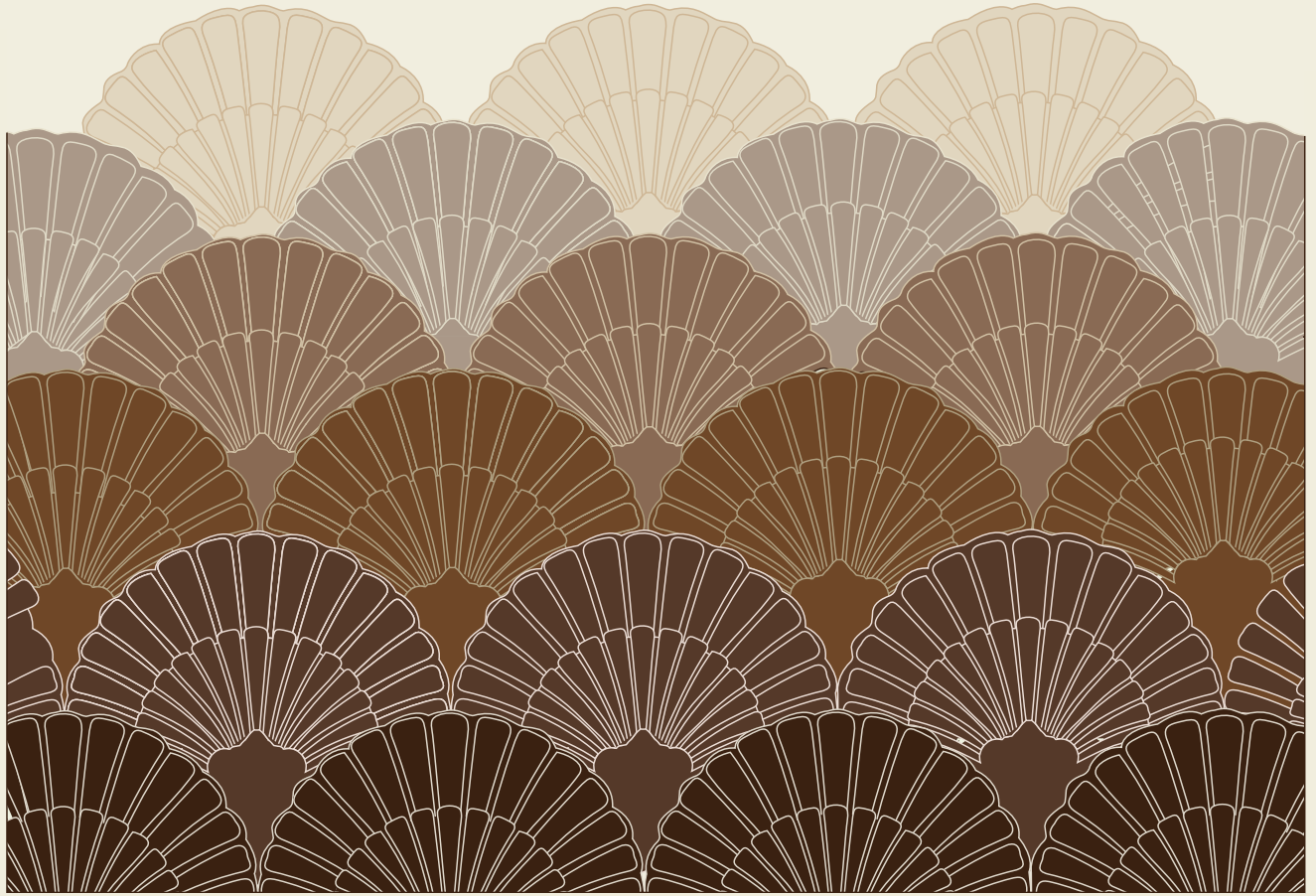


Fashion Design *and*
Strategic Management

Material Research
*Through Repurposed
Tea Bag Waste*



BARAYÉ

Capstone 2025

Yalda Zaminpaima

BARAYÉ

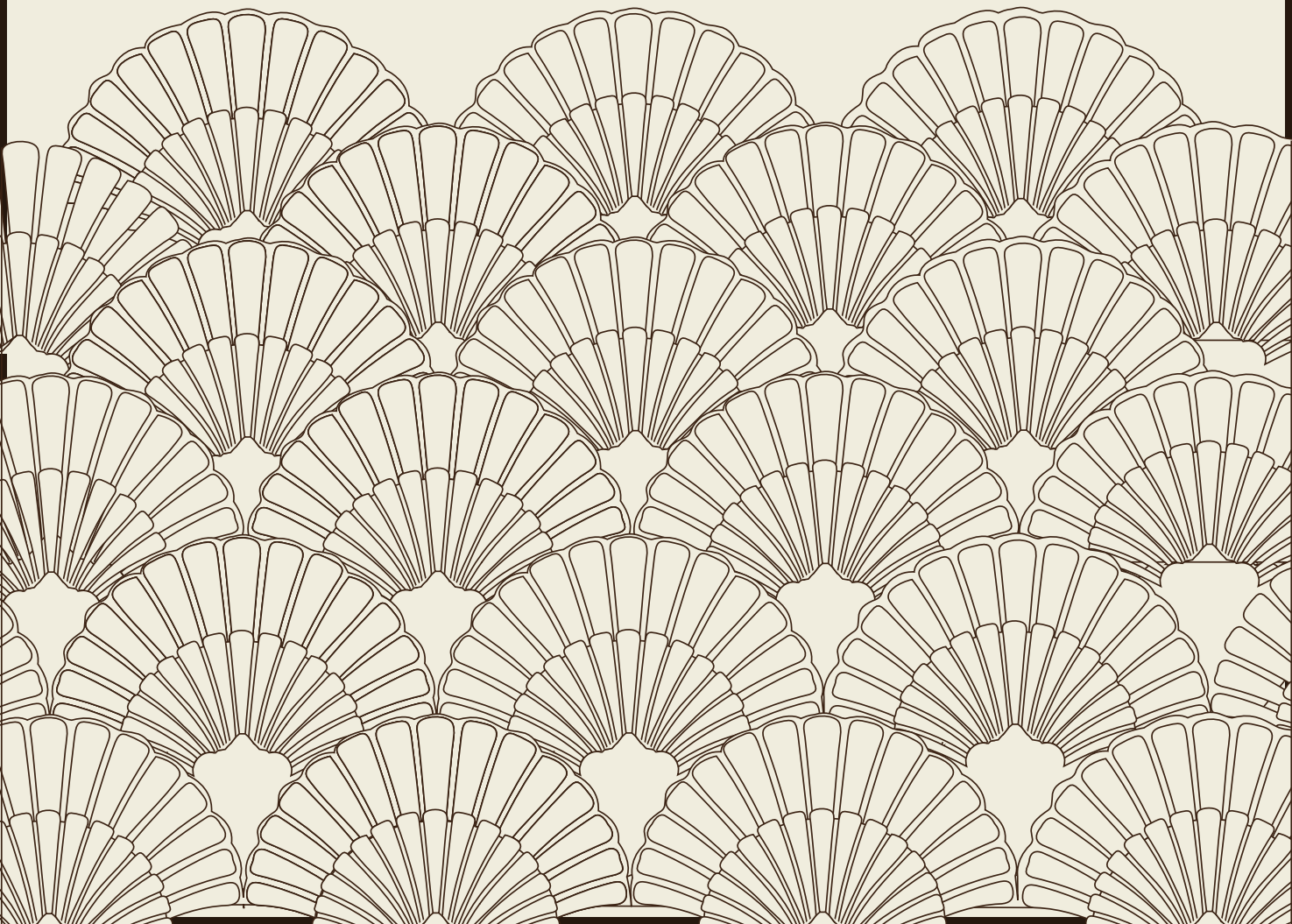




Figure 1
(Muirgils dream, 2015)

Acknowledgments

I am deeply grateful for the unwavering support of my family and friends, whose belief in my vision has been my greatest source of strength. Their love, patience, and encouragement kept me motivated throughout this journey.

A heartfelt thank you to everyone who helped me collect tea bags, a crucial part of this project. I am especially grateful to my dear friend Leen Gosheh and her family for their generosity and dedication in turning their home into a haven for tea bags.

I would also like to sincerely thank my Advisors, Andra Clitan and Joanne Hayek, for their invaluable guidance and support throughout this project. Their expertise, encouragement, and belief in my ideas gave me the confidence to push boundaries and explore new possibilities.

Additionally, I extend my gratitude to my professors, Susan Sonnenberg and Elmar Schüller, whose insights and mentorship contributed greatly to my research and development.

A special thank you to Gagan Rumba, Mona Al Hashimi, and Binish Nair for their unwavering support in the lab. Their kindness, patience, and daily assistance played a vital role in my research and experimentation.

Lastly, I want to express my appreciation to Kamand Karima, Maral Karima and Mandana Pasandeh for their thoughtful support and encouragement throughout this journey.

Abstract

Barayé is a design-led exploration of sustainable fashion rooted in emotional connection, material storytelling, and circular practices. This thesis investigates the potential of reused Tea bag waste as a medium for textile creation, reflecting on themes of care, ritual, and renewal. Through the development of bio-based materials and various experimental techniques, Barayé proposes a softer, more responsible approach to fashion—one that values what is often discarded. Blending personal narrative, cultural reflection, and material innovation, the project asks: how can design become an act of care—for the self, for the planet, and for the future? This work stands as a response to fast fashion's detachment, aiming to reshape our understanding of value through slow processes, conscious making, and the poetry of everyday materials.



Figure 2
(Shutterstock, 2016)

01

INTRODUCTION

- 1.2 Statement of the Problem **08**
- 1.3 Research Question **09**
- 1.4 Research Aim & Objectives **10**
- 1.5 Purpose of Study **12**
- 1.6 Scope & Limitations **14**
- 1.7 Conclusion **14**

02

LITERATURE REVIEW

- 2.2 Definitions **19**
- 2.3 History of Textiles **20**
- 2.4 Problem **22**
- 2.5 Sustainable Practice **24**
- 2.6 Existing Examples **28**
- 2.7 History of Tea **34**
- 2.8 Camellia Sinensis **36**
- 2.9 How to make Tea? **37**
- 2.10 Tea in 18th Century **39**
- 2.11 Japan Tea Ceremony **40**
- 2.12 Oxidization **42**
- 2.13 Invention of Tea bags **45**
- 2.14 All about Tea **46**
- 2.15 Tea Bag **48**
- 2.16 Tea around the World **50**
- 2.17 Most Tea Producing Countries **52**
- 2.18 Most Tea Consuming Countries **54**
- 2.19 Tea Harvesting **56**
- 2.20 Conclusion **58**

03

METHADODOLOGY

- 3.2 Data Collection Methods **62**
- 3.3 Thematic & Comparative Analysis **65**
- 3.4 Limitations of the Study **66**
- 3.5 Research Design & Process **68**
- 3.6 Ethical Considerations **69**
- 3.7 Research Diagram **70**
- 3.8 Participation Recruitment Process **72**

04

DATA ANALYSIS

- 4.2 Collaborations **77**
- 4.3 Interview Thematic Analysis **79**
- 4.4 What does Tea Mean to you? **80**
- 4.5 Tea Diagram **82**
- 4.6 Survey Participants **84**
- 4.7 Survey Data Visualizations **86**
- 4.8 Data Analysis Conclusion **100**

05

Tea POT ANALYSIS

- 5.2 China **104**
- 5.3 Japan **106**
- 5.4 Russia **108**
- 5.5 England **110**

06

CONCEPT DEVELOPMENT

- 6.2 Paper Experiments **114**
- 6.3 Childhood **117**
- 6.4 Sketches & Moodboard **118**
- 6.5 Garment Sketches **126**
- 6.6 Handbag Sketches **127**

07

MATERIAL EXPLORATION

- 7.2 Biomaterials **130**
- 1.3 Recipe and Properties **132**

- 8.2 Concept **148**
- 8.3 Branding Board **150**
- 8.4 Swot Analysis **152**
- 8.5 Process **154**
- 8.6 Technical Drawings **156**
- 8.7 Final Sketches **158**
- 8.8 Photoshoot **160**
- 8.9 Testing and Feedback **198**
- 8.10 Conclusion **200**
- 8.11 What's Next? **202**
- 8.12 Bibliography **204**
- 8.13 List of Figures **206**
- 8.14 Appendix **210**

08

BRANDING & STRATEGY



Figure 4
(Christopher, 1879)

One Introduction

The fashion industry is currently facing intense scrutiny due to its substantial environmental impact. Ranking as the second most polluting industry after oil and gas (Global Fashion Agenda & McKinsey & Company, 2020), it produces approximately 92 million tonnes of textile waste annually (Ellen MacArthur Foundation, 2017). Meanwhile, Tea, the second most consumed beverage in the world (FAO, 2018), contributes to massive waste in the form of Tea bags, with 5 billion being discarded annually (Topitschnig, 2020). This study explores the potential of Tea bags as a versatile biomaterial that can be used in various industries, including fashion and product design, to provide a more sustainable alternative.

Statement Of The Problem

Despite the large volume of Tea bags consumed worldwide, their reuse as biomaterials remains largely unexplored. Tea bags are challenging to recycle due to the diversity of materials used in their production (e.g., string, plastic, paper, aluminum staples), making them difficult to integrate into existing biomaterial solutions. This thesis addresses the research question: How can Tea bags be developed into a versatile biomaterial that serves industries like fashion, product, and more?

How can Tea bags be developed into a versatile biomaterials that serve industries like fashion, product and more?



Figure 3
(Pritchard and Hughes, 2018)

Research Aim and Objectives

The aim of this research is to investigate and develop a sustainable biomaterial from Tea bags, exploring its potential applications across various fields e.g., fashion and product. By transforming Tea bags into a functional and eco-friendly material, this study seeks to address environmental challenges and contribute to innovative solutions for waste reduction and sustainable material development.



Figure 4
Christopher Dresser, Teapot, 1879.
Electroplated nickel, ebonized
handle. Made by James Dixon & Sons,
England.

Purpose Of The Study

The purpose of this study is to develop a versatile biomaterial from Tea bags and explore its potential for industrial applications, particularly in fashion, product design, and packaging. By addressing the challenges and opportunities associated with repurposing Tea bags, this research seeks to advance the field of sustainable material innovation and provide eco-friendly alternatives for diverse industries.

Tea Garden

Scope and Limitations

The scope of this research is focused on the potential of Tea bags as a biomaterial. The research will primarily investigate the components of Tea bags—such as paper, string, and Tea leaves—and their potential applications. The study's limitations include the scalability of Tea bag collection and the challenges in creating a commercially viable product.

Conclusion

In conclusion, this study aims to bridge the gap in biomaterial research by developing a versatile Tea-based material that addresses the environmental challenges of both the fashion and product design industries. The research seeks to innovate and provide sustainable alternatives to



Figure 5
Tea Garden, 2017, glass
sculpture by Janis Miltenberger,
photographed by Peter Kuhnlein.



Two Literature Review

This section examines the evolution of textiles, the environmental challenges posed by textile waste, and the sustainable practices developed to address these issues. It sets the stage for exploring innovative approaches to bio-materials, such as the use of Tea bags, within the fashion and product design industries.

Would
you like
some Tea?

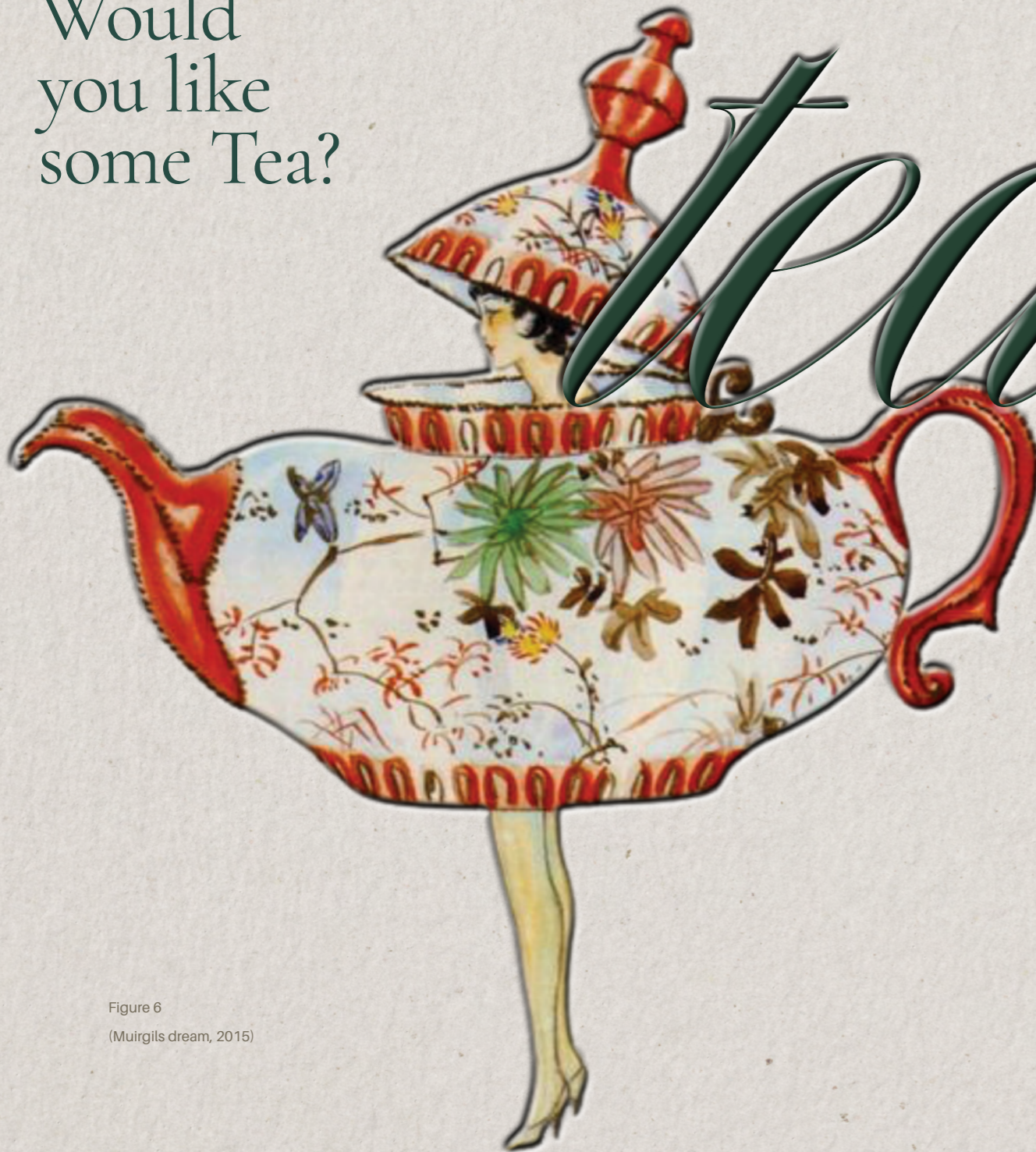


Figure 6
(Muirgils dream, 2015)

tea time

Biomaterials: According to Merriam-Webster, a biomaterial is "a natural or synthetic material (such as a metal or polymer) that is suitable for introduction into living tissue, especially as part of a medical device" (Merriam-Webster Dictionary, n.d.).

Sustainability: Defined by Oxford Languages, sustainability refers to "the avoidance of the depletion of natural resources in order to maintain an ecological balance" (Oxford Languages, n.d.).

Zero Waste: The Cambridge Dictionary defines zero waste as "a situation in which no waste material is produced, or no waste is sent to landfills or incinerators" (Cambridge Dictionary, n.d.).

Upcycling: According to Collins English Dictionary, upcycling is "the activity of making new furniture, objects, etc., out of old or used things or waste material" (Collins English Dictionary, n.d.).

Samovar: The Merriam-Webster Dictionary defines a samovar as "an urn with a spigot at its base used especially in Russia to boil water for Tea" (Merriam-Webster Dictionary, n.d.).

History Of Textiles

The history of textiles stretches back thousands of years, with natural fibers like wool, flax, silk, and cotton being among the earliest materials used in textile production. Early textile manufacturing was labor-intensive, relying on hand-spinning and weaving techniques that were passed down through generations. Ancient civilizations, such as those in Egypt and Mesopotamia, were known for their advancements in textile techniques, including linen production in Egypt and woolen fabrics in Mesopotamia (Jenkins, D.T., 2003).



Figure 7 | 3,500 B.C.

The world's oldest known leather shoe was found in an Armenian cave (Ravilius, NAT GEO, 2010).

Figure 8 | 3482 - 3102 B.C.

5,000 year old Tarkhan dress made of linen found in the ancient Egyptian necropolis of Tarkhan. (Archaeology Magazine, 2016).



The Industrial Revolution in the 18th and 19th centuries transformed textile production with the introduction of mechanized looms and spinning machines, significantly increasing output. The creation of synthetic fibers in the 20th century, such as polyester and nylon, further revolutionized the industry by making textiles more durable, affordable, and widely available (Harris, J., 1993).



Figure 9 | 2,500 - 2,200 B.C.

Embedded in dirt, dog teeth may have studded an ancient purse, whose textile has disintegrated. Photograph courtesy klaus bentele, Ida halle. (Curry, NAT GEO, 2012)

However, while synthetic materials improved accessibility and durability, they also introduced significant environmental challenges. Synthetic fibers like polyester are petroleum-based and contribute to non-biodegradable waste and microplastic pollution in oceans. The rise of fast fashion in the 21st century exacerbated these issues, as the mass production of inexpensive garments encouraged a disposable culture, leading to increased textile waste and environmental degradation (Fletcher, K., 2013).



Figure 10 | 1,000 - 1,200 B.C.

Approximately 3,000-year-old pants, the oldest ever found, displays weaving techniques and decorative patterns influenced by cultures across Asia. M. Wagner et al/archaeological research in Asia. (Powell, 2014; Smithsonian, 2014).

1.92 million tonnes of textiles waste is produced every year.

Textile waste has become one of the most pressing environmental issues associated with the fashion industry. According to the Ellen MacArthur Foundation (2017), approximately 92 million tonnes of textile waste are produced annually, largely due to fast fashion trends that encourage the rapid production and disposal of clothing.

Textiles are composed of synthetic fibers that take hundreds of years to decompose, contributing to landfills and releasing microplastics into water systems.

The fashion industry is the second most polluting industry in the world.

Additionally, the manufacturing of these textiles requires significant amounts of water, chemicals, and energy, further exacerbating environmental degradation. The fashion industry is also widely recognized as the second most polluting industry in the world, following only the oil and gas sector. This pollution stems from not only the waste generated by discarded garments but also the significant carbon emissions and resource use in textile production (Global Fashion Agenda & McKinsey & Company, 2020). The rise of fast fashion, in particular, has accelerated this environmental burden, driving mass production and overconsumption.

Figure 11
(Thecommons.earth, 2023)

Upcycling

In response to the significant environmental impact of the textile industry, various sustainable practices have been developed to address waste reduction, minimize ecological harm, and promote circularity. These practices are transforming how textiles are designed, produced, and consumed.

Upcycling involves repurposing old or discarded materials into new, high-quality products. It contrasts with traditional recycling, which often down cycles materials into lower-quality products. Designers and fashion brands are increasingly upcycling old clothing and fabric scraps to create unique, sustainable pieces, thereby diverting textile waste from landfills (Gwilt, A., 2014). This practice not only reduces waste but also conserves resources by extending the life cycle of materials.

Figure 12
(LOEWE, 2017)

Zero-waste techniques are innovative design processes aimed at eliminating textile waste by maximizing fabric efficiency. Through carefully crafted patterns and garments that minimize or completely avoid material offcuts, designers can significantly reduce waste. These approaches often utilize advanced software and cutting-edge design strategies to optimize production workflows (Rissanen, T., & McQuillan, H., 2016). By prioritizing efficiency and creativity, zero-waste techniques underscore the pivotal role of design innovation in driving sustainability within the fashion industry.

Zero Waste

Figure 13
(Team, 2021)

Natural Dyeing



Natural dyeing replaces toxic synthetic chemicals with plant-based or organic materials to color textiles. Derived from sources like indigo, Tea leaves, and onion skins, natural dyes provide an eco-friendly alternative to conventional dyeing methods, which are known for hazardous chemical use and harmful wastewater production (Sarkar, A.K., 2017).

This method not only reduces environmental pollution but also fosters safer working conditions in dyeing facilities.

Figure 14
(Denbow, 2017)

Biomaterials

The rise of biomaterials as a sustainable alternative to traditional textiles has gained significant traction with the current generation, driven by increasing environmental awareness and demand for eco-friendly solutions. Biomaterials, derived from renewable plant-based sources, align with the values of sustainability and innovation that resonate strongly with modern consumers and industries. Their popularity reflects a cultural shift toward reducing reliance on synthetic, resource-intensive materials, with ongoing research showcasing their potential for widespread industrial adoption and long-term environmental benefits (Brown, S. & Wilmann, J., 2018).



Figure 15
(daniellkayam, 2019)

Kambucha leather

This innovative biomaterial, designed by Cristina Hernandez, is produced through the fermentation of a mixture of water, Tea, sugar, yeast, and a bacterial culture. The resulting material serves as a sustainable and biodegradable alternative to traditional leather. By utilizing natural processes and renewable resources, kombucha Tea leather highlights the potential of biomaterials to reduce environmental impact while offering practical applications in design and fashion. This example underscores the growing relevance of eco-conscious innovation in addressing the challenges of sustainability.

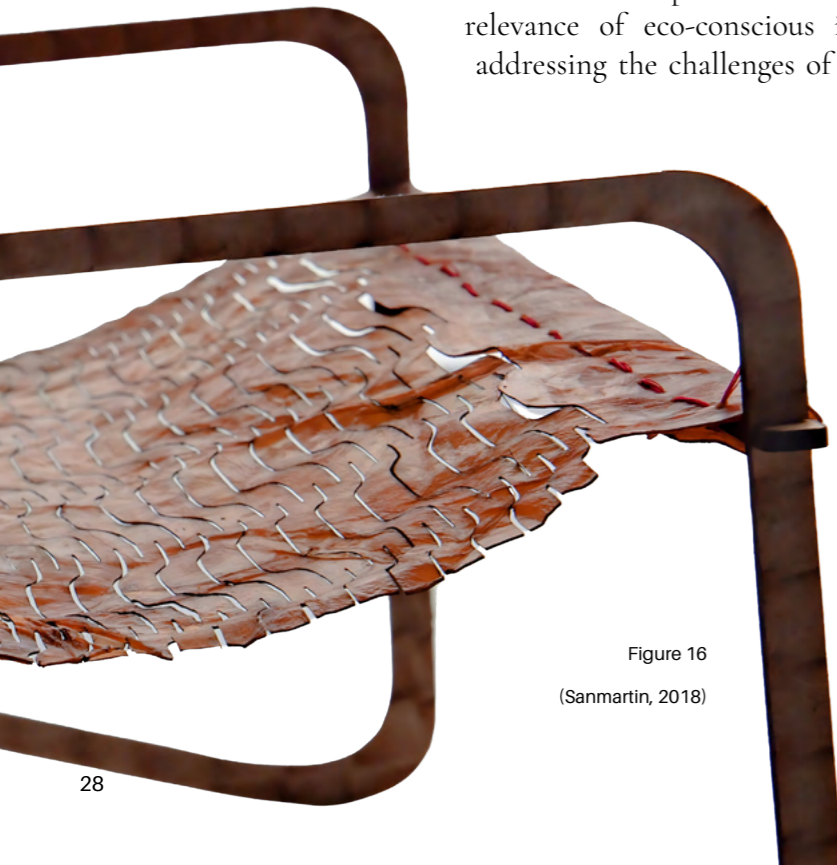


Figure 16
(Sanmartin, 2018)



MaTearial

Developed by Katherine Lopez, MaTearial is an innovative biomaterial crafted from a blend of Tea waste, water, glycerine, starch, and vinegar. This sustainable and biodegradable material demonstrates the potential for transforming organic waste into functional and eco-friendly products. MaTearial embodies a commitment to waste reduction and sustainable design, offering a creative approach to addressing environmental challenges.



