s(390) = .698$, $p < .001$, and with purchase intention, $r_s(390) = .670$, $p < .001$. Medical appropriateness was also positively associated with purchase intention, $r_s(390) = .531$, $p < .001$.

Although the type of image did not produce significant direct effects on any of the dependent variables, it remains theoretically relevant to explore whether the images may still exert an indirect influence on purchase intention through perceived appropriateness. Thus, a mediation analysis was conducted to explore whether perceived skincare appropriateness mediates the relationship between image type and purchase intention. Although skincare appropriateness was a strong predictor of purchase intention (B = .667, p < .001), image type did not significantly predict skincare appropriateness (B = .039, p = .437), nor did it have a direct effect on purchase intention (B = –.015, p = .700).

Extended Model of Theory of Planned Behaviour

Path analysis - Initial Model

The initial model based on the extended model of Theory of Planned Behaviour (Figure 5) revealed several significant predictors of consumers' intention to buy sustainable products. Attitudes exert a positive and statistically significant effect on intentions, indicating that more favourable evaluations of sustainable products are associated with stronger purchase intentions. Perceived behavioural control also shows a positive and significant effect on intentions, suggesting that individuals who feel more capable of performing the behaviour are more likely to intend to purchase. Environmental Concern exhibits significant direct effects on intentions.

Of the three concern variables, Social Concern and Health Concern do not have significant effects on the intentions to purchase eco-friendly packaging (all ps > .05). We then removed the non-significant paths and re-run the model (see figure 8 for the final model).

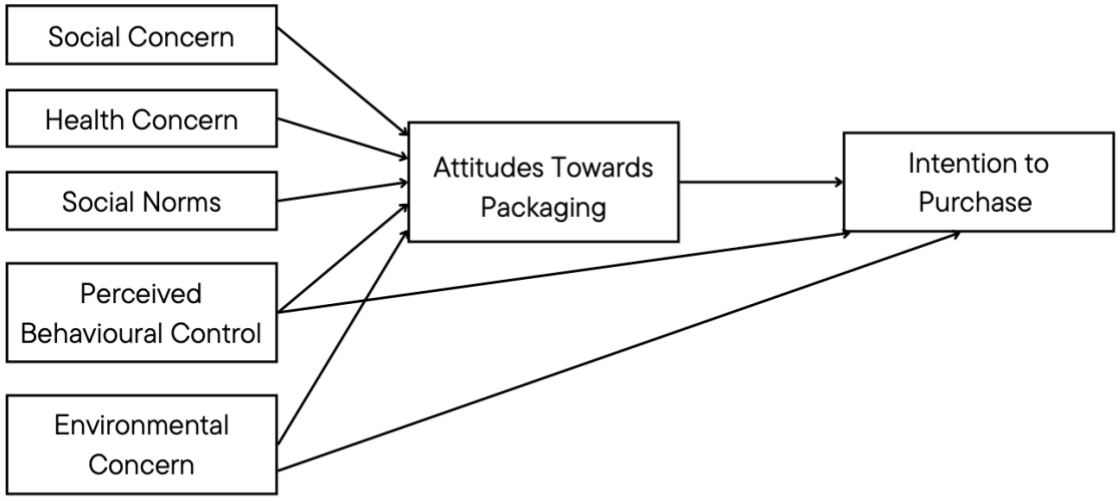

Figure 8. Final model

Path Analysis - Final Model

The FINAL model demonstrated an excellent overall fit to the data. Absolute fit indices indicated very good performance, with SRMR = 0.013 and RMSEA = 0.036, accompanied by a 95% confidence interval ranging from 0.000 to 0.099 and a p-value of 0.549 for the test of close fit, suggesting that the RMSEA is fully consistent with a well-fitting model. Information criteria were also reported (AIC = 1802, BIC = 1850, adjusted BIC = 1812) and can be used for comparison with alternative specifications. Incremental fit indices further supported the adequacy of the model,

with CFI = 0.996, TLI = 0.984, and RNI = 0.996, all exceeding conventional thresholds for excellent fit. Measures of absolute and parsimonious fit were similarly strong (GFI = 1.000, adjusted GFI = 0.996, parsimonious GFI = 0.086). Taken together, these indicators show that the specified SEM provides an excellent representation of the observed data, with minimal residual misfit and strong comparative performance across multiple criteria. The structural model provides clear evidence for some hypotheses and not for others, see Table 14 and figure 8.

Hypothesis	Path	Standardized β	p	Result
H1	Attitudes → Intention to purchase sustainable packaging	0.281	<.001	**Confirmed**
H2	Social Norms → Intention to purchase sustainable packaging			**Not confirmed**
H3	Perceived Behavioural Control → Intention to purchase sustainable packaging	0.190	<.001	**Confirmed**
H4	Social Concern → Attitudes toward sustainable packaging	0.232	<.001	**Confirmed**
H4b	Social Concern → Intention to purchase sustainable packaging			**Not confirmed**
H5	Environmental Concern → Attitudes toward sustainable packaging	0.311	<.001	**Confirmed**
H5b	Environmental Concern → Intention to purchase sustainable packaging	0.127	0.012	**Confirmed**

H6	Health Concern → Attitudes toward sustainable packaging	0.170	<.001	**Confirmed**
H6b	Health Concern → Intention to purchase sustainable packaging			**Not confirmed**

Table 14. Hypothesis tests for structural model paths: unstandardized estimates, standard errors (SE), standardised β, z-statistics, p-values, and hypothesis outcome for each tested path (H1–H6b).

3.3.5 Discussion

This study explores, in an Italian sample, consumers' preferences and decision-making regarding sustainable cosmetics and packaging, highlighting how health, social, and environmental concerns shape attitudes, how perceptions of product appropriateness drive purchase intentions, and what kind of communication means may enhance engagement and comprehension of sustainability information. Participants' spending intentions for cosmetics were generally low: most respondents fell within the lowest spending categories (up to 30 euros). The demographic patterns observed overall align closely with established findings in the broader cosmetics and luxury beauty literature. Women reported allocating a higher budget for cosmetics (i.e., a skincare face cream), confirming findings of other studies (Amberg and Fogarassy, 2019); this could reflect women's higher usage frequency and expenditure than men, reflecting gendered norms around appearance and self-presentation. Higher income and more educated consumers were also correlated with a higher allocated budget to invest in cosmetic products, greater willingness to purchase premium products, partly due to increased disposable resources and higher health or product literacy, as also found in other studies (Drăgan and Petrescu', 2013; Lin et al., 2018; Moharam, 2023; Wang, 2023). A positive association between age and spending intentions was found in our sample, as older consumers tend to invest more in skincare and cosmetic products, possibly due to heightened appearance-related concerns and greater purchasing power (Muise & Desmarais, 2010). Regarding participants' value-based orientations, environmental concern or social concern did not translate into a higher allocated budget for such a skincare product. The significant role of health concern in willingness to pay more for skincare products echoes studies demonstrating that health-oriented consumers are more inclined to invest in cosmetics perceived as safe or beneficial (Pudaruth et al.,

2015). Regarding the reported importance of environmental sustainability of the packaging for luxury cosmetics products, social sustainability concern shows the strongest association with the perceived importance of packaging sustainability, followed by environmental concern. These findings align with evidence that consumers often interpret sustainability in cosmetics through a multidimensional and human-centred lens rather than a purely ecological one (Alviri et el., 2025). The absence of association with health concern seems in contrast with literature showing that health-oriented consumers tend to value sustainable packaging as signalling safety, purity, and protection from harmful substances, attributes that are often intertwined with perceptions of "clean" or "responsible" beauty (Ghazali et al., 2017). The comparatively weaker role of environmental concern suggests that pro-environmental values, in the case of an anti-age cream, could be overridden by competing interests. Interestingly, no gender differences were found when participants were asked about the importance of sustainability of packaging, nor in their intentions to buy them, aligning with findings from Tengli and Srinivasan (2022) who explored Indian consumers' intentions towards natural cosmetics. Income, education, and age were also non-significant in reported purchase intentions towards plant-based sustainable material for the skincare packaging we presented. Overall, the present results reinforce the idea that sustainability perceptions in luxury beauty are multifaceted and that social and health-related values may exert a stronger influence than environmental attitudes alone, reflecting a broader shift toward holistic interpretations of sustainable luxury in cosmetics.

When these insights are considered alongside participants' attribute rankings, they become even more meaningful: quality emerged as the dominant criterion for evaluating luxury cosmetic packaging, with price and environmental protection occupying secondary positions. Among our high-spending consumers, the emphasis on quality becomes even more pronounced, while brand reputation and environmental efforts gain importance, providing evidence that premium buyers may reward brands that demonstrate ethical credibility and responsible practices. The relatively low importance assigned to aesthetics, exclusivity, and creativity challenges the traditional assumption about luxury consumption, which often emphasises visual appeal and symbolic differentiation. For instance, a study by Ghazali and colleagues (2017) found that hedonic value had the strongest influence on attitudes among luxury beauty consumers. Instead, our findings support recent arguments that contemporary luxury consumers adopt a more value-driven orientation, prioritising substance, trustworthiness, and social responsibility over superficial

markers of prestige. Overall, the convergence of attitudinal and ranking-based results underscores that sustainability perceptions in luxury cosmetics are multifaceted and that values, rather than purely environmental or aesthetic considerations, play a central role in shaping expectations around packaging.

When looking at the plant-based materials presented to participants in our study, the plant-based manipulation did not influence attitudes or purchase intentions. Instead, consumers relied primarily on internal cognitive appraisals, with both perceived appropriateness for skincare products and appropriateness for medical devices as predictors of intentions to purchase a cream with such packaging across all three types of images. This pattern suggests that consumers' judgments are anchored in concept-driven beliefs about whether a product is suitable and legitimate for skincare use: visual aesthetics may attract attention, but they do not meaningfully shift behavioural intentions when consumers already hold strong beliefs about what constitutes an appropriate skincare ingredient.

The strong consumer interest in learning more about sustainable packaging (more than 70% of our sample) aligns with existing literature showing that consumers, even sustainability-motivated ones often struggle to identify environmentally preferable products at the point of choice (Grunert et al., 2014; Lindh et al., 2016; Steenis et al., 2017). Our participants' preference for digital, easily accessible formats such as articles and videos further suggests that sustainability communication is most effective when delivered through concise, on-demand channels that support self-directed engagement. In this respect, immersive digital approaches such as augmented reality may offer value, as they allow complex sustainability information to be embedded directly into consumers' physical interactions with products, thereby enhancing comprehension and engagement (Scholz & Smith, 2016). The stronger preference for digital educational materials, including podcasts among higher-spending consumers, reinforces the relevance of such experience-driven communication strategies across both mainstream and premium segments. Overall, these findings indicate that sustainability education is not only welcomed but expected, and that digitally mediated, content-rich formats that emphasise interactive engagement represent a promising strategy for brands seeking to communicate packaging sustainability in ways that resonate across consumer groups.

The present study also examined the psychological determinants of consumers' intentions to purchase sustainable packaging by integrating the Theory of Planned Behaviour (TPB) with concern-related constructs. The findings offer several important insights and align with, but also

diverge from, previous research in meaningful ways.

A first key result is the strong influence of concern-related variables on attitudes. Social sustainability concern, environmental concern, and health concern all significantly predicted positive attitudes toward sustainable packaging. Existing literature shows that concern-related variables are powerful antecedents of positive attitudes toward sustainable products (Wang, Li & Luh, 2025). Mathura and Maharaj (2025) found that consumers in Trinidad who self-identified as environmentally conscious express markedly stronger favourable attitudes toward paper-based packaging. Young consumers in a study by Hallez and colleagues (2024) associated glass packaging with greater healthiness, which in turn enhances their overall evaluation of the product, including perceptions of sustainability, quality, and naturalness. Both health and environmental concerns contribute to forming positive attitudes towards green products also according to Grappe and colleagues (2022).

In our research, environmental concern shows also a direct effect on intentions to buy eco-friendly packaging as seen in literature (Prakash & Pathak, 2017).

Although social and health concerns did not exert direct effects on purchase intention in the structural model, they significantly predicted attitudes toward sustainable packaging, and attitudes in turn were a strong predictor of intention, indicating a clear indirect pathway from concerns to intention via attitudes. This pattern underscores the central role of attitudes as mediators: broad concerns raise an evaluative predisposition, but do not automatically translate into behavioural intent unless those concerns are concretised in favourable, behaviour-specific appraisals. This effect has been found by other researchers (Kingston, & Paulraj, 2023) and aligns with the well-documented attitude-behaviour gap in sustainability research: numerous studies have shown that individuals may express strong environmental or ethical concerns but fail to translate them into concrete behavioural intentions or actions (Echegaray & Hansstein, 2017; Auger & Devinney, 2007; Carrington et al., 2014). A recent study by Meena Rani and colleagues (2025), for instance, also found that among Indian consumers, intention to purchase sustainable packaging was not significantly influenced by environmental concerns. Barriers such as price, scepticism about environmental claims, or perceived lack of personal impact may weaken the link between values and behaviour (Kahraman and Kazançoğlu, 2019; Lavuri, 2022). Concerns raise an evaluative predisposition, but external constraints or doubts prevent a direct jump to intention, leaving attitudes to absorb the motivational content that survives these barriers. Psychological distance and

perceived efficacy may also have mattered: concerns are frequently abstract (i.e. global environment or general health) and therefore psychologically distant, whereas attitudes operationalise those abstract concerns into concrete, behaviour-specific evaluations (e.g., buying a product with eco-friendly packaging).

In our study, attitudes are strong predictors of intentions to buy sustainable packaging for skin care products. This is also confirmed by recent studies (Kingston & Paulraj, 2023) and by findings of a recent review of literature: "Attitude is the most pervasive and resilient drive" (Wijesinghe, 2025). Perceived behavioural control has also shown significant effects on intentions to purchase skin care products with sustainable packaging, aligning with existing literature on green consumerism (Ali, 2018; Kumar, 2021; Jin et al, 2020; Moharam, 2023; Moslehpour et al., 2021; Nguyen et al., 2017; Royani & Imaningsih, 2024; Yadav & Pathak, 2017).

Social Norms unexpectedly did not relate to intentions, differing from previous TPB-based studies, showing that normative influence plays a crucial role in sustainable consumption and that consumers may be more motivated to choose sustainable packaging when they perceive that such behaviour is socially expected or valued by peers (Nekmahmud et al., 2022; Pop et al., 2020). Our findings also diverge from research demonstrating that descriptive and injunctive norms can significantly increase pro-environmental intentions and behaviours (Cialdini et al., 2006). However, a systematic review by Wijesinghe (2025) suggests that the subjective norm is strongest when rooted in family or local-authority approval and, in our study, only one item explicitly mentioned family members. As Pristl and colleagues (2021) argued, social norms use hides some challenges. Their study indicates that the effect of perceived social norms on behavioural intentions for sustainable consumption depends critically on whether those norms have been internalised as personal norms. Also, their findings show that, under certain conditions, social norms can also operate through alternative pathways beyond personal norms, specifically when consumers report high self-efficacy and a strong collective self-concept. This nuance refines the Theory of Planned Behaviour's account of subjective norms by showing that normative influence is not uniformly direct but contingent on internalisation and individual traits. These could help explain our findings, given that we did not investigate personal norms or traits. In fact, for participants with high self-efficacy and strong perceived social norms, purchase intentions were affected independently of the degree to which normative content had been internalised (Pristl et al., 2021).

