

Enhancing Thailand's Creative Economy: Applying Andaman Sea Identity in Textile Design

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ABSTRACT

This study examined the distinct identities of the North and South Andaman Seas to guide textile pattern design that aligns with consumer preferences. Data were gathered through interviews with stakeholders from the Phuket and Trang Marine National Parks, field observations conducted via scuba diving, and a survey of 772 respondents (392 Asian and 380 European). The findings underscored differences in seawater color and marine biodiversity: the North Andaman Sea displays blue hues and deep-sea species like whale sharks and barracudas, while the South Andaman showcases greenish tones and species such as dugongs and dolphins. Consumer surveys indicated varied preferences: Asian consumers leaned toward abstract designs and monochromatic colors, while European consumers favored realistic, vibrant patterns. These insights into regional marine identities and consumer aesthetics lay the groundwork for developing unique textile designs, supporting Thailand's economic growth and promoting its distinct natural heritage in global markets.

Keywords: Textile Design, Textile Patterns, Creative Economy, Marine Biodiversity, Consumer Preferences

INTRODUCTION

The Andaman Sea, part of Thailand's marine landscape, supports a diverse array of ecosystems and marine species, making it one of Southeast Asia's biologically significant regions. This distinctive environment not only attracts local and international tourists, but also greatly contributes to Thailand's economy. However, this region faces increasing environmental threats from climate change, such as rising sea levels, coral bleaching, and biodiversity loss, which jeopardize its marine resources and ecological balance (Sutthipat, 2007). Conservation efforts have therefore become essential to protect the Andaman Sea's natural resources and promote sustainable economic growth. To tackle these challenges, the Thai government and industry have implemented a creative economy strategy that seeks to leverage cultural and natural heritage to enhance its competitiveness in global markets through innovation, design, and intellectual property (Office of the National Economic and Social Development Board and Thailand Creative & Design Centre, 2009; Tanhakorn & Chantuk, 2018).

However, many tourism products fail to portray Thailand's cultural and ecological diversity accurately, reducing these elements to superficial motifs that neither fully engage visitors nor foster deeper cultural understanding (Lynch & Horton, 2008; Ulrich & Eppinger, 2015; Zheng, 2018). This study aims to bridge this gap by examining differences in identity across the North and South Andaman Seas and by proposing approaches for

designing textile patterns that cater to consumer needs in both Asian and European markets. Specifically, this research seeks to: (a) analyze the underwater identities of the North and South Andaman regions, (b) investigate consumer preferences in textile design for various markets, (c) develop recommendations for textile designs that genuinely reflect the unique identities of the North and South Andaman Seas, and (d) support sustainable economic growth to boost Thailand's cultural and economic competitiveness in global markets. Despite the Andaman Sea's significant ecological and economic importance, there is a lack of research on how its distinct regional identities can be effectively represented in tourism products, especially in textile design. Existing tourism-related products often fail to authentically capture Thailand's cultural and ecological diversity, reducing these elements to generic motifs that lack depth and resonate with diverse consumer markets. While the creative economy strategy emphasizes leveraging cultural and natural heritage for global competitiveness, there is inadequate integration of ecological uniqueness into product innovation, particularly in aligning design with specific consumer preferences in Asian and European markets. Furthermore, research on consumer preferences for textile patterns in the context of marine-inspired designs is scarce, creating a knowledge gap in how these preferences can be tailored to reflect the identities of the North and South Andaman Seas. Addressing this gap can contribute to sustainable economic growth and cultural preservation through innovative design.

Objectives

1. To analyze the distinctive ecological and aesthetic characteristics of the North and South Andaman Seas, focusing on differences in seawater colors, marine species, and overall underwater identities.
2. To investigate consumer preferences for textile patterns in Asian and European markets, identifying trends in design aesthetics, including color schemes, abstraction levels, and pattern styles.
3. To develop recommendations for textile designs that authentically reflect the unique identities of the North and South Andaman Seas while aligning with the preferences of target consumer markets.
4. To support sustainable economic growth by leveraging marine heritage and ecological diversity in innovative textile products that enhance Thailand's cultural and economic competitiveness in global markets.

METHODOLOGY

Conceptual Framework

The conceptual framework (Figure 1) provides a theoretical foundation for this study, illustrating how essential elements shape the development of Andaman Sea-inspired textile patterns to ensure they are culturally resonant and commercially feasible.