Figure 17
(Futurematerialsbank.com, 2025)

Algae Sequins

Created through a collaboration between Charlotte McCurdy and Phillip Lim, Algae Sequin is an innovative biomaterial made from algae-based bioplastic. Designed as decorative embellishments for fashion, these sequins provide an eco-friendly alternative to traditional plastic-based sequins. By utilizing renewable and biodegradable materials, Algae Sequin exemplifies the potential of biomaterials to reduce environmental impact while maintaining functionality and aesthetic appeal in the fashion industry.

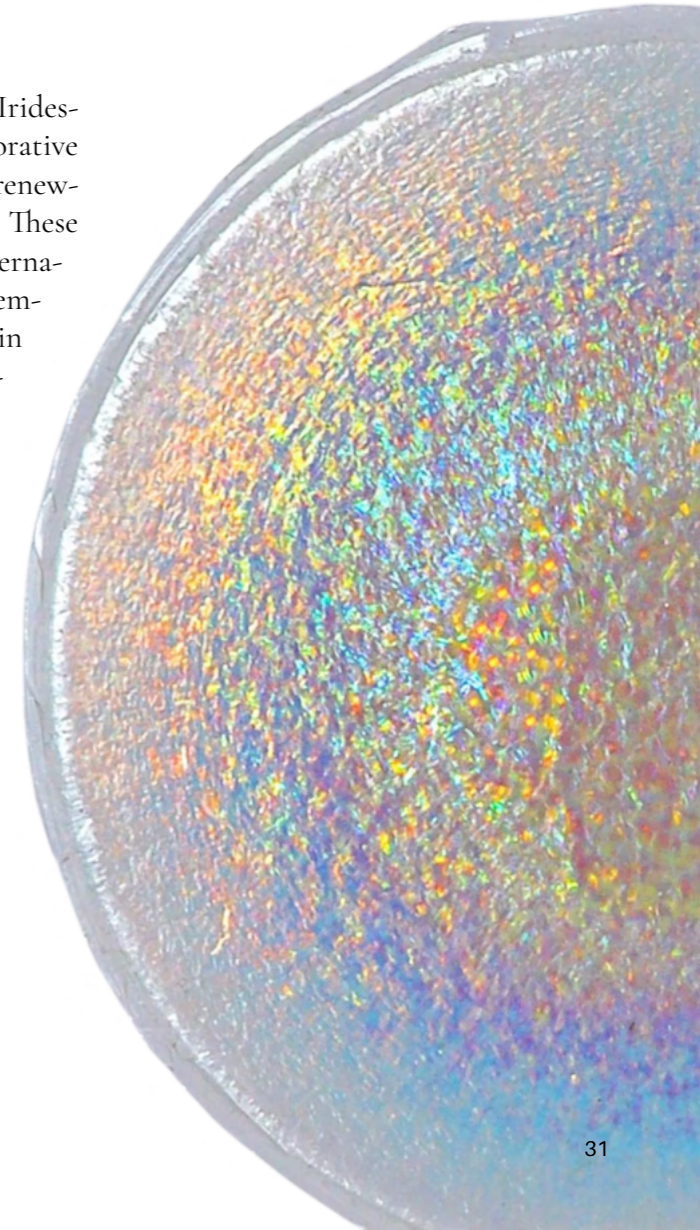
Figure 18
(McCurdy, 2024)



Bio Iridescent Sequin

Designed by Elissa Brunato, Bio Iridescent Sequin is an innovative decorative material made from cellulose, a renewable and biodegradable resource. These sequins offer an eco-friendly alternative to traditional plastic-based embellishments commonly used in fashion. By harnessing natural iridescence, Bio Iridescent Sequin eliminates the need for synthetic coatings or dyes, showcasing the potential of sustainable materials to merge environmental responsibility with aesthetic innovation in the fashion industry.

Figure 19
(Block, 2019)



Despite the cultural and historical significance of Tea as a beverage, Tea bags remain underexplored as a potential biomaterial. While other plant-based materials, such as pineapple leaf fibers (Piñatex) or algae-derived sequins, have gained considerable attention and been developed for industrial applications, Tea bags have yet to receive similar focus or innovation. This represents a significant gap in the sustainable materials field.



Figure 20
(Fiske, 2025)



Figure 21
(Kim Schoenberger, 2018)

The underutilization of Tea bags can be attributed to two primary challenges: their inherent difficulty in reuse and the variability in their composition. Tea bags are highly perishable and prone to mold if not dried and processed promptly, making large-scale collection and repurposing logistically complex (TNN, 2020). Additionally, Tea bags vary widely in material composition, as they can be made from plastic, paper, or cotton, and are produced in diverse sizes and shapes. This inconsistency complicates efforts to standardize their reuse as a biomaterial for broader applications.



Figure 22
(Carol, 2022)

By addressing these challenges, there is potential to transform Tea bags into a versatile and sustainable resource. However, their untapped potential highlights a clear gap in current research and innovation, positioning Tea bags as an overlooked material within the growing field of biomaterial development. This research seeks to explore how these challenges can be mitigated to unlock the possibilities of Tea bags as a valuable and scalable biomaterial.

In the Beginning

While the exact origin of Tea remains uncertain, its roots are often traced to ancient China through a popular legend. In 2737 BC, the Chinese emperor Shen Nung, a renowned herbalist, was sitting beneath a *Camellia sinensis* tree as his servant boiled drinking water. According to the tale, a few leaves from the tree drifted into the boiling water, creating an accidental infusion. Intrigued by the aroma, Shen Nung tasted the concoction, marking the serendipitous discovery of what we now know as Tea (Mair and Hoh, *The True History of Tea*, 2009).

*“Where there is Tea,
there is hope.”*

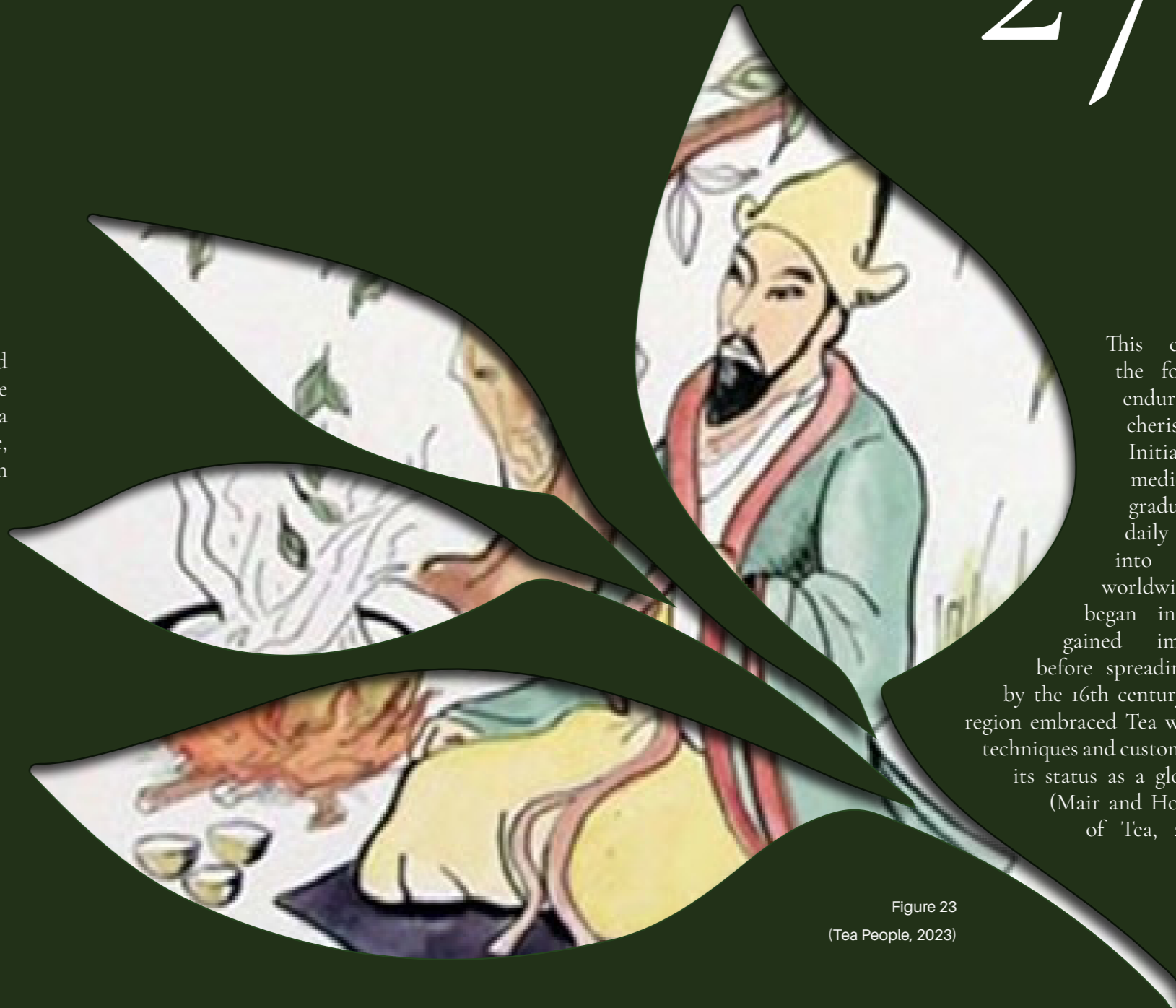
Arthur Wing Pinero, 1888

2737

BC

This chance event laid the foundation for Tea’s enduring legacy as a cherished beverage. Initially valued as a medicinal tonic, Tea gradually evolved into a daily staple, deeply woven into cultural traditions worldwide. Its journey began in China, where it gained immense popularity before spreading across Asia and, by the 16th century, into Europe. Each region embraced Tea with distinct brewing techniques and customs, further solidifying its status as a globally beloved drink (Mair and Hoh, *The True History of Tea*, 2009).

Figure 23
(Tea People, 2023)



Camellia Sinensis

One plant, many Teas.

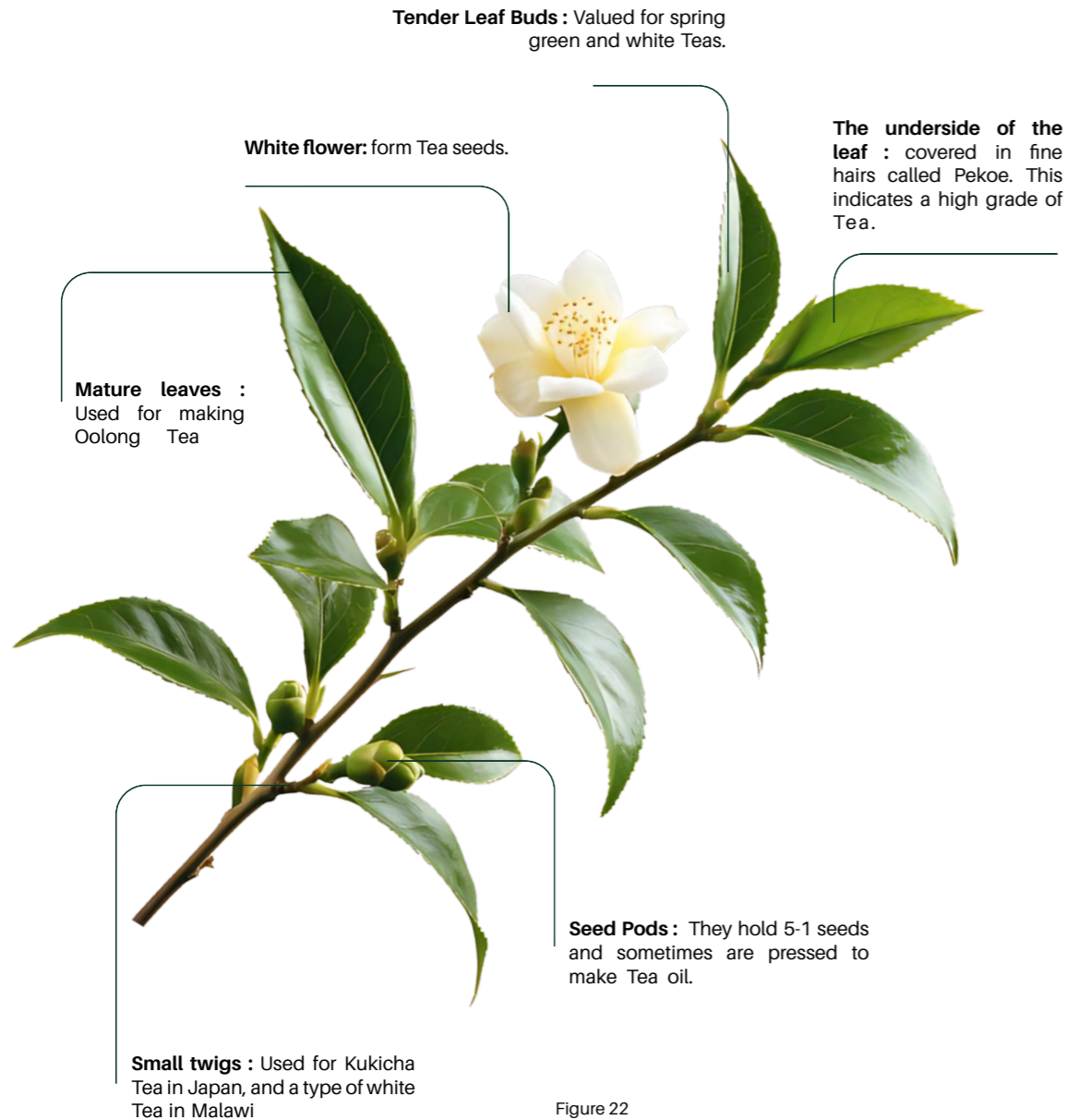
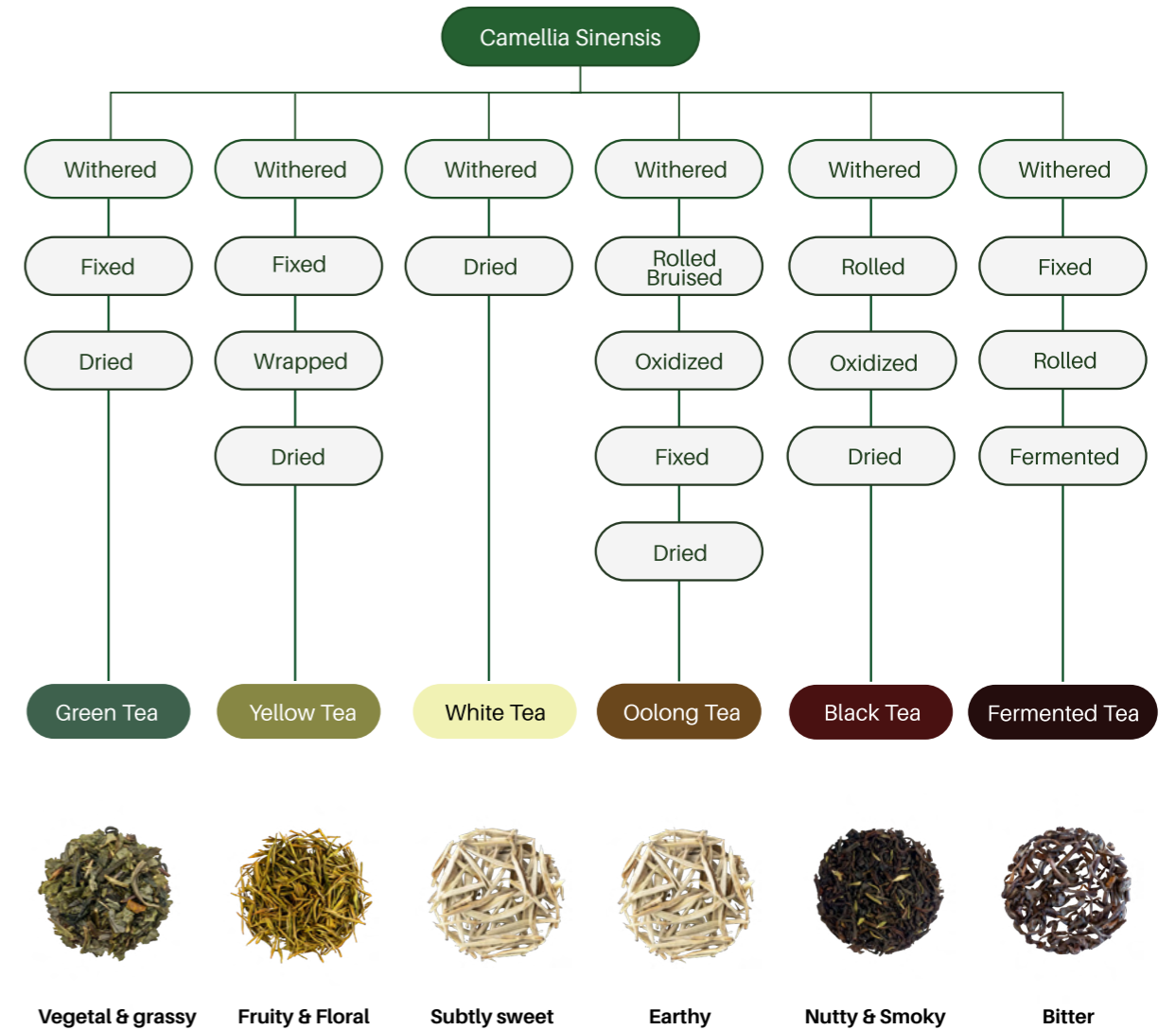


Figure 22
(Contributors to WikiTea, 2025)



8-18 Century

Afternoon

By the 8th century, Tea reached Japan, becoming central to cultural rituals like the chanoyu (Japanese Tea ceremony). Zen Buddhist monks adopted Tea for focus and wakefulness during meditation, imbuing it with spiritual and philosophical significance tied to harmony, purity, and respect. Tea spread globally via trade routes like the Silk Road, reaching Europe in the 16th century through Portuguese and Dutch merchants.

By the 18th century, Tea was a British obsession, with “afternoon Tea” becoming a cherished social tradition. European demand led to British-established plantations in India and Sri Lanka, making Tea widely accessible and transforming it into a daily staple across all social classes, driven by large-scale production and commercialization.

Figure 23
(Saatchi Art, 2025)



Figure 24
Tea Ceremony - Azuma Sugata,
Toshikata Mizuno 1866-1908
(Dieter Wanczura, 2018)

The Tea ceremony is a significant cultural and philosophical practice that originated in China during the Tang Dynasty (618–907) and was later refined in Japan as chanoyu, or the “way of Tea.” Rooted in Zen Buddhist principles, it emphasizes harmony, respect, purity, and tranquility, transforming the simple act of drinking Tea into a meditative and meaningful ritual.

Japan Tea Ceremony

In Japan, the Tea ceremony became a way to cultivate mindfulness and spiritual connection, particularly for Zen monks who used Tea to stay alert during meditation. The process celebrates the beauty of imperfection (wabi-sabi) and the transient nature of life (mono no aware), reflected in the carefully chosen rustic utensils and serene settings.

The Tea ceremony also fosters social and cultural bonds. Through precise rituals, both host and guests demonstrate respect, humility, and gratitude, creating an atmosphere of harmony and connection. This combination of spiritual depth, aesthetic appreciation, and social cohesion underscores why the Tea ceremony remains a cornerstone of Japanese culture and a globally admired tradition.



Figure 25
Elena Tcykina from
Getty Images (Green,
2017)

% of Tea Leaf Oxidation

This visual illustrates the percentage of oxidation in Tea leaves, categorizing types such as white, green, yellow, oolong, and black based on their relative oxidation levels. Black Tea, while the most oxidized within this group, is not fully oxidized, and fermented Teas, such as pu-erh, go through additional microbial fermentation, making them distinct. At the other end of the spectrum, white Tea experiences minimal natural oxidation during drying. These varying oxidation levels affect the Tea's color, from the light, delicate hues of white and green Teas to the deep, rich tones of black and fermented Teas.

Understanding the role of color is critical for my research. The natural pigmentation of Tea leaves, influenced by their oxidation levels, plays a significant role in determining their suitability for dyeing materials. Different oxidation levels result in distinct shades, offering a wide range of possibilities for creating biomaterials and sustainable fashion. This consideration ensures that the appropriate Tea type is selected based on the desired visual and material properties.



Figure 26
(Admin, 2013)

Accidental Invention

The invention of Tea bags is commonly credited to Thomas Sullivan, a New York Tea merchant, in the early 1900s. In 1908, Sullivan started sending samples of Tea to his customers in small silk pouches, which consumers mistakenly believed were meant to be used directly in hot water, much like metal Tea infusers. This accidental discovery paved the way for the creation of the modern Tea bag. After realizing the silk mesh was too fine, Sullivan began developing sachets made of gauze—the first purposely made Tea bags (Pettigrew, *A Social History of Tea*, 2001).

1908

During the 1920s, these were commercialized and grew in popularity. Tea bags were initially made from silk or cotton before transitioning to paper-based materials for mass production. The use of paper made Tea bags more affordable and accessible to a broader market, further popularizing Tea consumption globally. Today, most Tea bags are made from a blend of natural fibers such as paper or plant-based materials like cornstarch, with some brands incorporating plastic (polypropylene) for heat-sealing purposes (Pettigrew, *A Social History of Tea*, 2001).

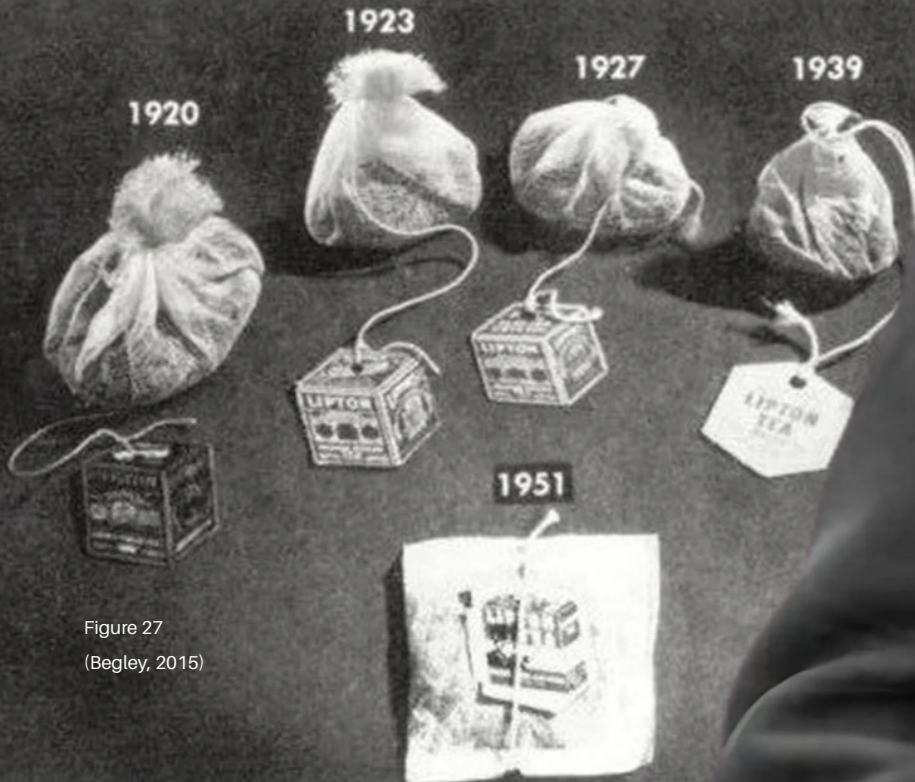


Figure 27
(Begley, 2015)

Figure 28
(YOLO-INC, 2025)

Tea is the **second most consumed** beverage in the world after water worldwide.

(Tea Association of the USA, Inc)

2-10 cups of Tea is consumed by **one** Tea drinking person a day.

(Statista, 2019)

Approximately **5 billion** Teabags are being used and disposed of globally yearly.

(Topitschnig, 2021)

The global Tea market was valued at approximately **\$200 billion** in 2022 and is projected to grow steadily.

(Statista, 2022)



Figure 29
(Freepik, 2023)



Figure 30
(Bag, 2025)

Tea bags were originally crafted from silk, offering a luxurious yet costly option. Over time, manufacturers transitioned to paper, a blend of wood pulp and abaca fibers, which provided a more economical alternative (Textile Learner, 2023). Today, most Tea bags are made using a mix of natural and synthetic materials, such as abaca and polypropylene, for added durability. However, this shift has sparked concerns about microplastic contamination, as polypropylene can release microplastics during decomposition (Environmental Science & Technology, 2019).

While Tea bags have made Tea preparation more convenient, they come with significant environmental challenges. Many Tea bags contain non-recyclable plastic seals, which release microplastics into water sources and soil as they break down. With over 5 billion Tea bags consumed and discarded annually (Topitschnig, 2021), they contribute to global pollution. Additionally, their production requires resource-intensive processes, resulting in a substantial ecological footprint.

Despite their widespread use, the potential of Tea bags as a sustainable biomaterial remains largely unexplored. Composed of natural fibers like abaca and wood pulp, Tea bags could be repurposed into reusable, eco-friendly products. This would help reduce waste and offer greener alternatives to synthetic materials, addressing both environmental and sustainability concerns.

Tea Around The World

The word for Tea primarily derives from two linguistic roots: cha and te, each tracing back to China and spreading along distinct trade routes. The term cha originates from Mandarin Chinese (chá) and traveled via overland routes like the Silk Road, influencing languages such as Hindi (chai), Persian (chay), and Arabic (shaay) (Mair & Hoh, 2009). In contrast, te comes from the Min Nan Chinese dialect, spoken in regions like Fujian Province, and was disseminated through maritime trade networks to European languages, including English (Tea), French (thé), and Dutch (thee) (Mair & Hoh, 2009).

This linguistic divergence reflects the historical flow of Tea along land and sea routes, showcasing how a single commodity shaped both language and culture globally.