3.3.6 Conclusions and Limitations

As Liobikienė and Bernatonienė (2017) argue, determinants of green purchase behaviour are heterogeneous and context-dependent and therefore cannot not be treated as equally influential predictors, particularly in the cosmetics sector. Consumer decisions in green cosmetics are shown to be shaped by a complex interaction of psychological, product-related, social, and situational factors, whose relative importance varies across consumers and contexts. Attitudinal factors (such as environmental concern, health consciousness, and ethical values) are therefore necessary but insufficient to explain green cosmetic purchases. Although positive attitudes toward sustainability are common, they often fail to translate into actual buying behaviour, illustrating a persistent attitude-behaviour gap. In contrast, product-related attributes (including perceived effectiveness, safety, ingredient transparency, certifications, packaging, price, and brand credibility) frequently exert a stronger and more direct influence on purchase decisions. Liobikienė and Bernatonienė (2017) suggest that treating all green purchase determinants as equally important leads to theoretical oversimplification and weak managerial implications. Instead, they advocate for hierarchical and context-sensitive models that prioritise determinants according to their actual impact in specific product categories such as cosmetics, where performance, safety, and trust often outweigh personal values.

Overall, these study findings align with those of Liobikienė and Bernatonienė (2017): green cosmetic purchasing is driven by a hierarchy of motives rather than a uniform set of predictors, meaning that even in the realm of sustainable consumption, environmental concern cannot be assumed to play a dominant role across consumers or contexts. Because product quality, efficacy, sensorial experience, and brand trust frequently outweigh sustainability motives, models that treat all determinants as equally influential risk misrepresenting actual consumer behaviour and overestimating the impact of environmental attitudes. The heterogeneity of drivers also implies that green cosmetic consumers are not a homogeneous segment, requiring more nuanced segmentation strategies that differentiate between health-driven, eco-driven, quality-driven, and socially motivated buyers. For marketers, the findings suggest that sustainability initiatives must be integrated with strong performance and experiential cues, ensuring that green attributes do not compromise perceived quality. For researchers, the review underscores the need for multi-dimensional, interaction-based models that account for the varying strength and interdependence of determinants, rather than treating them as isolated or equally weighted predictors.

The findings of this study offer several theoretical and practical implications. From a theoretical perspective, the results highlight the importance of integrating concern and value-related constructs into TPB models. Although these constructs did not directly predict purchase intention, they strongly influenced attitudes, confirming that value-based antecedents play a central role in shaping consumers' evaluative responses. It is important to take into consideration, how Szaban and colleagues (2025) argue, that sustainability and ethical labels do shape how consumers perceive prices in the cosmetics market, but their impact is limited and highly segmented: while a subset of eco-motivated consumers interprets these labels as added value and is more willing to pay a premium, others continue to prioritise different product attributes such as experience, meaning that sustainability cues alone rarely drive willingness to pay. Instead, individual values and consumer profiles moderate these effects, revealing that ethical intentions do not uniformly translate into price-related behaviour.

From a practical standpoint, the results suggest that interventions aimed at promoting sustainable packaging should carefully employ social influence mechanisms. Social norms can work effectively to increase purchase intention, communication strategies that emphasise collective expectations, peer endorsement, or community engagement may be particularly effective (Cialdini et al., 2006; White et al., 2019). However, our study points out that these can also be ineffective or even problematic. Marketers and policymakers should therefore understand how to benefit from highlighting how sustainable packaging choices are socially valued or increasingly adopted by others. Perceived social norms are unlikely to shape consumers' intentions to purchase sustainable packaging unless the normative message has been internalised as part of the individual's belief system, as shown by Pristl and colleagues (2021). Consequently, social-norm interventions are likely to work best as complements to persuasive efforts that explicitly target and reshape personal beliefs. At the same time, researchers (Pristl et al., 2021) point to additional opportunities for social-norm communication by focusing on segments characterised by high self-efficacy or a strong collective self-concept; marketing managers should therefore consider these traits when segmenting audiences and selecting targets for normative campaigns. It is also important to consider that descriptive normative appeals may lose effectiveness when the message source is perceived as socially distant: an important caveat given that many campaigns rely on testimonials that recipients may not view as members of their proximal reference groups (Pristl et al., 2021). To mitigate this, descriptive messages should use endorsers who reduce perceived social distance

(for example, by matching salient characteristics of the target group). Injunctive framing is the more robust strategy since it performs consistently across both proximal and distant referents and for both male and female recipients, whereas descriptive frames appear to be less effective for male audiences (Pristl et al., 2021).
Moreover, even though perceived behavioural control is shown to be a predictor of intentions to purchase sustainable packaging in our study, some aspects are yet to be taken into consideration. Behaviour is gated by implementation intentions (specific if-then plans such as "if I enter the skincare aisle, then I will pick the product with the sustainable packaging"), actual behavioural control (real availability, price, time, skills, household constraints) that is different for the perceived one, and by the immediate situational context (such as promotions, shelf placement, social cues), and when these volitional and contextual factors are misaligned with attitudes or overestimated by Perceived Behavioural Control, the intention-action link breaks down (Carrington, Neville & Whitwell, 2010). Social desirability can also inflate reported attitudes or perceived behavioural control without reflecting actual readiness to act. Additionally, the strong effect of concern-related constructs on attitudes suggests that educational initiatives should continue to emphasise the social, environmental, and health benefits of sustainable packaging. However, given the lack of direct influence on intention, such messaging should be paired with strategies that reduce perceived barriers, such as cost, convenience, or scepticism about environmental claims, to help bridge the attitude–behaviour gap. Retailers could also leverage digital formats, which were preferred by high-spending consumers in this study, to deliver targeted sustainability information.

Regarding limitations, a key limitation of this study lies in the sample composition. Although the research aimed to investigate consumer behaviour toward sustainable packaging in the luxury cosmetics sector, a relatively small proportion of participants identified as regular luxury consumers. This limits the generalisability of findings to the broader luxury market segment, where purchasing motivations and expectations may differ. Therefore, the study explored perceptions of several luxury-related packaging elements at a more general level. This allowed us to capture how such cues are interpreted not only by actual buyers but also by potential or occasional consumers, acknowledging that representations of luxury packaging extend beyond purchasing behaviour.

Future research should include a more targeted sample of high-end consumers to better capture luxury-specific dynamics. Moreover, the study relied on snowball sampling, which may also have introduced selection bias and limited the representativeness of the sample. As participants were primarily drawn from interconnected social networks, the findings may not fully reflect the broader population of personal care product consumers. While men also purchase and use cosmetics, their perspectives were underrepresented here.

Regarding the theoretical framework, the study's reliance on the Theory of Planned Behaviour requires acknowledging ongoing debates about its scope and assumptions. For instance, past behaviour can shape future actions in ways that bypass deliberate reasoning, leading to routinised or habitual responses. Another critique is the well-documented attitude–behaviour (or intention–behaviour) gap, where individuals' stated intentions do not always translate into actual practices. Dual-attitude models also suggest that implicit and explicit attitudes may coexist, and which one guides behaviour often depends on situational context, cognitive resources, and motivation. Finally, discrepancies between intention and behaviour may also reflect practical challenges, such as forgetting, limited volitional control, hypothetical bias, or measurement inconsistencies. Together, these limitations suggest that while the Theory of Planned Behaviour provides a useful framework, future research should integrate complementary perspectives (e.g., habit formation, contextual moderators, or dual-process models) to more fully capture the complexity of consumer decision-making around sustainable packaging. A qualitative approach could be considered to gather deeper insights, including psychological barriers that prevent consumers from translating positive attitudes into sustainable purchasing intentions. In addition, the study focused on cosmetics in general, but the construct related to the intentions to purchase only asked about an anti-age cream, which restricts the scope of the results to a single product category. This certainly narrows the insights, as it does not capture the full range of possible consumer behaviours or underlying motivations. Furthermore, it is important to acknowledge that packaging and product perceptions are difficult to fully disentangle, as consumers tend to evaluate them in an integrated and mutually reinforcing way. Although the questionnaire included several items explicitly referring to packaging-specific attributes, allowing for a more focused examination of how sustainability cues are interpreted at the packaging level, this inherent overlap still needs to be taken into consideration.

Further methodological limitations must also be acknowledged. First of all, the cross-sectional

design limits the ability to draw causal conclusions. Longitudinal studies would allow researchers to examine how attitudes, concerns, and social norms evolve over time and whether they consistently predict sustainable purchasing. Moreover, the reliance on self-reported measures may lead to social desirability bias or inaccuracies in self-perception. The intention construct did not include actual measures of consumer behaviour. As such, the findings capture only participants' self-reported purchase intentions rather than how these translate into real-life behaviour. Future research could address these issues by recruiting more diverse and balanced samples, including a broader range of products, and incorporating behavioural measures alongside personal norms to gain a more comprehensive understanding of consumer decision-making. Also, the model did not include contextual or economic variables such as price sensitivity, perceived product availability, or trust in sustainability claims. Prior research has shown that these factors can significantly influence sustainable consumption (Carrington et al., 2014). Mathura and Maharaj (2025) found a notable disparity between the proportion of individuals who were environmentally conscious and those willing to pay extra for more sustainable packaging. Incorporating such variables and addressing these questions may help explain why attitudes and perceived behavioural control showed negative effects on intention in this study.

Chapter 4: Environmental Education

(Based on Publication "Experiences and Perspectives of Environmental Educators: A Qualitative Exploration")

4.1 Introduction

Building on the industry-oriented and consumer insights outlined in the previous chapters, the present chapter shifts the analytical focus to a different yet complementary group of actors: environmental educators. While sustainable practices are shaped by market dynamics, regulatory frameworks, and consumer perceptions, they are also profoundly influenced by broader processes of environmental awareness, learning, and value formation. Environmental educators operate at the intersection of knowledge production, social norms, and behavioural change, playing a crucial role in translating abstract sustainability concepts into meaningful, actionable understandings for diverse audiences. Exploring their challenges and lived experiences allows for a deeper examination of how sustainability is communicated, negotiated, and sometimes constrained within specific cultural, institutional, and socio-political contexts. In the Italian setting - characterised by regional diversity, varying levels of institutional support, and evolving public engagement with environmental issues - this chapter aims to illuminate the structural, pedagogical, and emotional dimensions of environmental education, thereby complementing the previous findings and situating consumer- and industry-level dynamics within a wider ecosystem of sustainability education and practice.

From this point onward, the content is largely based on previously published academic work.

4.1.1 Environmental Education

Over the past decades, environmental education (EE) has emerged as a vital response to the increasing global environmental challenges. Leading international organisations, such as UNESCO, UNEP, and the North American Association for Environmental Education (NAAEE), have developed definitions and frameworks for EE that share key common characteristics. According to these organisations, environmental education goes beyond the simple transmission of knowledge, aiming to foster awareness of environmental challenges, critical understanding of environmental systems, the development of problem-solving skills, the motivation to take action,

and the cultivation of a sense of responsibility for environmental stewardship (UNESCO, 2022; UNEP, n.d.; NAAEE, n.d.)

The positive outcomes of environmental education have been extensively documented in both formal and informal settings. Research demonstrates its capacity to influence pro-environmental behaviours, defined as actions aimed at minimising harm to the environment (Ardoin et al., 2018; Ardoin et al., 2020; Suárez-Perales et al., 2021). For example, educational interventions can lead to immediate, tangible contributions, such as habitat restoration, environmental clean-ups, and biodiversity monitoring (Ardoin et al., 2020; Lovell et al., 2009; Uneputty & Suyoso, 1998), while also fostering long-term changes in daily behaviours, such as energy and water conservation (Ardoin et al., 2020) and reduced greenhouse gas emissions through sustainable transportation choices (Lewis et al., 2014).

In addition to individual behavioural changes, environmental education programmes have demonstrated significant community-level impacts. These include increasing collective resilience through enhanced community participation, fostering new local environmental initiatives, and improving communication among stakeholders (Ardoin et al., 2020). For instance, a conservation programme in Russia aimed at mitigating human-animal conflict successfully increased local knowledge of Amur tiger ecology and improved attitudes towards tiger conservation (Stern, Powell & Hill, 2014; Trewhella et al., 2005).

Environmental education has also shown benefits across diverse populations and age groups. Among children and toddlers, EE programmes improved environmental literacy, nurtured pro-environmental attitudes, and developed broader social and emotional skills such as empathy, self-control, and communication (Ardoin & Bowers, 2020). Vulnerable populations, including inmates in correctional facilities, have equally benefited from EE initiatives that combine education with conservation projects. These programmes, often conducted in collaboration with researchers and natural area managers, have demonstrated positive outcomes such as increased environmental connectedness, reduced stress, improved health, and a sense of societal contribution (Gallagher, 2013; Kaye et al., 2015; Lindemuth, 2014). Spending time in natural settings, facilitated by EE interventions, is another significant outcome that enhances individuals' connectedness to nature. This connection not only predicts increased engagement in pro-environmental behaviours (Mackay & Schmitt, 2019; Whitburn, Linklater & Milfont, 2019) but also supports physical and mental well-being, including improved cognitive functions, better sleep, and reduced blood

pressure (Martin et al., 2020; Jimenez et al., 2021). Wilson's (1984) biophilia hypothesis further underpins this evidence, suggesting that humans possess an innate tendency to connect with nature. Research on biophilic learning environments demonstrates their effectiveness in enhancing students' attentional performance and reinforcing their affiliation with nature over time (Barbiero et al., 2021).

Environmental educators play a critical role in delivering these interventions, translating EE principles into practice, and empowering individuals and communities to adopt sustainable behaviours. Their expertise shapes not only the content but also the methods used to engage diverse audiences, making them pivotal agents of change. Understanding their experiences, challenges, and perspectives is therefore essential to improve the design and delivery of EE programmes and to strengthen their societal impact. Yet, while the effectiveness of EE interventions has been extensively explored, less attention has been paid to the educators themselves.

While research largely focuses on the outcomes of EE interventions and the strategies that promote behavioural and attitudinal changes, the perspectives of environmental educators - those who design and deliver such interventions- remain underexplored. Studies on teacher identity formation (Izadinia, 2014; Gracia, Rodríguez & Pedrajas, 2022) have highlighted how educators shape their professional roles; however, the unique professional identity of environmental educators has received little scholarly attention.

The present study aims to address this gap by exploring the experiences, challenges, and perspectives of environmental educators within the Italian context. Through qualitative data, this research sheds light on how educators interpret and implement EE principles while navigating the complexities of promoting environmental awareness, knowledge, and action in their professional practice.

4.2 Materials and Methods

4.2.1 Study design and setting

Semi-structured interviews were conducted with 22 individuals working in the field of environmental education. Interviews were conducted between May 2023 and August 2024.

4.2.2 Sample and Recruitment

To be eligible, individuals had to be working or have worked in the field of environmental education in Italy. Approximately 28 Italian individuals found online or through snowballing were contacted by email, phone message, or phone call and invited to participate in the study. The interviewer (SR)arranged an interview online via Google Meet, Webex, or Skype. Before the interview, participants were asked to sign the informed consent form digitally.