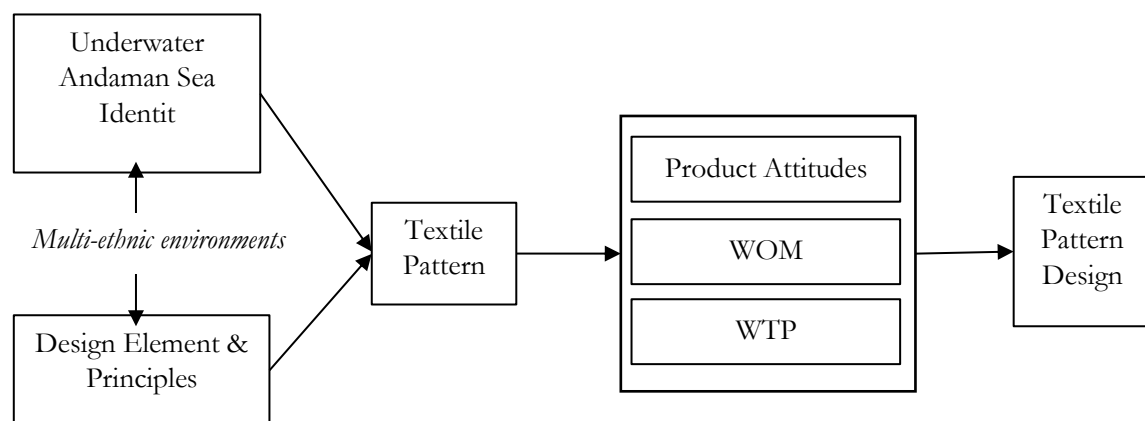


Figure 1: Conceptual Framework

Source: Researchers, 2024

At the heart of this framework is the Underwater Andaman Sea Identity, which represents the distinctive marine biodiversity and habitats found in the North and South Andaman regions. These identities serve as the primary inspiration, ensuring that the designs authentically reflect the ecological significance of the Andaman Sea. Design Elements and Principles are then applied to transform these identities into cohesive textile patterns, with colors, textures, and motifs derived from the sea's natural beauty, resulting in marketable designs that remain connected to ecological inspiration. The framework also incorporates the Multi-ethnic Environments component,

which recognizes the diverse cultural preferences of Asian and European consumers, enabling designs that appeal to a wide range of aesthetic tastes while maintaining ecological authenticity.

The framework assesses Product Attitudes, Word of Mouth (WOM), and Willingness to Purchase (WTP) to evaluate each design's visual appeal, cultural relevance, and economic viability. Product Attitudes measure consumer perceptions, including cultural alignment and aesthetic appeal. WOM evaluates the likelihood that consumers will recommend the products to others (De Bruyn & Lilien, 2008), which is essential for broadening market reach. WTP assesses consumer interest in purchasing Andaman Sea-inspired textiles, indicating their economic potential (Dodds et al., 1991).

These elements influence the creation of the Textile Pattern, which is subsequently evaluated for market viability and impact on Thailand's creative economy. This integrated approach ensures that the design process aligns with the study's objectives, supporting sustainable tourism, cultural preservation, and economic growth. By combining ecological inspiration and consumer attitudes, this framework offers a structured method to develop textile patterns that promote Thailand's natural heritage on a global scale.

Research Procedures and Instruments

Building on the conceptual framework, the research was designed into two phases, each of which addressed one specific research objective. Each phase employed specific methods and tools to collect data and generate insights, gradually progressing toward the final textile designs.

Phase 1: Comparative Analysis of North and South Andaman Sea Identities.

Purpose: This phase focused on understanding the distinct underwater identities of the North and South Andaman regions, aligning with the Underwater Andaman Sea Identity component of the framework.

Data Collection: Data was gathered through direct field observations, such as deep-sea diving, to document unique marine species and habitats. Additional insights are obtained from structured interviews with maritime experts and local stakeholders, helping to develop a comprehensive understanding of the ecosystems in investigated areas.

Phase 2: Assessment of Consumer Preferences in Asian and European Markets.

Purpose: This phase investigated consumer preferences for textile design across different cultural contexts to support the Multi-ethnic Environments component.

Data Collection: A total of 772 respondents (392 from Asia and 380 from Europe) were surveyed using a checklist-style questionnaire based on WOM, WTP, and consumer behaviors to capture their design preferences. This data helped identify the aesthetic priorities of Asian and European consumers.

Phase 3: Creative Development and Synthesis of Fabric Patterns Representing the Andaman Sea's Identity

Purpose: Preliminary research was conducted before the creation of textile patterns. Insights were generated from data gathered through direct field observations, such as deep-sea diving, to document unique marine species and habitats. Additional insights were obtained from structured interviews with marine experts and local stakeholders to develop a comprehensive understanding of these ecosystems. A survey with a checklist-style questionnaire, grounded in theories of Word-of-Mouth (WOM), Willingness to Pay (WTP), and consumer attitudes, was conducted with 772 respondents (392 from Asia and 380 from Europe) to capture consumers' preferences in textile patterns. This data helped to identify the aesthetic priorities of Asian and European consumers. This phase focused on developing textile patterns that authentically represent the Andaman Sea's identity.

Data Collection: Collaborative workshops with design experts and co-researchers were conducted to translate ecological data and consumer preferences into initial design concepts. Workshops were conducted to gather expert feedback and refine the patterns to ensure they align with the preferred design elements and principles.

Phase 4: Evaluation and Development of Marketable Products to Enhance Thailand's Creative Economy

Purpose: This phase assessed the prototypes for commercial viability and suitability for international markets, aligning with consumer attitudes, WOM, and WTP.