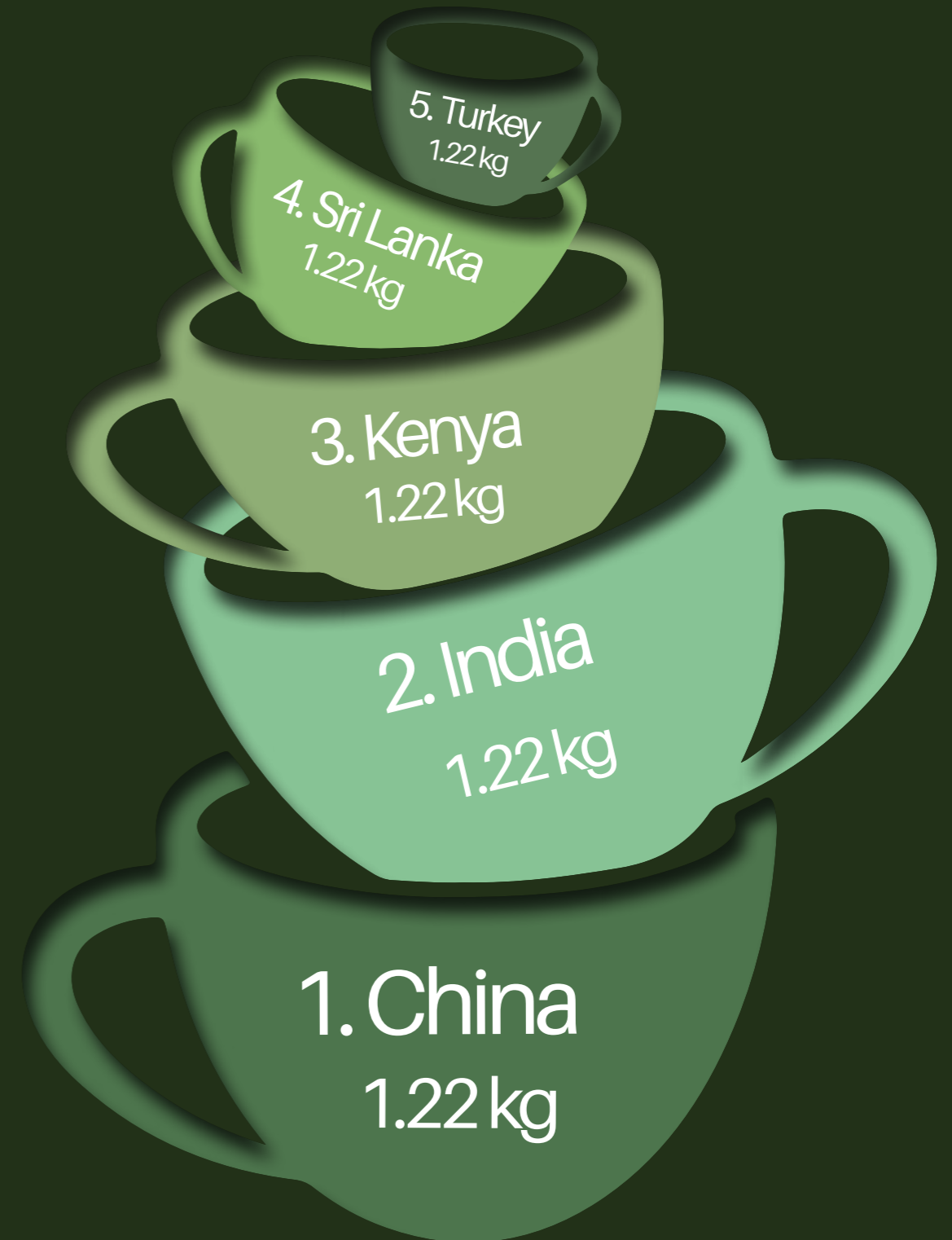


Figure 31

(Bag, 2025)

Most Tea Producing Countries

According to Statista's 2023 data, the top Tea-producing countries and their respective production volumes are China, India, Kenya, Sri Lanka, and Turkey. These nations significantly contribute to the global Tea industry, reflecting their agricultural and cultural expertise. Interestingly, the Middle East, despite its deep-rooted cultural association with Tea consumption, is not a major Tea producer. This contrast underscores the importance of investigating the region's Tea consumption practices and exploring innovative uses for Tea bags and Tea-based materials within the Middle East, which is central to my research on sustainable fashion and biomaterials.



Most Tea Consuming Countries.

Tea consumption is a key part of daily life in many countries, with Turkey leading globally at 3.16 kilograms per person annually, reflecting its deep cultural significance. Ireland follows with 2.19 kilograms, and the UK ranks third with 1.94 kilograms, showcasing traditions like afternoon Tea. Other major consumers include Pakistan, Iran, and Russia, where Tea plays a central role in social and daily routines.

While highlighting Tea's cultural importance, these high consumption rates also point to significant environmental challenges, such as the disposal of Tea packaging, emphasizing the need for sustainable solutions.



Figure 32
(Unknown,Unknown)

Tea Harvesting

Figure 33
(Jordhammond, 2023)

Cultivation and Growth

Tea plants (*Camellia sinensis*) thrive in tropical and subtropical regions, requiring well-drained soil, high humidity, and consistent rainfall. It takes around three to five years for the plants to mature before they are ready for harvesting (Mondal, 2014).

Harvesting the Leaves

Tea leaves are typically harvested by hand, picking the top two leaves and a bud. The timing of the harvest is crucial for flavor, with early spring leaves yielding a delicate taste and later harvests producing a stronger flavor (Mondal, 2014).

Processing and Oxidation

After harvesting, the leaves are withered to reduce moisture, then rolled to release enzymes. The oxidation process determines the Tea type—green Tea undergoes minimal oxidation, while black Tea is fully oxidized. The leaves are then dried to preserve their quality (Zhen, 2002).

Sorting and Packaging

Once dried, the leaves are sorted by size and quality. Premium Teas are made from whole leaves, while broken leaves are used for Tea bags. The sorted Tea is then packaged and distributed (Zhen, 2002).

tea

Tea consumption is a key part of daily life in many countries, with Turkey leading globally at 3.16 kilograms per person annually, reflecting its deep cultural significance. Ireland follows with 2.19 kilograms, and the UK ranks third with 1.94 kilograms, showcasing traditions like afternoon Tea. Other major consumers include Pakistan, Iran, and Russia, where Tea plays a central role in social and daily routines.

While highlighting Tea's cultural importance, these high consumption rates also point to significant environmental challenges, such as the disposal of Tea packaging, emphasizing the need for sustainable solutions.



Figure 34
(Fired-earth, 2015)



Three Methodology

This study employs a methodological framework designed to explore the potential of repurposing Tea bags into sustainable biomaterials for applications in fashion and product design. Given the exploratory and innovative nature of this research, a predominantly qualitative approach is adopted, supported by practical experimentation. The methodology is structured to examine the technical, aesthetic, and environmental dimensions of Tea bag-derived materials, bridging theoretical insights with practical applications. This comprehensive approach ensures a well-rounded understanding of the material's feasibility, sustainability, and potential impact across various industries.



Data Collection Methods

This study employed both primary and secondary data collection methods to ensure a comprehensive analysis of the potential for repurposing Tea bags into sustainable biomaterials. Secondary data comprised academic literature, industry reports, and case studies focusing on biomaterials, sustainable fashion, and the cultural significance of Tea. These sources established the theoretical framework that underpinned the study and guided the design of primary data collection methods.

Figure 35
(Mary Cassatt, 1880)

Interviews

Interviews were conducted with restaurant managers and Tea business owners to explore their waste management practices regarding Tea bags. These interviews provided valuable insights into how Tea bags were managed within the trade sector and assessed the feasibility of partnerships for collecting Tea bag waste as raw material for biomaterial experimentation.

Consumer Questionnaires

Questionnaires were distributed to Tea consumers to examine the cultural associations of Tea and their awareness of its environmental impact. The data collected focused on the frequency of Tea bag use, cultural values tied to Tea consumption, and perceptions of sustainable practices. This allowed the study to capture consumer attitudes toward eco-friendly innovations and evaluate the broader social context of Tea bag usage.

Tea Bag Collection

Used Tea bags were sourced from personal consumption, restaurants, and partnerships with Tea businesses. These Tea bags were categorized by their material composition—paper-based, plastic-based, or hybrid—to ensure systematic experimentation. Initial testing involved assessing their physical properties, such as texture, flexibility, and durability, which informed the feasibility of their application as biomaterials. This comprehensive approach integrated qualitative and quantitative data to provide a nuanced understanding of the technical, cultural, and environmental dimensions of using Tea bags as biomaterials.



Spill the Tea!

To analyze the qualitative data, thematic analysis was employed to identify patterns, themes, and challenges related to the development of Tea bag-based biomaterials. This method was particularly suited for uncovering insights from interviews and questionnaires, focusing on recurring themes such as material properties, technical feasibility, and cultural relevance.

For experimental data, a comparative analysis was conducted to evaluate the biomaterials derived from Tea bags against established sustainable materials, such as Piñatex and mycelium leather. Key factors considered included tensile strength, biodegradability, texture, and aesthetic qualities. This comparative approach highlighted the unique potential of Tea bag-derived biomaterials for industrial applications.

Figure 35
(Mary Cassatt, 1880)

Limitations Of The Study

This study encountered several limitations that should be acknowledged. One primary challenge was the variability in the content and quality of Tea bags, as manufacturers use diverse materials such as paper, plastic, and natural fibers. Although Tea bags were categorized by material type to enhance sample consistency, achieving complete uniformity across samples proved difficult. Variations in structural integrity and material composition occasionally influenced the outcomes of experimental testing.

The coding of data during thematic analysis also introduced a degree of subjectivity. To address this, cross-referencing with secondary data was undertaken to minimize potential bias and ensure a more reliable interpretation of findings. However, subjectivity remains an inherent limitation of qualitative research.



Figure 36
(Shoji Hamada, 1955)

Another limitation was that the experimental phase was conducted at a laboratory scale, and the processes developed were not tested for industrial-scale application.

Questions regarding large-scale production feasibility and supply chain management were beyond the scope of this research, which restricts the generalizability of the findings.

The study also relied on the availability of waste Tea bags, which were not always easy to source. While efforts were made to collect materials from personal use, restaurants, and partnerships with Tea businesses, the quantity and quality of collected Tea bags posed challenges. These constraints may have impacted the consistency of experimental results and limited the applicability of the findings to broader contexts.

Lastly, the conversion of Tea bags into a stable biomaterial presented significant technical challenges due to their heterogeneous nature and the presence of contaminants. Addressing these issues would require more advanced processing methods to ensure the biomaterials are viable for commercial applications.

Research Design and Process

The research design was structured as a sequential, multi-phase process. It began with secondary data collection to establish a theoretical framework that informed primary data collection and experimental design. The experimental phase involved systematically testing Tea bag components to evaluate their suitability as biomaterials. This phase included dismantling Tea bags, categorizing their materials, and conducting preliminary tests to assess their properties and performance. The iterative nature of the research design allowed for continuous refinement of methods based on experimental results, ensuring responsiveness to challenges and opportunities. In the final phase, a comparative analysis evaluated the developed biomaterials against existing sustainable alternatives to determine their viability for broader application. This research design integrated qualitative and quantitative methodologies, bridging theoretical insights with practical experimentation. By addressing both the technical and cultural dimensions of the study, it ensured a robust and comprehensive investigation into the feasibility of Tea bag-based biomaterials.

Ethical Considerations

Ethical considerations were integral to this research to ensure adherence to the highest standards of ethical practice. Participants involved in interviews and questionnaires were provided with detailed information about the study's objectives and voluntarily consented to participate. To protect their privacy, participant identification was conducted anonymously, making it impossible to trace individuals. Any personally identifiable information collected was securely stored to ensure confidentiality and safeguard participants' rights. Additionally, the study fully complied with institutional requirements and ethical guidelines for research involving human participants.

The collection and use of materials also followed strict ethical standards. Tea bags used in the study were sourced responsibly, with attention to both hygiene and environmental impact. The research avoided generating unnecessary waste by repurposing materials that would have otherwise been discarded in landfills. Throughout the study, emphasis was placed on the proper disposal of experimental waste, ensuring that the environmental approach aligned with established ethical principles. This commitment to sustainability and ethical integrity was maintained across all aspects of the research process.

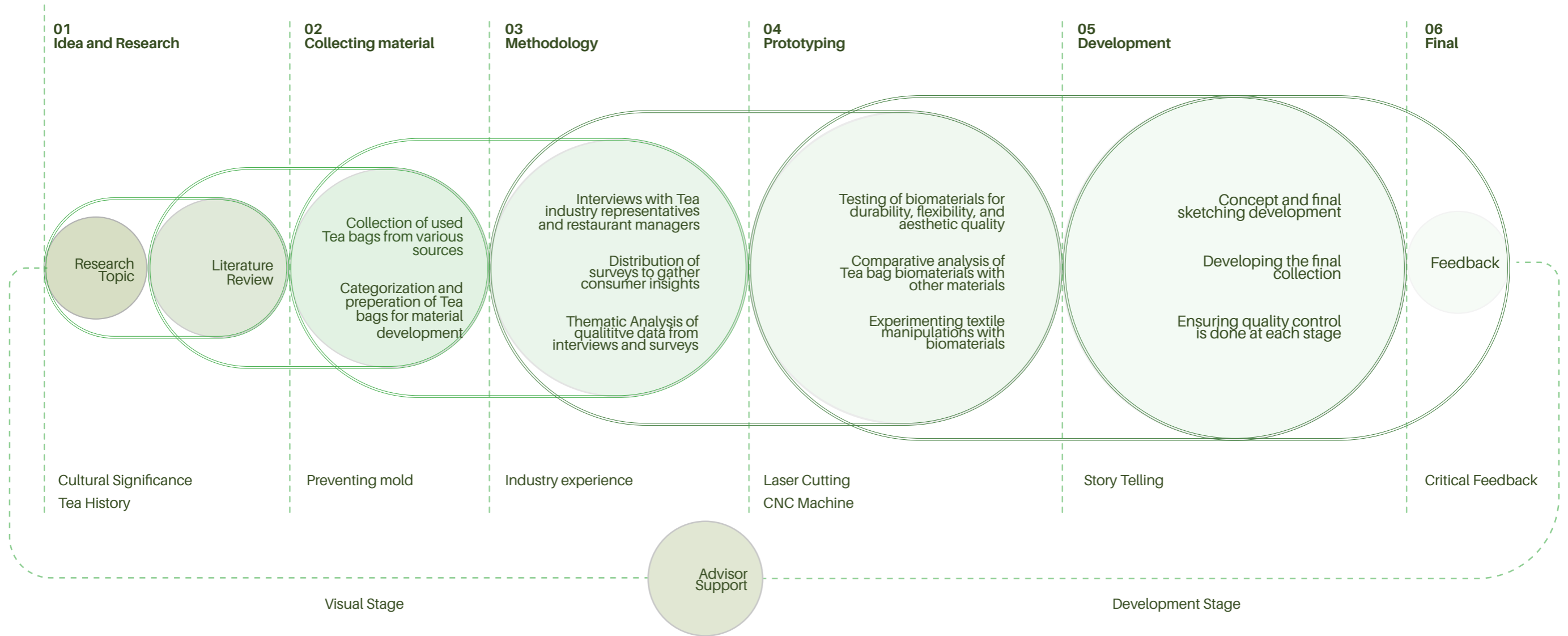




Figure 37
(Smith, 2019)

Participant Recruitment Process

For the purposes of this study, participants were recruited based on specific criteria to ensure relevance to the research objectives. The recruitment focused on company owners and key stakeholders in the Middle Eastern Tea industry. Participants were required to meet the following criteria:

Industry Experience:

Participants must have a minimum of five years of experience in the Middle Eastern Tea industry, ensuring they possess substantial knowledge and insights into Tea production, distribution, or cultural practices in the region.

Relevance to the Research Topic:

Participants were selected from companies or organizations that directly engage with Tea products, including production, packaging, or innovative uses of Tea in materials and products.

Regional Focus:

All participants were required to operate primarily within the Middle East, aligning with the study's focus on Tea culture and sustainability in the region.

Data Analysis

Data Analysis presents the findings derived from surveys, interviews, and thematic analysis. This section critically examines the data collected, highlighting consumer preferences, cultural insights, and sustainability perspectives related to Tea and biomaterials. The analysis provides a foundation for understanding the feasibility and potential applications of Tea-based innovations in various industries.

Feel Good Tea

As detailed in the interview transcript provided in Appendix [X], Feel Good Tea Co. demonstrates a strong commitment to sustainability through initiatives like biodegradable corn fiber Tea bags and recyclable glass packaging, along with a customer recycling program offering discounts for refills. Selling tens of thousands of Tea bags monthly, they significantly reduce waste while fostering eco-friendly consumer habits. The founder highlighted their interest in exploring sustainable and innovative packaging solutions, such as plant-based and compostable materials. This aligns with the direction of this research, which focuses on repurposing Tea materials into sustainable biomaterials. By providing new sustainable packaging options, this research can directly support Feel Good Tea Co.'s vision for

innovation and environmental responsibility. Despite challenges like higher costs and consumer education, the company remains dedicated to driving sustainable change in the Tea industry.

Shandiz Palace

As detailed in the interview transcript provided in Appendix [X], Shandiz, an Iranian restaurant, caters primarily to Iranian customers, with 80% of their clientele identifying as such, followed by Arabs and Asians. Tea plays a significant role in their dining experience, with 70% of customers ordering Tea after meals as part of tradition. Black Tea with saffron, served from a large samovar, is the most popular choice, making up 75% of orders, while green Tea and other varieties account for 10% and 15%. For the owner, Tea is a relaxing drink that boosts focus and reflects deep cultural roots. They associate Tea with tradition, highlighting its integral role in daily life across the UAE, Iran, and globally. While Shandiz does not repurpose Tea leaves or packaging, as they use loose-leaf Tea for its cost-effectiveness and quality, this research offers an opportunity to collect their Tea waste. This collaboration can help the restaurant contribute to sustainability and align with environmental trends.

Golden Kabab

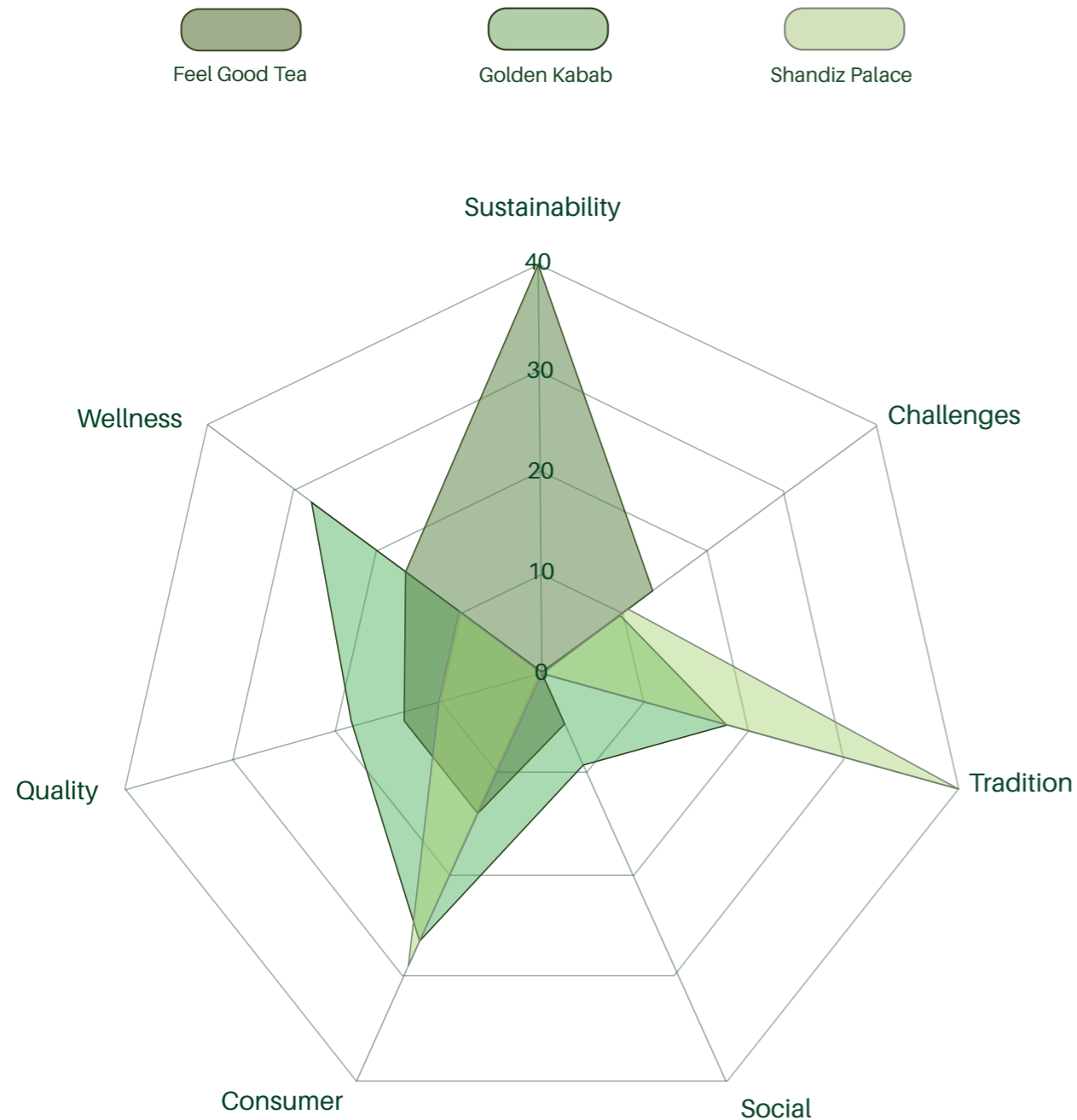
As detailed in the interview transcript provided in Appendix [X], Golden Kabab, located in Barsha, serves a diverse clientele, with approximately 60% of customers being Iranian, 20% Arab, and 20% from other nationalities. Tea is a staple at the restaurant, with 85% of their 75–100 daily customers ordering Tea, often with dessert or after meals. Black Tea is the most popular, making up 80% of orders, followed by other flavors (15%) and green Tea (5%), reflecting Iranian traditions. For the owner, Tea holds personal and cultural significance as a drink that fosters relaxation and strengthens social and cultural ties within families and communities. While they associate Tea with relaxation, they also emphasize its traditional role in Iranian culture. The restaurant exclusively uses loose-leaf Tea for its superior quality and authenticity but does not currently engage in reusing or repurposing Tea leaves or packaging. This research offers an opportunity to collect their Tea waste, allowing Golden Kabab to support sustainability efforts and align with modern environmental practices.

Summary

The interviews with Feel Good Tea Co., Shandiz, and Golden Kabab revealed a shared emphasis on Tea as a cultural and social staple, with each business highlighting its significance in fostering relaxation, tradition, and community. All three rely primarily on loose-leaf Tea, valuing its quality and authenticity, but none currently reuse or repurpose Tea waste. While sustainability remains a challenge for Shandiz and Golden Kabab, Feel Good Tea Co. actively explores innovative eco-friendly packaging and waste management practices. This research identifies an opportunity to collaborate with these businesses by collecting Tea waste, enabling them to contribute to sustainable practices and align with environmental trends.

Figure 38
(Pexels.com, 2025)





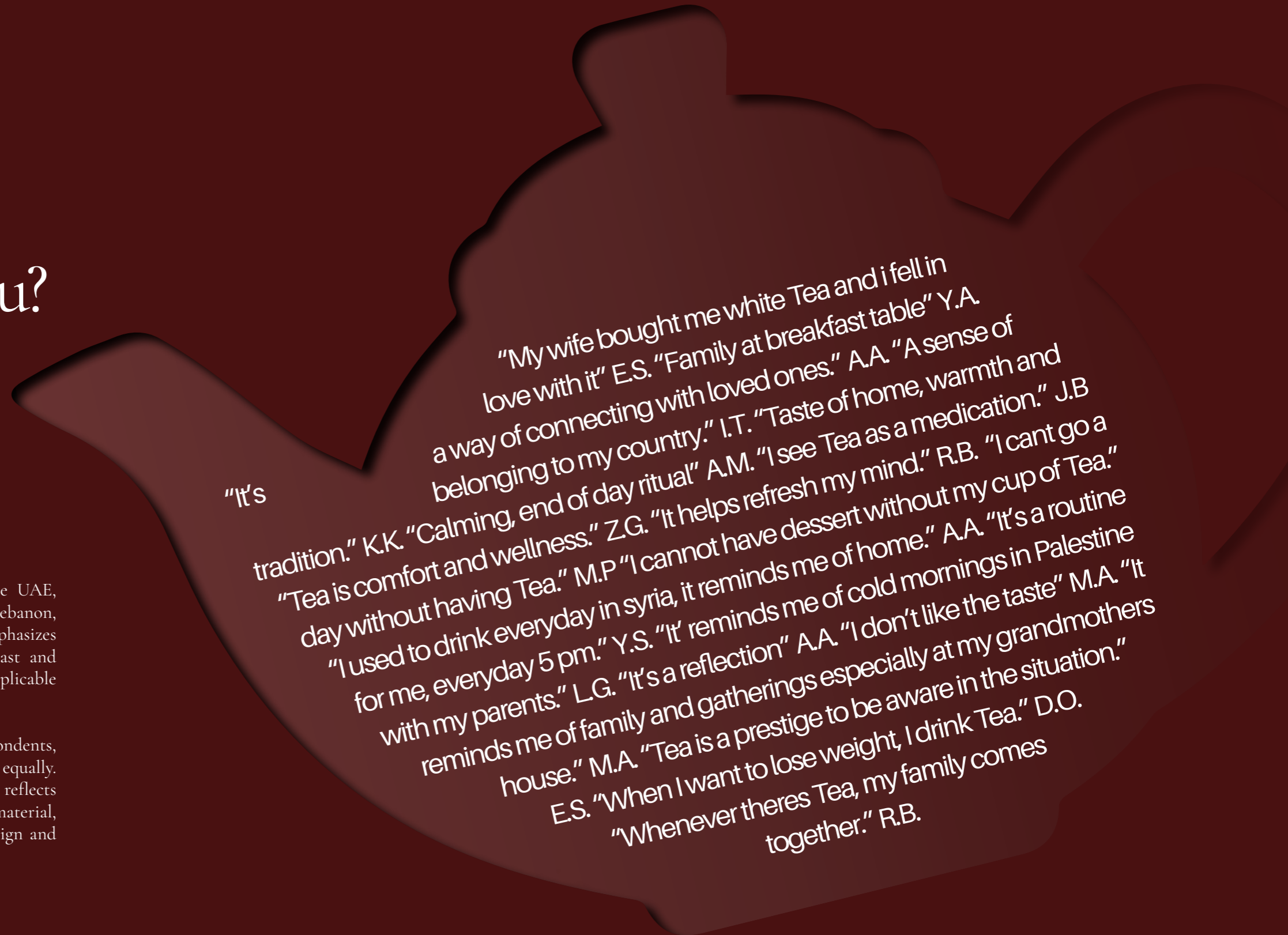
Interview Thematic Analysis

The radar graph summarizes the interview findings across six key themes: sustainability, challenges, tradition, social, consumer, and quality. Overall, Feel Good Tea showed a strong focus on sustainability and wellness, reflecting its commitment to environmentally conscious practices. Golden Kabab prioritized consumer satisfaction and social aspects, aligning with its community-oriented business model. Shandiz Palace emphasized tradition the most, showcasing its dedication to preserving cultural values. These distinctions highlight the varying priorities of each company in the Middle Eastern Tea industry, providing valuable insights for the study.

What does Tea mean to you?

The majority of respondents (88.1%) live in the UAE, with smaller groups from countries like Iran, Lebanon, and others. This demographic distribution emphasizes the cultural relevance of Tea in the Middle East and surrounding regions, making your project highly applicable to local traditions and values.