4.2.3 Materials and Data Collection

Online in-depth interviews were conducted to investigate participants' work-related experiences, challenges, needs, and desires, and to unveil their beliefs and considerations on human-nature relationships and the role of environmental education. The length of the interviews ranged from 40 minutes to 1 hour and 10 minutes. Interviews were based on a topic guide (Table 15), which provided a flexible interview structure. The topic guide was created in conjunction with the research team, which included clinical psychologists, health psychologists, and marine scientists with experience in environmental literacy. De-identified audio recordings were transcribed verbatim using an assisted transcription software (Trint).

EXPERIENCES AND PROFESSIONAL IDENTITY: challenges, unmet needs, concerns and desires Professional life and daily tasks Professional definition and evolution of professional identity over time Self-perception as an environmental educator Rewarding aspects Major challenges Mitigating factors and strategies, desires Motivations for pursuing this career
BELIEFS AND ATTITUDES ABOUT NATURE and PRO-ENVIRONMENTAL BEHAVIOURS Personal feelings of connectedness to nature Perceptions about lay people's feelings of connectedness to nature Personal theories about barriers and motivations to pro-environmental behaviours and pro-nature behaviours in individuals
EDUCATING THE PUBLIC Perceived importance of educating the public about animal welfare and environmental issues Who is responsible for educating the public?

Perceived most appropriate audience to address when aiming at promoting PEBs and positive human-animal interactions and why Experiences in educating the public and the biggest challenges faced Unmet needs, perceived skills and perceived self-efficacy
EDUCATING THE EDUCATORS Training received Perceived need for training Training desired Preferred training topics and modalities Barriers and facilitators to training
POLICIES **Knowledge gaps in legislation**: What authorities should know but currently do not when legislating on animal welfare and nature conservation strategies. **Current deficiencies & Overlooked aspects:** Elements that authorities should consider but currently neglect in policymaking for animal welfare and conservation. **Priority issues:** Identification of the most important PEBs and PCBs that authorities should address

Table 15. Interview Topic Guide

4.2.4 Analysis

The interview transcripts were analysed using the framework analysis method, which is a systematic method commonly used in qualitative research for analysing complex and diverse data (Gale et al., 2013). This method was deemed to be the most appropriate to integrate both a priori issues and the predefined areas we intended to explore, and the emergent data and themes.

This method ensures a thorough and transparent analysis of the qualitative data, allowing for a structured and systematic approach to understanding the perspectives, challenges, and needs of individuals working in environmental education. The framework for the analysis was developed by 2 researchers. One investigator summarised themes and supporting quotes from each transcript with a discussion of key areas with the research team. The framework, findings, and interpretation of the analysis were discussed and approved by all co-authors.

4.3 Results

Participants' characteristics are in Table 16. Environmental educators' responses were clustered around 3 emerging themes: Working with Nature: Experiences and Challenges; Attitudes, Beliefs,

and Professional Visions of Environmental Educators; and Educating the Educators: Training Needs and Professional Pathways (see Figure S1, Appendices).

	N=22
Age	Mean age: 42 y.o. (sd=12)
Sex	F=13; M=9
Educational Background	Natural Sciences and Biology= 14 Educational and Social Sciences = 3 Other n= 4
Audience (some participants work with more than one)	Children n=21 Adults = 15 Vulnerable Population n=4
Contract Type	Self-employed= 18 Employed= 4

Table 16. Participants' characteristics

4.3.1 Working with Nature: Experiences and Challenges

The interviews painted a complex picture of the challenges faced by environmental educators, revealing recurring themes of professional ambiguity, precarious employment, emotional strain, and the intrinsic motivations that keep educators engaged.

A central issue is the lack of a clear definition and training pathway for the profession. Many participants described entering the field without formal preparation, often relying on self-directed learning and the support of colleagues. One educator reflected, "If you want to work in environmental education, in my opinion, there is no training path that leads you to do it. You do it because you like certain topics, you get educated about these topics, and [...] you do it by sorting this out with the help of colleagues" (44, Male, Agronomy). Others shared similar experiences, such as, "I got thrown into the fray when conducting activities, so I just started out like that with a little training as an observer" (50, Female, Environmental Sciences).

Closely linked to this is the limited job stability and financial precarity experienced by environmental educators. Employment opportunities are often seasonal, with few prospects for long-term roles or sustainable incomes. Despite being highly qualified - “We are prepared and willing to work, we have studied a lot, we speak many languages, we all have one, two, three degrees” - many participants described facing endless precarity (38, Female, Natural Sciences). For some, this instability has forced difficult personal choices. As one educator explained, “There will come a time when I won't be able to do it anymore because financially, I won't be able to afford it anymore. [...] I got married, so what if I want to become a mother?” (38, Female, Natural Sciences).

This financial insecurity is compounded by a pervasive societal perception that environmental education should be driven by ethical motivations rather than financial incentives. This belief, as one participant noted, creates cognitive dissonance: “We still think that scientific communication and scientific dissemination are a sort of volunteering activity. [...] People make you feel guilty because it seems like you don't want to share your knowledge” (26, Female, Marine Biology). Educators often experience shame or guilt when advocating for fair pay, despite recognising the value of their expertise and professionalism.

Participants also voiced frustration over the lack of recognition for the time, effort, and expertise required to deliver effective environmental education. Many reported that their work is often perceived as informal or voluntary, overlooking the high level of professionalism involved in designing and delivering educational activities. One participant explained, “I work not to become very rich, but to pay my bills, to start a family, and live decently. And for all these things I need a salary because if I want to do it well it means that for every topic I teach, I have to update myself, train myself, and evaluate the different aspects, which is not just trivially studying plants, but doing all that work to think about the activities to implement, think about the kind of audience I will have, improve my communication skills and therefore I do much work that requires time and commitment” (48, Female, Natural Sciences). Another educator highlighted the hidden labour involved in preparing lessons and activities, which often goes unrecognised: “All the hours you work are not recognised. When implementing an environmental education project, it is not only the hour you do or the 2 hours of the day you spend at school, but you must prepare everything, a lesson...” (44, Male, Agronomy).

The emotional toll of these challenges is significant. Many participants spoke of the stress and frustration caused by financial instability, which undermines their ability to plan. “I do not have a good income and cannot make great plans. [...] I feel a bit of distrust and frustration,” admitted one educator (33, Female, Educational Sciences). Others pointed to the broader difficulty of remaining motivated in the face of slow societal change: “To struggle so much, to commit so much, to dedicate your whole life, all your days, all your resources to see such a little change. [...] The challenge is to maintain your attention and determination and avoid burnout” (48, Male, Herbal Sciences).

Despite these hardships, the relational aspects of their work provide a powerful source of motivation for many educators. Interacting with children and teenagers and fostering a connection to nature in younger generations is a deeply rewarding experience. One participant described the joy of witnessing children’s curiosity and wonder: “I like it a lot because you have the opportunity to transmit your passion to kids and to experience such passion through their eyes. [...] It’s rewarding because you feel like a little part of their change is because of you” (38, Female, Natural Sciences).

4.3.2 Attitudes, Beliefs, and Professional Visions of Environmental Educators

The interviews revealed that intrinsic motivation and deeply held personal values play a central role in shaping the professional paths of environmental educators. Many participants described entering this field driven by a passion for nature and a sense of purpose that sustains them despite the profession’s challenges. For some, their role is conceptualised as that of interpreters or translators of nature, tasked with bridging the gap between scientific knowledge and public understanding. One participant likened their work to weaving connections between experts and non-experts: “I feel almost like a spider in weaving a web between lay people and experts, therefore between science and the world of pupils and teachers” (64, Female, Philosophy). Another educator explained, “You have to decode science so that everyone can understand it. This role must make it clear that everyone has to have access to science” (61, Female, Foreign Languages and Literature). Similarly, another participant highlighted their mission to make complex topics engaging and accessible: “I explain difficult concepts to you and I make it simple, I make it

digestible for you, I make it understandable for you, I make it interesting and fun!" (56, Female, Natural Sciences).

In addition to making science more accessible, several educators articulated a desire to strengthen people's connection to nature as a means of fostering empathy and a sense of responsibility for its protection. One participant explained, "It is not enough to take a group out and show them an oak, a beech, because they can study those on a book, but you need to make them empathise with the natural environment" (38, Female, Natural Sciences). Another participant emphasised the importance of storytelling in building this emotional connection, stating, "I tell stories because clearly we are human beings and need stories to empathise with an environment that in part still remains a bit alien to us" (26, Female, Marine Biology).

Participants also highlighted the importance of emotions in the learning process, describing how emotional engagement is not only a tool for education but also an integral part of building meaningful connections with nature. Many viewed their work as an effort to transform knowledge into experiences capable of igniting curiosity, wonder, and passion. "The important thing is to transform work into an experience that is fun, that is curious, that allows people to become passionate, to become curious" (48, Female, Natural Sciences). Another educator added, "In addition to the scientific aspect, we also try to create excitement" (44, Male, Agronomy).

Several participants explained how multisensory experiences enhance understanding, making information more accessible and memorable: "If you can integrate the information with colours, sounds, smells and you can see it, people will definitely be able to understand it much better" (33, Male, Evolutionary Biology). Nature itself was described as an ideal context for emotional learning, offering opportunities to create powerful and transformative experiences for both children and adults. One educator reflected, "In my work, I see a component linked to the transmission of information but also one related to emotions, to the pleasure of being in the woods, the pleasure of taking a walk at night to see fireflies. (...) You cannot ignore the emotional aspect, it is not merely telling information but feeling good in nature" (57, Male, Natural Sciences).

The interviews also revealed divergent views on the regulation and organisation of the profession. While participants agreed on the importance of gaining recognition and legitimacy as environmental educators, opinions varied on how this should be achieved. Some participants advocated for greater institutional integration, suggesting that environmental educators should be employed by government agencies, such as forest rangers, or formally included in the national

education system. They saw this as a way to secure professional stability, increase access to resources, and reinforce the role's credibility within society. Others, however, argued for maintaining independence, viewing flexibility and autonomy as defining features of the profession that enable educators to tailor their approaches to diverse contexts and audiences. These contrasting views reflect the tensions between professionalisation and autonomy that characterise the field. While some participants viewed institutional frameworks as a path to greater legitimacy, others expressed concern that formalisation might limit creativity and responsiveness - qualities they see as essential to the role. For many educators, these debates are rooted in their personal sense of mission and identity, which frames their work as more than just a job. As one participant shared, "This has always been my life mission, let's say since I was 16, so from a personal choice that then turned into activism" (48, Male, Herbal Sciences). These reflections underscore how educators' values, emotions, and beliefs converge to shape their professional trajectories, while also raising important questions about the future of environmental education as a recognised and structured field.

4.3.3 Educating the Educators: Training Needs, Skills Development, and Professional Pathways

The interviews revealed a widespread perception among participants that training and professional development opportunities are critical for improving the quality and effectiveness of environmental education. While many educators possess strong content knowledge in natural sciences, they consistently highlighted gaps in pedagogical and relational skills as areas requiring additional training and support. Consistently, several participants stressed the importance of pedagogical training to complement their scientific expertise. They argued that understanding educational theories and methods is essential for translating complex information into accessible and engaging content for diverse audiences. One participant explained, "We need to learn about psychology, pedagogy, and in general those subjects related to educational sciences because I may know a lot of things about insects but then if I am not able to explain them to the people in front of me I cannot be a good environmental educator" (61, Female, Foreign Languages and Literature). Others echoed the need for interdisciplinary approaches, suggesting closer collaboration between natural scientists, pedagogists, and psychologists to refine educational strategies. As one

interviewee put it, “We -hard scientists- really need to unite, so to speak, with pedagogists and psychologists to understand how to move people” (28, Female, Marine Biology).

In addition to pedagogical knowledge, participants underlined the need for relational and communication skills training, especially for engaging with diverse audiences, including children, teenagers, and individuals with special educational needs. Some reflected on the challenges they face when working in classrooms without adequate preparation for managing complex social and cognitive dynamics. “There is a need for training in pedagogical methodologies such as how to teach and especially (...) to people who have cognitive difficulties or people who have problems that may fall within the autism spectrum or people who have problems that perhaps have a marked aggressiveness”, shared one participant (33, Male, Evolutionary Biology).

Educators also emphasised the importance of adapting communication styles to different age groups, recognising that effective teaching requires sensitivity to developmental differences. One interviewee explained, “A part (of the training) should also be linked to developmental pedagogy. (...) because you still have to tell stories, knowing what you tell, but you also have to know how to decline what you tell based on who is in front of you” (48, Male, Natural Sciences). Similarly, another participant added, “Something (needed is) related to the pedagogical aspect in order to understand according to the different age groups, what the user is able to perceive based on his cognitive capacity. Clearly, a child in a nursery is different from a year-six child, they have different skills and abilities. It would certainly be useful to know them. Here, that is something that I would like to delve into a lot, because I have never had the opportunity to do it. (...) Communication is very important—how to communicate, how to be as clear and effective as possible if there are tools precisely for a more effective communication” (46, Female, Natural Sciences).

When discussing training preferences, participants expressed a strong interest in practical, hands-on approaches that can be directly applied to their activities. Rather than purely theoretical courses, educators highlighted the value of experiential learning, workshops, and simulations that focus on real-life teaching scenarios. Such approaches were viewed as more aligned with the dynamic and interactive nature of environmental education, enabling educators to immediately test and refine new techniques in their practice.

Several participants also expressed a need to expand their audience beyond children and teenagers, recognising that meaningful environmental education requires the involvement of parents,

teachers, and other members of the community. Educators argued that engaging adults and institutional figures could create long-lasting effects by reinforcing pro-environmental behaviours both at home and within schools. One participant explained, “Training teachers is a very powerful tool in order to have an impact on the new generations (...) Also school principals, because simply being able to get schools to collaborate more with research institutes, with researchers, inviting experts who go visit them in class or take them on a trip” (28, Female, Natural Sciences).

The interviews also revealed divergent views on the ideal educational pathways for environmental educators. Some participants advocated for flexible entry points into the profession, allowing individuals from diverse educational and professional backgrounds to bring different perspectives and skills to the field. Others, however, emphasised the need for educators to have strong foundations in natural sciences, suggesting that pedagogical and relational competencies should be added later as part of professional development. These differing perspectives highlight the tensions between specialisation and inclusivity, underscoring the need for a balanced and adaptable training framework that accommodates diverse profiles while maintaining high standards of expertise.

4.4 Discussion

This study explored the experiences, challenges, and perspectives of environmental educators, with particular attention to their motivations, beliefs, training needs, and professional identity. Findings highlight the importance of intrinsic motivations, the emotional dimensions of environmental learning, and the need for improved training programmes and professional recognition. The results also revealed divergent views on professionalisation, reflecting tensions between institutionalisation and flexibility in the field.