Data Collection: Five experts evaluated the prototypes for suitability for the research objectives. The feedback guided further modifications to optimize marketability and cultural relevance.

Analysis Method

To ensure the data were analyzed methodically and aligned with the research objectives, specific methods were applied throughout the two phases. In Phase 1, data from structured interviews and field observations were

analyzed through sorting, coding, categorization, and relationship determination. This four-step analysis provided a detailed understanding of the unique characteristics of the North and South Andaman regions, which informed the ecological aspects of the textile designs. In Phase 2, descriptive statistics, including frequencies, measures of central tendency, distributions, and percentages, were applied to interpret consumer survey data. This analysis reveals specific consumer preferences for textile patterns, supporting the customization of designs to diverse cultural tastes.

RESULTS

Geographic and Marine Identity of the Andaman Sea

Understanding the geographic and marine identity of the Andaman Sea is essential for developing textile patterns that authentically represent the region's natural beauty and ecological diversity. This section examines the environmental characteristics and marine biodiversity of the North and South Andaman regions, alongside stakeholder requests for design elements that reflect regional identities.

Environmental Characteristics of the North and South Andaman Sea

The Andaman Sea spans approximately 1,093 kilometers along Thailand's western coastline, bordered by Myanmar, Singapore, and Malaysia (Marine and Coastal Resources Research & Development Institute, 2015; Central Information Center for Marine and Coastal, 2024). Within this area, the North and South Andaman regions exhibit significant environmental characteristics that influence the types of marine ecosystems that flourish. The North Andaman Sea, covering areas such as Phuket, Phang Nga, and Ranong, features clear, deep blue waters that transition to lighter shades over a white sandy seabed. This region boasts steep depths reaching up to 3,000 meters, providing habitats for a diverse range of coral and marine species. In contrast, the South Andaman Sea, which includes Krabi, Trang, and Satun, has more turbid, greenish waters resulting from sediment deposition due to coastal activities. This region is considerably shallower, with depths of less than 300 meters (Marine and Coastal Resources Research & Development Institute, 2015; Central Information Center for Marine and Coastal, 2024). These climatic differences create unique habitats in each region, leading to varied color palettes and motifs for textile designs that reflect each area's visual identity. Figure 2 presents photographs of the North and South Andaman Seas, showcasing the visual differences between the two regions.



Figure 2: *North (Left two) and South (Right) the Andaman Sea*
Source: Nuttida Pujeeb, 2024

Marine Biodiversity and Its Influence on Design.

These environmental variations contributed to distinct marine biodiversity in each region. North Andaman was known for its uncommon marine species, such as whale sharks, manta rays, orcas, guitar sharks, schools of barracuda, and sea turtles (Thamrongnawasawat & Saisaeng, 2007). These species, along with the clear blue water, offered a variety of unique visual elements suited for textile designs.

In contrast, the South Andaman is home to species, including dugongs, dolphins, leatherback turtles, and Bryde's whales (Thamrongnawasawat & Saisaeng, 2007; Thamrongnawasawat, 2009). The coral formations also vary, with the North displaying long, layered structures and the South featuring extensive coral beds. Both regions sustain diverse marine life that can be depicted in design elements. Table 1 summarizes both regions' marine biodiversity and oceanographic characteristics, as observed through data collected from Marine National Park Operation Centers and fieldwork (44 dives).

Table 1: Marine Biodiversity and Oceanographic Characteristics in North and South Andaman

Table 1: Marine Biodiversity and Oceanographic Characteristics in North and South Andaman						
Data Sources	North Andaman			South Andaman		
	Oceanography	Marine Animals		Oceanography	Marine Animals	
		General	Rare		General	Rare
Marine National Park	1. A clear blue color	1. Yellow Boxfish	1. Sea Turtle			

Operation Center 2, Phuket Province	characterizes the seawater. 2. Coral is distributed around the rocky areas. 3. Popular tourist spot: Richelieu Rock	2. Longfin Batfish 3. Striped Barracuda School 4. Squid 5. Clownfish (Nemo) 6. Blue Trevally School	2. Leatherback Turtle 3. Whale Shark 4. Omura's Whale 5. Bryde's Whale 6. Shovelnose Ray 7. Dolphin 8. Manta Ray			
Marine National Park Operation Center 3, Trang Province				1. Turquoise color with turbidity near the coast 2. Soft corals and sea fans 3. Popular tourist spot: Tarutao Pinnacle	1. Blacktip Reef Shark 2. Stingray 3. Clownfish (Nemo) 4. Giant Moray 5. Striped Barracuda School 6. Longfin Batfish 7. Seahorse	1. Sea Turtle 2. Leatherback Turtle 3. Giant Trevally 4. Manta Ray
Fieldwork by Scuba Diving (total 44 dives)	1. The seawater is clear blue but shifts to a deeper blue tone when light does not penetrate. 2. Alternating soft and hard corals are present, forming rocky outcrops in deep-sea areas.	1. Remora 2. Striped Snapper School 3. Yellowback Fusilier School 4. Longfin Batfish 5. Striped Barracuda School	1. Sea Turtle 2. Whale Shark 3. Shovelnose Ray	1. The sea has a turquoise color. 2. Limestone mountains alternate with underwater rock formations, featuring clusters of soft corals and sea fans in red, pink, and orange shades.	1. Remora 2. Dogface Pufferfish 3. Longfin Batfish 4. Striped Barracuda School 5. Lionfish 6. Clownfish (Nemo) 7. Blue Trevally School	1. Manta Ray 2. Leopard Shark

Stakeholder Preferences for Textile Design Elements.