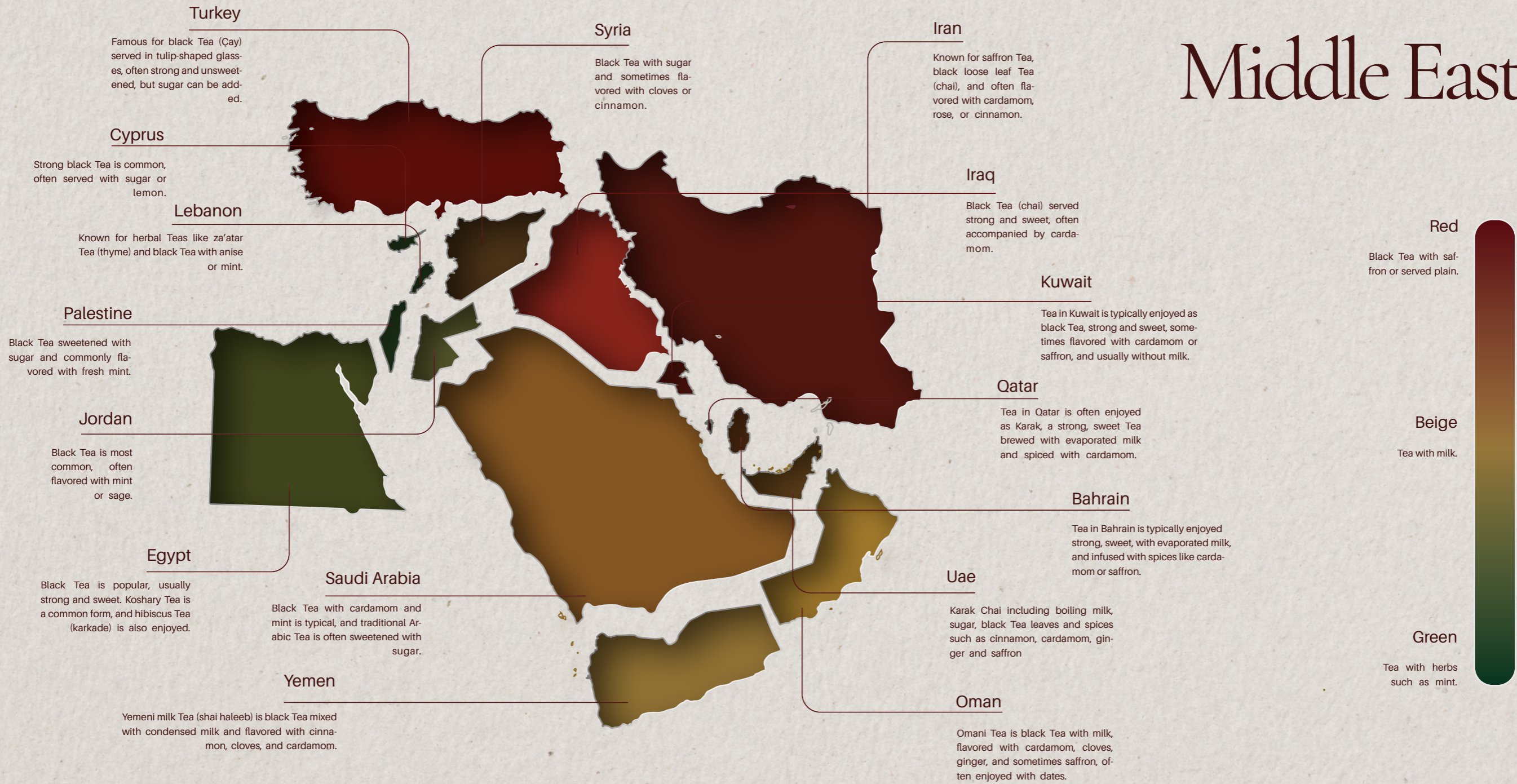
Tea bags are the preferred choice for 77.1% of respondents, while 7.1% use loose-leaf Tea, and 15.7% use both equally. The dominance of Tea bags in daily consumption reflects their potential as a consistent source of waste material, making them a viable option for sustainable design and material experimentation.



"It's

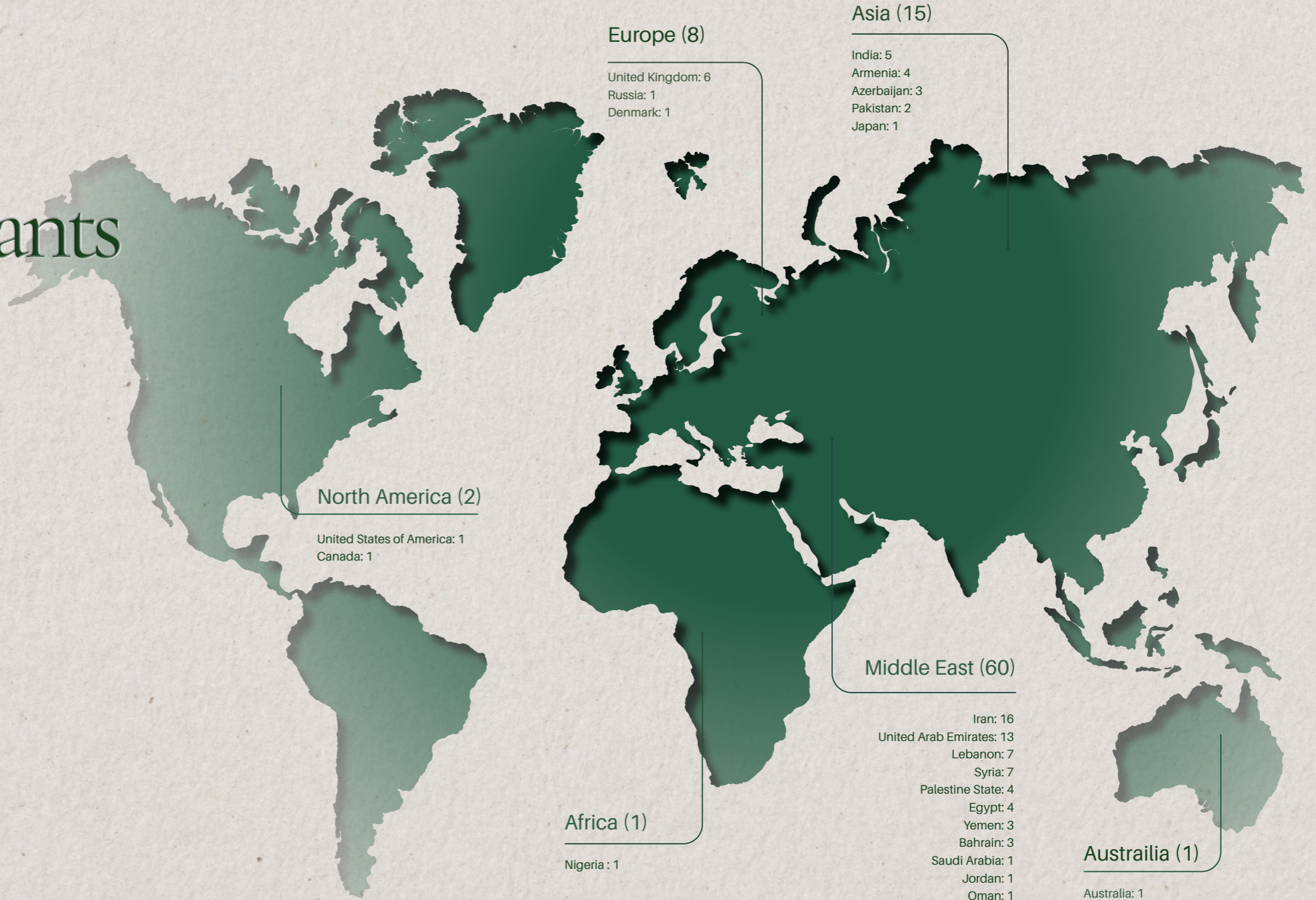
tradition." K.K. "Calming, end of day ritual" A.M. "I see Tea as a medication." J.B. "Tea is comfort and wellness." Z.G. "It helps refresh my mind." R.B. "I cant go a day without having Tea." M.P. "I cannot have dessert without my cup of Tea." "I used to drink everyday in syria, it reminds me of home." A.A. "It's a routine with my parents." L.G. "It's a reflection" A.A. "I don't like the taste" M.A. "It reminds me of family and gatherings especially at my grandmothers house." M.A. "Tea is a prestige to be aware in the situation." E.S. "When I want to lose weight, I drink Tea." D.O. "Whenever theres Tea, my family comes together." R.B.

Middle East



Survey Participants

- 68.9% Middle East
- 17.2% Asia
- 9.2% Europe
- 4.6% Other



Where do you live?

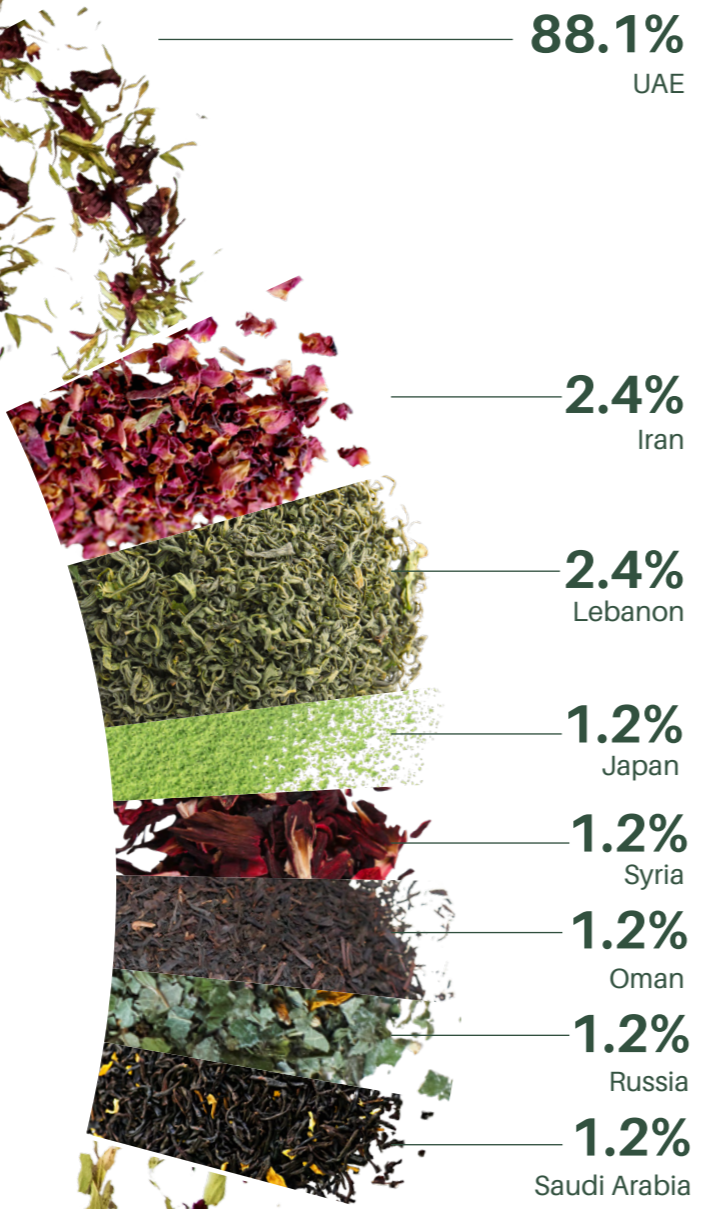


Figure 39 (Pixabay.com, 2025)

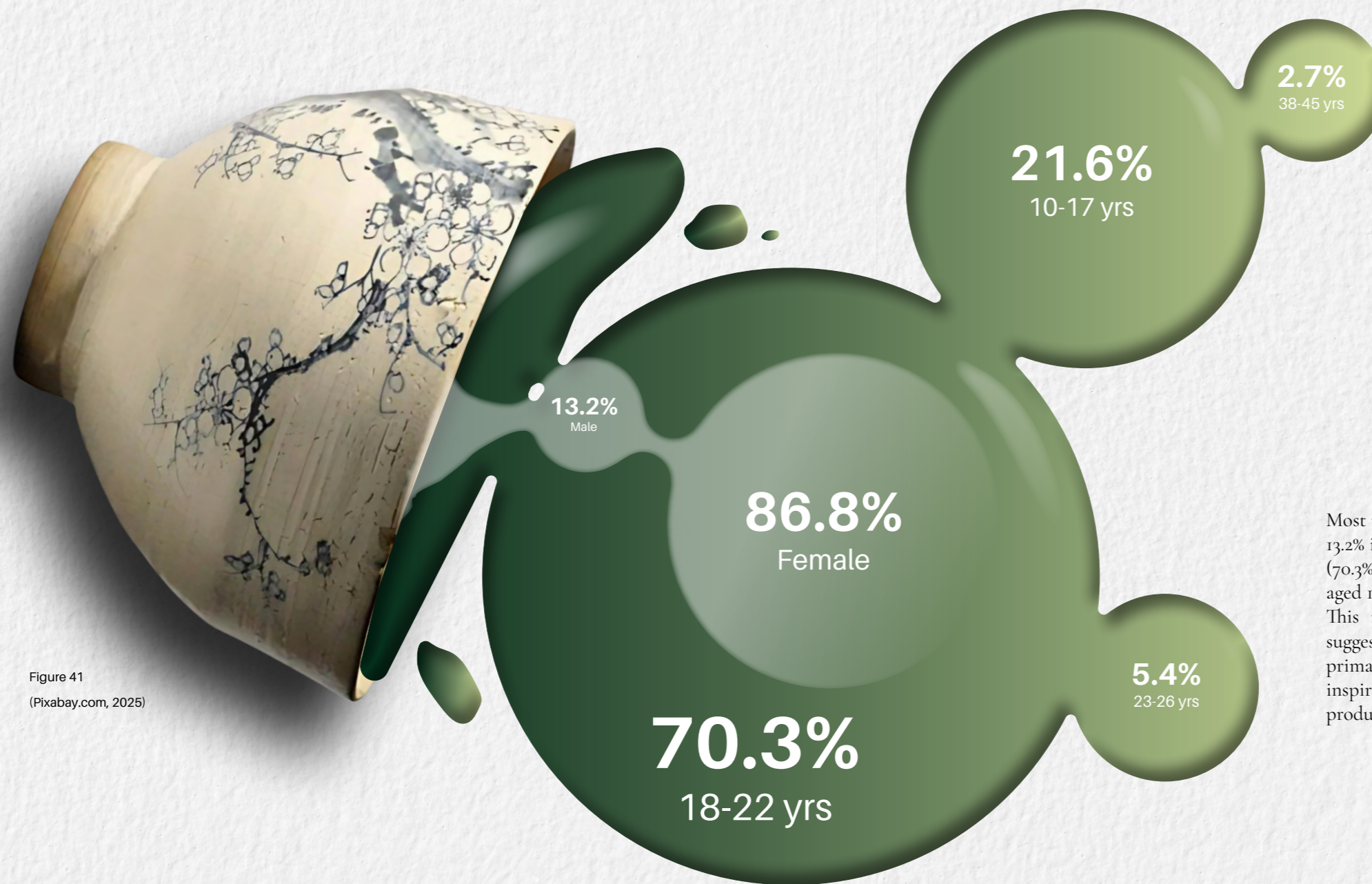
Which type of Tea do you most often use at home?

The majority of respondents (88.1%) live in the UAE, with smaller groups from countries like Iran, Lebanon, and others. This demographic distribution emphasizes the cultural relevance of Tea in the Middle East and surrounding regions, making your project highly applicable to local traditions and values.

Tea bags are the preferred choice for 77.1% of respondents, while 7.1% use loose-leaf Tea, and 15.7% use both equally. The dominance of Tea bags in daily consumption reflects their potential as a consistent source of waste material, making them a viable option for sustainable design and material experimentation.



Figure 40 (Pixabay.com, 2025)



Age and Gender

Most respondents are female (86.8%) overall, with only 13.2% identifying as male. In terms of age, the majority (70.3%) fall within the 18-22 age group, followed by 21.6% aged 10-17 and smaller percentages in older age groups. This reflects a predominantly young demographic, suggesting that designs should cater to a younger, primarily female audience by emphasizing culturally inspired, aesthetically appealing, and sustainable products that align with their values and preferences.

Figure 41
(Pixabay.com, 2025)

Would you consider owning a garment or accessory crafted from biomaterials made using Tea waste?

The majority of respondents (60.5%) showed a preference for accessories crafted from biomaterials made with Tea waste, while 34.2% would consider both garments and accessories. Only 5.3% preferred garments alone. This suggests that focusing on accessories, such as bags or jewelry, might be a more viable and appealing market for Tea-waste biomaterials, especially in early product development stages.

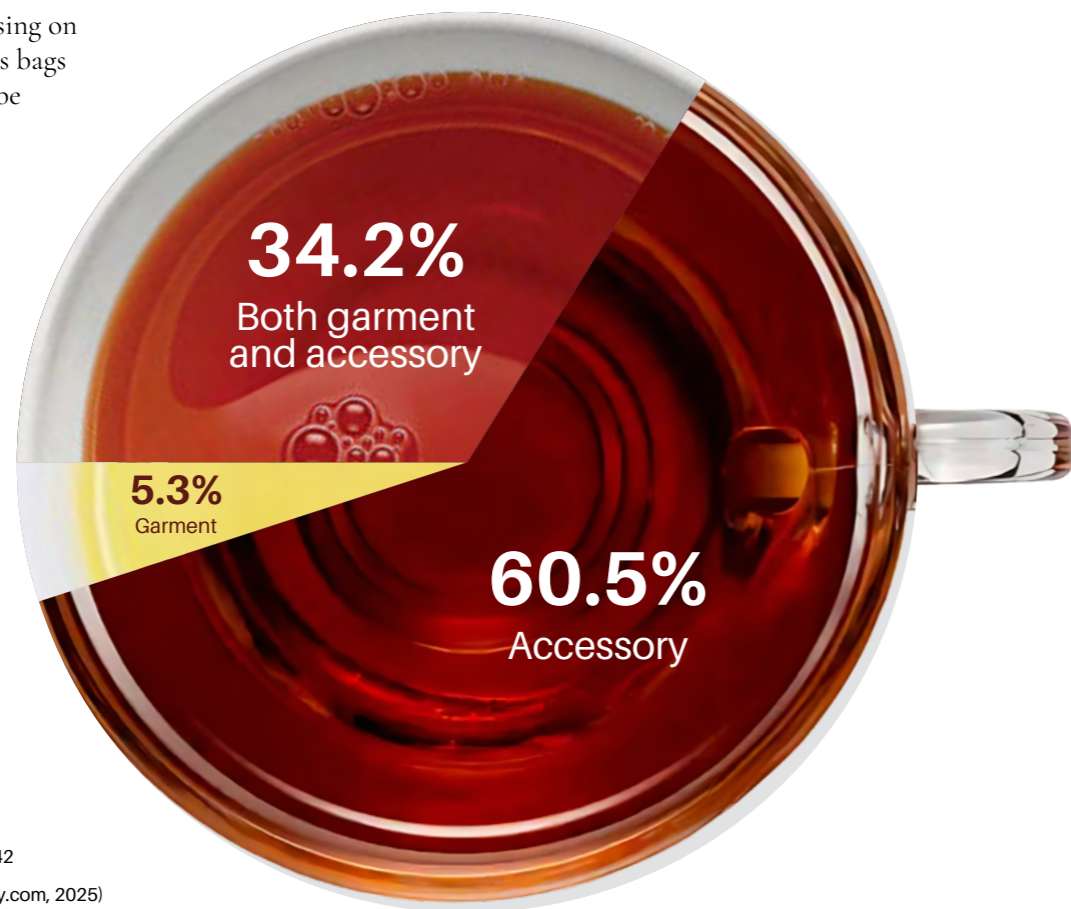


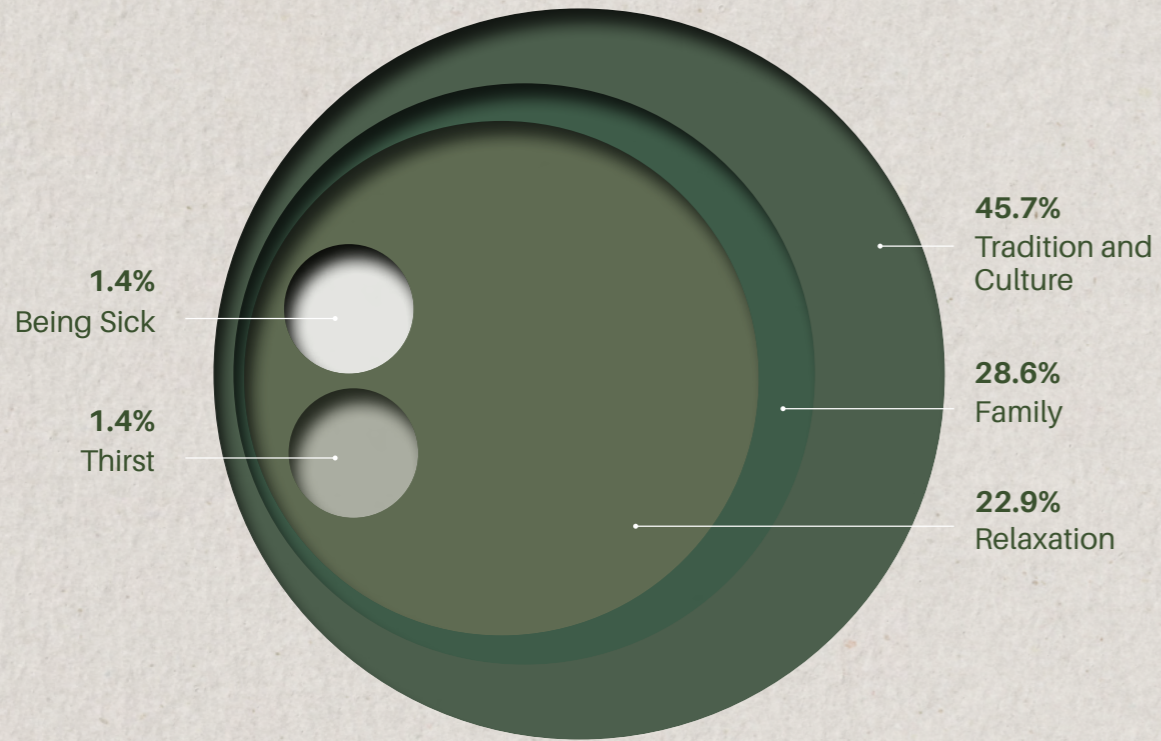
Figure 42
(Pixabay.com, 2025)

Do you believe there is potential for biomaterials, such as those made from Tea waste, to be widely used in various industries?

A significant 71.1% of respondents believe that biomaterials from Tea waste have the potential to be widely used across industries, while 28.9% were uncertain but open to the possibility. This highlights the broader applicability of Tea waste biomaterials beyond fashion, encouraging further exploration into sectors like interior design, packaging, or construction.



Figure 43
(Pixabay.com, 2025)



Which do you associate most when it comes to 'Tea'?

Tea is most commonly associated with tradition and culture (45.7%), followed by family (28.6%) and relaxation (22.9%). This highlights Tea's deep emotional and cultural significance, suggesting that products made from Tea bags could emphasize cultural motifs or family-oriented uses to resonate with consumers. Additionally, integrating elements that promote relaxation, such as soothing designs or wellness-focused products, could further align with these associations, adding both emotional and practical value to the creations. Respondents demonstrated eco-conscious practices, with 78.9% actively reducing waste and 71.1% recycling regularly. However, only 23.7% reported prioritizing the purchase of sustainable products. This gap suggests that accessible, eco-friendly alternatives, such as products made from upcycled Tea bags, could appeal to a larger audience.

What actions do you take to support Sustainability in your daily life?

71.1%
Recycling

23.7%
Buying Sustainable products

78.9%
Reduce Waste

Figure 44
(Edmond Bellefroid, 2015)





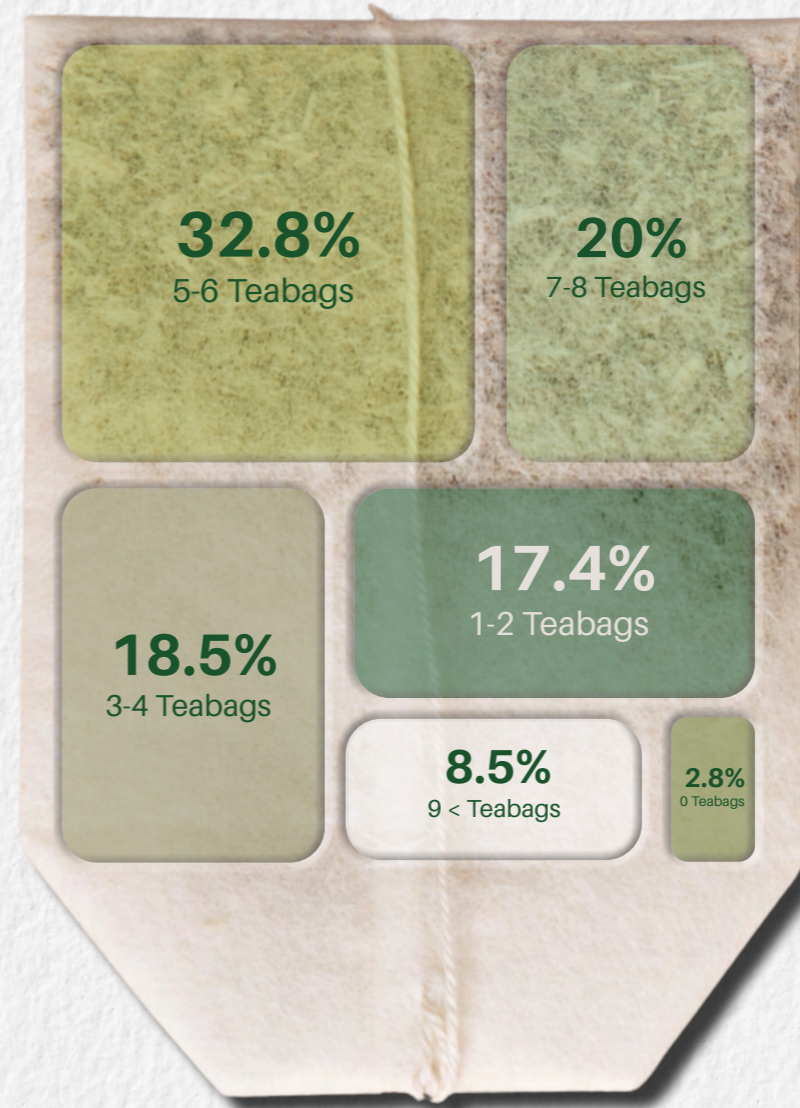
What would make you more likely to purchase products made from Tea biomaterials?

Respondents prioritized unique design (76.3%), aesthetic appeal (71.1%), and high durability (68.4%) in sustainable products, with affordability (50%) as an additional consideration. This indicates that sustainable materials and products should combine functionality with distinctive and visually appealing designs to meet consumer expectations effectively.

Figure 44
(Freepik, 2023)

On average, how many Tea bags do you personally use in a day?

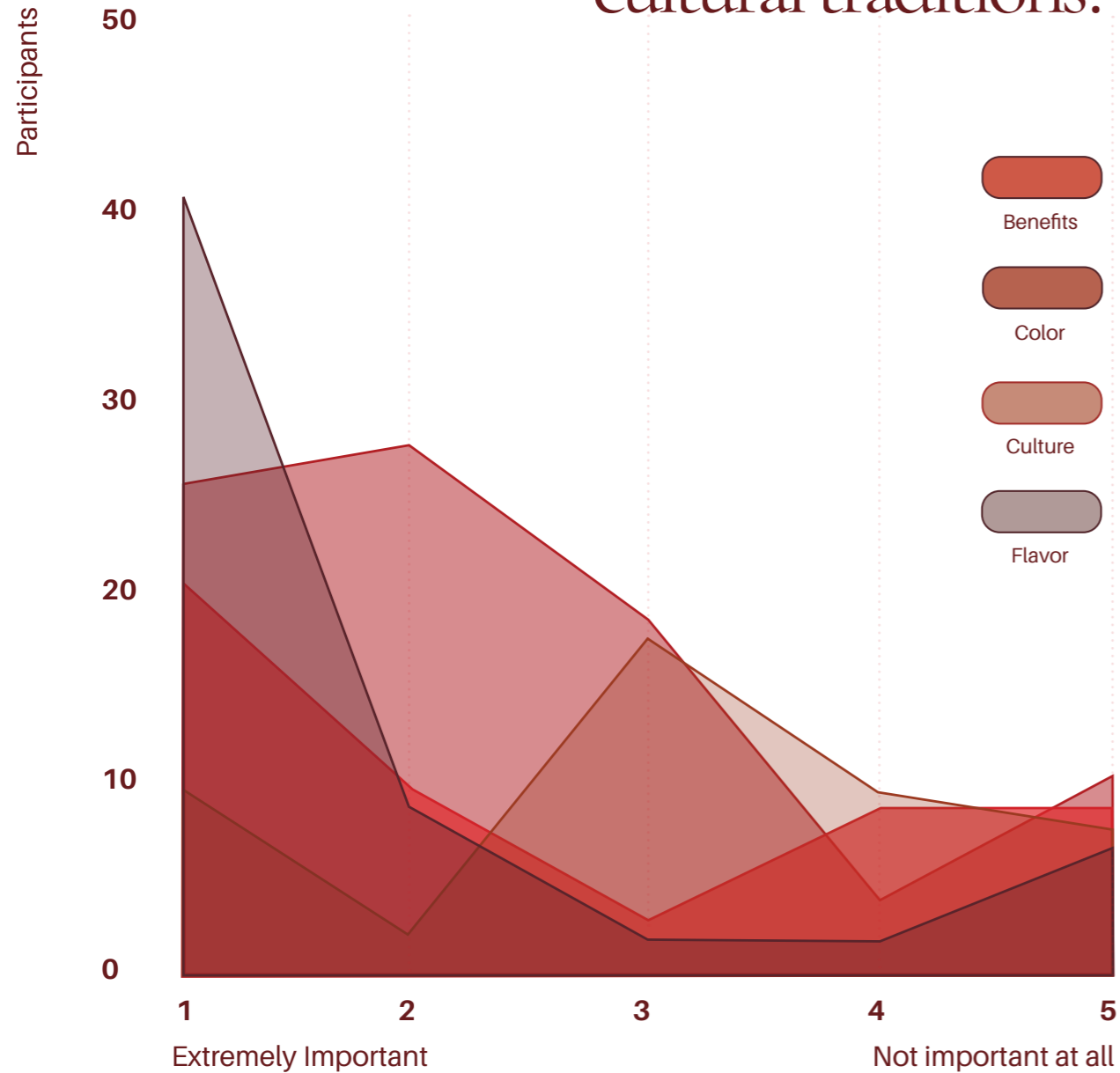
Most respondents (43.4%) reported using 1-2 Tea bags daily, making this the most common personal consumption pattern, followed by 28.9% who use 3-4 Tea bags. A notable 25% indicated they do not use Tea bags at all. This highlights the widespread reliance on Tea bags for daily consumption and points to their potential availability as a resource for upcycling in sustainable design projects.