The findings confirm that intrinsic motivations, personal values, and a strong sense of mission drive many environmental educators, helping them to overcome economic and professional challenges. These findings are consistent with previous studies conducted in Greece (Gavrilakis, Daskolia, & Blintziou, 2021) and Canada (Dobrinski & Upitis, 2008), where educators often draw on their personal ethics and commitment to conservation as primary drivers for entering the profession. Like these contexts, participants in our study reported having diverse educational backgrounds, including both natural and social sciences, although only a few received specialised

trainings in environmental education. However, while in the Greek context (Gavrilakis, Daskolia, & Blintziou, 2021) personal experiences with environmental education were identified as common motivators, this aspect was not mentioned by our Italian participants. Instead, social interactions and relational satisfaction emerged as key factors sustaining educators' commitment, reinforcing the idea that the emotional and social dimensions of their work serve as buffers against the financial and institutional precarity they often experience. These findings contribute to the literature highlighting environmental education as a value-driven and vocational profession, aligning with data on teacher educators' identity (Izadinia, 2014). However, the tension between ethical motivation and financial recognition highlighted in this study expands the existing literature, emphasising the cognitive dissonance experienced by educators when faced with social expectations of altruism and volunteerism (Mintrop & Ordenes, 2017; Savira, Nurwidawati & Ayub, 2022).

Our findings also underscore the centrality of emotions in environmental learning, both as a teaching strategy and to build empathy and connection with nature. Participants' emphasis on experiential and multisensory approaches aligns with existing research highlighting the potential of emotional engagement to promote learning retention and pro-environmental actions (Ardoin & Bowers, 2020; Whitburn, Linklater & Milfont, 2019). Furthermore, the emphasis on storytelling and emotional connection to nature observed in this study aligns with Wilson's (1984) biophilia hypothesis and with research on transformative experiences in nature (Whitburn, Linklater & Milfont, 2019). Similar insights are reported in the Spanish context by Cebrián & Junyent (2015), where teachers identified communication skills and the ability to manage emotions as essential tools for promoting sustainability education. Likewise, Ojala (2015) explores how emotional regulation not only enhances learning but also strengthens competence and willingness to act, echoing our participants' views on the need to integrate emotions into teaching strategies.

A recurring theme in the findings is the lack of institutional recognition and economic instability faced by environmental educators, which often contributes to frustration and burnout. Many participants expressed that public perceptions of environmental education as primarily altruistic work undermine its professional status and the need for fair compensation. Addressing these challenges requires awareness campaigns that highlight the value and societal impact of environmental education, as well as successful programs that promote conservation efforts. Increased visibility could enhance job satisfaction and professional identity. Furthermore, the

collaborative networks reported among educators in this study demonstrate an opportunity for institutional support to strengthen mentorship programmes and encourage knowledge sharing, fostering both professional growth and peer support.

A key finding in our study was the divergent views regarding professionalisation. While some advocated for formal recognition and integration into national education systems, others valued flexibility and autonomy. These tensions reflect broader debates about the identity and legitimacy of environmental educators, who operate at the intersection of natural sciences, pedagogy, and communication (Gracia, Rodríguez & Pedrajas, 2022). The lack of a clear professional framework echoes findings from Canada, where participants also expressed mixed views about the need for certification pathways and defined career structures (Dobrinski & Upitis, 2008). The diversity of opinions highlights the need for further dialogue and structural solutions that balance stability with the adaptability required to address evolving environmental challenges.

Participants in our study expressed a strong demand for training focused on pedagogical methods, relational skills, and communication strategies. These findings align with previous research highlighting the importance of professional development to address diverse learning needs and facilitate audience engagement (Stern, Powell & Frensley, 2022; Wibeck, 2014). Given that many participants reported feeling unprepared early in their careers, future training programmes should prioritise experiential learning opportunities such as workshops, simulations, and field-based activities. These approaches can help educators apply pedagogical concepts in real-world settings, enhancing their confidence and self-efficacy, for instance following the framework by Diep & Hartmann (2016). Establishing evaluation metrics—including feedback mechanisms, teaching effectiveness assessments, and student engagement surveys—would further support educators' skills development and long-term professional growth.

Participants in our study also stressed the need to expand their audience, moving beyond children to include parents, teachers, and the broader community. Building on existing collaborative networks, investing in community-based approaches can amplify the long-term impact of environmental education by fostering intergenerational learning and strengthening community participation. Such strategies position educators not only as instructors but also as facilitators of community engagement, reinforcing their role in conservation efforts. To support this expanded role, policymakers should consider structured training programmes and certification pathways that

balance scientific knowledge, pedagogical expertise, and communication skills with flexibility to accommodate diverse professional backgrounds.

This study explored the experiences, challenges, and perspectives of environmental educators, shedding light on their motivations, beliefs, training needs, and professional identity. The findings emphasise the value-driven nature of this profession and the central role of emotions and experiential learning in fostering environmental engagement. Educators expressed a strong desire for structured training programmes that enhance pedagogical methods, communication skills, and relational competencies. Moreover, addressing recognition and economic stability emerged as critical steps to support their professional development and prevent burnout. Expanding audiences and strengthening community networks were also identified as key strategies for amplifying the impact of environmental education.

Despite its contributions, this study has some limitations. The findings are based on interviews conducted within the Italian context, which may limit their generalisation to other cultural or institutional settings. Additionally, the qualitative approach relied on self-reported data, which may be influenced by participants' perceptions and social desirability bias. The cross-sectional design also limits the ability to evaluate the long-term impacts of training interventions or professional changes.

Future research should explore cross-cultural comparisons to examine how environmental educators in different contexts navigate challenges, professional identity, and training needs. Longitudinal studies could provide insights into the evolution of skills, self-efficacy, and career progression over time. Pilot programmes should also be developed to test experiential learning frameworks, focusing on their effectiveness in improving educational practices and student outcomes. Lastly, research should broaden its scope to include stakeholders and audiences, assessing the broader impact of environmental education on communities and conservation efforts.

Chapter 5: General Discussion and Conclusions

5.1 Integration of Findings Across Studies

The four studies presented in this thesis are complementary, relying on different methods and samples, and want to contribute to the towering aim of illuminating crucial psychological dimensions in shaping people's view of sustainability in luxury. Understanding the cognitive, emotional, and affective processes that underlie how people perceive something as sustainable luxury becomes essential for identifying the most effective strategies to reshape how value is attributed to luxury objects, as well as for determining which actions can be taken to modify these representations of reality. Once these underlying processes are understood, it becomes possible to design multi-level interventions that allow new values, attitudes, and representations to enter and transform what "luxury" signifies and to integrate, at its core, the importance of environmental and human survival. This final chapter aims to synthesise the empirical and conceptual contributions of the previous chapters.

Chapter 2 presented an expert-driven prioritisation of operational and symbolic interventions to define and implement sustainable luxury using a Delphi approach; Chapter 3 examined consumers' attitudes, beliefs, preferences and willingness to pay in the cosmetics and packaging domain, as well as their needs and preferences about education on more sustainable options; Chapter 4 provided environmental educators' perspectives and the challenges they face in their professional practice.

Across the studies, traceability and supply chain transparency emerge as important prerequisites for legitimacy. Experts ranked traceability, fair labour, and circular practices as high priorities, signalling high stakeholder salience. These priorities align with evidence that consumers and institutional actors increasingly demand verifiable information about product origins and working conditions (Business & Human Rights Resource Centre, 2023; Holmqvist & Kowalkowski, 2023). The literature on consumers synthesised in Chapter 3 confirms that labels and material cues matter for perceived product appropriateness, even when willingness to pay remains constrained. The empirical investigation of Italian consumers presented in Chapter 3 further confirms these patterns. Taken together, these findings suggest that, at the end of the value chain, environmental education is essential to enable consumers to interpret traceability signals, labels, and material cues, thereby

transforming information transparency into meaningful understanding and informed consumption practices. In-depth interviews with educators reveal the presence of a wide range of complementary expertise, reflecting heterogeneous educational and professional backgrounds. In light of the overall findings, this diversity can be interpreted as evidence of the strategic importance of educators' roles and as a significant opportunity to mobilise rich, multifaceted knowledge in support of credible and effective sustainability narratives.

Altogether, the studies also demonstrate that operational feasibility and symbolic meaning must be aligned. Empirical data on consumers indicate that quality and brand reputation remain dominant purchase drivers; thus, symbolic communication of sustainability must not undermine perceived product excellence, although an increasing interest in sustainability is evident. This gap could be partially filled through environmental educators, who, in our study, however, report their perceived need for specific training and skill acquisition to strengthen their role and professional standing.

Experts in our Delphi study (Chapter 2) emphasised fair business practices and supplier equity as crucial factors to be targeted; however, evidence of supply chain power imbalances (Nurhayati et al., 2021) and limited remediation disclosures (Business & Human Rights Resource Centre, 2023) points to significant structural barriers that must be overcome. Consumers' limited willingness to pay more for sustainability further complicates redistribution, suggesting that brands cannot rely solely on price premiums to internalise social costs. Taken together, our studies indicate that systemic mechanisms such as contractual fairness, profit sharing, and policy incentives are necessary complements to market signalling.

Chapter 3 also shows that health and social values can sometimes outweigh abstract environmental concerns. Indeed, our quantitative study demonstrates that health and social concerns strongly predict the perceived importance of sustainable packaging and purchase intentions, alongside environmental attitudes. These findings help explain why sustainability claims framed around safety, purity, or social justice can be as persuasive as, or even more persuasive than, generic ecological appeals in luxury cosmetics (Ghazali et al., 2017; Pudaruth et al., 2015). Experts' recommendations from the Delphi study (Chapter 2) around communication and education (such as storytelling and emotional engagement) also need to be calibrated to these human-centred values in order to translate legitimacy into market outcomes. Educators' insights from the qualitative study (Chapter 4) further suggest that communication strategies capable of translating technical

aspects into accessible narratives are most likely to resonate with the public. In this respect, narratives that highlight how efforts to protect the natural environment can also generate benefits for human health and social equity may be particularly effective.

The results illuminate the debate highlighted in the introduction between luxury and sustainability and show how sustainability interventions must negotiate these contradictions rather than treat them as peripheral (Carrigan, Moraes & McEachern, 2013; Kapferer & Michaut-Denizeau, 2014). The Delphi study results suggest a reformative pathway that preserves core luxury values such as craftsmanship and quality while embedding sustainability as an extension of excellence rather than a dilution of prestige. Our empirical evidence further cautions against treating sustainability as an add-on attribute. Instead, the thesis argues for a systemic change in operational practices, governance mechanisms, and communication: the transition requires reconfiguring governance, communication, and value distribution so that sustainability becomes an intrinsic dimension of luxury's excellence.

Traceability, fair business practices, and circular operations form the operational bedrock that secures legitimacy, health and social framings provide additional effective consumer-facing narratives, and institutional supports, policies, certifications, and education are essential to redistribute costs and align incentives. This thesis, therefore, contributes to a theoretical synthesis that situates sustainable luxury at the intersection of stakeholder salience, symbolic meaning, and operational feasibility.

Future research should adopt a longitudinal, mixed-methods approach to examine how the detected recommendations and interventions affect consumer trust, market performance, suppliers and workers' welfare over time. Experimental studies could test the relative effectiveness of health-framed versus environment-framed sustainability messages in specific luxury contexts, further clarifying the pathways through which legitimacy translates into purchase behaviours and identifying consumer segments by product types and demographic characteristics. Comparative cross-cultural research would be valuable to assess how different regulatory frameworks and cultural value systems mediate the feasibility and perceived salience of the recommended interventions. Finally, impact evaluations of contractual and redistributive mechanisms are needed to identify feasible and equitable models for sustainability governance within luxury supply chains.

5.2 Conclusions

Our findings lead to a broader reflection on what sustainable luxury ultimately represents: not merely a set of practices, but a reconfiguration of truth, value, and responsibility. The prominence of transparency as a new form of truth-making, an increasing demand for social responsibility and the continuing debate around the tensions between exclusivity and equality, status and ethics, reveal that luxury is less a product category than a symbolic system undergoing transformation as sustainability enters its core. Therefore, it remains conceptually unclear whether these requirements merely redefine the conditions under which luxury is considered acceptable or whether they fundamentally transform the meaning of luxury itself. Our findings, in fact, underscore that sustainability is a relational good requiring redistribution, shared governance, and institutional support, an insight that shifts the conversation from individual choice to collective responsibility. Health and social values further suggest that sustainability is experienced as a practice of care, expanding luxury's symbolic repertoire toward relational and ethical dimensions. The paradoxes of sustainable luxury, its simultaneous pull toward tradition and reform, thus become generative, pushing the sector to innovate not only materially but morally and narratively. Moreover, our results raise questions about the nature of legitimacy in luxury markets: although consumers and institutional actors increasingly demand verifiable information, consumers' limited willingness -or means - to pay more suggest that legitimacy does not automatically translate into economic redistribution or structural change along the supply chain. This gap points to a deeper conceptual issue regarding how ethical value is generated, communicated, and rewarded within luxury systems. Finally, the findings foreground the underexplored role of mediation and interpretation. As sustainability information becomes more technical and complex, the results suggest that environmental education and communicative actors may represent a critical, yet still conceptually marginalised, mechanism through which transparency is transformed into understanding, and understanding into meaningful engagement of the general public (i.e., consumers). Educators emerge as crucial mediators in this transition, enabling consumers to navigate the moral and material complexity of sustainability claims.

Taken together, these reflections invite further theorisation of luxury not only as a market category, but as a socio-cultural system whose legitimacy increasingly depends on education, interpretation,

and institutional support rather than on symbolic signalling alone.
From Hume's ambivalent account of luxury as potentially beneficial or pernicious, we inherit the insight that luxury's moral status depends on its form of expression and social effects. Adopting phenomenological and aesthetic perspectives, we shift the attention from material excess to the *experience* of luxury: its capacity to suspend ordinary utility, to cultivate refined attention, and to generate non-instrumental value. When luxury is understood as an aesthetic mode of experience rather than a set of exclusive objects, sustainability becomes conceptually coherent with luxury's deepest aims: preserving craft, enhancing longevity, amplifying beauty and enriching human sensibility. This philosophical turn aligns with our findings and can have ethical and political implications. If luxury's legitimacy increasingly depends on transparency, fairness, and shared governance, then luxury must commit to a new truth-making: one that privileges relational care over scarcity.
The challenge then is not only to make products greener but to reconfigure the social and institutional relations that produce value, redistributing benefits, recognising labour, and educating publics to interpret complex claims: the paradoxes of exclusivity versus equality, permanence versus novelty, symbolic status versus ethical legitimacy are tensions to be negotiated creatively. The future of luxury may thus lie in practices that make aesthetic refinement inseparable from ecological and social responsibility, cultivating forms of care toward people, the planet, and future generations.