To ensure that textile designs appropriately depict the Andaman Sea's rich ecological heritage, insights were gathered from local stakeholders familiar with the region's unique biodiversity. Stakeholder interviews revealed a strong desire for fabric patterns that showcase common and rare species from each region, with 62.5% of respondents (n=8) seeking designs incorporating various species to represent the Andaman Sea's diversity. Additionally, respondents suggested using Northern Andaman's deep blue tones and Southern Andaman's darker, greener hues to convey the visual contrasts between these two regions.

Table 2 summarizes the results from the stakeholder interviews, indicating specific preferences for color tones, design styles, and themes. North Andaman's clear blue waters and rare species are best depicted by realistic styles in blue and dark blue tones, while South Andaman's coral diversity and beach lifestyle lend themselves to abstract styles in bright or brown tones. These preferences provided valuable guidance for creating textile patterns that resonate with local identity and international aesthetic appeal.

Table 2: Analysis Results of Interviews on Design Perspectives Reflecting the Identities of the Northern and Southern Andaman Seas

Key points to present (%)	Design patterns (%)		
	Color tone	Style	Things to consider when designing
Marine life (62.5)	Blue / Dark Blue (50)	Realistic (87.5)	Diversity of aquatic life (62.5)
Marine environment (50)	Bright colours (37.5)	Abstract (25)	The diverse colors of coral (37.5)
Identity of the sea or highlighted places (25)	Dark tone/ Brown tone (25)	-	Seascape (25)
Lifestyle (12.5)	-	-	-

Consumer Preferences for Fabric Pattern Design in Asian and European Markets

According to the survey results, there were 392 respondents from Asia and 380 from Europe. Among the Asian respondents, 146 people (37.2%) considered the presentation of stories or meanings behind fabric patterns to be highly important in influencing their purchasing decisions (Table 3). Of European respondents, 114 people (30%) also claimed that the presentation of stories or meanings behind fabric patterns significantly impacted their purchasing decisions.

Table 3: The importance of presenting the story or meaning of fabric patterns has an impact on purchasing decisions

The importance of presenting the story or meaning of fabric patterns has an impact on purchasing decisions	Asians			Europeans		
	n		%	n		%
Presenting the story or meaning behind the fabric patterns.	Most important	83	21.2	Most important	95	25.0
	Very important	146	37.2	Very important	114	30.0
	Moderately important	101	25.8	Moderately important	64	16.8
	Slightly important	43	11.0	Slightly important	57	15.0
	Not important	19	4.8	Not important	50	13.2

The survey results indicated that **Variety** is the most valued design principle for Asian and European consumers, with 25.3% of Asians and 23.4% of Europeans ranking it as their top preference (Table 4). This shared prioritization suggests diverse and engaging patterns are particularly appealing across these markets. Proportion is the second-most important principle, cited by 23.2% of Asian and 22.1% of European respondents, reflecting a mutual appreciation for balanced compositions. Differences emerge with the principle of Rhythm, in which Asians ranked third, whereas Europeans showed a stronger preference for Contrast, suggesting subtle variations in aesthetic preferences between markets.

Table 4: Influence of Design Principles on Purchasing Decisions by Region

Design principles	Asians				Europeans			
	Rank	Importance Level	n	%	Rank	Importance Level	n	%
1. Emphasis	7	Most important	67	17.1	6	Most important	69	18.2
		Very important	61	15.6		Very important	65	17.1
		Moderately important	82	20.9		Moderately important	78	20.5
		Slightly important	86	21.9		Slightly important	81	21.3
		Not important	96	24.5		Not important	87	22.9
2. Balance	3	Most important	87	22.2	3	Most important	81	21.3
		Very important	67	17.1		Very important	69	18.2
		Moderately important	64	16.3		Moderately important	67	17.6
		Slightly important	102	26.0		Slightly important	91	23.9
		Not important	72	18.4		Not important	72	18.9
3. Unity	5	Most important	77	19.6	5	Most important	74	19.5
		Very important	70	17.9		Very important	68	17.9
		Moderately important	75	19.1		Moderately important	73	19.2
		Slightly important	87	22.2		Slightly important	84	22.1
		Not important	83	21.2		Not important	81	21.3
4. Contrast	6	Most important	74	18.9	3	Most important	81	21.3
		Very important	83	21.2		Very important	69	18.2
		Moderately important	82	20.9		Moderately important	67	17.6