Household Tea bag usage varies significantly, with 32.8% of households consuming 5-6 Tea bags daily and 20% using 7-8. Smaller households consuming 1-2 Tea bags accounted for 17.4% of responses. This indicates a substantial amount of Tea bag waste generated at the household level, providing a scalable resource for repurposing into biomaterials.

Approximately how many Tea bags does your household use in a day?

How important is Tea in your family or cultural traditions?



Do you re-use the Tea bags?

Tea is deeply valued as part of cultural and familial traditions, with many respondents ranking it as highly significant due to its benefits, flavor, culture and color. Among these, flavor stood out as the most important factor, highlighting the sensory and personal enjoyment tied to Tea consumption. This underscores the emotional and cultural connections people have with Tea, making it a meaningful element to incorporate into sustainable and culturally resonant design. The majority of respondents (92.9%) reported that they never reuse Tea bags, while only 7.1% stated they do so occasionally. This indicates a lack of awareness or systems for reusing Tea bags, presenting an opportunity to introduce innovative solutions that encourage their repurposing in creative and functional ways.



Figure 45
(Freepik, 2023)

Findings

The collected data highlights the cultural significance of Tea and its potential application in sustainable biomaterials, directly supporting the goals of this project. Tea holds deep cultural and familial value, with the majority of respondents rating it as highly significant. This finding validates the project's aim to incorporate Tea waste into sustainable biomaterials, blending emotional and cultural connections with environmental innovation. Furthermore, 71.1% of respondents believe that biomaterials made from Tea waste have potential for widespread application across industries, including fashion, demonstrating the scalability of such materials beyond traditional garment use.

Consumer preferences offer further insights. While 60.5% of respondents expressed a preference for accessories crafted from Tea waste biomaterials, only 5.3% showed interest in garments alone. This suggests that initial product development should prioritize accessories, such as bags or jewelry, which are likely to achieve greater acceptance before expanding into garment production. Respondents also indicated a preference for sustainable products with unique designs (76.3%), aesthetic appeal (71.1%), and durability (68.4%). These findings emphasize the importance of creating biomaterials that combine functional performance with visual and tactile appeal.

The survey also revealed an opportunity to address gaps in sustainability practices. While 92.9% of respondents reported never reusing Tea bags, 78.9% actively reduce waste, and 71.1% recycle. This discrepancy highlights a potential to educate consumers about the environmental benefits of repurposing Tea waste. Given that most participants consume 1-2 Tea bags per day, and households use up to 5-6 Tea bags daily, the project can leverage this consistent waste stream to develop scalable, sustainable solutions.



Limitations

Despite the promising findings, the project faces several limitations that must be addressed. One major challenge is the technical complexity of developing biomaterials from Tea waste. Creating durable, flexible, and scalable materials that meet both aesthetic and functional demands remains in the experimental stage, posing potential delays to full-scale production.

Market acceptance also poses a limitation. Although the survey highlights interest in sustainable products, consumers may initially resist adopting materials derived from unconventional sources like Tea waste. Addressing this resistance will require targeted awareness campaigns to build trust and familiarity with such products.

The study's geographic focus limits its global applicability. With 88.1% of respondents residing in the UAE, the findings predominantly reflect regional perspectives. This may not fully capture diverse global Tea consumption habits or cultural practices, which could affect the broader relevance of the project. Furthermore, while Tea is culturally significant in the Middle East and nearby regions, its importance may vary in other contexts, potentially impacting the universal appeal of Tea waste-based biomaterials.

Additionally, the project relies heavily on qualitative data, lacking detailed quantitative analyses, such as lifecycle assessments or carbon footprint evaluations. These metrics are critical for substantiating the environmental benefits of Tea waste biomaterials and for comparing them to existing alternatives.

Lastly, the lack of awareness about Tea bag reuse among respondents highlights a need for consumer education. Integrating educational strategies into the project will be essential for fostering widespread acceptance and encouraging sustainable practices.

Figure 46
(Alamy Limited, 2025)

Tea Pot Analysis

The analysis explores Teapots and Teacups from various cultures, focusing on their shapes, patterns, and designs. Chinese Yixing Teapots feature smooth, organic forms, while English porcelain Teapots and Teacups display intricate floral patterns and gilded edges. Japanese kyusu Teapots emphasize minimalism and function, whereas Middle Eastern designs incorporate elaborate engravings and geometric motifs. Teacups are also examined for their proportions, handles, and surface treatments. By deconstructing these elements, the research highlights how materiality, form, and ornamentation shape the cultural and sensory experience of Tea drinking.

China



Figure 48

Porcelain painted in enamels and gilt,
China, 1736 -1795
(Chitracollection.com, 2024)

Figure 47

Porcelain painted in underglaze enamels, China,
1722-1662
(Christies.com, 2020)



Figure 49

Tea Pot, Qing dynasty
1644-1912
(Jacksions.auction, 2025)

Japan

Figure 51

Stoneware with wood ash glaze Tea Bowl,
1950, Japan.
(GALLERY JAPAN, 2025)



Figure 50

Kyusu, JunzoMmaekawa, 1976,
Tokoname, Japan.
(Hulssg, 2024)



Figure 52

Pottery decorated with polychrome
enamels; Straw handle. Edo period
1615-1868, Japan
(The Metropolitan Museum of Art, 2024)





Figure 53

A Large And Impressive Silver Gilt And Shaded Enamel Russian-Style Samovar, Second Half 20th Century. (Jacksions.auction, 2025)

Figure 54
A Russian gilded silver and shaded enamel Tea glass holder, Khlebnikov, Moscow, 1908-1917 (Sothebys.com, 2025)



Russia



Figure 55

Gilded silver and shaded Russian enamel Tea glass holder. By the 11th Artel. Moscow, ca. 1910 (John Atzbach Antiques, 2025)

England

Figure 56

Porcelain painted in overglaze enamels and gilt 1775 Worcester, England.
(John Atzbach Antiques, 2025)



Figure 57

A Russian gilded silver and shaded enamel Tea glass holder, Khlebnikov, Moscow, 1908-1917
(Museum of Royal Worcester, 2021)

Figure 58

Coalport Porcelain Adelaide Tea Cup & Saucer Pattern
813/2 c.1830
(Thefancyfox.co.uk, 2025)



Concept Development

The design process draws inspiration from Teapots and Teacups across cultures, translating their shapes, patterns, and craftsmanship into structured forms. Sketches and mood boards explore material manipulation, bending paper to reflect the curves and elegance of Teapot designs.

The color palette is influenced by Tea culture—green for green Tea's freshness, deep browns and beiges for black Tea and dried leaves, amber and gold for brewed Tea, and earthy terracotta tones inspired by traditional ceramics. These elements create a cohesive visual and material narrative, blending cultural heritage with contemporary design.



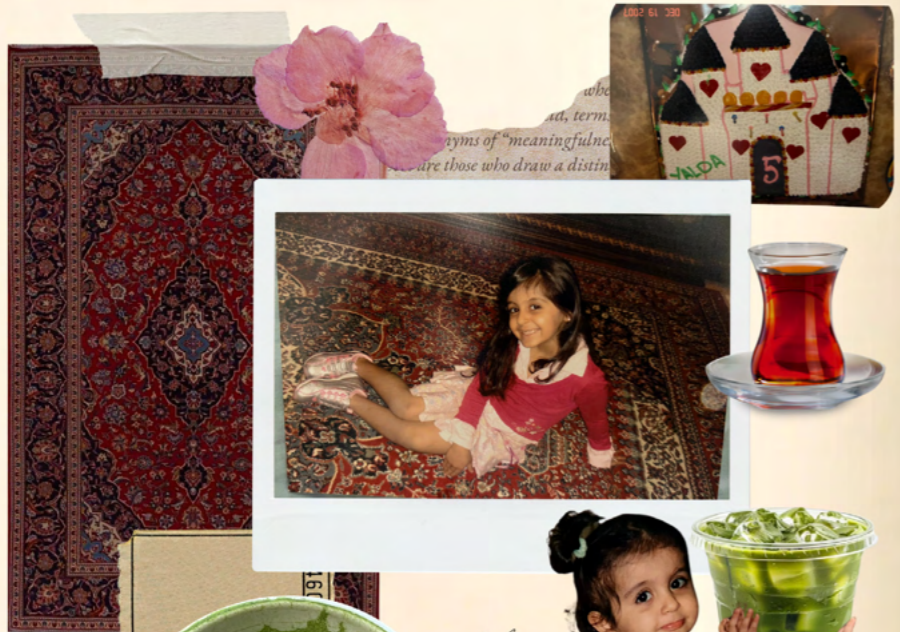
Teapots, with their elegant curves and seamless functionality, serve as a key inspiration for the exploration of bending and shaping paper into dynamic forms. Their rounded bodies, curved spouts, and structured lids demonstrate how rigid materials can be manipulated to create fluid, organic shapes. This concept is translated into paper, where folding, curving, and layering techniques replicate the Teapot's dimensionality and sculptural qualities.

Figure 59
(OEN | Design & Handcrafted Goods, 2020)



Paper Experiments

By treating paper as a structural yet flexible medium, this approach bridges the gap between traditional craftsmanship and contemporary material exploration, influencing innovative design processes in textiles and fashion.



Nabat



My father drinking tea with his friends in Iran 1991

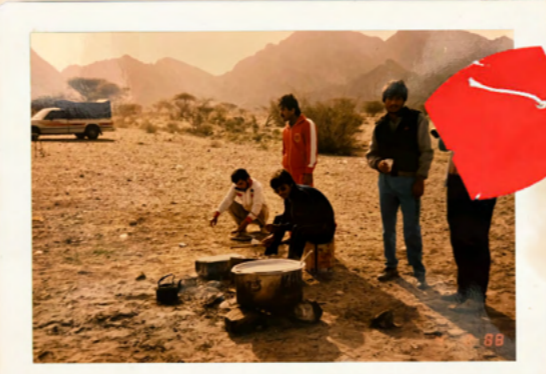
Chai Karak



matcha



name is Yalda, and I'm for
 I love
 experimenting with unexpected materials
 There's something exciting about making things that
 feel both personal and purposeful.
 Lately, I've been exploring sustainable fashion,
 trying to find new ways to work with natural and
 repurposed materials. It's a mix of trial and error,
 but I enjoy the process of figuring things out as I go.
 That's all for now. Let's see where this goes.
 Yalda



Where It All Began

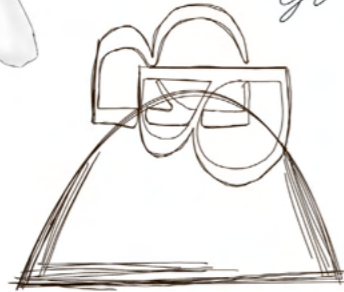
As a child, I would have chai nabat every day—the warmth, the sweetness, and the ritual of it, all wrapping me in comfort. I used to love dressing up, experimenting with layers, colors, and textures, finding joy in how each piece told its own story. These daily moments, woven into my past, have shaped the way I approach Barayé. Just as I find beauty in the layers of a garment or the ritual of Tea, I'm creating something that's rich, layered, and steeped in meaning—an exploration of materiality and memory that influences how I see and create today.



Flowy



Gradient



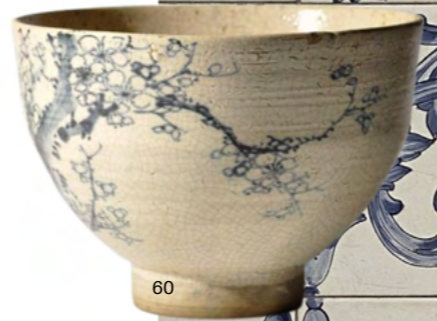
lace



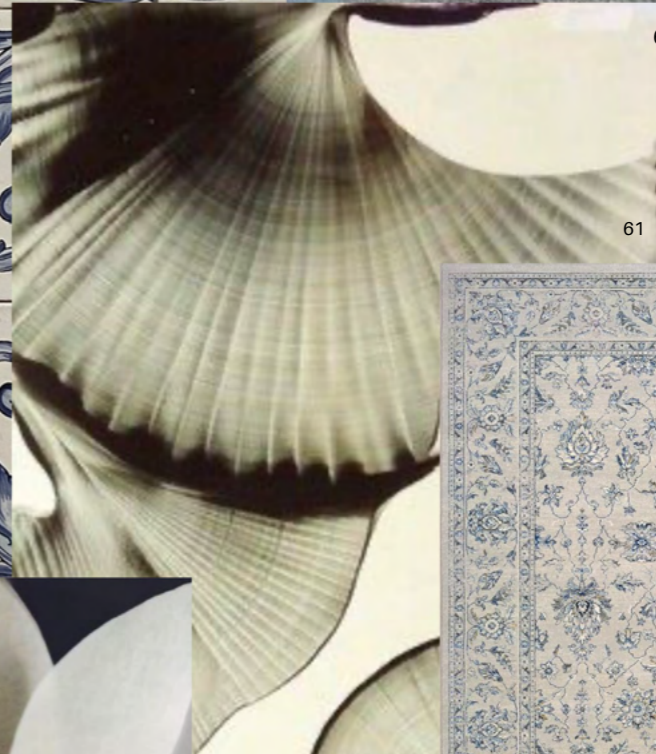
Clean & minimal



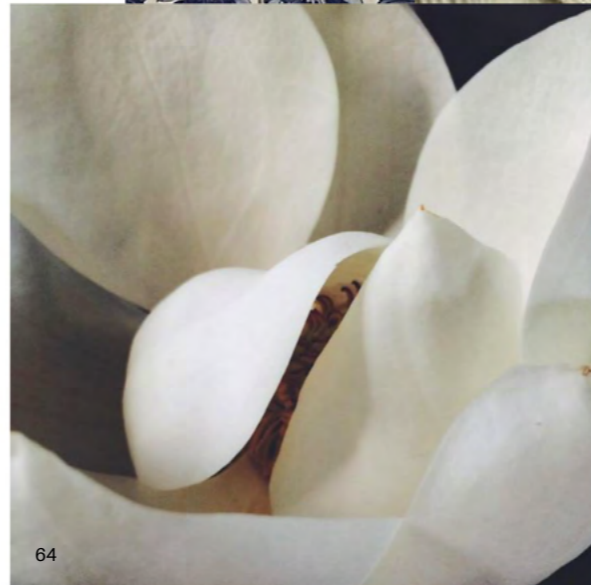
Organic shapes



60



61



64



62



63



66



65

68



69



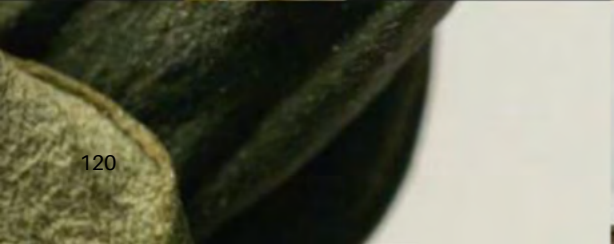
73



72



71



120



75



floral



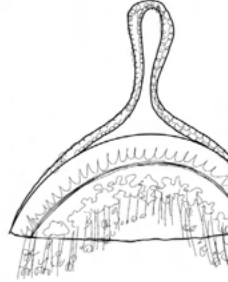
curves from teapot

nature

tea leaf plants



circles & curves



121



floral



79



77



76

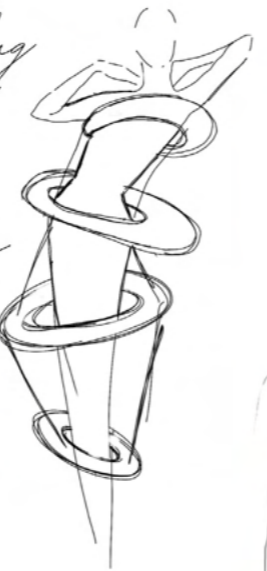


tea bag color

branding



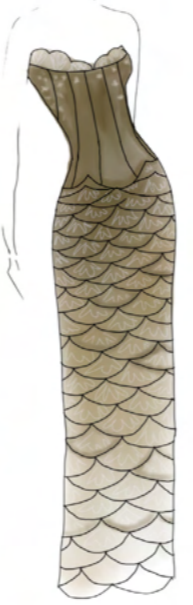
tea cups



strong curves



122



Tea stained water effect



83



78



80



81



82

123



86



85



88



87



90



91



93



92

black tea



strong curves

tea leaf shape



round teapot



bio-resin tea beads



125





Material Exploration

This chapter explores the development of textile-based and paper-based materials using Tea waste and Tea bag waste. Through experimental methods, the study assesses their structural properties, durability, and suitability for fashion applications. By comparing both material types, this research aims to determine their potential for wearable and decorative use, as well as the challenges related to scalability and performance.

One

Ingredients: 500ml Tea water, 18ml Glycerin, 8g Gelatine, 5g salt, 1 cup Loose Leaf Tea.

Properties: Flexible, Medium-Thickness, Waterproof, Light-weight.

Improvements : Lacks Heat Resistant.



Three

Ingredients: 540ml Tea water, 18ml Glycerin, 120g Gelatine, 2g salt, 1 cup Loose Leaf Tea.

Properties: Rigid, Medium-Thickness, Durable, Waterproof, Light-weight, Rough texture.

Improvements : Lacks Heat Resistant.

Technique : Laser cut, engraved and attached together.



Two

Ingredients: 500ml Green Tea water, 40ml Glycerin, 40g Gelatine, 5g salt, 1 cup Loose Leaf Green Tea.

Properties: Flexible, Smooth, Thin yet Durable, Waterproof, Light-weight.

Improvements : Lacks Heat Resistant.

Technique : Laser cut, Engraved and Woven together.



Four

Ingredients: 540ml Tea water, 18ml Glycerin, 120g Gelatine, 2g salt, 10 hand cut Tea bags.

Properties: Rigid, Medium Thickness, Durable, Waterproof, Light-weight, Rough texture.

Improvements : Lacks Heat Resistant.

Technique : Laser cut, engraved and attached together.



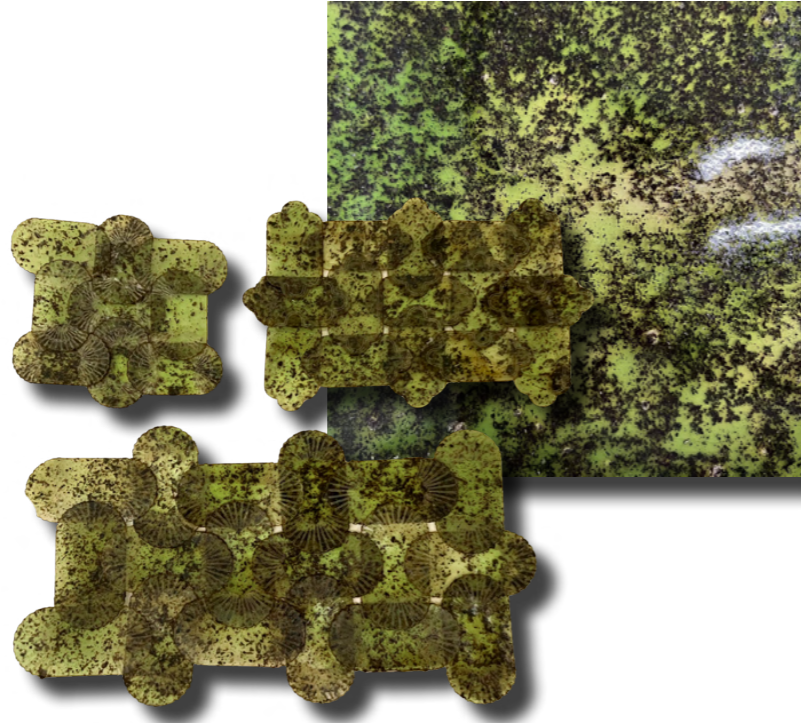
Five

Ingredients: 500ml Green Tea water, 18ml Glycerin, 8g Gelatine, 5g salt, 1 drop green food coloring, 2 cups Loose Leaf Green Tea.

Properties: Flexible, Medium-Thickness, waterproof, Light-weight.

Improvements : Lacks Heat Resistant.

Technique : Laser cut, Engraved and attached together.



Seven

Ingredients: 540ml Tea water, 10ml Glycerin, 120g Gelatine, 2g salt, 1 and a half cup Loose Leaf Tea.

Properties: Rigid, Medium-Thickness, Durable, Waterproof, Light-weight, Rough texture.

Improvements : Lacks Heat Resistant.

Technique : Laser cut and engraved.



Six

Ingredients: 400ml Tea water, 24ml Glycerin, 5g salt, 10 hand cut Tea Bags.

Properties: Super sticky, Flexible, Light-weight.

Improvements : Lacks Heat Resistant, Extremely sticky, making it difficult to handle, Not practical.



Eight

Ingredients: 540ml Tea water, 18ml Glycerin, 8g Gelatine, 2g salt, 9 Tea bags.

Properties: Flexible, Medium Thickness, Durable, Waterproof, Light-weight, Super Smooth Texture.

Improvements : Lacks Heat Resistant.

Technique : Bio-paint on Tea bag, then sealed with biomaterial.

Nine

Ingredients: 400ml Green Tea water, 24ml Glycerin, 40g Gelatine, 5g salt, 1 cup Loose Leaf Green Tea, Half a cup dried rose.

Properties: Flexible, Smooth, Thin yet Durable, Waterproof, Light-weight.

Improvements : Lacks Heat Resistant.

Technique : Laser cut, hand stitch.



Eleven

Ingredients: 400ml Hibiscus Tea water, 24ml Glycerin, 60g Gelatine, 5g salt, 1 cup Loose Leaf Hibiscus Tea.

Properties: Flexible, Smooth, Thin yet Durable, Waterproof, Light-weight.

Improvements : Lacks Heat Resistant.

Technique : Laser cut, Hand stitch.



Ten

Ingredients: 400ml Green Tea water, 24ml Glycerin, 80g Gelatine, 5g salt, 1 cup Loose Leaf Mixed Tea.

Properties: Rigid, Smooth, Durable, Waterproof, Heavy.

Improvements : Lacks Heat Resistant.

Technique : Laser cut and engrave.



Twelve

Ingredients: 540ml Tea water, 18ml Glycerin, 108g Gelatine, 2g salt, 10 hand cut Tea bags.

Properties: Rigid, Medium Thickness, Durable, Waterproof, Light-weight, Rough texture.

Improvements : Lacks Heat Resistant.

Technique : Added Tea bio-resin within the biomaterial.

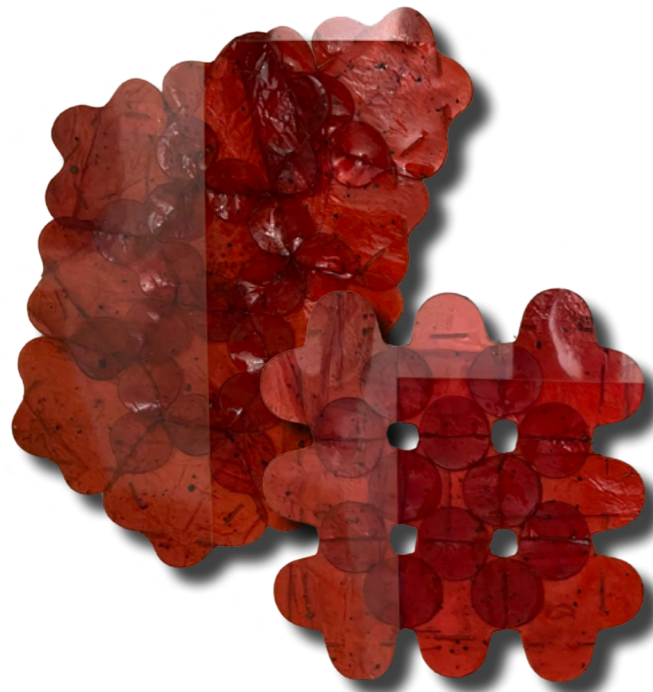
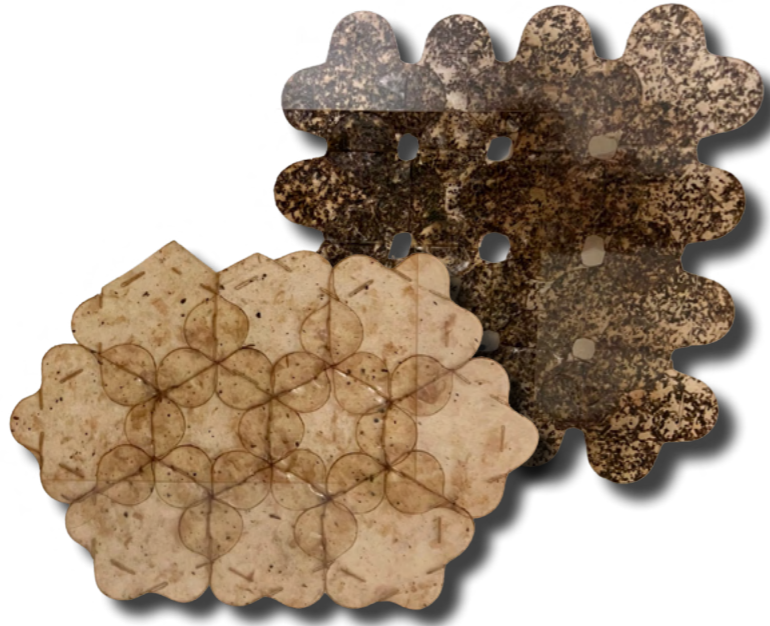
Thirteen

Ingredients: 400ml Tea water, 24ml Glycerin, 40g Gelatine, 5g salt, 1 cup Loose Leaf Green Tea | 4 tbs Loose Leaf Tea.

Properties: Flexible, Smooth, Thin yet Durable, Waterproof, Light-weight.

Improvements : Lacks Heat Resistant.

Technique : Laser cut and attached together.



Fourteen

Ingredients: 400ml Hibiscus Tea water, 24ml Glycerin, 40g Gelatine, 5g salt, 1 cup Loose Leaf Hibiscus Tea.

Properties: Flexible, Smooth, Thin yet Durable, Waterproof, Light-weight.

Improvements : Lacks Heat Resistant.

Technique : Laser cut and attached together.