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Appendices

Chapter 2: Sustainable Luxury through Expert Consensus

Supplementary A - Phase 1 Survey Items

- "Which **factors** should be considered to foster a sustainable luxury? (i.e. the environmental impact of raw materials, ethical sourcing, labour practices, the carbon footprint of production processes, fair wages and safe working conditions). Please, add **your suggestions** in the text boxes and **rate each of them** in terms of their importance."
- Which **methods** should be considered to foster a sustainable luxury? (i.e. life cycle assessment, circular economy models, implementing sustainable certifications such as Fair Trade, GOTS). Please, add **your suggestions** in the text boxes and **rate each of them** in terms of their importance.
- Which **processes** should be considered to foster a sustainable luxury? (i.e. lean manufacturing to minimise waste, closed-loop recycling systems, and sustainable packaging initiatives). Please, add **your suggestions** in the text boxes and **rate each of them** in terms of their importance.
- Which **technological aspects** should be considered to foster a sustainable luxury? (i.e. development and use of eco-friendly materials, advancements in renewable energy for production, and smart manufacturing technologies such as IoT for efficient resource management). Please, add **your suggestions** in the text boxes and **rate each of them** in terms of their importance.
- Which **critical checkpoints** should be considered to foster a sustainable luxury? (i.e. regular sustainability audits, setting measurable sustainability goals, and transparent reporting on progress). Please, add **your suggestions** in the text boxes and **rate each of them** in terms of their importance.

Table S1

	Factors to be taken into account when considering Sustainability and Luxury.	Mean (standard deviation) Rating 0-4	(% Very important and Extremely important) N=77	Number and % of Participants considering it among the top 5 Priority (N=77)	Number and % of Participants considering it among the 5 of Lowest Priority (N = 77)
1	Adoption of Circular Economy models, meaning production and consumption practices involving sharing, lending, reusing, repairing, refurbishing, and recycling materials and products for as long as possible.	3.2 (0.9)	83.1%	37 (48.1%)	4 (5.2%)
2	Adoption of lean manufacturing practices to reduce water, energy, raw material, and chemical consumption through optimised processes.	3.5 (0.7)	90.9%	20 (26%)	9 (11.7%)
3	Adoption of Closed-Loop Recycling Systems, production models where used materials are recycled and reintroduced into the production cycle to create new, similar products without losing quality.	3.0 (1.1)	75.3%	15 (19.5%)	9 (11.7%)
4	Adoption of upcycling models and strategies, a reuse process that does not require further material processing (e.g., transforming jeans into a skirt).	2.6 (1.2)	63.3%	5 (6.5%)	16 (20.8%)
5	Adoption of Life Cycle Assessment (LCA) to evaluate the environmental impact at each stage: from design to production, distribution, use, and end-of-life.	3.3 (0.9)	80.5%	29 (37.7%)	11 (14.3%)
6	Ensuring traceability and transparency across the entire supply chain by leveraging advanced technologies such as blockchain to verify the origin of materials and ensure	3.2 (0.9)	81.8%	29 (37.7%)	10 (13%)

	compliance with ethical practices by suppliers.				
7	Designing high-quality, durable products while optimising resources through techniques that minimise waste, such as modular or custom designs.	3.2 (0.7)	88.3%	32 (41.6%)	9 (11.7%)
8	Employing bio-based materials composed of renewable resources such as mycelium, synthetic silk, or biodegradable plastics.	2.7 (1.2)	63.6%	14 (18.2%)	15 (19.5%)
9	Employing recycled materials derived from post-consumer or post-industrial waste, such as recycled PET for fabrics and metal recycling.	2.6 (1.2)	59.7%	7 (9.1%)	16 (20.8%)
10	On-demand manufacturing to reduce production and storage costs and environmental impact.	2.8 (1.1)	63.6%	13 (16.9%)	22 (28.6%)
11	Minimising and optimising logistics and transportation to reduce the carbon footprint.	2.9 (1.0)	71.4%	13 (16.9%)	18 (23.4%)
12	Selecting materials and/or extraction or production practices with minimal impact on biodiversity and the environment.	3.2 (0.9)	80.5%	14 (18.2%)	7 (9.1%)
13	Ensuring that production processes respect human rights and promote safe and fair working conditions.	3.6 (0.7)	94,8%	36 (46.8%)	6 (7.8%)
14	Promoting local craftsmanship by collaborating with artisans and local communities to preserve traditional techniques.	3.3 (0.8)	84.4%	24 (31.2%)	15 (19.5%)
15	Employing renewable energy sources and technologies in production processes, such as solar heating and low-energy systems.	3.1 (0,9)	76.6%	4 (5.2%)	9 (11.7%)

16	Employing techniques or machinery that optimise the amount of raw materials (e.g., additive manufacturing; 3D printing) to reduce waste and scraps.	2.9 (0.9)	72.7%	3 (3.9%)	19 (24.7%)
17	Creation of digital twins to simulate and optimise production processes before physical realisation (e.g., virtual collections to reduce physical prototypes).	2.3 (1.2)	44.2%	3 (3.9%)	42 (54.5%)
18	Adopting internationally recognised sustainability standards (e.g., GOTS, FSC, ISO 14001, etc.).	3.0 (1.0)	70.1%	8 (10.4%)	18 (23.4%)
19	Educational marketing to communicate the product's story, the materials used, and the positive impact of the purchasing choice on communities and the environment.	3.0 (0,8)	72.7%	16 (20.8%)	16 (20.8%)
20	Educating consumers on recognising labels and certifications.	3.2 (0,9)	81.8%	19 (24.7%)	22 (28.6%)
21	Extended Producer Responsibility to ensure the producer's accountability throughout the entire product life cycle, including the post-consumer stage.	3.0 (1.0)	75.3%	12 (15.6%)	12 (15.6%)
22	Employing packaging made from biodegradable sustainable materials.	3.0 (1,03)	70.1%	7 (9.1%)	19 (24.7%)
23	Employing packaging made from recycled or recyclable materials.	2.8 (1,03)	66.2%	4 (5.2%)	19 (24.7%)
24	Reducing the amount of packaging used through optimised and functional design.	3,1 (0.99)	72.7%	11 (14.3%)	15 (19.5%)

Table S1. Perceived Importance and Prioritisation of Sustainability Factors in the Context of Luxury in ***Round 1 Delphi*** *(N = 77).*

The table reports mean ratings and standard deviation (0-4 scale), the percentage rating each factor as "3-

Very important" or "4-Extremely important", and the number and percentage of participants ranking each factor among their top five or bottom five priorities.

Table S2

	Critical Checkpoints for achieving Sustainable Luxury	**Mean (standard deviation) Rating 0-4**	**(% Very important and Extremely important) N=77**
1	Implementation of regular internal or external audits to monitor compliance with sustainability practices and corporate standards. Measurable goal: Percentage of business operations subject to annual audits compared to the total. Checkpoint: Frequency of audits (e.g., quarterly or annual); reports with recommendations and corrective actions implemented.	2.6 (0.97)	57.1%
2	Reduction of CO_2 emissions, energy consumption, or the use of recycled materials. Measurable goal: Reduction of the carbon footprint within a defined period (e.g., by 25% over 3 years). Checkpoint: Periodic measurement (e.g., annual) of emissions using standard tools (e.g., GHG Protocol); verification of milestone achievements (e.g., -10% after the first year).	3.1 (0,96)	72.7%
3	Publication of regular reports that communicate progress in sustainability to stakeholders, including successes and areas for improvement. Measurable goal: Production of a periodic (e.g., annual) sustainability report accessible to the public. Checkpoint: Timely release of reports (e.g., by Q2 each year); increased stakeholder engagement (e.g., feedback received).	2.5 (1,0)	48.1%
4	Obtaining recognised certifications (e.g., ISO 14001, GOTS, FSC) to demonstrate compliance with environmental and social sustainability standards. Measurable goal: Percentage of certified products relative to the total (e.g., 75% within 5 years). Checkpoint: Compliance audits by certification bodies; number of certifications obtained annually.	2.6 (1,1)	55.8%
5	Monitoring and continuous improvement of working conditions along the supply chain, ensuring fairness, safety, and respect for human rights. Measurable goal: Percentage of suppliers verified according to ethical criteria (e.g., 100% of critical suppliers within 2 years). Checkpoint: Regular inspections; anonymous employee reports; implementation of corrective actions; training programs.	3.3 (0,7)	84.4%

Table S2. Perceived Importance and Prioritisation of Checkpoints and Measures to achieve Sustainable Luxury in ***Round 1 Delphi*** *(N = 77).* The table reports mean ratings and standard deviation (0-4 scale), and the percentage rating each checkpoint as "3-Very important" or "4-Extremely important".

Table S3

	Factors to be taken into account when considering Sustainability and Luxury	**Mean (standard deviation) Rating 0-4**	**(% Very important and Extremely important) total=51**
Aspects generated by Advisory Panel	Adoption of Circular Economy models, meaning production and consumption practices involving sharing, lending, reusing, repairing, refurbishing, and recycling materials and products for as long as possible.	3.3 (0.64)	90.2%
	Adoption of lean manufacturing practices to reduce water, energy, raw material, and chemical consumption through optimised processes.	3.5 (0.57)	96.1%
	Adoption of Closed-Loop Recycling Systems, production models where used materials are recycled and reintroduced into the production cycle to create new, similar products without losing quality.	3.0 (0.94)	82.4%
	Adoption of upcycling models and strategies, a reuse process that does not require further material processing (e.g., transforming jeans into a skirt).	2.4 (0.85)	51.0%
	Adoption of Life Cycle Assessment (LCA) to evaluate the environmental impact at each stage: from design to production, distribution, use, and end-of-life.	3.3 (0.85)	86.3%
	Ensuring traceability and transparency across the entire supply chain by leveraging advanced technologies such as blockchain to verify the origin of materials and ensure compliance with ethical practices by suppliers.	3.3 (0.8)	86.3%
	Designing high-quality, durable products while optimising resources through techniques that minimise waste, such as modular or custom designs.	3.3 (0.8)	90.2%
	Employing bio-based materials composed of renewable resources such as mycelium, synthetic silk, or biodegradable plastics.	2.8 (1.0)	66.7%

	Employing recycled materials derived from post-consumer or post-industrial waste, such as recycled PET for fabrics and metal recycling.	2.6 (1.0)	60.8%
	On-demand manufacturing to reduce production and storage costs and environmental impact.	3.0 (0.7)	80.4%
	Minimising and optimising logistics and transportation to reduce the carbon footprint.	2.9 (0.8)	72.5%
	Selecting materials and/or extraction or production practices with minimal impact on biodiversity and the environment.	3.2 (0.9)	82.4%
	Ensuring that production processes respect human rights and promote safe and fair working conditions.	3.7 (0.6)	98.0%
	Promoting local craftsmanship by collaborating with artisans and local communities to preserve traditional techniques.	3.2 (0.6)	92.2%
	Employing renewable energy sources and technologies in production processes, such as solar heating and low-energy systems.	3.1 (0.8)	78.4%
	Employing techniques or machinery that optimise the amount of raw materials (e.g., additive manufacturing; 3D printing) to reduce waste and scraps.	2.9 (0.8)	74.5%
	Creation of digital twins to simulate and optimise production processes before physical realisation (e.g., virtual collections to reduce physical prototypes).	2.0 (1.0)	25.5%
	Adopting internationally recognised sustainability standards (e.g., GOTS, FSC, ISO 14001, etc.).	2.9 (1.0)	72.5%
	Educational marketing to communicate the product's story, the materials used, and the positive impact of the purchasing choice on communities and the environment.	3.0 (0.7)	76.5%
	ducating consumers on recognising labels and certifications.	3.2 (0.7)	80.4%
	Extended Producer Responsibility to ensure the producer's accountability throughout the entire product life cycle, including the post-consumer stage.	2.9 (0.9)	72.5%

	Employing packaging made from biodegradable, sustainable materials.	3.0 (0.9)	74.5%
	Employing packaging made from recycled or recyclable materials.	2.7 (1.0)	66.7%
	Reducing the amount of packaging used through optimised and functional design.	3.2 (0.8)	84.3%

		Mean (standard deviation) Rating 0-4	**(% Very important and Extremely important) total=51**	**Number and % of Participants considering it among the top 5 Priority (N=51 responses)**
Aspect generated in Round 1 By Musa Spoke 5 Members	Fair resources allocation and distribution to achieve positive social impact	2.6 (0.9)	56.9%	15 (29.4%)
	Fostering sustainable consumption through consumer communities and small circles, while also influencing broader society.	2.6 (1.0)	58.8%	12 (23.5%)
	Harnessing experiential consumption, emotional engagement, subjective feelings, and social pressure to incentivize sustainable purchases.	2.4 (1.0)	47.1%	6 (11.8%)
	Improving the aesthetic of sustainable products	2.5 (1.1)	52.9%	15 (29.4%)
	Involvement of the company in practical sustainable actions (i.e. reforestation)	2.9 (1.0)	72.5%	23 (45.1%)
	Equal repartition of profits across the supply chain (suppliers, manufacturer, branders, retailers)	2.9 (1.0)	66.7%	20 (39.2%)
	Salary cap for top managers, less gap with workers' salary	2.7 (1.0)	64.7%	8 (15.7%)
	Providing benefits for businesses and companies when adopting sustainable practices, while decreasing costs of adopting such practices.	2.7 (1.0)	64.7%	22 (43.1%)

	Animal welfare	2.6 (1.3)	62.7%	15 (29.4%)
	Ensuring fair business practices by preventing large companies from using their bargaining power to impose unfair conditions on smaller suppliers, manufacturers, or other stakeholders in the supply chain.	3.2 (0.7)	80.4%	22 (43.1%)
	Fair price with limited mark-ups	2.2 (1.2)	51.0%	6 (11.8%)
	Evaluating how companies act as responsible corporate citizens while navigating ethical dilemmas in the pursuit of sustainable luxury.	2.5 (1.1)	52.9%	14 (27.5%)
	Rethinking growth and development as distinct concepts within sustainable luxury	2.4 (1.1)	49.0%	9 (17.6%)

Table S3. Perceived Importance and Prioritization of Sustainability Factors in the Context of Luxury in ***Round 2 Delphi*** *(N = 51).* The table reports mean ratings and standard deviation (0-4 scale), the percentage rating each factor as "3-Very important" or "4-Extremely important", and the number and percentage of participants ranking each new factor generated by MUSA-Spoke5 members in Round 1 among their top five priorities.

Table S4

	Critical Checkpoints for achieving Sustainable Luxury	**Mean (standard deviation) Rating 0-4**	**(% Very important and Extremely important) total=51**
1	Implementation of regular internal or external audits to monitor compliance with sustainability practices and corporate standards. Measurable goal: Percentage of business operations subject to annual audits compared to the total. Checkpoint: Frequency of audits (e.g., quarterly or annual); reports with recommendations and corrective actions implemented.	2.7 (0.9)	60.8%
2	Reduction of CO_2 emissions, energy consumption, or the use of recycled materials. Measurable goal: Reduction of the carbon footprint within a defined period (e.g., by 25% over 3 years). Checkpoint: Periodic measurement (e.g., annual) of emissions using standard tools (e.g., GHG Protocol); verification of milestone achievements (e.g., -10% after the first year).	3.2 (0.8)	88.2%
3	Publication of regular reports that communicate progress in sustainability to stakeholders, including successes and areas for improvement. Measurable goal: Production of a periodic (e.g., annual) sustainability report accessible to the public. Checkpoint: Timely release of reports (e.g., by Q2 each year); increased stakeholder engagement (e.g., feedback received).	2.5 (1.0)	47.1%
4	Obtaining recognised certifications (e.g., ISO 14001, GOTS, FSC) to demonstrate compliance with environmental and social sustainability standards. Measurable goal: Percentage of certified products relative to the total (e.g., 75% within 5 years). Checkpoint: Compliance audits by certification bodies; number of certifications obtained annually.	2.7 (1.0)	60.8%
5	Monitoring and continuous improvement of working conditions along the supply chain, ensuring fairness, safety, and respect for human rights. Measurable goal: Percentage of suppliers verified according to ethical criteria (e.g., 100% of critical suppliers within 2 years). Checkpoint: Regular inspections; anonymous employee reports; implementation of corrective actions; training programs.	3.3 (0.6)	92.2%

Table S4. Perceived Importance and Prioritisation of Checkpoints and Measures to achieve Sustainable Luxury in ***Round 2 Delphi*** *(N = 51).* The table reports mean ratings and standard deviation (0-4 scale), and the percentage rating each checkpoint as "3-Very important" or "4-Extremely important".