		Slightly important	88	22.4		Slightly important	91	23.9
		Not important	65	16.6		Not important	72	18.9
5. Rhythm	4	Most important	80	20.4	4	Most important	77	20.3
		Very important	83	21.2		Very important	79	20.8
		Moderately important	74	18.9		Moderately important	73	19.2
		Slightly important	62	15.8		Slightly important	66	17.4
		Not important	93	23.7		Not important	85	22.4
6. Proportion	2	Most important	91	23.2	2	Most important	84	22.1
		Very important	75	19.1		Very important	74	19.5
		Moderately important	69	17.6		Moderately important	70	18.4
		Slightly important	75	19.1		Slightly important	74	19.5
		Not important	82	20.9		Not important	78	20.5
7. Variety	1	Most important	99	25.3	1	Most important	89	23.4
		Very important	45	11.5		Very important	55	14.5
		Moderately important	77	19.6		Moderately important	75	19.7
		Slightly important	82	20.9		Slightly important	78	20.5
		Not important	89	22.7		Not important	83	21.8

Regarding design elements, **Color** is the primary factor influencing purchasing decisions across all groups, with 33.9% of Asian and 26.6% of European respondents considering it the most critical element (Table 5). This widespread preference demonstrates the universal appeal of vibrant colors in textile design. Secondary elements such as **Texture** for Asians, with 30.1% ranking it highly, and **Value** for Europeans underscore slight regional differences in sensory preferences; Asians favor the tactile qualities of the fabric, while Europeans emphasize contrast and depth.

Table 5: Unique Design Elements in Purchasing Decisions by Region

Unique design elements that influence purchasing decisions	Asians				Europeans			
	Rank	n		%	Rank	n		%
1. Line	5	Most important	75	19.1	4	Most important	74	19.5
		Very important	61	15.6		Very important	64	16.8
		Moderately important	82	20.9		Moderately important	83	21.8
		Slightly important	91	23.2		Slightly important	88	23.2
		Not important	83	21.2		Not important	71	18.7
2. Shape	6	Most important	74	18.9	2	Most important	101	26.6
		Very important	67	17.1		Very important	70	18.4
		Moderately important	81	20.7		Moderately important	63	16.6
		Slightly important	117	29.8		Slightly important	77	20.3
		Not important	53	13.5		Not important	69	18.2
3. Form	5	Most important	75	19.1	2	Most important	101	26.6
		Very important	59	15.1		Very important	70	18.4

		Moderately important	90	23.0		Moderately important	63	16.6
		Slightly important	98	25.0		Slightly important	77	20.3
		Not important	70	17.9		Not important	69	18.2
4. Color	1	Most important	133	33.9	1	Most important	101	26.6
		Very important	64	16.3		Very important	70	18.4
		Moderately important	54	13.8		Moderately important	63	16.6
		Slightly important	75	19.1		Slightly important	77	20.3
		Not important	66	16.8		Not important	69	18.2
5. Value	3	Most important	91	23.2	2	Most important	101	26.6
		Very important	80	20.4		Very important	70	18.4
		Moderately important	78	19.9		Moderately important	63	16.6
		Slightly important	83	21.2		Slightly important	77	20.3
		Not important	60	15.3		Not important	69	18.2
6. Texture	2	Most important	118	30.1	5	Most important	73	19.2
		Very important	69	17.6		Very important	69	18.2
		Moderately important	58	14.8		Moderately important	78	20.5
		Slightly important	80	20.4		Slightly important	100	26.3
		Not important	67	17.1		Not important	60	15.8
7. Space	4	Most important	90	23.0	3	Most important	84	22.1
		Very important	58	14.8		Very important	77	20.3
		Moderately important	86	21.9		Moderately important	76	20.0
		Slightly important	86	21.9		Slightly important	79	20.8
		Not important	72	18.4		Not important	64	16.8

As shown in Table 6, color tone preferences differ by region, with Asian consumers preferring **Pastel tones** and European consumers preferring **Colorful tones**. Asians' predilection for gentler tones contrasts with Europeans' tendency for more brilliant patterns, suggesting that each market has deeper cultural associations with color.