Fifteen

Ingredients: 400ml Hibiscus Tea water, 24ml Glycerin, 40g Gelatine, 5g salt, 1 cup Loose Leaf Hibiscus Tea.

Properties: Flexible, Smooth, Thin yet Durable, Waterproof, Light-weight.

Improvements : Lacks Heat Resistant.

Technique : Laser cut and attached together.



Sixteen

Ingredients: 400ml Hibiscus Tea water, 24ml Glycerin, 40g Gelatine, 5g salt, 1 cup Loose Leaf Hibiscus Tea.

Properties: Flexible, Smooth, Thin yet Durable, Waterproof, Light-weight.

Improvements : Lacks Heat Resistant.

Technique : Laser cut and attached together.

Seventeen

Ingredients: 400ml Mixed Tea water, 24ml Glycerin, 70g Gelatine, 5g salt, 1 cup Loose Leaf Green Tea | 4 tbs Loose Leaf Tea.

Properties: Flexible, Smooth, Thin yet Durable, Waterproof, Light-weight.

Improvements : Lacks Heat Resistant.

Technique : Laser cut, engraved and attached together.



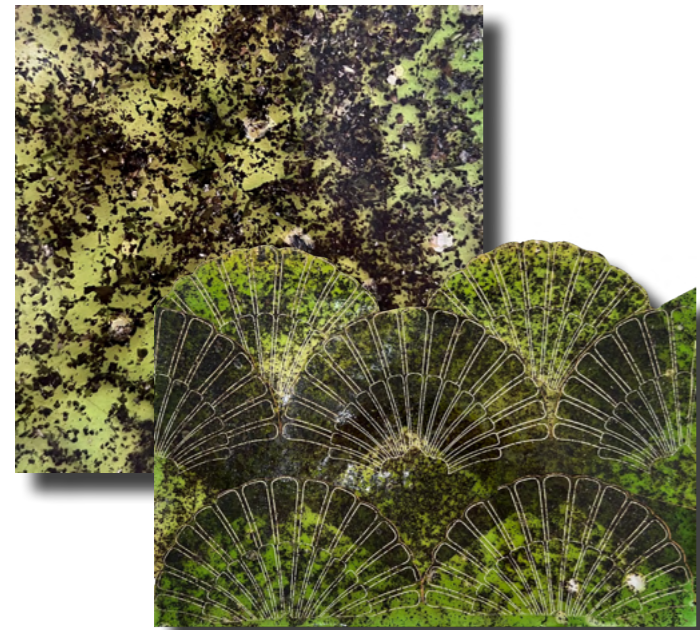
Nineteen

Ingredients: 400ml Green Tea water, 24ml Glycerin, 40g Gelatine, 5g salt, 1 cup Loose Leaf Green Tea, Half a cup dried rose.

Properties: Flexible, Smooth, Thin yet Durable, Waterproof, Light-weight.

Improvements : Lacks Heat Resistant.

Technique : Laser cut, engraved and hand stitch.



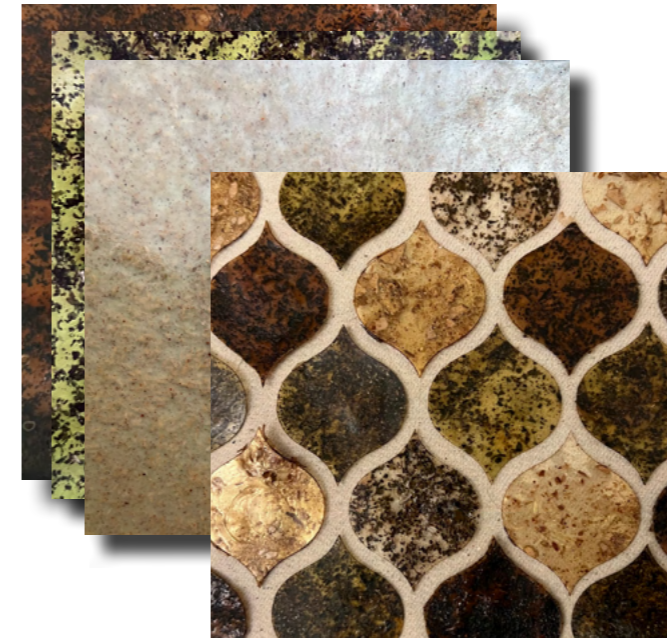
Eighteen

Ingredients: 400ml Green Tea water, 24ml Glycerin, 40g Gelatine, 5g salt, 1 cup Loose Leaf Green Tea.

Properties: Flexible, Smooth, Thin yet Durable, Waterproof, Light-weight.

Improvements : Lacks Heat Resistant.

Technique : Laser cut, engraved and attached together.



Twenty

Ingredients: 540ml Tea water, 18ml Glycerin, 108g Gelatine, 2g salt, 10 hand cut Tea bags.

Properties: Rigid, Medium Thickness, Durable, Waterproof, Light-weight, Rough texture.

Improvements : Lacks Heat Resistant.

Technique : Laser cut and attached together.

Twenty One

Ingredients: 480ml Tea water, 16ml Glycerin, 96g Gelatine, 5g salt, 1 cup Loose Leaf Mixed Tea

Properties: Smooth, Durable, Waterproof, Light-weight.

Improvements : Lacks Heat Resistant.



Twenty Three

Ingredients: Tea bag paper, 20g gelatine, 10g glycerin

Properties: Smooth, Durable, Waterproof, Light-weight.

Improvements : Lacks Heat Resistant.

Technique : Quilling.



Twenty Two

Ingredients: 480ml Tea water, 16ml Glycerin, 96g Gelatine, 5g salt, Half a cup Tea bag paper.

Properties: Smooth, Durable, Waterproof, Light-weight.

Improvements : Lacks Heat Resistant.



Twenty Four

Ingredients: 480ml Tea water, 16ml Glycerin, 96g Gelatine, 5g salt, 1 cup Loose Leaf Mixed Tea, Half a cup Tea bag paper.

Properties: Smooth, Durable, Waterproof, Light-weight.

Improvements : Lacks Heat Resistant.

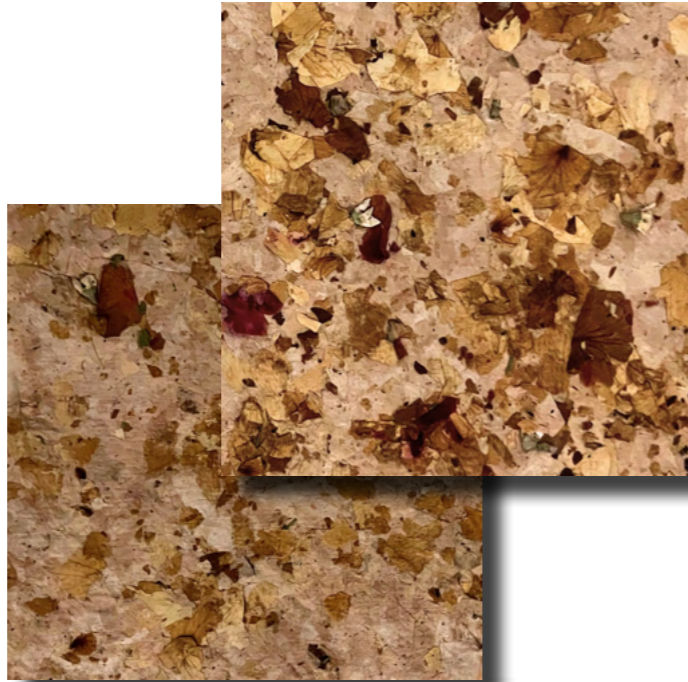
Twenty Five

Ingredients: *Half a tub of Tea water, 12 Tea bags, Half a cup dried mix flower.*

Properties: Medium Flexibility, Rough Texture, Thin yet Durable, Light-weight.

Improvements : Lacks Heat Resistant.

Technique : Mould and Deckle.



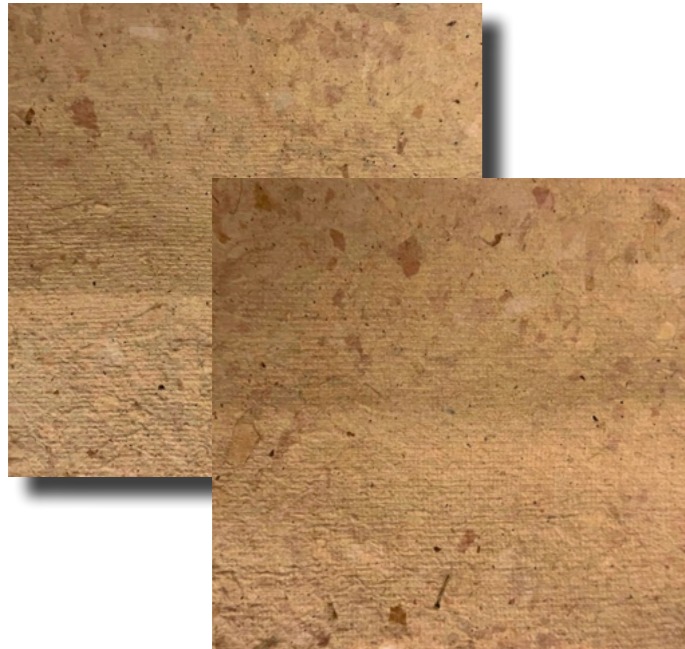
Twenty Seven

Ingredients: *Half a tub of Tea water, 12 Tea bags, Half a cup waste Tea bag paper tags.*

Properties: Flexible, Smooth, Medium thickness, Durable, Light-weight.

Improvements : Lacks Heat Resistant.

Technique : Mould and Deckle.



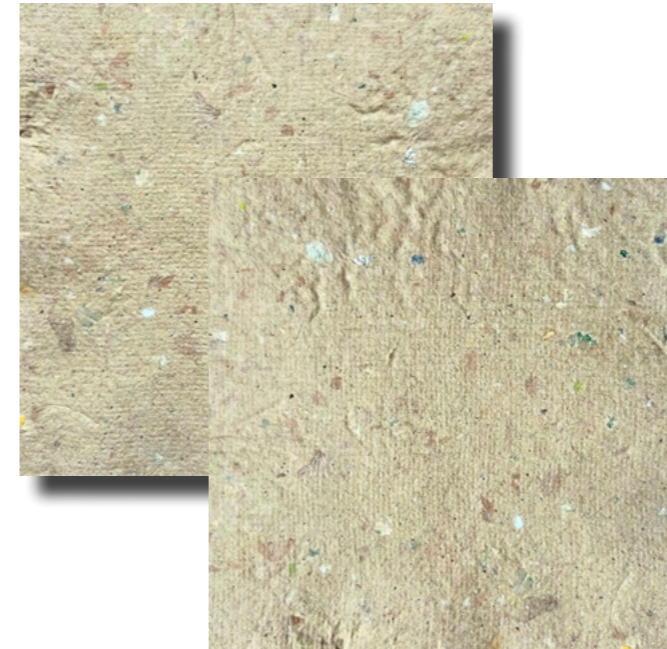
Twenty Six

Ingredients: *Half a tub of Tea water, 12 Tea bags, 9 A4 recycled paper, 4 tbs Loose Leaf Tea.*

Properties: Flexible, Smooth, Medium thickness, Durable, Light-weight.

Improvements : Lacks Heat Resistant.

Technique : Mould and Deckle.



Twenty Eight

Ingredients: *Half a tub of Green Tea water, 12 Tea bags, Half a cup waste Tea bag paper tags.*

Properties: Flexible, Smooth, Medium thickness, Durable, Light-weight.

Improvements : Lacks Heat Resistant.

Technique : Mould and Deckle.



Branding and Strategy

Branding, storytelling, and strategy are essential in positioning this thesis project within the fashion industry. Beyond material innovation, a strong brand identity and narrative highlight the value of Tea bag-based textiles. Storytelling links the material's origins to cultural heritage and sustainability, reinforcing authenticity. Strategic positioning ensures alignment with the affordable luxury market, balancing aesthetics, functionality, and environmental responsibility. Together, these elements redefine sustainable fashion and challenge industry norms.

Barayé begins with Tea—an everyday ritual reimagined as a foundation for sustainable fashion. The brand transforms used Tea bags and leaves into thoughtful materials, blending biomaterial innovation with traditional weaving to craft garments, bags, and accessories that carry meaning beyond aesthetics.

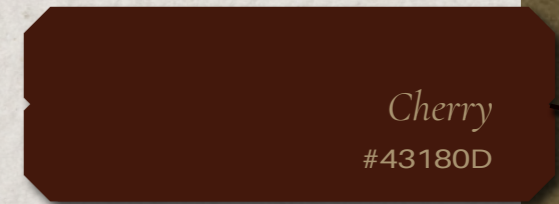
Barayé's palette reflects nature—earthy greens, warm browns, soft beiges, and Tea-stained reds—rooted in organic origins. It offers affordable luxury for women who value quiet elegance, thoughtful design, and conscious fashion. More than clothing, Barayé is a story of care, transformation, and resistance to waste. A return to nature, a step toward the future.



BARAYÉ



“Barayé,” meaning “for” or “because of” in Persian, embodies the brand’s philosophy—because sustainability is essential, because culture carries identity, and because innovation shapes the future.



S

Strengths

01

Innovative Materials – Unique use of Tea bags and biomaterials sets Barayé apart in sustainable fashion.

02

Strong Cultural Narrative – Heritage and storytelling enhance authenticity and emotional connection with consumers.

03

Sustainability Focus – Aligns with the rising demand for eco-friendly and ethical fashion.

W

Weakness

01

Material Durability – Ensuring the longevity of Tea-based textiles remains a challenge.

02

Market Awareness – As an emerging brand, it requires strong marketing to establish recognition.

03

Production Costs – Sustainable materials and craftsmanship may lead to higher pricing, limiting accessibility.

O

Opportunities

01

Growing Demand for Sustainable Fashion – Increasing consumer preference for eco-conscious alternatives.

02

Collaborations and Partnerships – Potential to work with sustainable brands, researchers, or artisans.

03

Luxury Market Entry – The brand's craftsmanship and uniqueness could position it in the affordable luxury sector.

T

Threats

01

Competition in Sustainable Fashion – Many brands are entering the eco-fashion space, making differentiation crucial.

02

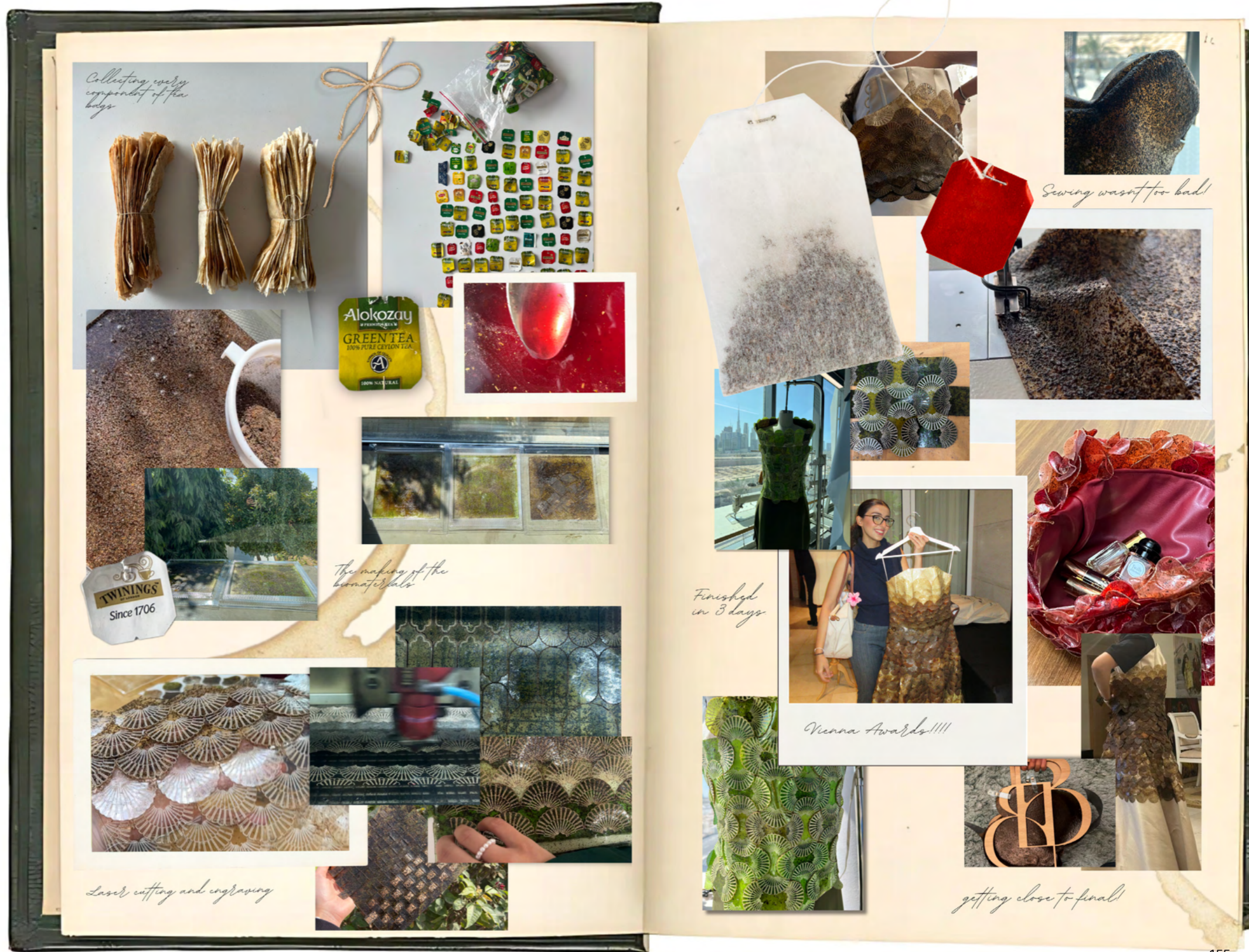
Consumer Skepticism – Questions about durability and practicality of unconventional materials.

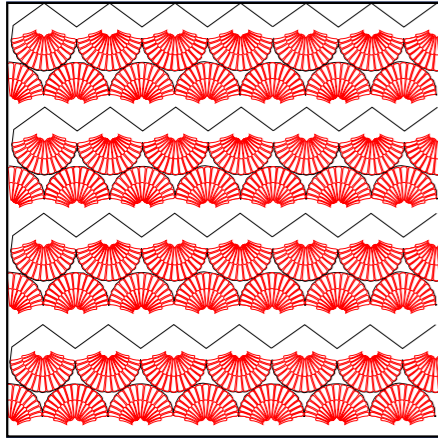
03

Economic Factors – Higher production costs may make the brand less accessible during financial downturns.

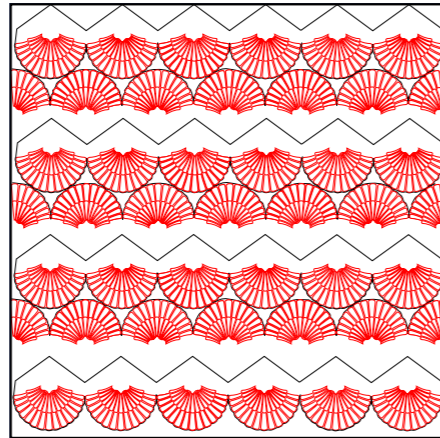
In Lab & Studio

This project has been a hands-on exploration of biomaterials, where I created over 100 molds through a process filled with experimentation, accidents, and unexpected breakthroughs. Some of the most innovative textures and forms came from mistakes such as cracks, uneven surfaces, or chemical reactions that I learned to embrace and refine. Techniques like engraving and laser cutting allowed me to further manipulate these materials, combining them with other methods to bring depth and uniqueness to each piece. From start to finish, I genuinely enjoyed every step, shaping, failing, learning, and ultimately transforming these materials into garments and bags that reflect both the process and the passion behind them.

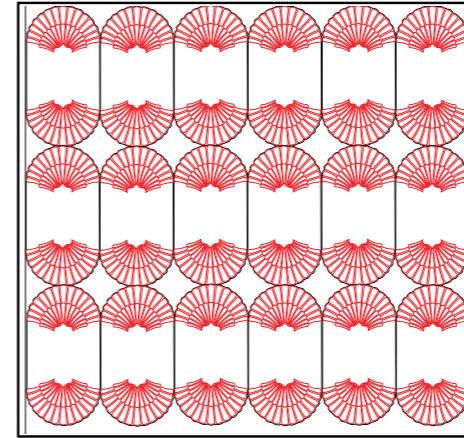




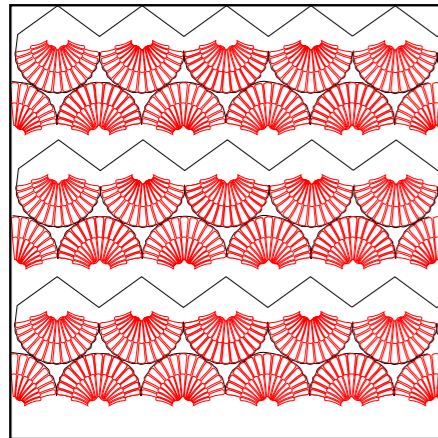
Size : 2 cm, Color : Dark Brown



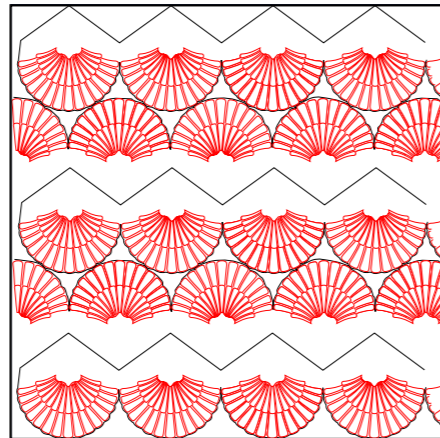
Size : 3 cm, Color : Dark Brown



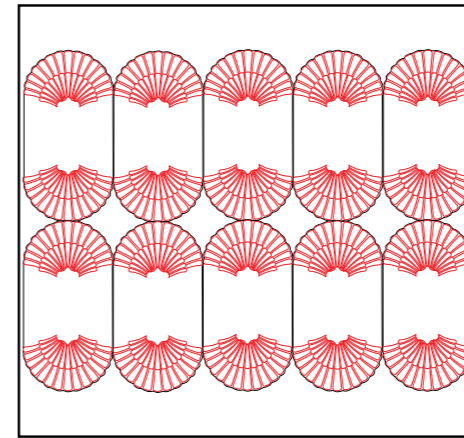
Size : 8 cm, Color : Dark, Medium & Light Green



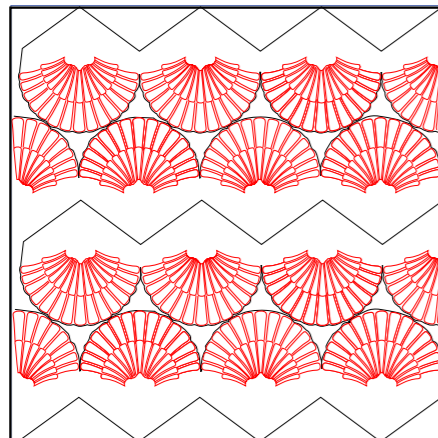
Size : 4 cm, Color : Medium Brown



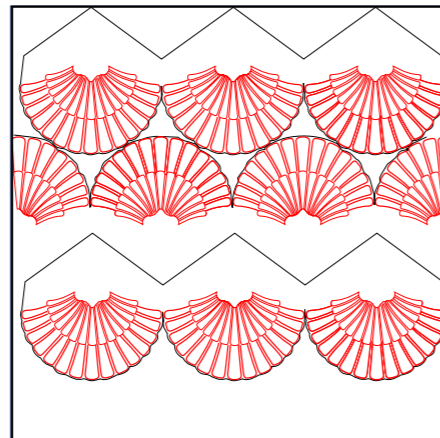
Size : 5.5 cm, Color : Light Brown



Size : 10 cm, Color : Dark, Medium & Light Green



Size : 6.5 cm, Color : Beige



Size : 7 cm, Color : Clear





EVRAE

A gradient-dyed dress inspired by the evolving hues of black tea as it steeps. Skillfully crafted with a blend of biomaterials, the piece showcases a seamless transition from rich, deep tones to soft, translucent shades, mirroring the organic diffusion of color in water.

The design features a smaller, modular shape that gradually expands, mimicking the organic growth process and the infusion of tea. Each segment evolves in size, symbolizing the natural unfolding of color and form, much like Tea leaves gradually opening as they steep.





VERDRA

Verdra channels the essence of green tea, using layered translucent modules that overlap to reveal a spectrum of green tones—mirroring how tea slowly releases its color and deepens as it steeps.

Identical, leaf-like modules are laser-engraved with fine diffusion-inspired patterns onto biomaterial tinted with green tea. When assembled, their precise interlocking creates depth, texture, and varying shades of green through layered transparency.





Every Friday, I visit my grandmother's house, where we share tea and connect over stories that have been passed down through generations. The location is a space that holds those cherished moments, filled with warmth, heritage, and tea rituals. It's here that the garments came to life, blending tradition with innovation through biomaterials dyed with tea, reflecting both my personal history and the culture that shapes me.



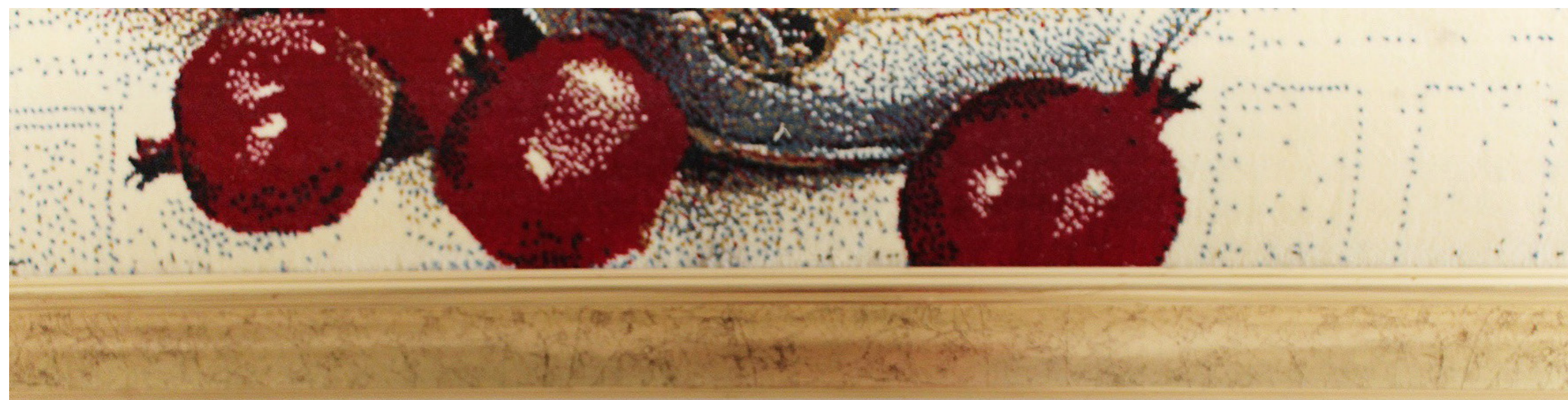


Tea holds more than flavor, it carries time, stains, and stories. In using it as a dye, I was drawn to the way it marks fabric much like it marks moments: subtly, but permanently. The garments absorb these traces, becoming quiet records of intimacy, habit, and care.

This project isn't just about tradition, it's about how tea creates space for conversation, connection, and reflection. It's a symbol of togetherness, where stories unfold and ideas brew, just like the garments themselves.







ATHELA

Crafted from hibiscus Tea bags, Athela turns waste into ornament. Its layered, translucent surface evokes growth, erosion and renewal, blurring the boundary between the natural and the made.

Athela, inspired by tea rituals and residue, features modular hibiscus-dyed units that mimic organic growth. Its evolving shape, reminiscent of petals and leaves, blends fluidity with structure, grounded in process and transformation.