Table S5. Clustered sustainability factors and stakeholder-specific actionable steps resulting from a two-round Delphi study, organised by priority and feasibility (Classes I–III).

Class	Topic	Factors from Delphi	Actionable Steps
Class I – Feasible & Immediate Action	Ethical Governance & Human Rights	Ensuring that production processes respect human rights and promote safe and fair working conditions Ensuring traceability and transparency across the entire supply chain by leveraging advanced technologies such as blockchain to verify the origin of materials and ensure compliance with ethical practices by suppliers Ensuring fair business practices by preventing large companies from using bargaining power to impose unfair conditions on smaller suppliers or manufacturers[a]	**For luxury brands** • Integrate human-rights due diligence into business-to-business relationships and audits • Integrate ethical monitoring and supplier equity audits to ensure fair treatment across the supply chain • Map multi-tier supply chains and require disclosure beyond first-tier suppliers • Use digital traceability tools (e.g., blockchain, RFID) linked to compliance criteria • Establish grievance and remediation mechanisms for workers • Establish long-term, partnership-based relationships with small suppliers and manufacturers • Provide employees with opportunities for continuous personal and professional development • Engagement of luxury and apparel firms with trade unions and worker representatives **For policymakers** • Mandate human-rights reporting and due-diligence obligations in the luxury and fashion sectors

			• Incentivise supply-chain transparency through tax credits or recognition programs • Strengthen competition and fair-trade regulations to prevent abuse of market power • Promote regulatory frameworks that discourage unfair contractual practices and abuse of dominant bargaining power **For NGOs and industry bodies** • Support worker representation and social auditing schemes • Monitor power asymmetries and unfair contractual practices • Support small suppliers and workers through advocacy and capacity-building • Develop shared standards and benchmarks for ethical luxury supply chains
	Sustainable Operations & Resource Efficiency	Adoption of lean manufacturing practices to reduce water, energy, raw material, and chemical consumption through optimised processes Reducing the amount of packaging used through optimised and functional design On-demand manufacturing to reduce production and storage costs and environmental impact	**For luxury brands** • Conduct process-mapping to identify inefficiencies and waste hotspots • Invest in on-demand or small-batch production models to reduce overproduction, inventory risks, and waste. • Integrate advanced production technologies to enable small-batch and customised production. • Pilot digital body-scanning and fitting technologies to improve garment accuracy, reduce returns, and support personalised production at scale. • Use automated logistics and digital production planning systems to increase

responsiveness while lowering environmental impact.
- Redesign packaging to minimise material use while preserving luxury aesthetics
- Adopt energy- and water-efficient machinery and production systems

For policymakers

- Support clean production technologies through subsidies or innovation funding
- Introduce extended producer responsibility schemes for packaging

For NGOs and consultants

- Provide technical support for lean and low-impact manufacturing transitions
- Disseminate best practices and case studies within the luxury sector

	Circular Design & Life-Cycle Responsibility	Adoption of Circular Economy models, meaning production and consumption practices involving sharing, lending, reusing, repairing, refurbishing, and recycling materials and products for as long as possible Adoption of Closed-Loop Recycling Systems, production models where used materials are recycled and reintroduced into the production cycle to create new, similar products without losing quality Adoption of Life Cycle Assessment (LCA) to evaluate the environmental impact at each stage: from design to production, distribution, use, and end-of-life Durable, high-quality product design, modular or custom designs that minimise waste, such as modular or custom designs	**For luxury brands** • Integrate LCA into the design phase to guide material and process choices • Design products for longevity, repairability, and recyclability • Develop take-back, repair, or refurbishment programmes • Collaborate with recycling partners to implement closed-loop systems **For policymakers** • Encourage circular business models through regulation and procurement policies • Standardise LCA methodologies for luxury and fashion products **For NGOs and research institutions** • Support innovation in circular materials and recycling technologies • Monitor and evaluate the real environmental impact of circular claims
	Responsible Sourcing & Biodiversity Protection	Selecting materials and/or extraction or production practices with minimal impact on biodiversity and the environment	**For luxury brands** • Prioritise certified, regenerative, or low-impact raw materials • Work with suppliers to reduce ecosystem damage and improve land stewardship • Disclose sourcing practices and biodiversity impacts transparently **For policymakers**

			• Strengthen regulations on resource extraction and biodiversity protection • Support traceable certification schemes for sustainable materials **For NGOs** • Monitor biodiversity impacts of luxury supply chains • Advocate for ecosystem-based approaches to material sourcing
	Cultural Value, Craftsmanship & Local Embeddedness	Promoting local craftsmanship by collaborating with artisans and local communities to preserve traditional techniques	**For luxury brands** • Establish long-term partnerships with artisan communities • Ensure fair compensation and capacity-building initiatives • Embed craftsmanship narratives into transparent sustainability storytelling **For policymakers** • Protect cultural heritage through geographic indications and artisan support schemes **For NGOs and cultural institutions** • Support skill transmission, training, and intergenerational knowledge transfer

	Consumer Literacy	Educating consumers on recognising labels and certifications	**For luxury brands** • Communicate certification and labelling information clearly and accessibly • Invest in consumer education initiatives that explain the meaning and limits of sustainability labels **For policymakers** • Standardise sustainability labels and improve their clarity for consumers • Support public awareness campaigns on credible certifications **For NGOs and consumer organisations** • Provide independent guidance on interpreting labels and certifications • Act as watchdogs against misleading or opaque sustainability claims

Class II – Medium Priority / Feasible	Low-Impact Production & Energy Transition	Employing renewable energy sources and technologies in production processes, such as solar heating and low-energy systems Employing techniques or machinery that optimise the amount of raw material (e.g., additive manufacturing; 3D printing) to reduce waste and scraps	**For luxury brands** • Gradually replace fossil-based energy with on-site or contracted renewable energy sources (e.g., solar heating, low-energy systems) • Invest in advanced manufacturing technologies that minimise material waste and production scraps • Integrate energy- and material-efficiency targets into operational KPIs **For policymakers** • Provide subsidies or incentives for renewable energy adoption and energy-efficient manufacturing technologies • Support pilot projects for advanced, low-waste production systems **For NGOs and technical partners** • Disseminate best practices on energy transition and resource-efficient manufacturing • Support the impact monitoring of energy and material savings
	Responsible Packaging & Logistics	Employing packaging made from biodegradable sustainable materials Minimising and optimising logistics and transportation to reduce the carbon footprint	**For luxury brands** • Transition to biodegradable or certified sustainable packaging materials while maintaining functional and aesthetic requirements • Redesign logistics networks to reduce transportation distances and reliance on carbon-intensive modes

- Reduce employee travel through the introduction of digital structure and prioritise low-emission transport solutions where feasible

For policymakers

- Encourage sustainable packaging through material regulations and eco-design requirements
- Support low-carbon logistics infrastructure and reporting frameworks

For NGOs

- Monitor and benchmark packaging and logistics-related environmental impacts
- Promote transparency and accountability in logistics emissions reporting

	Standards, Accountability & Life-Cycle Responsibility	Adopting internationally recognised sustainability standards (e.g., GOTS, FSC, ISO 14001) Extended Producer Responsibility to ensure the producer's accountability throughout the entire product life cycle, including the post-consumer stage Involvement of the company in practical sustainable actions (e.g., reforestation)[a]	**For luxury brands** • Adopt and maintain internationally recognised certifications to formalise sustainability commitments • Integrate Extended Producer Responsibility principles into product and business model design • Develop mechanisms for post-consumer responsibility, such as take-back or recycling programmes • Engage in practical sustainability initiatives such as reforestation, community-based environmental projects, or conservation programmes **For policymakers** • Strengthen regulatory frameworks for Extended Producer Responsibility • Support and incentivise corporate participation in measurable sustainability actions **For NGOs and certification bodies** • Monitor, verify, and report on corporate participation in sustainability programmes • Facilitate partnerships between companies and local or global sustainability initiatives • Educate stakeholders on the scope and limits of sustainability standards

	Sustainability Communication & Consumer Engagement	Educational marketing to communicate the product's story, the materials used, and the positive impact of the purchasing choice on communities and the environment	**For luxury brands** • Use educational marketing to transparently communicate material choices, production processes, and community impacts • Avoid greenwashing by aligning marketing narratives with verifiable practices and certifications • Engage consumers as informed stakeholders rather than passive buyers **For policymakers** • Promote truthful sustainability communication through advertising standards and guidelines **For NGOs and consumer organisations** • Support consumer literacy on sustainability claims and certifications Act as watchdogs against misleading sustainability narratives

Class III – Emergent / Less Feasible	Socio-Economic Equity & Fair Governance	Equal repartition of profits across the supply chain (suppliers, manufacturers, branders, retailers)[a] Salary cap for top managers; reducing gaps with workers' salaries[a] Providing benefits or incentives for companies adopting sustainable practices, while decreasing the costs of adopting such practices.[a] Fair resource allocation and distribution to achieve positive social impact[a] Fair price with limited mark-ups[a] Evaluating how companies act as responsible corporate citizens while navigating ethical dilemmas in the pursuit of sustainable luxury[a]	**For luxury brands** • Develop profit-sharing mechanisms or equitable pricing strategies with suppliers and partners • Review executive compensation policies to align with sustainability and social equity goals • Provide internal incentives for sustainable business practices (e.g., bonus schemes linked to sustainability KPIs) • Incorporate social impact metrics into corporate decision-making • Promote transparency in pricing and value distribution across the supply chain **For policymakers** • Support regulatory frameworks that encourage equitable profit-sharing and fair wages • Provide financial incentives or tax relief for companies adopting sustainable practices **For NGOs and civil society** • Monitor corporate practices regarding fair resource distribution and responsible governance • Advocate for accountability and transparency in executive pay and supplier relations

	Sustainable Consumption & Cultural Engagement	Fostering sustainable consumption through consumer communities and small circles, while influencing broader society[a] Rethinking growth and development as distinct concepts within sustainable luxury[a] Harnessing experiential consumption, emotional engagement, subjective feelings, and social pressure to incentivise sustainable purchases[a]	**For luxury brands** • Develop community-driven initiatives and campaigns to engage consumers in sustainable practices • Promote post-material values such as quality, craftsmanship, and longevity over mere acquisition • Use experiential marketing and immersive storytelling to encourage sustainable choices • Monitor social influence and peer networks to amplify sustainable behaviour **For policymakers** • Promote educational and awareness campaigns to foster sustainable consumption patterns • Support initiatives that explore post-material and well-being-based economic metrics **For NGOs** • Facilitate community networks that encourage sustainable luxury choices • Provide independent guidance and assessment of sustainability claims

	Sustainable Materials & Circular Product Design	Employing bio-based materials composed of renewable resources such as mycelium, synthetic silk, or biodegradable plastics Employing recycled materials derived from post-consumer or post-industrial waste, such as recycled PET for fabrics and metal recycling Employing packaging made from recycled or recyclable materials Adoption of upcycling models and strategies, a reuse process that does not require further material processing (e.g., transforming jeans into a skirt) Animal welfare[a]	**For luxury brands** • Integrate bio-based, recycled and cruelty-free materials into product design • Develop upcycling programmes to transform post-consumer products into new items • Redesign packaging to maximise recyclability and reduce environmental footprint • Ensure animal welfare standards are respected in material sourcing (e.g., no fur, ethical leather, or certified alternatives) • Track material provenance and recycling rates to ensure authenticity **For policymakers** • Support research and adoption of cruelty-free and recycled materials • Encourage certification schemes for animal welfare and sustainable sourcing • Provide incentives for the adoption of upcycling and circular materials **For NGOs and research institutions** • Monitor material claims to prevent greenwashing • Monitor and verify animal welfare practices and sustainability claims • Support innovation in bio-based, recycled, and cruelty-free materials

	Digital Innovation & Process Optimisation	Creation of digital twins to simulate and optimise production processes before physical realisation (e.g., virtual collections to reduce physical prototypes) Improving the aesthetic of sustainable products[a]	**For luxury brands** • Implement digital twins and virtual prototyping to reduce waste and optimise production • Enhance product aesthetics while maintaining sustainability standards to appeal to luxury consumers • Use virtual simulations to balance design innovation, material efficiency, and production feasibility **For policymakers** • Provide funding or technical support for digital sustainability innovations • Encourage adoption of industry-wide standards for virtual design and sustainable production technologies **For NGOs and technical partners** • Evaluate and certify digital sustainability practices • Provide guidance on combining aesthetic and environmental objectives

[a] Aspects suggested by MUSA Spoke 5 Members in 1st Round and rated in 2nd Round

Chapter 3: Consumers and Sustainable Packaging

Table S6 - Research Strings

DATABASE	RESEARCH STRING
Web of Science: limited to English	TS=((psychological-factor* OR psychological OR social OR social-factor* OR socio-psychological-factor* OR psychological factor* OR social factor* OR socio-psychological factor* OR perception* OR effect* OR attitude* OR behavio?r* OR evaluation* OR belief* OR intention* OR willingness-to-pay OR choice* OR preference* OR understanding OR impact* OR decision* OR concern* OR barrier* OR driver* OR consumption* OR purchas* OR motive* OR experiment* OR investigation* OR exploration*) AND (sustainable OR green OR eco-friendly OR environmentally-friendly OR bio-based OR organic) AND (cosmetic* OR beauty OR skin-care OR personal-care OR beauty-care) AND (packaging))
Scopus: limited to English	TITLE-ABS-KEY ((psychological-factor* OR psychological OR social OR social-factor* OR socio-psychological-factor* OR "psychological factor*" OR "social factor*" OR "socio-psychological factor*" OR perception* OR effect* OR attitude* OR behavio?r* OR evaluation* OR belief* OR intention* OR willingness-to-pay OR choice* OR preference* OR understanding OR impact* OR decision* OR concern* OR barrier* OR driver* OR consumption* OR purchas* OR motive* OR experiment* OR investigation* OR exploration*) AND (sustainable OR green OR eco-friendly OR environmentally-friendly OR bio-based OR organic) AND (cosmetic* OR beauty OR skin-care OR personal-care OR beauty-care) AND packaging) AND (LIMIT-TO (LANGUAGE , "English"))
Proquest: (– anywhere except full text for each row) limited to English	noft("psychological-factor*" OR “social-factor*” OR “psychological” OR “social” OR “socio-psychological-factor*” OR ("psychological factor" OR "psychological factors") OR ("social factor" OR "social factors") OR "socio-psychological factor*" OR"perception*" OR "effect*" OR "attitude*" OR "behavio?r*" OR "evaluation*" OR "belief*" OR "intention*" OR "willingness-to-pay" OR "choice*" OR "preference*" OR "understanding" OR "impact*" OR "decision*" OR "concern*" OR "barrier*" OR "driver*" OR "consumption*" OR "purchase*" OR "motive*" OR "experiment*" OR "investigation*" OR "exploration*") AND noft("cosmetic*" OR "beauty" OR "skin-care" OR "personal-care" OR "beauty-care") AND noft("sustainable" OR "green" OR "eco-friendly" OR "environmentally-friendly" OR "bio-based" OR "organic") AND noft(packaging)