Table 6: Consumer Preferences for Pattern Designs and Desired Features on Clothing

Consumer preferences for pattern designs and desired features on clothing	Asians				Europeans			
	Rank	n		%	Rank	n		%
1. Colorful	3	Most important	69	17.6	1	Most important	84	22.1
		Very important	58	14.8		Very important	76	20.0
		Moderately important	70	17.9		Moderately important	82	21.6
		Slightly important	94	24.0		Slightly important	73	19.2
		Not important	101	25.8		Not important	65	17.1
2. Monotone	1	Most important	75	19.1	3	Most important	64	16.8
		Very important	74	18.9		Very important	65	17.1
		Moderately important	83	21.2		Moderately important	75	19.7
		Slightly important	101	25.8		Slightly important	86	22.6

		Not important	59	15.1		Not important	90	23.7
3. Pastel	2	Most important	70	17.9	2	Most important	71	18.7
		Very important	67	17.1		Very important	69	18.2
		Moderately important	77	19.6		Moderately important	78	20.5
		Slightly important	99	25.3		Slightly important	86	22.6
		Not important	79	20.2		Not important	76	20.0

In terms of style preferences, **Abstract designs** are preferred by 32.7% of Asian consumers, indicating a tendency toward interpretive and stylized aesthetics (Table 7). **Realistic patterns**, on the other hand, are preferred by 29.5% of European consumers. This divergence shows cultural differences, with Asians favoring more artistic, abstract visuals while Europeans seek lifelike representations in textile patterns.

Table 7: Preferences and Demands for Textile Pattern Design

Preferences and demands for textile pattern design	Asians				Europeans			
	Rank	n		%	Rank	n		%
1. Realistic	2	Most important	82	20.9	1	Most important	112	29.5
		Very important	32	8.2		Very important	58	15.3
		Moderately important	77	19.6		Moderately important	73	19.2
		Slightly important	69	17.6		Slightly important	55	14.5
		Not important	132	33.7		Not important	82	21.6
2. Surrealist	3	Most important	66	16.8	3	Most important	64	16.8
		Very important	78	19.9		Very important	76	20.0
		Moderately important	78	19.9		Moderately important	80	21.1
		Slightly important	61	15.6		Slightly important	65	17.1
		Not important	109	27.8		Not important	95	25.0
3. Abstract	1	Most important	128	32.7	2	Most important	78	20.5
		Very important	57	14.5		Very important	47	12.4
		Moderately important	74	18.9		Moderately important	75	19.7
		Slightly important	45	11.5		Slightly important	70	18.4
		Not important	88	22.4		Not important	110	28.9

Product preferences for textile patterns also vary by market; **Clothing** is the top choice for 34.7% of Asian respondents, suggesting a preference for wearable textile applications (Table 8). Conversely, **European consumers overwhelmingly favor Scarves**, with 95.5% indicating this preference. These findings highlight differences in lifestyle and fashion patterns between the two demographics, with each region envisioning different applications for patterned textiles.

Table 8: Demand Types for Products Related to Textile Patterns

Demand types for products related to textile patterns	Asians			Europeans		
	Rank	n	%	Rank	n	%
1. Scarf	2	87	22.2	1	363	95.5
2. Clothing	1	136	34.7	2	361	95.0
3. Bags (handbags, backpacks, etc.)	3	83	21.2	3	321	84.5
4. Shoes	7	16	4.1	7	132	34.7
5. Headwear (hats, hair accessories, etc.)	4	24	6.1	4	307	80.8
6. Other accessories (gloves, etc.)	5	22	5.6	5	251	66.1
7. Lingerie or swimwear	6	19	4.8	6	237	62.4
8. Other	8	5	1.3	8	52	13.7

The fundamental design principles impacting purchasing decisions throughout these markets are Variety, Proportion, and Rhythm, with Color, Texture, and Value as the key elements. These preferences provide a comprehensive insight into consumer expectations and are synthesized in Table 9, consolidating the core influences shaping design and purchasing behaviors in each market.

Table 9: Summary of the Questionnaire for Pattern Development

	No.	Asian	European
Key Design Principles Influencing Purchase Decisions	1	Variety	Variety
	2	Proportion	Proportion
	3	Rhythm	Rhythm
Key Design Elements Influencing Purchase Decisions	1	Color	Color
	2	Texture	Value
	3	Value	Space
Color Preferences for Fabric Patterns	1	Pastel	Colorful
	2	Monotone	Pastel
Preferences and Desires for Fabric Pattern Design	1	Abstract	Realistic
	2	Realistic	Abstract

Table 10: Demand Types for Products Related to Textile Patterns

Demand types for products related to textile patterns	Asians			Europeans		
	Rank	n	%	Rank	n	%
1. Scarf	2	87	22.2	1	363	95.5
2. Clothing	1	136	34.7	2	361	95.0
3. Bags (handbags, backpacks, etc.)	3	83	21.2	3	321	84.5
4. Shoes	7	16	4.1	7	132	34.7
5. Headwear (hats, hair accessories, etc.)	4	24	6.1	4	307	80.8
6. Other accessories (gloves, etc.)	5	22	5.6	5	251	66.1
7. Lingerie or swimwear	6	19	4.8	6	237	62.4
8. Other	8	5	1.3	8	52	13.7

Creative Development of Andaman Sea-Inspired Fabric Patterns

Interviews with stakeholders indicated a preference for fabric patterns that highlight both common and rare marine species. Variety emerged as a key design principle, including diverse fish species and colors, with careful attention to proportion and rhythm. To capture the distinct and realistic elements were blended, resulting in semi-realistic patterns that incorporate vibrant colors alongside monotone elements. Figure 3-5 demonstrate the textile design process.