OBLIQUE

Oblique blends material innovation with symbolic design. Made from discarded upholstery fabric and black tea biomaterial, its diagonal grip mimics the act of pouring tea, turning a simple gesture into a poetic statement on sustainability and ritual.



The sculptural form of the bag draws from the fluid lines of a teapot in motion with a deliberate tilt. The repeating logo, cut from the tea-based material, creates a layered frame that feels both ornamental and architectural. The soft cream body contrasts the rich, earthy brown, subtly evoking the blend of milk and tea.

BIRAE

Birae is a sculptural handbag made from plywood and black tea bioleather. The wooden form draws inspiration from traditional teapot handles, minimal, curved, and purposeful.





Birae is crafted from CNC-cut plywood and black tea bioleather, laser-cut for precision. Its curved form is inspired by traditional teapot handles, merging heritage design with digital fabrication and sustainable materials.



LYRAEA

Made from green Tea biomaterials, Lyraea draws from the curves of traditional teapots, reinterpreted with a thick, sculptural handle that flows with the body.

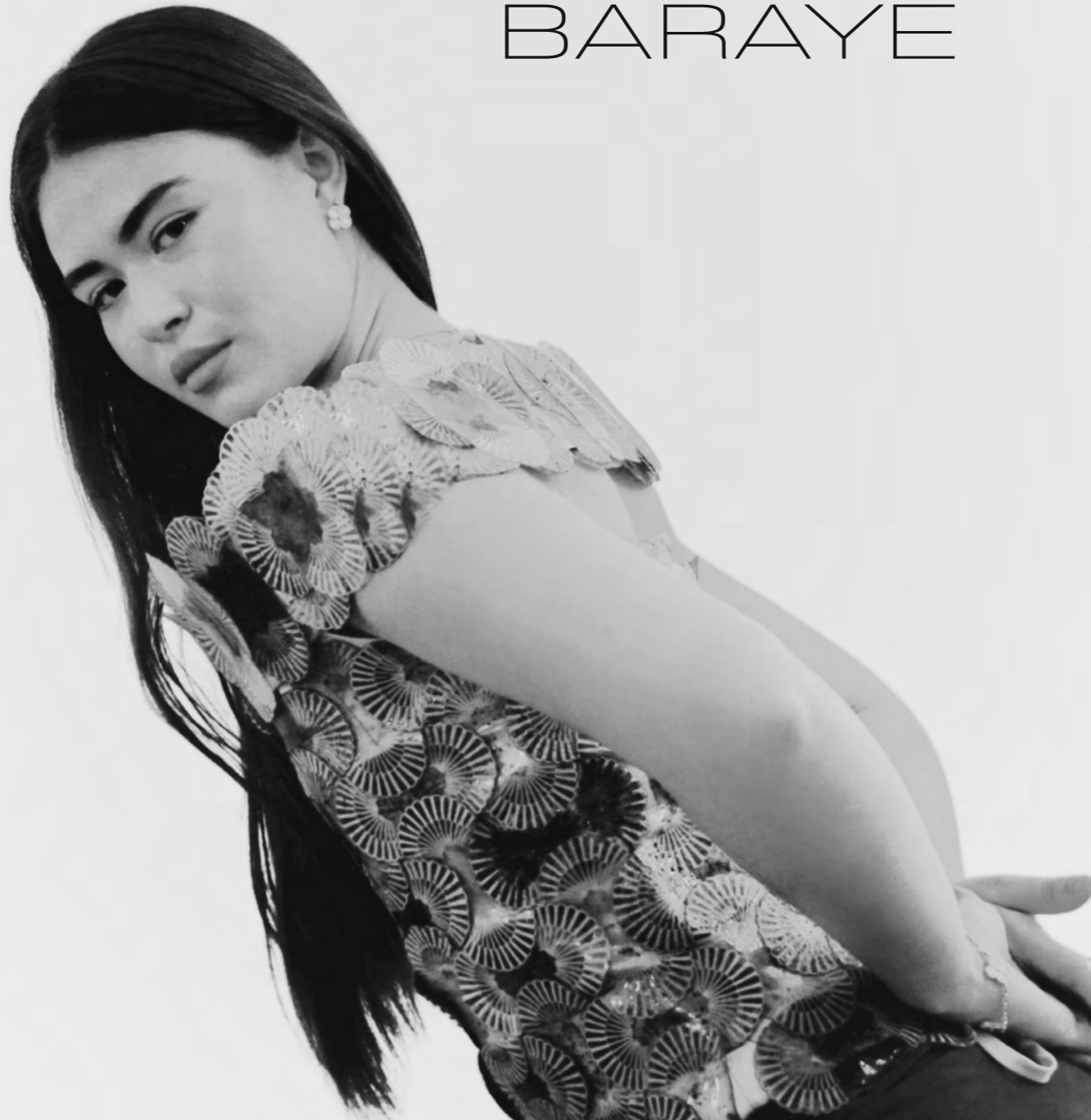




Layered in nuanced shades of green, the green tea biomaterial reflects the living tones of *Camellia sinensis*, the plant behind all true teas. Its surface is intricately laser-engraved with radial, vein-like patterns that echo tea leaves in structure and spirit, blending the organic irregularity of nature with the precision of digital fabrication.



BARAYÉ



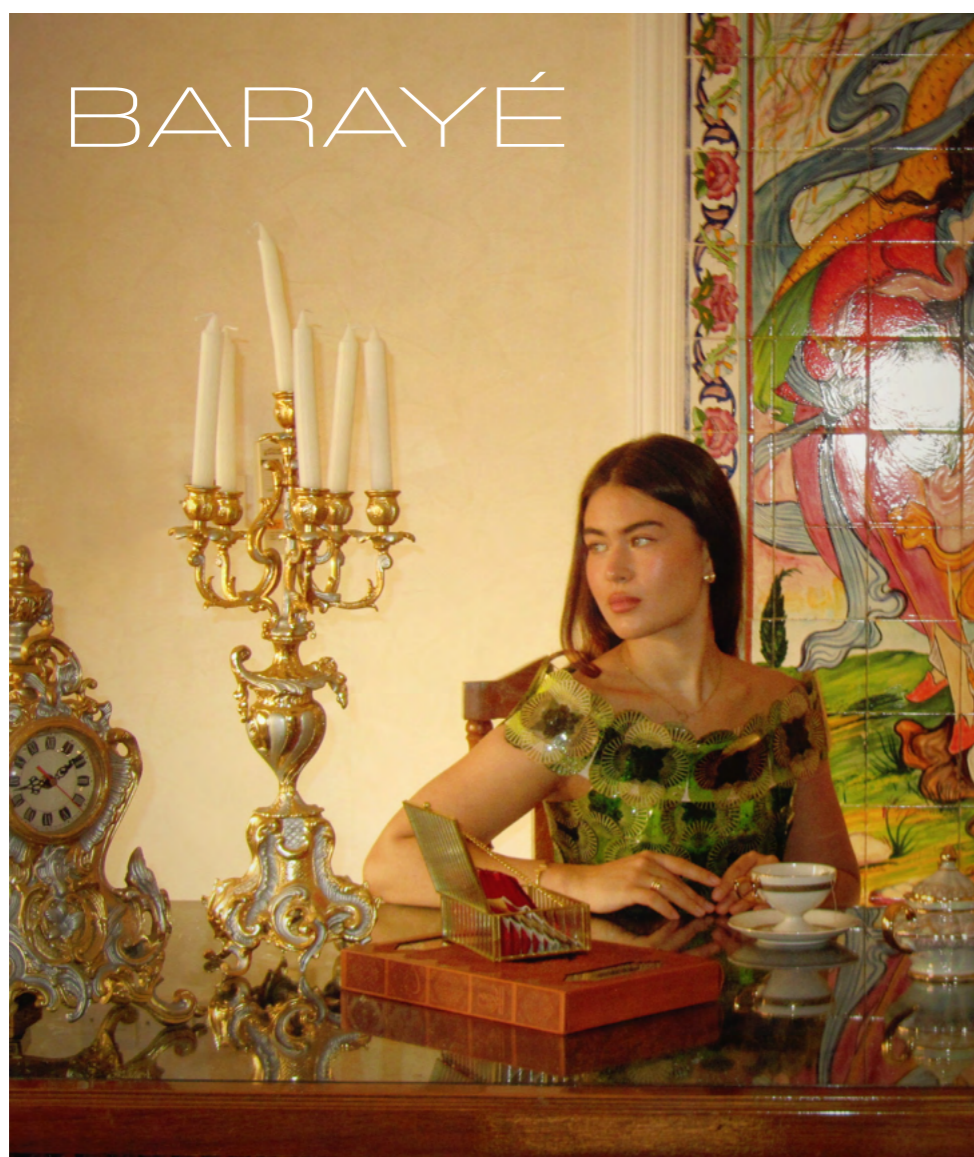
BARAYÉ





BARAYÉ

BARAYÉ



Spill the Tea!

Testing and Feedback

This project involved the development and evaluation of two dresses and a series of handbags, all crafted from biomaterials derived from used Tea bags and natural binders such as glycerin and gelatin. The objective was to test the material's functionality, durability, and aesthetic potential in both wearable and functional forms.

The two dresses explored different construction techniques, one emphasizing structure through layered biomaterial panels, and the other focusing on movement using woven Tea bag strips. While both garments successfully maintained their form and conveyed the intended conceptual narrative, wear trials revealed limitations in flexibility and comfort. Areas under stress required reinforcement, and inner finishes needed refinement for improved wearability.

In contrast, the handbags demonstrated greater practicality. Designed to carry lightweight essentials, they performed well in terms of usability and resilience. The piece dyed with hibiscus Tea, producing a rich red tone, stood out for its striking appearance and was particularly well-received during testing. Feedback indicated that the bags were more convenient and adaptable for daily use compared to the gowns.

Participant responses across all prototypes highlighted appreciation for the innovative use of waste materials and the tactile, sensory experience of the pieces. Constructive insights informed design improvements, including enhanced





Conclusion

This thesis explored the potential of Tea-based biomaterials as a sustainable alternative in Fashion and Product design, focusing on the innovative use of Tea bags, Tea herbs, and natural binders to create textiles and accessories. By bridging traditional craft with emerging sustainable practices, this research demonstrates how waste materials can be transformed into expressive and functional design elements. The literature review highlighted the urgency of material innovation in fashion, emphasizing the environmental toll of conventional textiles and the growing interest in circular design systems.

Survey findings revealed that consumers are increasingly drawn to sustainability, with many respondents expressing interest in products that are ethically made, environmentally conscious, and visually unique. There was particular appreciation for designs that incorporate upcycled or natural elements, reinforcing the direction of this study and validating the exploration of biomaterials as both a concept and a product.

In the practical phase, Tea waste was successfully collected and repurposed into usable material, with over 2,000 Tea bags gathered and processed. This substantial volume not only provided enough raw material for experimentation, but also demonstrated the feasibility of scaling this process. While challenges around durability and flexibility were noted, the collection volume shows that large-scale production is achievable with proper sourcing strategies and community or commercial support.

The material was tested through the creation of two dresses and four handbags. While the dresses highlighted the visual and conceptual richness of the biomaterial, the handbags proved to be more practical, convenient, and durable. Feedback from the testing phase indicated that accessories are more suitable for real-life application at this stage of material development, and serve as an effective introduction to this innovative material for everyday users. The response to the handbags, in particular, pointed to their market potential and wearability.

To conclude, this thesis contributes to the growing body of sustainable fashion research by offering a new, nature-based alternative rooted in material storytelling and waste revalorization. With clear consumer interest, successful material collection, and promising test results, Tea-based biomaterials hold real potential for future application in both design and industry.

What's next?

This project represents the beginning of a broader exploration into the potential of Tea-based biomaterials. Moving forward, the focus will be on refining the material's physical properties, such as improving flexibility, durability, and moisture resistance, to ensure it is suitable for both long-term wear and practical use. Continued experimentation and testing will be crucial in advancing the material from a conceptual prototype to a reliable, functional textile.

Another important area of development will be enhancing the paper made from Tea bags. The paper proved to be a versatile and sustainable byproduct, with potential applications in both fashion and other creative industries. Future efforts will explore its strength, texture, and scalability, enabling it to be used for packaging, accessories, and even as a design element in larger projects.

Collaboration will be vital to support the technical evolution of this project. Partnering with material scientists, textile engineers, and sustainability experts will provide the expertise needed to optimize the biomaterial's performance and refine the production process for greater efficiency and consistency. These collaborations will also help with technical testing and certification, making the material ready for commercial use.

The successful collection of over 2,000 Tea bags has demonstrated that sourcing this material at scale is entirely feasible. Moving forward, the next step will be establishing a sustainable system for sourcing raw materials, whether through partnerships with local cafés or community-based collection initiatives. Improving the material's production process will also be a priority, making it easier to replicate and scale.

In terms of product development, the feedback received from testing products like the four handbags has highlighted their practicality and appeal. Moving forward, the focus will shift towards creating functional accessories that merge sustainability with everyday use.

Looking to the future, there is also the opportunity to extend the applications of this biomaterial beyond fashion. The unique characteristics of Tea-based materials — including their texture and sustainability — could be explored in areas such as footwear, interior design, and eco-friendly packaging. This would allow the material to evolve into a multidisciplinary solution, making a significant contribution to sustainable design practices across various industries.



8.12 Bibliography

- Amir-Ebrahimi, M. (2015). Iranian Tea Culture and Its Socio-Cultural Significance. *Iranian Studies Journal*, Vol. 38, pp. 25-45. Available at: <https://www.iranianstudiesjournal.org> (Accessed: 25 October 2024).
- Andrew, S., & Halcomb, E.J. (2009). *Mixed Methods Research for Nursing and Health Sciences*. Wiley-Blackwell.
- Archaeology Magazine (2016). Digs & Discoveries - Dressing for the Ages. *Archaeology Magazine - May/June 2016*. Available at: <https://archaeology.org> (Accessed: 25 October 2024).
- Barnard, M. (2014). *Fashion as Communication*. 2nd edn. Routledge.
- Black, S. (2012). *The Sustainable Fashion Handbook*. Thames & Hudson.
- Cambridge Dictionary (n.d.). Zero Waste. In: *Cambridge Dictionary Online*. Available at: <https://dictionary.cambridge.org>(Accessed: 25 October 2024).
- Collins English Dictionary (n.d.). Upcycling. In: *Collins Dictionary*. Available at: <https://www.collinsdictionary.com>(Accessed: 25 October 2024).
- Connett, P. (2013). *The Zero Waste Solution: Untrashing the Planet One Community at a Time*. Chelsea Green Publishing.
- Curry, A. (2012). World's Oldest Purse Found—Studded With a Hundred Dog Teeth? [online] *Animals*. Available at: <https://www.national-geographic.com/animals/article/120627-worlds-oldest-purse-dog-teeth-science-handbag-friederich>(Accessed 22 Oct. 2024).
- Ellen MacArthur Foundation (2017). *A New Textiles Economy: Redesigning Fashion's Future*. Available at: <https://www.ellenmacarthur-foundation.org> (Accessed: 25 October 2024).
- Environmental Science & Technology. (2019). Study on Microplastics in Tea Bags. Retrieved from <https://pubs.acs.org/journal/esthag>.
- Fletcher, K. (2013). *Sustainable Fashion and Textiles: Design Journeys*. Earthscan.
- Fletcher, K. and Grose, L. (2012). *Fashion & Sustainability: Design for Change*. Laurence King Publishing.
- Food and Agriculture Organization of the United Nations (FAO) (2018). Intergovernmental Group on Tea: Current Market Situation and Medium Term Outlook. Rome: FAO. Available at: <http://www.fao.org> (Accessed: 25 October 2024).
- Global Fashion Agenda & McKinsey & Company (2020). *Fashion on Climate: How the Fashion Industry Can Urgently Act to Reduce Its Greenhouse Gas Emissions*. Available at: <https://www.globalfashionagenda.com> (Accessed: 25 October 2024).
- Global Textile Source. (2024). *The History of Handloom: Weaving Through The Ages*.
- Gwilt, A. (2014). *A Practical Guide to Sustainable Fashion*. Bloomsbury Publishing.
- Gwilt, A. (2015). *Shaping Sustainable Fashion: Changing the Way We Make and Use Clothes*. Routledge.
- Harris, J. (1993). *5000 Years of Textiles*. British Museum Press.
- Hijosa, C. (2014). Piñatex: Sustainable Alternative to Leather. *Ananas Anam*.
- Jenkins, D.T. (2003). *The Cambridge History of Western Textiles*. Cambridge University Press.
- Jenkins, D. T. (2003). *The Cambridge History of Western Textiles*. Cambridge University Press.
- Kant, R. (2012). Textile Dyeing Industry an Environmental Hazard. *Natural Science*, 4(1), pp. 22-26. doi:10.4236/ns.2012.41004.
- Kassab, R. (2013). Tea Drinking in Lebanon and Syria: A Cultural History. *Eastern Mediterranean Journal*, Vol. 22, pp. 67-90.
- Mondal, T.K. (2014). *Tea: Genomics and Molecular Aspects*. Springer.
- McDonough, W., & Braungart, M. (2002). *Cradle to Cradle: Remaking the Way We Make Things*. North Point Press.
- Merriam-Webster (n.d.). Biomaterial. In: *Merriam-Webster.com Dictionary*. Available at: <https://www.merriam-webster.com> (Accessed: 25 October 2024).
- Merriam-Webster (n.d.). Samovar. In: *Merriam-Webster.com Dictionary*. Available at: <https://www.merriam-webster.com>(Accessed: 25 October 2024).
- Morris, J. (2019). *A History of Tea: The Cultural Impact on the Middle East*. Oxford University Press.
- National Geographic (2010). World's Oldest Leather Shoe Found—Stunningly Preserved. Available at: <https://www.nationalgeographic.com> (Accessed: 25 October 2024).
- Niinimäki, K. (2013). *Sustainable Fashion: New Approaches*. Aalto ARTS Books.
- Oxford Languages (n.d.). Sustainability. In: *Oxford Languages*. Available at: <https://languages.oup.com> (Accessed: 25 October 2024).
- Postrel, V. (2020). *The Fabric of Civilization: How Textiles Made the World*. Basic Books.
- Postrel, V. (2020). *The Fabric of Civilization: How Textiles Made the World*. Basic Books.
- Rissanen, T., & McQuillan, H. (2016). *Zero Waste Fashion Design*. Fairchild Books.
- Ross, M. (2008). The Dangers of Synthetic Dyes. *Environmental Toxicology Journal*, 23(3), pp. 230-235. <com/2012/05/featured-artist-ruth-tabancay.html> [Accessed 27 Oct. 2024].
- Sabry, M. (2012). A History of Tea in Egypt and Its Cultural Significance. *Cairo Historical Journal*, Vol. 16, pp. 34-56.
- Sarkar, A.K. (2017). Sustainable Dyeing Techniques. *Textiles & Clothing Sustainability Journal*.
- Savaş, Ö. (2013). Tea Culture in Turkey: Social Functions and Historical Importance. *Journal of Middle Eastern Social Life and Customs*, Vol. 19, pp. 82-105.
- Stevens, E. (2020). Emerging Biomaterials: The Future of Sustainable Textiles. *Journal of Biodegradable Polymers*.
- Stoddard, A. (2003). *Tea Celebrations: The Way to Serenity*. New York: HarperCollins.
- Strauss, M. (2016). The Textile Industry's Dirty Secret: How to Solve the Microplastic Problem. *Environmental Innovations Journal*, 14(2), pp. 112-119.
- Tea.co.uk (2024). UK Tea & Infusions Association - History of Tea. Available at: <https://www.Tea.co.uk/history-of-Tea>(Accessed 25 October 2024).
- Textile Heritage Museum. (2024). *A Timeline of Textile History*.
- Textile Learner. (2023). *Abaca Fiber: Properties, Manufacturing Process, and Uses*. Retrieved from <https://www.textilelearner.net>.
- Thames, A. and Thomsen, J. (2016). *Sustainable Textiles: Life Cycle and Environmental Impact*. Woodhead Publishing.
- TNN (2020). Why You Shouldn't Leave Your Tea Bags in Water for More Than Four Hours. *Times of India*, 25 October. Available at: <https://timesofindia.indiatimes.com> (Accessed: 25 October 2024).
- Topitschnig, D. (2020). The Environmental Cost of Tea Bags. *The Guardian*, 19 November. Available at: <https://www.theguardian.com/environment/2020/nov/19/environmental-impact-of-tea-bags> (Accessed: 25 October 2024).
- Watson, M. and Yan, A. (2015). *Designing Sustainable Garments: A Guide for Fashion Professionals*. Bloomsbury Publishing.
- Watt, G. (1908). *The Commercial Products of India: Tea and Its Influence on Regional Practices*. Cambridge University Press.
- Williams, D. F. (1987). *Definitions in Biomaterials*. Proceedings of a Consensus Conference of the European Society for Biomaterials, Chester, England: Elsevier.
- Wilson, E. (2007). *Adorned in Dreams: Fashion and Modernity*. 2nd edn. I.B. Tauris.
- Wood, S. and Wilkerson, A. (2013). The Role of Natural Fibers in the Textile Industry. *Journal of Textile Science*, 11(4), pp. 345-359.
- World Commission on Environment and Development (WCED) (1987). *Our Common Future*. Oxford: Oxford University Press.
- Yates, J. (2020). Eco Textiles: Impact and Innovation. *Sustainable Futures Journal*, 28(7), pp. 78-85.
- some things looming (2024). Featured Artist: Ruth Tabancay. [online] *Blogspot.com*. Available at: <http://somethingslooming.blogspot.com>.
- Zhen, Y.S. (Ed.). (2002). *Tea: Bioactivity and Therapeutic Potential*. CRC Press.

8.13 List of Figures

Figure 1: Living (2022). Living Water Tea House. [online] Living Water Tea House. Available at: <https://www.livingwaterTeahouse.com/> [Accessed 13 Mar. 2025].

Figure 2: Shutterstock. (2016). Used Tea Bag On White Background Stock Photo 358560758 | Shutterstock. [online] Available at: <https://www.shutterstock.com/image-photo/used-Tea-bag-on-white-background-358560758> [Accessed 13 Mar. 2025].

Figure 3: Pritchard, E.-L. and Hughes, L. (2018). Plastic-free Tea bags: The brands that don't contain plastic and the brands that still do. [online] Country Living. Available at: <https://www.countryliving.com/uk/food-drink/a3291/plastic-Tea-bags-environment/> [Accessed 12 Mar. 2025].

Figure 4: Victoria (2025). Teapot | Dresser, Christopher | V&A Explore The Collections. [online] Victoria and Albert Museum: Explore the Collections. Available at: <https://collections.vam.ac.uk/item/O78328/Teapot-dresser-christopher/> [Accessed 12 Mar. 2025].

Figure 5: Miltenberger, J. (2017). Janis Miltenberger. [online] Janis Miltenberger. Available at: <https://www.janismiltenberger.com/more> [Accessed 12 Mar. 2025].

Figure 6: Pinterest. (2015). muirgil's dream. [online] Available at: <https://www.pinterest.com/pin/1013732197363094469/> [Accessed 12 Mar. 2025].

Figure 7: Ravilious, K. (2010). World's Oldest Leather Shoe Found—Stunningly Preserved. [online] Culture. Available at: <https://www.nationalgeographic.com/culture/article/100609-worlds-oldest-leather-shoe-armenia-science> [Accessed 12 Mar. 2025].

Figure 8: Archaeology Magazine. (2025). Digs & Discoveries - Dressing for the Ages - Archaeology Magazine - May/June 2016. [online] Available at: <https://archaeology.org/issues/may-june-2016/digs-discoveries/trenches-egypt-predynastic-period-tarkhan-dress/> [Accessed 12 Mar. 2025].

Figure 9: Curry, A. (2012). World's Oldest Purse Found—Studded With a Hundred Dog Teeth? [online] Animals. Available at: <https://www.nationalgeographic.com/animals/article/120627-worlds-oldest-purse-dog-teeth-science-handbag-friederich> [Accessed 12 Mar. 2025].

Figure 10: Science News. (2022). The world's oldest pants stitched together cultures from across Asia. [online] Available at: <https://www.sciencenews.org/article/pants-oldest-ancient-horseman-asia-culture-origin> [Accessed 12 Mar. 2025].

Figure 11: Thecommons.earth. (2023). Commons. [online] Available at: <https://www.thecommons.earth/blog/textile-recycling-woes-why-do-so-many-clothes-end-up-in-landfills> [Accessed 12 Mar. 2025].

Figure 12: LOEWE. (2017). Loewe. [online] Available at: <https://www.loewe.com/int/en/ss17-runway> [Accessed 12 Mar. 2025].

Figure 13: Team, 1 G. (2021). Grace Ling uses CGI to create zero-waste and buyer-friendly fashion. [online] 1 Granary. Available at: <https://1granary.com/interviews/designers/grace-ling-uses-cgi-to-create-zero-waste-and-buyer-friendly-fashion/> [Accessed 12 Mar. 2025].

Figure 14: Denbow, R. (2017). Experimenting with Natural Dyes. [online] A Beautiful Mess. Available at: https://abeautifulmess.com/experimenting-with-natural-dyes/#_a5y_p=6208960 [Accessed 12 Mar. 2025].

Figure 15: Daniellkayam (2019). SEAmopathy by daniel elkayam explores using algae to create vegan materials. [online] designboom | architecture & design magazine. Available at: <https://www.designboom.com/design/daniel-elkayam-seampathy-vegan-materials-made-from-algae-07-29-2019/> [Accessed 12 Mar. 2025].

Figure 16: Sanmartin, S. (2018). Kombucha · Material Studies · Vegan Leather. [online] Behance. Available at: <https://www.behance.net/gallery/67127811/Kombucha-Material-Studies-Vegan-Leather> [Accessed 12 Mar. 2025].

Figure 17: Futurematerialsbank.com. (2025). Tea waste by Katherine Lopez – Future Materials Bank. [online] Available at: <https://www.futurematerialsbank.com/material/Tea-waste-3/> [Accessed 12 Mar. 2025].

Figure 18: McCurdy, C. (2024). Charlotte McCurdy. [online] Charlotte McCurdy. Available at: <https://www.charlottemccurdy.com/> [Accessed 12 Mar. 2025].

Figure 19: Block, I. (2019). Bio Iridescent Sequin made from trees responds to growing demand for greener fashion. [online] Dezeen. Available at: <https://www.dezeen.com/2019/08/02/bio-iridescent-sequin-elissa-brunato-sustainable-fashion/> [Accessed 12 Mar. 2025].

Figure 20: Fiske, K. (2025). Art-Wise Women. [online] Blogspot.com. Available at: https://artwisewomen.blogspot.com/2010_10_01_archive.html [Accessed 12 Mar. 2025].

Figure 21: Kim Schoenberger. (2018). Expressions Of Love - Kim Schoenberger. [online] Available at: <https://www.kimschoenberger.com/exhibitions/expressions-of-love-2010/?pid=39> [Accessed 12 Mar. 2025].

Figure 22: Carol (2022). carol ann webster. [online] carol ann webster. Available at: <https://carolannwebster.com/blog-2/how-to-add-an-image-to-a-Tea-bag-method-number-one> [Accessed 12 Mar. 2025].

Figure 23: Tea People. (2023). Tea People. [online] Available at: <https://Teapeople.co.uk/pages/history-of-Tea> [Accessed 12 Mar. 2025].

Figure 24: Contributors to WikiTea (2025). Camellia sinensis. [online] WikiTea. Available at: https://Tea.fandom.com/wiki/Camellia_sinensis [Accessed 12 Mar. 2025].

Figure 25: Saatchi Art. (2025). saatchiart.com. [online] Available at: <https://www.saatchiart.com/en-ae/account/artworks/412176?epik=djoyJnU9YzFVdE9kSWErMEX-LZnJsVCrzkctXZlJlUjRiZFlQNkcmcDowJm49RzRMNEZHdJJNGgreG4xSjMnElndyZoPUFBQUFBRzZSNWYo> [Accessed 12 Mar. 2025].