Table S7 - Studies included in the Systematic Literature Review

Authors, Year	Country	Population and Sample	Theoretical Model	Instruments	Design	Quality	Aim	Packaging definition / labels	Target Variable(s)
Amberg & Fogarassy 2019	Hungary	General Consumers; Sample n=197	Segmentation study	Questionnaire adapted from (Matić & Puh, 2016)	Cross-sectional	high	Link between consuming biological food and that using natural cosmetics. To determine grouping for consumers based on their usage of natural cosmetics.	Natural Packaging	Beliefs and Attitudes Intention to purchase,Behaviours and Preferences
Andrade et al. 2020	Brazil	Sample N= 8 key figures of 5 companies in the Personal Hygiene and Perfumer Industry (HPPC).	-	Semi-structured interviews	Qualitative	low	To explore the vision and current status of interest of five Brazilian enterprises in the field of HPPC in the implementation of Green Logistics (reduction or non-generation of waste) for developing their packaging and Acceptance of QFD in communities of practice (CoP) to measure consumer needs regarding Green Logistics.	Recycling packaging according to Green Logistics (OECD, 2013)	Beliefs and Attitudes Industry Perspectives
Drăgan & Petrescu 2013	Romania	Sample= 86 customers	Segmentation study	Questionnaire – ad-hoc questions	Cross-sectional	medium	Profiling consumers in terms of purchasing behaviour and interest in buying organic, natural and conventional skin care goods; To investigate their knowledge about these product, their attitudes regarding organic skin care in comparison to conventional skincare.	Eco-Friendly biodegradable packaging	Beliefs and Attitudes Knowledge and Awareness Intention to purchase,Behaviours and Preferences Socio-Demographic Factors

Grappe et al., 2022	Canada (Quebec)	Sample=684 respondents (personal care products consumers)	Theory of planned behaviour (Ajzen, 1985) Framing Theory (Tversky & Kahneman, 1981)	Questionnaire that measured: Credibility of the claims: four items inspired by (Moussa & Touzani, 2008); Attitudes towards the claims: Four items from the research of (Maheswaran & Meyers-Levy, 1990); Attitude towards the cosmetic product: three item from (Lombart & Louis, 2012); Purchase Intentions: Four items from (Zeithaml et al., 1996); Health concern: five items from (Gould, 1988); Environmental Concern: four items from (Kim & Seock, 2009); Personal	(randomized) 2x2* between subjects Experimental design	high	Attitudes and Purchase intentions of personal care products by comparing four claims: • one pertaining to presence and health (with avocado oil) • one to absence and health (paraben free) • one to presence and the environment (with recyclable plastic) • one to absence and the environment (reduced environmental impact)	"with recyclable plastic," and "reduced environmental impact" packaging	Beliefs and Attitudes Intention to purchase,Behaviours and Preferences

				appearance: four items from (Cash & Labarge, 1996); Subjective Norm: Three items from (Hsu et al., 2017); Perceived Behavioural Control: two items from the study of (Redondo Palomo et al., 2015)					
Hanss & Böhm 2012	Norway	Sample=123 Consumers (volunteers)	-	Semi-structured interviews	Qualitative	medium	Consumer understanding of the concept of sustainability; Opinions about various attributes related to sustainability; Opinion about labels related to sustainability: indicative of sustainability and familiarity	19 eco-labels issued by third-part independent bodies: BDIH label for natural cosmetics, the previous EU bio label, the German EG bio label, the Norwegian Debio økologisk label and the Nordic Swan; (b) the international Fairtrade label; (c) nine labels from organisations that offer products with sustainable attributes (i.e. Demeter, Grano Vita, Helios, Lavera, Rapunzel, Sunkost, The Body Shop, Tine Økologisk, Weleda); and (d) four labels of major grocery and cosmetics	Beliefs and Attitudes Knowledge and Awareness

								brands on the Norwegian market (i.e. Nidar, Nivea, Stabburet, Tine).	
Kahraman & Kazançoğlu 2019	Turkey	Sample=20 women-consumers	Exploratory	Semi-structured interviews	Qualitative	medium	Attitudes of consumers toward the products claiming that their products are natural and eco-friendly; The factors that play a role in the consumers' purchase intention of claimed -to-be natural products; How greenwashing is perceived and its relationship with purchase intentions.	Labels included "the power of nature with you," "botanical beauty," "natural cleanser," "with 100% olive oil," "100% natural," "have natural ingredients more than 98%," "products with olive oil," "biodegradable formula," "paraben free," "silicon free," "colorant free," "reduced packaging waste," and "50% less plastic."	Beliefs and Attitudes Knowledge and Awareness Intention to purchase,Behaviours and Preferences
Lavuri et al. 2022	India	Sample=389 respondents Consumers	Stimulus-Organism-Response (SOR) paradigm (Jacoby, 2002) Dual factor theory (Herzberg, F. I., 1966)	Questionnaire : adaptation of pre-validated items LOHAS consumption propensity (Environmental Concern) 5-item scale adapted from (H. H. Park, 2015) and (Song, 2007); Attitudes towards green ads and green brand image: each one	Cross-sectional	high	To investigate the impact of • Green advertisement • Green Brand Image • LOHAS consumption tendency • Perceived consumers' effectiveness On trust and attitudes toward luxury organic beauty products; To investigate the impact of trust and attitudes on purchase intentions.	(Luxury) organic beauty products	Beliefs and Attitudes Intention to purchase,Behaviours and Preferences

	measured with an adapted 3-item scale from (Alamsyah et al., 2020); Perceived consumer effectiveness: adapted 3-item scale from(Park, 2015); Trust towards organic cosmetics 3-item scale from (H. H. Park, 2015)and (H.-H. Park & Noh, 2012); Attitudes towards organic cosmetics (health Concern) 3-item scale adapted from (Paul et al., 2016), (Lavuri & Susandy, 2020), (Lavuri, 2022); Purchase intention adapted 3-item scale from (Lavuri		

				& Susandy, 2020), (Lavuri, 2022), (H. H. Park, 2015)					
Lin et al. 2018	UK	Sample n=30 British females consumers	Exploratory	Qualitative in-depth approach: 5 focus groups	Qualitative	mediu m	• Definition of Green Cosmetics • Attitude towards Green Cosmetics: Affective components Cognitive Components Conative Components (behavioural tendency) • Factors influencing the attitude formation	finition of green cosmetics ed to participants	Beliefs and Attitudes Knowledge and Awareness Intention to purchase,Behav iours and Preferences
Lofthouse et al. 2017	UK	Sample n=36 consumers, 89% females Designers Trial focus groups sample n=16 consumers	Feasibility applied project	Questionnaire and industry-based workshops for designers; 2 multi-activity focus groups to trial prototypes	Mixed	mediu m	To investigate the feasibility, consumers acceptance and sustainability of a refillable packaging system for "body wash" (understanding consumer experiences and associated functional requirements)	Refillable packaging system	Intention to purchase,Behavio urs and Preferences
Moharam 2023	Baharai n	Sample n= 400 female consumers	Theory of planned behaviour (Ajzen, 1985) Value-belief-Norms Theory (Stern, 2000)	Attitudes towards Green cosmetics using scales from previous studies (Lin et al., 2018; Pop	Cross-sectional	high	To analyse the factors influencing green purchasing behaviour of eco-friendly cosmetics.	green cosmetics	Beliefs and Attitudes

	et al., 2020; Shimul et al., 2022) Subjective Norms using scales from previous studies (Matharu et al., 2020; Minton et al., 2018) PBC using scales from previous studies (Hsu et al., 2017; Yadav & Pathak, 2017) Environmental Beliefs using scales from previous studies (Čapienė et al., 2021; Kautish et al., 2019) Attitudes toward green cosmetics: - female perceptions of the environmental and health benefits of green cosmetics, -		Intention to purchase,Behaviours and Preferences

	their willingness to pay for such products. Sub jective norms: Through identifying normative beliefs which are based on a person's previous experiences and socialization. Perceived behavioral control: Through identifying the sense of obligation to take pro-environmental behavior with great control over these behaviors. Environmenta l beliefs: By identifying the ecological - worldview and environmental - knowledge.	

Moslehpour et al. 2021	Thailand	Sample n=357 subjects among Gen Y (1980-2000) Consumers	The theory of planned behavior (Ajzen, 1985) the value attitude behavior hierarchy model (Homer & Kahle, 1988)	Questionnaire developed from past studies; Environmental awareness construct is divided into environmental concern (EC), environmental knowledge (EK), green marketing awareness (GMA), green price sensitivity (GPS) and attitude towards green packaging (ATGP). EC from: (Keynes, 2018), (Trivedi & Shrama, 2018), (Yadav & Pathak, 2016); EK from: (Keynes, 2018), (Lee, 2017); ATGP from: (Prakash & Pathak, 2017), (Koenig-Lewis et al., 2014); GMA	Cross-sectional	high	To investigate whether environmental awareness affect Generation Y's purchasing intention for personal care products in Thailand.	Biodegradable packaging; green packaging	Beliefs and Attitudes Intention to purchase,Behaviours and Preferences

				from: (Rahmi et al., 2017), (Suki, 2016); GPS from: (Gao et al., 2017); PI from: (Prakash & Pathak, 2017), (Lee, 2017)					
Najm et al. 2023	Malaysia	Sample= 330 Consumers	Value-belief-Norms Theory (VBN) (Stern, 2000) Planned behaviour theory (TPB) (Ajzen, 1985), Moderated Mediation Model (Baron & Kenny, 1986; Preacher, Rucker, & Hayes, 2007).	Questionnaire developed from past studies EC from: (Al Mamun et al., 2020), (Zollo et al., 2021), (Jaini et al., 2020); Attitudes towards NPD from: (Prabowo & Aji, 2021), (Imiru, 2017); Attitudes towards PPI from: (Shukla et al., 2021); PA towards natural skincare products from: (Khan & Salim, 2021); Attitudes	Cross-sectional	high	To determine the relationship between aspects of packaging of natural skincare products (i.e., natural packaging design (NPD), packaging printed information (PPI) and safety certificate (SC)), environmental concern and personal attitudes, and their effects on the intention to purchase (PI).	Natural packaging	Beliefs and Attitudes Intention to purchase,Behaviours and Preferences

				towards SC from: (Ahmad et al., 2015); PI from: (Zollo et al., 2021)					
Pop et al. 2020	Romania and Hungary	Sample=180 women consumers	Theory of Planned Behaviour (Ajzen, 1985)+ motivations and social media.	Questionnaire developed from past studies Attitudes towards Social Media from: (Gunawan & Huarng, 2015), (Goldsmith et al., 2000); Attitudes towards Green Cosmetics from: (Chin et al., 2018), (Matthes & Wonneberger, 2014); Environmental Concern from: (Sánchez-Fernández et al., 2009), (Roberts & Bacon, 1997), (Izagirre-Olaizola et	Cross-sectional	high	To test the theory of planned behaviour on purchasing intentions of green cosmetics; to explore Altruistic motivation, egoistic motivation and their influence on attitudes; to explore the social media influence on attitudes and subjective norms and on egoistic and altruistic motivations.	environmentally friendly cosmetics; green cosmetics	Beliefs and Attitudes Intention to purchase,Behaviours and Preferences

				al., 2015); Health Concern from: (Tarkiainen & Sundqvist, 2005), (Sony & Ferguson, 2017); Subjective Norms and Purchase intention from: (Chin et al., 2018)					
Simão et al. 2022	Portugal	Study 1 Sample=256 consumers	Bias and Halo effect	Questionnaire developed from past studies Perceived naturalness from: (Rozin, 2005); Perceived efficacy from: (Vanbergen et al., 2020); Perceived safety from: (Bauer et al., 2013); Sensorial perception from: (Brakus et al., 2009); Perceived Greenwashing from: (Leonidou & Skarmeas, 2017);	Single-factor between-subjects experimental design (100 % natural origin vs. no-claim)	high	To investigate the influence of natural claims on consumers' perceptions and purchase intentions of personal care products; the moderator effects of individual differences (i.e., health and environmental concern).	Natural product; free of chemical residues; not contaminated; products' ingredients are free from harmful substances	Beliefs and Attitudes Knowledge and Awareness Intention to purchase,Behaviours and Preferences

				Purchase intention from: (Barber et al., 2012); Knowledge about natural personal care products from: (Ghazali et al., 2017); Environmental concern from: (Maloney & Ward, 1973); Health concern from: (Mai & Hoffmann, 2015).					
Singhal & Malik 2021	Delhi, India	Sample=100 female consumers	Segmentation study	Questionnaire – ad-hoc questions	Cross-sectional	medium	To examine the statistical difference between the age, education and income level with attitude towards green cosmetic products; to find out the impact of green cosmetic products on the purchasing behaviour; to determine the relationship between attitudes and purchasing behaviour	eco-friendly cosmetics products	Beliefs and Attitudes Knowledge and Awareness Intention to purchase,Behaviours and Preferences Socio-Demographic Factors

Skackauskiene & Vilkaite-Vaitone 2022	Lithuania and Norway	Sample=9 stakeholders (marketing managers from arts, energy, hospitality, telecommunications, digital printing, cosmetics, and windows & doors enterprises)	-	Semi-structured interviews	Qualitative	low	To explore current challenges and future perspectives of green marketing, considering the role of culture in terms of market and communications <u>Research questions:</u> • What challenges do enterprises face when implementing green marketing solutions in the current business environment in high and low context cultures? • Do the challenges of green marketing implementation differ depending on the industry and size of the enterprise in high and low context cultures? • What actions do the enterprises take to overcome green marketing challenges in high and low context cultures?	Green (marketing)	Industry Perspectives
Šniepienė & Jankauskienė 2021	Lithuania	Sample=335 consumers	Segmentation study	Questionnaire – ad-hoc questions	Cross-sectional	low	To explore how • Use • Types of organic cosmetics • Reasons for choosing/not choosing organic cosmetics	Organic cosmetics	Beliefs and Attitudes Knowledge and Awareness Intention to purchase,Behaviours and Preferences