Figure 3. Design Process in the Drafting Phase

Source: Nuttida Pujeeb, 2024



Figure 4. Design Process in the Creation of Fish
Source: Nuttida Pujeeb, 2024



Figure 5. Scanning and Editing for Layout Arrangement
Source: Nuttida Pujeeb, 2024



Figure 6. Fabric Patterns of the North (left) and South (right) Andaman Sea
Source: Nuttida Pujeeb, 2024

The design process was strongly influenced by the contrasting characteristics of the Andaman region. In the North Andaman Sea, with its clear blue hues and predominantly hard coral formations, the patterns emphasized large marine species such as whale sharks, guitar sharks, schools of barracudas, and turtles. In contrast, the Southern Andaman Sea, characterized by estuaries, mangroves, and soft corals, inspired patterns featuring species like manta rays, zebra sharks, and leatherback turtles.

Expert evaluations of these fabric patterns highlighted strong coherence in the design, with the principle of variety receiving a score of 4.4/5 (Figure 7) and the overall coherence reaching 5/5 (Figure 8). Experts recommended further color contrast and lighting enhancements to bring depth and vibrancy to the designs.

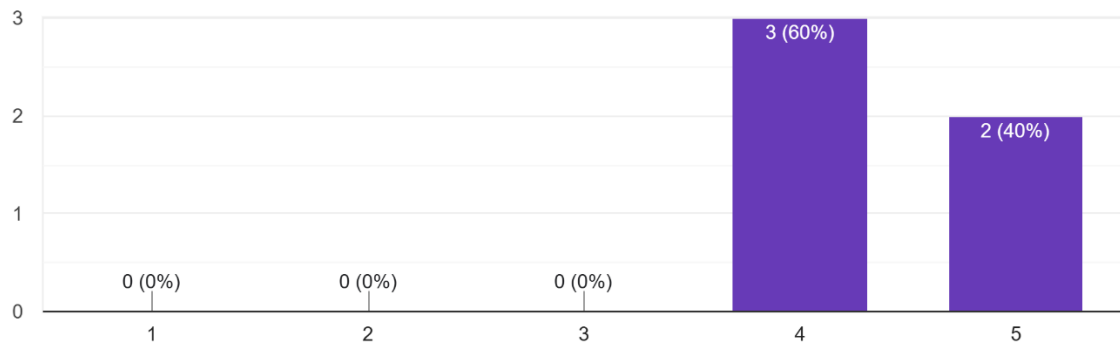


Figure 7: Fabric Patterns Representing the Identity of the Northern and Southern Andaman Sea, Highlighting Diversity (Variety) y = n of expert evaluations and x = Level of consistency

Source: Nuttida Pujeeb, 2024

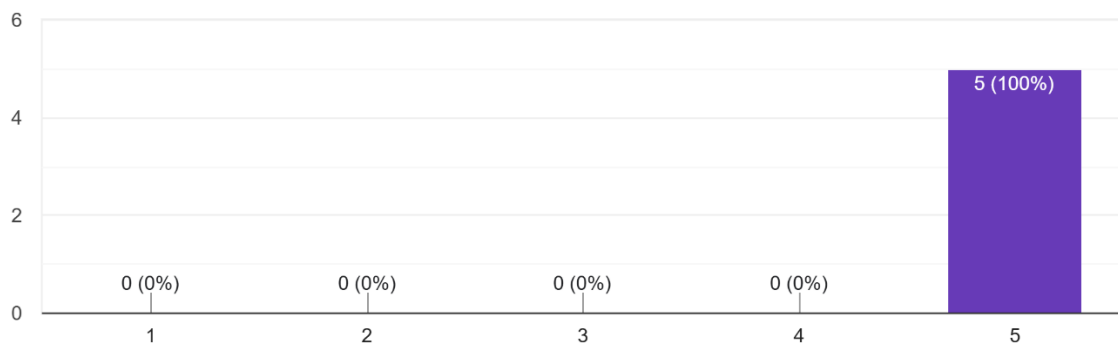


Figure 8: Fabric Patterns Representing the Identity of the Northern and Southern Andaman Sea, with Vibrant Colors (Colorful). y = n of expert evaluations and x = Level of consistency

Source: Nuttida Pujeeb, 2024

The developed fabric patterns were transformed into mock-up products, primarily focusing on scarves and clothing items based on consumer interest reflected from survey results in phase 2. Expert evaluations rated products with fabric patterns representing the identity of the northern and southern Andaman Sea, fostering an appreciation for the natural beauty at 4.6/5 (Figure 8), the feasibility of these products at 4.2/5 (Figure 9), and their potential to contribute to Thailand's creative economy at 4.0/5 (Figure 10). Feedback from experts highlighted the importance of standardizing color schemes to ensure consistency in production. This standardization is expected to maintain the visual coherence of the designs across various applications. The semi-realistic designs were noted for adaptability, indicating a strong potential for fostering public-private collaboration to expand Thailand's creative industries further. By integrating these Andaman Sea-inspired patterns into products with commercial viability, there is an opportunity to promote Thailand's cultural and ecological heritage on an international scale, aligning with the goals of the national creative economy (Figure 11-13).