Figure 26: Dieter Wanczura (2018). Tea Ceremony - Azuma Sugata - Toshikata Mizuno 1866-1908. [online] Artelino.com. Available at: https://www.artelino.com/show/japanese_single_print.asp?mbk=31600 [Accessed 12 Mar. 2025].

Figure 27: Green, M. (2017). Matcha green Tea on white wood. [online] iStock. Available at: <https://www.istockphoto.com/photo/matcha-green-Tea-on-white-wood-gm897794252-247734591> [Accessed 12 Mar. 2025].

Figure 28: Admin (2013). Understanding the Broader Types of Tea | Dominion Tea. [online] Dominion Tea. Available at: <https://blog.dominionTea.com/2013/12/26/oolong-white-and-yellow-understanding-the-broader-types-of-Tea/> [Accessed 12 Mar. 2025].

Figure 29: TBegley, S. (2015). A Brief History of the Tea Bag. [online] TIME. Available at: <https://time.com/3996712/a-brief-history-of-the-Tea-bag/> [Accessed 13 Mar. 2025].

Figure 30: Bag, T. (2025). Teabag Images – Browse 513 Stock Photos, Vectors, and Video. [online] Adobe Stock. Available at: <https://stock.adobe.com/ae/search?k=Tea-bag> [Accessed 14 Mar. 2025].

Figure 31: Bag, T. (2025). Teabag Images – Browse 513 Stock Photos, Vectors, and Video. [online] Adobe Stock. Available at: <https://stock.adobe.com/ae/search?k=Tea-bag> [Accessed 14 Mar. 2025].

Figure 32: Pinterest. (2015). Pinterest. [online] Available at: <https://www.pinterest.com/search/pins/?q=green%20Tea&rs=typed> [Accessed 14 Mar. 2025].

Figure 33: Instagram. (2021). JORD | TRAVEL PHOTOGRAPHY on Instagram: ‘Symmetrical scenes during the Tea harvest of Moc Chau, Vietnam. While it’s true that drones elevate our visuals to new heights (pun intended), handheld cameras ground us in the details and immerse us in a more relatable way... If you could only use a drone or handheld camera for the rest of your life, which would it be, and why? 📷📷📷📷’. [online] Available at: <https://www.instagram.com/jordhammond/p/CyggKOSNjXZE/> [Accessed 14 Mar. 2025].

Figure 34: Fired-earth (2015). Fired Earth. [online] Tumblr. Available at: <https://fired-earth.tumblr.com/post/108407033384/stormphyre-and-thou-said-fired-earth> [Accessed 14 Mar. 2025].

Figure 35: Mfa.org. (2025). The Tea – Works – Museum of Fine Arts, Boston. [online] Available at: <https://collections.mfa.org/objects/32829> [Accessed 14 Mar. 2025].

Figure 36: Pinterest. (2015). Shoji Hamada, Yunomi c.1955. [online] Available at: <https://www.pinterest.com/pin/6262886976891208/> [Accessed 14 Mar. 2025].

Figure 37: Smith, I. (2019). Warren MacKenzie's commitment to craft. [online] Apollo Magazine. Available at: https://www.apollo-magazine.com/tribute-warren-mackenzie-potter-1924-2018/?fbclid=IwAR2YwZtAEj0Rcz9YsToggqfVeEjVlKlKeLsIL4MTD_Jg4gXc3wtxBw4F-Dc [Accessed 16 Mar. 2025].

Figure 38: Pexels.com. (2025). Pexels. [online] Available at: <https://www.pexels.com/@anna-pou/> [Accessed 16 Mar. 2025].

Figure 39, 40, 41, 42, 43: Pixabay.com. (2025). Pixabay. [online] Available at: <https://pixabay.com/> [Accessed 16 Mar. 2025].

Figure 44: Freepik. (2023). Green Tea Images - Free Download on Freepik. [online] Available at: <https://www.freepik.com/free-photos-vectors/green-Tea> [Accessed 21 Mar. 2025].

Figure 45: Freepik.com. (2025). Available at: https://www.freepik.com/search?format=search&last_filter=query&last_value=Tea+bag&query=Tea-bag [Accessed 21 Mar. 2025].

Figure 46: Alamy Limited (2025). China chinese Teapot hi-res stock photography and images - Alamy. [online] Alamy. Available at: <https://www.alamy.com/stock-photo/china-chinese-Teapot.html?sortBy=relevant> [Accessed 21 Mar. 2025].

Figure 47: Christies.com. (2020). A CHINESE BLUE AND WHITE ‘LOTUS’ TeaPOT AND COVER, KANGXI PERIOD (1662-1722) | Christie's. [online] Available at: <https://www.christies.com/lot/lot-a-chinese-blue-and-white-lotus-Teapot-5782625/?from=salesummary&intObjectID=5782625&sid=feba0ae6-30ae-4514-8837-ee-5ac5de5c5> [Accessed 21 Mar. 2025].

Figure 48: Chitracollection.com. (2024). Chitra Collection. [online] Available at: <https://chitracollection.com/> [Accessed 21 Mar. 2025].

Figure 49: Jacksons.auction. (2025). Available at: http://jacksons.auction/catalogs/Nov12_catalog/image.aspx?img=1073_1.jpg [Accessed 21 Mar. 2025].

8.13 List of Figures

Figure 50: Hulssg (2024). Junzo Maekawa (b.1976) - HULS GALLERY SINGAPORE. [online] HULS GALLERY SINGAPORE - Japanese Crafts Gallery. Available at: <https://huls.com.sg/portfolio/junzo-maekawa/> [Accessed 24 Mar. 2025].

Figure 51: GALLERY JAPAN. (2025). Tea bowl Related Artists & Artworks Gallery Japan(4page). [online] Available at: https://www.galleryjapan.com/locale/en_US/artist/list/?keyword=Tea%20bowl&keyword_type=4&page=4 [Accessed 24 Mar. 2025].

Figure 52: The Metropolitan Museum of Art. (2024). Teapot | Japan | Edo period (1615–1868) | The Metropolitan Museum of Art. [online] Available at: <https://www.metmuseum.org/art/collection/search/62542> [Accessed 24 Mar. 2025].

Figure 53: Jacksons.auction. (2025). Jackson's International Auctioneers and Appraisers. [online] Available at: http://jacksons.auction/catalogs/Oct10_catalog/LotDetail.aspx?Lot=493 [Accessed 24 Mar. 2025].

Figure 54: Sothebys.com. (2025). (#120) A Russian gilded silver and shaded enamel Tea glass holder, Khlebnikov, Moscow, 1908-1917. [online] Available at: <https://www.sothebys.com/en/auctions/ecatalogue/2014/russian-silver-works-of-art-n09208/lot.120.html> [Accessed 24 Mar. 2025].

Figure 55: John Atzbach Antiques. (2025). 11th Artel Shaded Enamel Tea Glass Holder – John Atzbach Antiques. [online] Available at: <https://atzbach.com/product/11th-artel-shaded-enamel-tea-glass-holder/> [Accessed 24 Mar. 2025].

Figure 56: 1stdibs.com. (2017). Antique Staffordshire pottery creamware Teapot by Greatbach circa 1780. [online] Available at: [https://www.1stdibs.com/furniture/dining-entertaining/pottery/antique-staffordshire-pottery-creamware-Teapot-greatbach-circa-1780/id-f_807450/?epik=djoyjnU9Mo8tbXUoWm9FSX\]zRnF6WFUtc3NxSH-hsTW9HMjNEdVEmcDowJm49NVhmNUlaTowoVXdGeTRWdUp4TmZYUSZoPUFBQUFBRzZoZWVhV](https://www.1stdibs.com/furniture/dining-entertaining/pottery/antique-staffordshire-pottery-creamware-Teapot-greatbach-circa-1780/id-f_807450/?epik=djoyjnU9Mo8tbXUoWm9FSX]zRnF6WFUtc3NxSH-hsTW9HMjNEdVEmcDowJm49NVhmNUlaTowoVXdGeTRWdUp4TmZYUSZoPUFBQUFBRzZoZWVhV) [Accessed 24 Mar. 2025].

Figure 57: Museum of Royal Worcester. (2021). Neo Rococo Teapot | Museum of Royal Worcester. [online] Available at: <https://www.museumofroyalworcester.org/discover-learn/collections/neo-rococo-Tea-pot/> [Accessed 24 Mar. 2025].

Figure 58: Thefancyfox.co.uk. (2025). Coalport Porcelain Adelaide Tea Cup & Saucer Pattern 2/813 c.1830. [online] Available at: https://www.thefancyfox.co.uk/en-GB/Tea-table-ware/coalport-porcelain-adelaide-tea-cup-saucer-pattern-2-813-c-1830/prod_11794 [Accessed 24 Mar. 2025].

Figure 59: OEN | Design & Handcrafted Goods. (2020). Focusing on the Essential – Ceramics by Léa & Nicolas | OEN. [online] Available at: <https://the189.com/ceramics/focusing-on-the-essentials-ceramics-by-lea-nicolas/> [Accessed 24 Mar. 2025].

Figure 60: Japaneseaesthetics (2016). Japanese Aesthetics. [online] Tumblr. Available at: <https://japaneseaesthetics.tumblr.com/post/142461870501/noko706-antique-japanese-kutani-blue-white> [Accessed 24 Mar. 2025].

Figure 61: Roi James Studio. (2018). Discover the Art of Roi James: Contemporary, Meditative, Moving. [online] Available at: <https://rojames.com/art/#40> [Accessed 24 Mar. 2025].

Figure 62: Couristan. (2024). 7142/9696 - Couristan. [online] Available at: <https://www.couristan.com/product/7142-9696/> [Accessed 24 Mar. 2025].

Figure 63: Pinterest. (2015). Shoji Hamada, Yunomi c.1955. [online] Available at: <https://www.pinterest.com/pin/384072674489598571/> [Accessed 24 Mar. 2025].

Figure 64: Pinterest. (2015). Pin page. [online] Available at: <https://www.pinterest.com/pin/384072674489625863/> [Accessed 24 Mar. 2025].

Figure 65: Alamy Limited (2025). Green Tea bag hi-res stock photography and images - Alamy. [online] Alamy. Available at: <https://www.alamy.com/stock-photo/green-Tea-bag.html?sortBy=relevant> [Accessed 24 Mar. 2025].

Figure 66: Amazon.com. (2025). Amazon.com | Hand Crafted Ceramic Blue Meadow Teapot: Teapots. [online] Available at: https://www.amazon.com/Hand-Crafted-Ceramic-Meadow-Teapot/dp/B01F4IFKXO/ref=as_li_ss_tl?srs=14601942011&ie=UTF8&qid=1510657851&sr=8-91&linkCode=sl1&tag=spreec3-20&linkId=ddf2f6fb116d1911f3eace5ccf7be1cc [Accessed 24 Mar. 2025].

Figure 67: Pinterest. (2015). Pin page. [online] Available at: <https://www.pinterest.com/pin/384072674489288194/> [Accessed 24 Mar. 2025].

Figure 68: Pinterest. (2015). Pin page. [online] Available at: <https://www.pinterest.com/pin/384072674488675286/> [Accessed 24 Mar. 2025].

Figure 69: Connell, J. (2017). Sherrie Gallerie. [online] Sherrie Gallerie. Available at: <https://www.sherriegallerie.com/jim-connell> [Accessed 24 Mar. 2025].

Figure 70: Pinterest. (2015). Pin page. [online] Available at: <https://www.pinterest.com/pin/384072674487528377/> [Accessed 24 Mar. 2025].

Figure 71: Freepik. (2023). Green Tea Images - Free Download on Freepik. [online] Available at: <https://www.freepik.com/free-photos-vectors/green-Tea> [Accessed 21 Mar. 2025].

Figure 72: Pinterest. (2015). TRIBÛ - fabric & material assortment. [online] Available at: <https://www.pinterest.com/pin/536843218099148252/> [Accessed 24 Mar. 2025].

Figure 73: Pinterest. (2015). Pinterest. [online] Available at: <https://www.pinterest.com/search/pins/?q=green%20Tea%20cup%20vintage&rs=typed> [Accessed 24 Mar. 2025].

Figure 74: Pinterest. (2015). Pin page. [online] Available at: <https://www.pinterest.com/pin/29484572557101573/> [Accessed 24 Mar. 2025].

Figure 75: Pinterest. (2015). Pin page. [online] Available at: <https://www.pinterest.com/pin/11047961581358455/> [Accessed 24 Mar. 2025].

Figure 76: Couristan. (2024). 7142/9696 - Couristan. [online] Available at: <https://www.couristan.com/product/7142-9696/> [Accessed 24 Mar. 2025].

Figure 77: Pinterest. (2015). Pin page. [online] Available at: <https://www.pinterest.com/pin/15199717490095915/> [Accessed 24 Mar. 2025].

Figure 78: Pinterest. (2015). Pin page. [online] Available at: <https://www.pinterest.com/pin/384072674489545001/> [Accessed 24 Mar. 2025].

Figure 79: Pinterest. (2015). Pin page. [online] Available at: <https://www.pinterest.com/pin/11118330328169266/> [Accessed 24 Mar. 2025].

Figure 80: Pinterest. (2015). 10 Things You Didn't Know You Were Cleaning Wrong. [online] Available at: <https://www.pinterest.com/pin/56949431535357020/> [Accessed 24 Mar. 2025].

Figure 81: Pinterest. (2015). Shoji Hamada, Yunomi c.1955. [online] Available at: <https://www.pinterest.com/pin/384072674489598571/> [Accessed 24 Mar. 2025].

Figure 82: Pinterest. (2015). Pin page. [online] Available at: <https://www.pinterest.com/pin/384072674489625959/> [Accessed 24 Mar. 2025].

Figure 83: Pinterest. (2015). Pin page. [online] Available at: <https://www.pinterest.com/pin/384072674489625873/> [Accessed 24 Mar. 2025].

Figure 84: Itsnicethat.com. (2016). Yves Klein: the man famous for trademarking his own shade of blue. [online] Available at: <https://www.itsnicethat.com/news/yves-klein-tate-liverpool-exhibition-211016> [Accessed 24 Mar. 2025].

Figure 85: Pinterest. (2015). Pin page. [online] Available at: <https://www.pinterest.com/pin/638948265905459608/> [Accessed 24 Mar. 2025].

Figure 86: Pinterest. (2015). Brown Betty Teapot, 6-Cup. [online] Available at: <https://www.pinterest.com/pin/55309901668594696/> [Accessed 24 Mar. 2025].

Figure 87: Pinterest. (2015). Pin page. [online] Available at: <https://www.pinterest.com/pin/5207355813843289/> [Accessed 24 Mar. 2025].

Figure 88: Pinterest. (2015). Pin page. [online] Available at: <https://www.pinterest.com/pin/6825836929119259/> [Accessed 24 Mar. 2025].


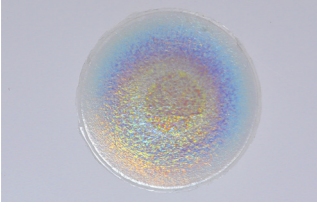
Figure 89: Pinterest. (2015). Pin page. [online] Available at: <https://www.pinterest.com/pin/384072674489110432/> [Accessed 24 Mar. 2025].

Figure 90: Pinterest. (2015). Pin page. [online] Available at: <https://www.pinterest.com/pin/384072674489110459/> [Accessed 24 Mar. 2025].

Figure 91: Victoria (2025). Teapot | Gulotta, Gerald | Chen, Guoliang | V&A Explore The Collections. [online] Victoria and Albert Museum: Explore the Collections. Available at: <https://collections.vam.ac.uk/item/O438424/Teapot-chen-guoliang/> [Accessed 24 Mar. 2025].

Figure 92: Pinterest. (2015). Pin page. [online] Available at: <https://www.pinterest.com/pin/384072674489110349/> [Accessed 24 Mar. 2025].

Figure 93: Pinterest. (2015). Pin page. [online] Available at: <https://www.pinterest.com/pin/351912465917785/> [Accessed 24 Mar. 2025].

Image	Existing Product	Designer	Material Source	Type of Application	Sustainability aspect	Innovation	Production Scale (Estimation)	Durability (Estimation)	Weakness	Cost
	Kambucha Tea Leather	Cristina Hernandez	A fermentation process of a mixture of water, Tea, sugar, yeast and a bacterial culture.	Accessories and products like furniture	Sustainable, biodegradable	Bio-based material	Small-scale artisanal	Medium	limited durability and water sensitivity	\$\$
	Piñatex	Dr Carmen Hijosa	Pineapple Leaf Fibers	Fashion (Accessories, Upholstery, Footwear, Automotive)	Sustainable, biodegradable	Bio-based material	Large-scale	High	Cost & Accessibility	\$\$\$
	Algae Sequin	Charlotte McCurdy collaboration with Phillip Lim	Algae bio-plastic	Fashion (Decorative Embellishments)	Sustainable, biodegradable	Bio-based material	Small-scale	Medium	Not yet scalable for mass production	\$\$\$
	Bio Iridescent Sequin	Elissa Brunato	Cellulose	Fashion (Decorative Sequins)	Sustainable, biodegradable	Bio-based material	Small-scale	Medium	Not yet scalable for mass production	\$\$
	MaTearial	Katherine Lopez	Tea waste, water, glycerine, starch, vinegar	Unknown	Sustainable, biodegradable	Bio-based material	Small-scale	Medium	Not yet scalable for mass production	\$

1. Tea production often generates waste, such as Tea bags and packaging materials. How do you currently manage these aspects of production?

At Feel Good Tea Co., sustainability is a key focus, and we actively manage waste through thoughtful material choices. Our Tea bags are made from corn fiber, a biodegradable material that ensures minimal environmental impact. Additionally, our loose-leaf Tea products are packaged in glass containers, which are fully recyclable. We've also implemented a customer-centric recycling initiative: customers can return their glass tubes to us, and we refill them with Tea at a 50% discount. This program not only reduces waste but also incentivizes sustainable habits among our customers.

2. To measure the potential impact of repurposing Tea waste, could you share an approximate number of Tea bags sold each month?

Feel Good Tea Co. sells approximately tens of thousands of Tea bags per month. Given our commitment to biodegradable materials, this volume represents a significant reduction in traditional plastic waste commonly associated with Tea bags. For loose-leaf Teas, our refillable glass tube program further amplifies our environmental efforts by minimizing single-use packaging waste.

3. What does Tea mean to you personally, and how does it connect to the vision of Feel Good Tea Co.?

Tea, to us, is much more than a beverage—it's a ritual, a source of comfort, and a bridge to wellness. It embodies moments of connection, relaxation, and self-care, which are at the heart of our brand's vision. At Feel Good Tea Co., we aim to reimagine Tea as an experience that uplifts and inspires, while staying rooted in values of sustainability, quality, and community. Our passion for Tea drives us to create blends that not only taste exceptional but also contribute positively to the world around us.

4. Are there sustainable practices you're interested in, or that you might consider implementing in the future?

We are constantly exploring new ways to expand our sustainability efforts. In addition to our current initiatives, we are considering implementing composting programs for used Tea leaves and promoting partnerships with eco-conscious suppliers. We're also interested in introducing more bulk-buy options to reduce packaging waste further and exploring innovative materials for packaging, such as plant-based or compostable labels and seals. Our goal is to align every aspect of our production process with environmentally friendly practices.

5. What challenges or limitations come up when implementing sustainable practices in Tea production?

Sustainable practices often come with higher costs, which can be a challenge, particularly when trying to balance affordability for our customers. Sourcing eco-friendly materials like biodegradable Tea bags or recyclable packaging can be limited by availability and logistics. Additionally, educating consumers about the importance of sustainability and encouraging participation—such as returning glass tubes for refills—requires continuous effort and creative communication. Despite these challenges, we remain committed to prioritizing sustainable solutions wherever possible.

6. With sustainability becoming a bigger factor in consumer choices, what trends do you foresee in the Tea industry?

We foresee an increasing demand for sustainable packaging, biodegradable materials, and transparent supply chains. Consumers are becoming more conscious of their environmental footprint, and they expect brands to share their values. In the Tea industry, this means a shift toward refillable, recyclable, and compostable packaging solutions, as well as a focus on ethical sourcing and organic certifications. Functional Teas promoting wellness will also grow in popularity, blending sustainability with health-conscious trends. At Feel Good Tea Co., we see this as an opportunity to lead by example and inspire meaningful change in the industry.

7. Do you give consent for the information you provide to be used in a research project?

Yes.

Main theme	Sub theme	Quoted evidence
Sustainability	Aim	Sustainability is a key focus
	biodegradable	Our Tea bags are made from corn fiber, a biodegradable material
	Environment	Ensures minimal environmental impact
	Re-usable	Customers can return their glass tubes to us
	Reduce waste	Given our commitment to biodegradable materials, this volume represents a significant reduction in traditional plastic waste commonly associated with Tea bags.
	Values	While staying rooted in values of sustainability,
	Aim	Expand our sustainability efforts.
	Collaboration	Promoting partnerships with eco-conscious suppliers.
	Reduce Waste	Reduce packaging waste
	Plant-based	Plant-based or compostable labels and seals.
	Biodegradable, Recyclable	Sourcing eco-friendly materials like biodegradable Tea bags or recyclable packaging
	Biodegradable	Sustainable packaging, biodegradable materials, and transparent supply chains.
	Wellness	Ritual, comfort
Wellness		Functional Teas promoting wellness will also grow in popularity
Health		Sustainability with health-conscious trends.
Self-care, relaxation		Moments of connection, relaxation, and self-care
Community		Sustainability, quality, and community.
Quality	Material	Thoughtful material choices
	Glass	Refillable glass tube
	Quality, Values	While staying rooted in values of sustainability, quality, and community
	Taste	Our passion for Tea drives us to create blends that not only taste exceptional
Consumer	Refill, discount	We've also implemented a customer-centric recycling initiative: customers can return their glass tubes to us, and we refill them with Tea at a 50% discount.
	Experience	We aim to reimagine Tea as an experience that uplifts and inspire
	Footprint	Consumers are becoming more conscious of their environmental footprint
	Habits	This program not only reduces waste but also incentivizes sustainable habits among our customers.
Challenges	Price, Cost	Sustainable practices often come with higher costs,
	Affordable	Trying to balance affordability for our customers.
	Availability	Sourcing eco-friendly materials like biodegradable Tea bags or recyclable packaging can be limited by availability and logistics.
	Education	Educating consumers about the importance of sustainability and encouraging participation—such as returning glass tubes for refills—requires continuous effort and creative communication.
Social	Community	We aim to reimagine Tea as an experience that uplifts and inspires, while staying rooted in values of sustainability, quality, and community.

1. What are the top three nationalities of customers who visit your restaurant?

As we are an Iranian Restaurant, majority of our customers are Iranians, I would say about 80%. The remaining are Arabs and asian customers.

2. On average, how many customers order Tea daily at your restaurant? (e.g., 85% of our customers order Tea, which is XYZ a day)

About 70% of our customers order Tea after their meals. It's tradition to have Tea after you eat.

3. Could you estimate the percentage breakdown of the Tea flavors served? (e.g., 80% black Tea, 15% green Tea, 5% others)?

Majority of our customers order our traditional Black Tea with saffron in the big Samovar. I would say about 75% black Tea, 10% green Tea & 15% others

4. What personal or cultural significance does Tea hold for you?

Tea is relaxing drink that helps increase my attention & focus, I drink Tea every day and somehow my tiredness just goes away.

5. If you had to associate Tea with one of the following, which would you choose: Tradition, Culture, or Relaxation? Why?

Tradition because I think most people love Tea because it has been a popular part of everyday life here in the UAE and in Iran for so long, not just in the middle east but everywhere in the world. Tea is an essential part of most people's lives.

6. Do you ever reuse or repurpose Tea bags, leaves, or packaging? If yes, how? Are there any sustainable practices you follow?

No, we use only the loose Tea leaves and we throw away the packaging and waste. Loose Leaf Tea is actually more affordable for us than Tea bags, not only that, its also better quality. Sustainability is a challenge for us.

7. Do you give consent for the information you provide to be used in a research project?

Yes

Main theme	Sub theme	Quoted evidence
Wellness	Relax, Tiredness	Tea is relaxing drink that helps increase my attention & focus, I drink Tea every day and somehow my tiredness just goes away.
	Quality	Loose Leaf Tea is actually more affordable for us than Tea bags, not only that, its also better quality.
Consumer	Nationality	As we are an Iranian Restaurant, majority of our customers are Iranians, I would say about 80%. The remaining are Arabs and asian customers.
	Tea	About 70% of our customers order Tea after their meals.
	Tea	I would say about 75% black Tea, 10% green Tea & 15% others
	Not Sustainable	Sustainability is a challenge for us.
Challenges	Tradition, Tea after meal	It's tradition to have Tea after you eat.
	Tradition, Black Tea, Samovar, Saffron	Majority of our customers order our traditional Black Tea with saffron in the big Samovar.
	Tradition, daily life	Tradition because I think most people love Tea because it has been a popular part of everyday life
	Daily life	Tea is an essential part of most people's lives.
Tradition		

1. What are the top three nationalities of customers who visit your restaurant?

We have a lot of different nationalities because of our location in Barsha. Approximately 60% are Iranians, 20% Arab and 20% other nationalities.

2. On average, how many customers order Tea daily at your restaurant? (e.g., 85% of our customers order Tea, which is XYZ a day)

We have around 75-100 customers a day and approximately 85% of our customers order Tea daily. Tea is something that is always ready fresh because of its high demand. Nearly all the nationalities order Tea with dessert or after their food.

3. Could you estimate the percentage breakdown of the Tea flavors served? (e.g., 80% black Tea, 15% green Tea, 5% others)?

Approximately 80% black Tea, 5% green Tea and 15% other flavors. Black Tea is most common in Iran that's why in our restaurant it's their culture and tradition to drink black Tea.

4. What personal or cultural significance does Tea hold for you?

Tea consumption fosters social communication, strengthening social & cultural ties between individuals & communities. It brings families and loved ones together in my opinion. I personally drink because it makes me feel relaxed.

5. If you had to associate Tea with one of the following, which would you choose: Tradition, Culture, or Relaxation? Why?

I believe Relaxation as it has been scientifically shown to reduce stress and inflammation as well as improve attention and focus

6. Do you ever reuse or repurpose Tea bags, leaves, or packaging? If yes, how? Are there any sustainable practices you follow?

No, we do not use Tea bags as loose leaf Tea is the traditional way of making true Iranian Tea. It's higher quality and tastes better. We do not re-use.

7. Do you give consent for the information you provide to be used in a research project?

Yes

Main theme	Sub theme	Quoted evidence
Wellness	Family, love, relax	It brings families and loved ones together in my opinion. I personally drink because it makes me feel relaxed.
	Relax, reduce stress, improve	I believe Relaxation as it has been scientifically shown to reduce stress and inflammation as well as improve attention and focus
Quality	Fresh	Tea is something that is always ready fresh because of its high demand.
	Quality, Taste	Loose leaf Tea is higher quality and tastes better.
Consumer	Nationality	We have a lot of different nationalities because of our location in Barsha. Approximately 60% are Iranians, 20% Arab and 20% other nationalities.
	Tea order	We have around 75-100 customers a day and approximately 85% of our customers order Tea daily.
	Food, Tea	Nearly all the nationalities order Tea with dessert or after their food.
Challenges	Not sustainable	We do not re-use.
Tradition	Black Tea, Culture, Tradition	Black Tea is most common in Iran that's why in our restaurant it's their culture and tradition to drink black Tea.
	Tradition, Tea	No, we do not use Tea bags as loose leaf Tea is the traditional way of making true Iranian Tea.
Social	Communication, Culture, Individual, Community	Tea consumption fosters social communication, strengthening social & cultural ties between individuals & communities.