							• Organic cosmetics identification criteria vary between the consumers with different socio-demographic characteristics.		Socio-Demographic Factors
Suphasomboon & Vassanadumrongdee 2022	Thailand	Sample=423 consumers	Extension of the Perceived Value Theory (Sweeney & Soutar, 2001) by including ethical concern (Holbrook, 1999)	Questionnaire developed and adapted from past studies Functional value, emotional value, social value from: (Sweeney & Soutar, 2001); Ethical Concern from: (Mohd Suki, 2016), (P.-C. Lin & Huang, 2012), (Ghazali et al., 2017), (Jaini et al., 2019)	Cross-sectional	high	The study aims to evaluate the relationships between the perceived value, ethical concern and the purchase intention of green cosmetics/personal care products, as well as to estimate the mediating role of ethical concern.	Green cosmetics (in *ethical concern scale*: organic and natural formulation, ethical sourcing, green manufacturing processes, green packaging not toxic to the environment).	Beliefs and Attitudes Intention to purchase,Behaviours and Preferences Socio-Demographic Factors
Suphasomboon & Vassanadumrongdee 2023	Thailand	Sample n=12 industry and Policy Stakeholders 8 industry stakeholders, 2 government stakeholders, and 2 civil society (NGOs) stakeholders.	Exploratory	Semi-Structured Interviews and deductive content analysis	Qualitative	medium	To have access to perspectives of key stakeholders from management and policy in order to better understand what issues they perceive as opportunities and obstacles in achieving sustainable production and consumption within the field of green cosmetics	environmental-friendly products	Industry Perspectives

Vázquez et al. 2023	Spain	Sample N= 3000 consumers	Segmentation study	Environmental Concern (Hinkes & Christoph-Schulz, 2020; Liu et al., 2017) Label Awareness (Kaczorowska et al., 2019; Zander et al., 2015) Label Attitude (Kaczorowska et al., 2019; Sogari et al., 2016; Zander et al., 2015; Zha et al., 2020) Purchase behaviour (Gadema & Oglethorpe, 2011; Grymshi et al., 2022; Peschel et al., 2016)	Cross-sectional	high	To identify segments of Spanish consumers based on their awareness, attitudes and use of 28 certified sustainability labels in different household goods.	28 labels providing information on the sustainability of the products: all the labels included (1) provided information about a social and/or environmental attribute of product; (2) this information wass certified, accredited or validated by an independent organisation, and (3) communicated on the product by means of a logo and/or text that is representative of the label.	Beliefs and Attitudes Knowledge and Awareness Intention to purchase,Behaviours and Preferences
Zollo et al. 2021	Italy and Spain	Sample= 473 consumers (n = 266 from Spain, n = 207 from Italy).	Social Proof Theory (Cialdini, 1993) Theory of Planned Behaviour (Ajzen, 1985)	Questionnaire developed and adapted from past studies Attitudes towards Organic	Cross-Sectional	high	To test whether the higher the pro-environmental values of a consumer and his/her understanding, familiarity, and knowledge of organic PCPs is correlated to higher interest in social reassurance (SR; (individual tendency to	Environmentally friendly; organic products	Beliefs and Attitudes Knowledge and Awareness

	products from: (Bauer et al., 2013), (Ghazali et al., 2017), (Lea & Worsley, 2005); Attitudes towards Online reviews from: (Hennig-Thurau et al., 2003), (E. E. K. Kim et al., 2011), (Filieri, 2015); Product Knowledge from: (C. W. Park et al., 1994), (Ghazali et al., 2017); Social Reassurance from: (Hennig-Thurau et al., 2003), (E. E. K. Kim et al., 2011); Intention to purchase from: (Ghazali et al., 2017)	compare own evaluation with that of others). To test whether social reassurance influences convenience & quality and information adoption, as well as whether convenience & quality influence information adoption. To test whether Information adoption significantly influences consumers' intention to purchase organic PCPs.		Intention to purchase,Behaviours and Preferences

Supplementary B: Participant Information Sheet and Informed Consent

Titolo del progetto:
"Making Luxury Sustainable: An Exploration of Consumers' Needs, Perceptions and Behaviours"
Le vogliamo proporre di partecipare ad una ricerca che mira a valutare gli stili di acquisto di prodotti cosmetici, in particolare quelli di lusso. È Suo diritto essere informata/o circa lo scopo e le caratteristiche dello studio affinché Lei possa decidere in modo consapevole e libero se partecipare. La invitiamo quindi a scaricare e leggere il documento seguente che offre maggiori dettagli circa la ricerca, i suoi obbiettivi e modalità. I ricercatori coinvolti in questo progetto restano a disposizione per rispondere alle sue domande.
Scarica qui l'informativa: Informativa.pdf
Dichiaro di aver ricevuto tutte le informazioni necessarie a comprendere il progetto di ricerca, ciò che comporta la mia partecipazione allo studio, i rischi e i benefici implicati nello studio, secondo quanto riportato nel foglio informativo qui allegato. Sono stato inoltre informato del mio diritto di ritirarmi in qualsiasi momento dallo studio stesso e di avere libero accesso alla documentazione relativa alla sperimentazione ed alla valutazione espressa dal Comitato Etico. Pertanto, alla luce delle informazioni che mi sono state fornite:

- ACCONSENTO a a partecipare allo studio
- NON ACCONSENTO a a partecipare allo studio

English:

Project title:
"Making Luxury Sustainable: An Exploration of Consumers' Needs, Perceptions and Behaviours"
You are invited to take part in a research study aimed at evaluating purchasing styles of cosmetic products, particularly luxury cosmetics. It is your right to be informed about the purpose and the characteristics of the study so that you can make a free and informed decision about whether to participate. We therefore invite you to download and read the following document, which provides further details about the research, its objectives, and procedures. The researchers involved in this project are available to answer any questions you may have.
Download the information sheet here: Information Sheet.pdf
I declare that I have received all the information necessary to understand the research project, what my participation in the study involves, and the risks and benefits associated with it, as reported in the information sheet attached here. I have also been informed of my right to withdraw from the study at any time and to have free access to the documentation relating to the study and to the evaluation issued by the Ethics Committee. Therefore, in light of the information provided to me:

- I AGREE to participate in this research study
- I DO NOT AGREE to participate in this research study

Supplementary C: Short message to invite in participating to online survey

Ciao, mi chiamo Alexia Del Greco e sto svolgendo, come parte del mio progetto di dottorato, una ricerca sui comportamenti e le attitudini relative all'acquisto di cosmesi. Ho sviluppato un breve questionario e sarei grata se mi aiutassi compilandolo e magari mandandolo ad amici e conoscenti di qualsiasi età e genere.
Il link al questionario è: https://unimib.qualtrics.com/jfe/form/SV_82Ztdu8BC5qbzSe
Se volessi più informazioni scrivimi pure a a.delgreco1@campus.unimib.it.

English:

Hi, my name is Alexia Del Greco, as part of my PhD project, I am conducting a study on cosmetics purchasing behaviours and attitudes. I have developed a short questionnaire, and I would really appreciate it if you could help by completing it and possibly sharing it with friends and contacts of any age and gender.
Here is the link to the survey:
https://unimib.qualtrics.com/jfe/form/SV_82Ztdu8BC5qbzSe
If you would like more information, feel free to contact me at a.delgreco1@campus.unimib.it.
Thank you very much for your help!

Table S8 - Questionnaire on Qualtrics in the Original Language and with English Translation (in italics)

Construct	Items	Likert Scale
Attitudes adapted from (Moharam, 2023)	1. Credo che un packaging ecologico sia migliore per l'ambiente rispetto a quello convenzionale 2. Sono disposto a spendere soldi extra per cosmetici con un packaging ecologico 3. Mi piace l'idea di utilizzare un packaging ecosostenibile per i miei cosmetici. 4. Trovo che il packaging ecologico sia altrettanto efficace di quello convenzionale 5. Penso che sia importante sostenere le aziende che impiegano/producono imballaggi ecologici. *1. I believe that eco-friendly packaging is better for the environment than conventional packaging.* *2. I am willing to spend extra money on cosmetics with eco-friendly packaging.* *3. I like the idea of using sustainable packaging for my cosmetics.* *4. I think eco-friendly packaging is just as effective as conventional packaging.* *5. I believe it is important to support companies that use or produce eco-friendly packaging.*	1 (per nulla) – 7 (moltissimo) *1 (Not at all) – 7 (Very much)*
Subjective Norms adapted from (Moharam, 2023)	1. La mia famiglia e i miei amici pensano che dovrei usare cosmetici con un packaging ecologico 2. Sento la pressione dai social network sul dover utilizzare cosmetici con un packaging ecologico 3. Le persone che sono importanti per me usano spesso cosmetici con confezioni ecologiche 4. Il mio social network valorizza l'utilizzo di packaging rispettosi dell'ambiente.	1 (per nulla) – 7 (moltissimo)

	1. My family and friends think I should use cosmetics with eco-friendly packaging. *2. I feel pressure from social media to use cosmetics with eco-friendly packaging.* *3. People who are important to me often use cosmetics with eco-friendly packaging.* *4. My social network values the use of environmentally friendly packaging.*	*1 (Not at all) – 7 (Very much)*
Perceived Behavioural Control adapted from (Moharam, 2023)	1. Dispongo delle risorse necessarie per identificare/riconoscere i cosmetici con packaging eco-friendly 2. Ho le risorse necessarie per acquistare cosmetici con packaging ecosostenibile 3. È facile trovare cosmetici con packaging eco-friendly 4. Comprendo informazioni riguardanti packaging ecologici 5. Scegliere packaging ecologici dipende da me 6. Conosco le certificazioni (es. vegan, cruelty free, FSC ecc) che leggo sui packaging *1. I have the necessary resources to identify/recognize cosmetics with eco-friendly packaging.* *2. I have the necessary resources to purchase cosmetics with sustainable packaging.* *3. It is easy to find cosmetics with eco-friendly packaging.* *4. I understand information regarding eco-friendly packaging.* *5. Choosing eco-friendly packaging depends on me.* *6. I am familiar with the certifications (e.g., vegan, cruelty-free, FSC, etc.) that appear on packaging.*	1 (per nulla) – 7 (moltissimo) *1 (Not at all) – 7 (Very much)*
Environmental Concern	1. Stiamo raggiungendo il limite massimo del numero di persone su questa Terra 2. Gli esseri umani hanno il diritto di modificare l'ambiente naturale per i propri bisogni	1 (Fortemente in disaccordo) – 5 (fortemente d'accordo)

	3. Quando gli esseri umani interferiscono con la natura, si producono effetti disastrosi 4. Grazie all'ingegno umano, la Terra rimarrà un luogo vivibile 5. Gli esseri umani stanno abusando gravemente dell'ambiente 6. La Terra in realtà ha tante risorse naturali se solo sapessimo farne buon uso 7. Gli esseri umani hanno il dovere di tutelare la vita di animali e piante 8. L'equilibrio dell'ambiente è forte abbastanza da reggere l'impatto delle società industrializzate 9. Malgrado i progressi, siamo ancora in balia della forza della natura 10. I problemi ambientali sono stati in larga misura esagerati 11. La terra ha risorse limitate 12. Gli esseri umani sono destinati a comandare sulla natura 13.L'equilibrio della natura è delicato e fragile 14.Con il tempo gli esseri umani impareranno come funziona la natura e riusciranno a controllarla 15. Se le cose vanno avanti così, presto ci sarà una catastrofe ambientale *1. We are approaching the limit of the number of people the earth can support.* *2. Humans have the right to modify the natural environment to suit their needs.* *3. When humans interfere with nature it often produces disastrous consequences.* *4. Human ingenuity will ensure that we do NOT make the earth unlivable.* *5. Humans are severely abusing the environment.* *6. The earth has plenty of natural resources if we just learn how to develop them.* *7. and animals have as much right as humans to exist.* *8. The balance of nature is strong enough to cope with the impacts of modern industrial nations.* *9. Despite our special abilities, humans are still subject to the laws of nature.* *10. The so-called "ecological crisis" facing humankind has been greatly exaggerated.*	*1 (Strongly disagree) – 5 (Strongly agree)*

	11. The earth is like a spaceship with very limited room and resources. *12. Humans were meant to rule over the rest of nature.* *13. The balance of nature is very delicate and easily upset.* *14. Humans will eventually learn enough about how nature works to be able to control it.* *15. If things continue on their present course, we will soon experience a major ecological catastrophe.*	
Health Concern	1. Acquisto e mangio cibi considerando la mia salute 2. Limito alimenti come zucchero, caffè, grassi ecc 3. Scelgo diete a basso contenuto di grassi, grassi saturi o colesterolo 4. Evito alimenti con molti additivi 5. Di solito leggo gli ingredienti sulle etichette degli alimenti (5) *1. I purchase and eat foods with my health in mind.* *2. I limit foods such as sugar, coffee, fats, etc.* *3. I choose diets low in fat, saturated fat, or cholesterol.* *4. I avoid foods with many additives.* *5. I usually read the ingredients on food labels*	1 (fortemente in disaccordo) – 5 (fortemente d'accordo) *1 (Strongly disagree) – 5 (Strongly agree)*
Social Concern	1. Quando acquisto prodotti di cosmesi, è per me importante considerare la loro sostenibilità sociale (come la lotta alla povertà e garantire delle condizioni di dignità di base per ciascun lavoratore) *1. When buying cosmetic products, I consider it important that they are socially sustainable (e.g., fighting poverty and ensuring basic dignity for all workers).*	1 (fortemente in disaccordo) – 5 (fortemente d'accordo) *1 (Strongly disagree) – 5 (Strongly agree)*

Intentions to Purchase	 Dagli scarti di cavolfiore si può ottenere un materiale - in foto - con cui creare packaging la cui produzione causa minori emissioni di carbonio e richiede minore quantità di energia rispetto a plastica tradizionale e altre bioplastiche. Compreresti una crema viso con un packaging prodotto con gli scarti del cavolfiore? *From cauliflower waste, a material can be obtained – as shown in the photo – that can be used to create packaging whose production causes lower carbon emissions and requires less energy compared to traditional plastic and other bioplastics. Would you buy a face cream with packaging made from cauliflower waste?*	1 (Per nulla) – 5 (Moltissimo) *1 (Not at all) – 5 (Very much)*

	 Dagli scarti di carota si può ottenere un materiale - in foto - con cui creare packaging la cui produzione causa minori emissioni di carbonio e richiede minore quantità di energia rispetto a plastica tradizionale e altre bioplastiche. Compreresti una crema viso con un packaging prodotto con gli scarti della carota? *From carrot waste, a material can be obtained – as shown in the photo – that can be used to create packaging whose production causes lower carbon emissions and requires less energy compared to traditional plastic and other bioplastics. Would you buy a face cream with packaging made from carrot waste?*	1 (Per nulla) – 5 (Moltissimo) *1 (Not at all) – 5 (Very much)*

	 Dagli scarti di prezzemolo si può ottenere un materiale - in foto - con cui creare packaging la cui produzione causa minori emissioni di carbonio e richiede minore quantità di energia rispetto a plastica tradizionale e altre bioplastiche. Compreresti una crema viso con un packaging prodotto con gli scarti del prezzemolo? *From parsley waste, a material can be obtained – as shown in the photo – that can be used to create packaging whose production causes lower carbon emissions and requires less energy compared to traditional plastic and other bioplastics. Would you buy a face cream with packaging made from parsley waste?*	1 (Per nulla) – 5 (Moltissimo) *1 (Not at all) – 5 (Very much)*

Chapter 4: Environmental Education

Figure S1-. Emerging themes and subthemes

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