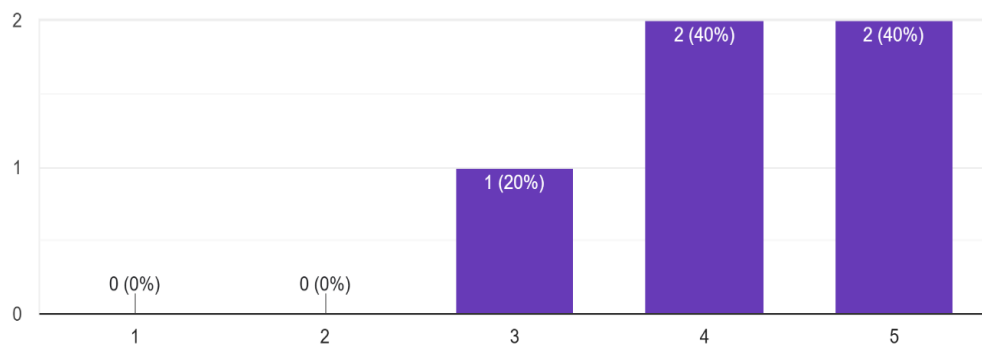


Figure 9: Fabric Patterns Representing the Identity of the Northern and Southern Andaman Sea, Fostering an Appreciation for the Natural Beauty. y = n of expert evaluations and x = Level of consistency

Source: Nuttida Pujeeb, 2024

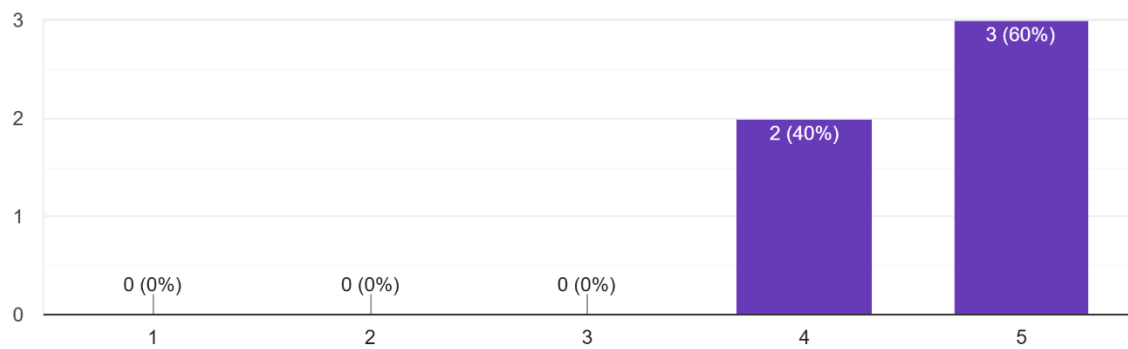


Figure 10: Products Featuring Fabric Patterns that Reflect the Identity of the Northern and Southern Andaman Sea. $y = n$ of expert evaluations and $x =$ Level of consistency
Source: Nuttida Pujeeb, 2024

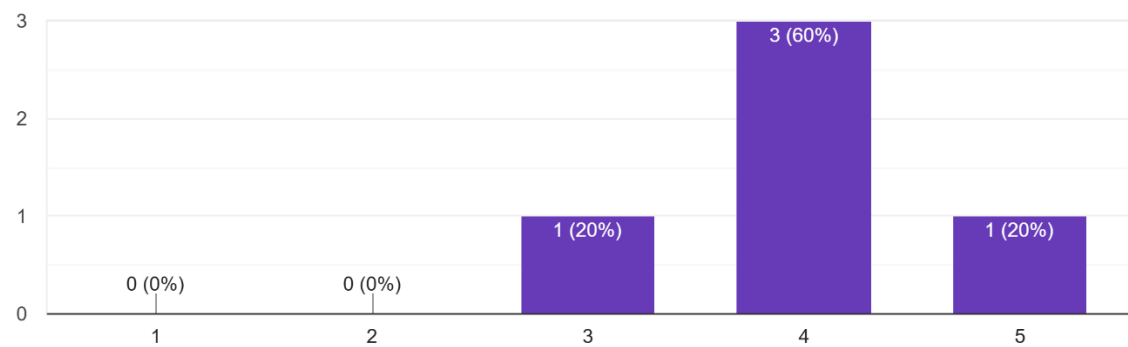


Figure 11: Products with Fabric Patterns that Showcase the Identity of the Northern and Southern Andaman Sea, Enhancing Thailand's creative economy on a global scale. $y = n$ of expert evaluations and $x =$ Level of consistency
Source: Nuttida Pujeeb, 2024



Figure 12: Product Development of Scarves from Fabric Patterns
Source: Nuttida Pujeeb, 2024

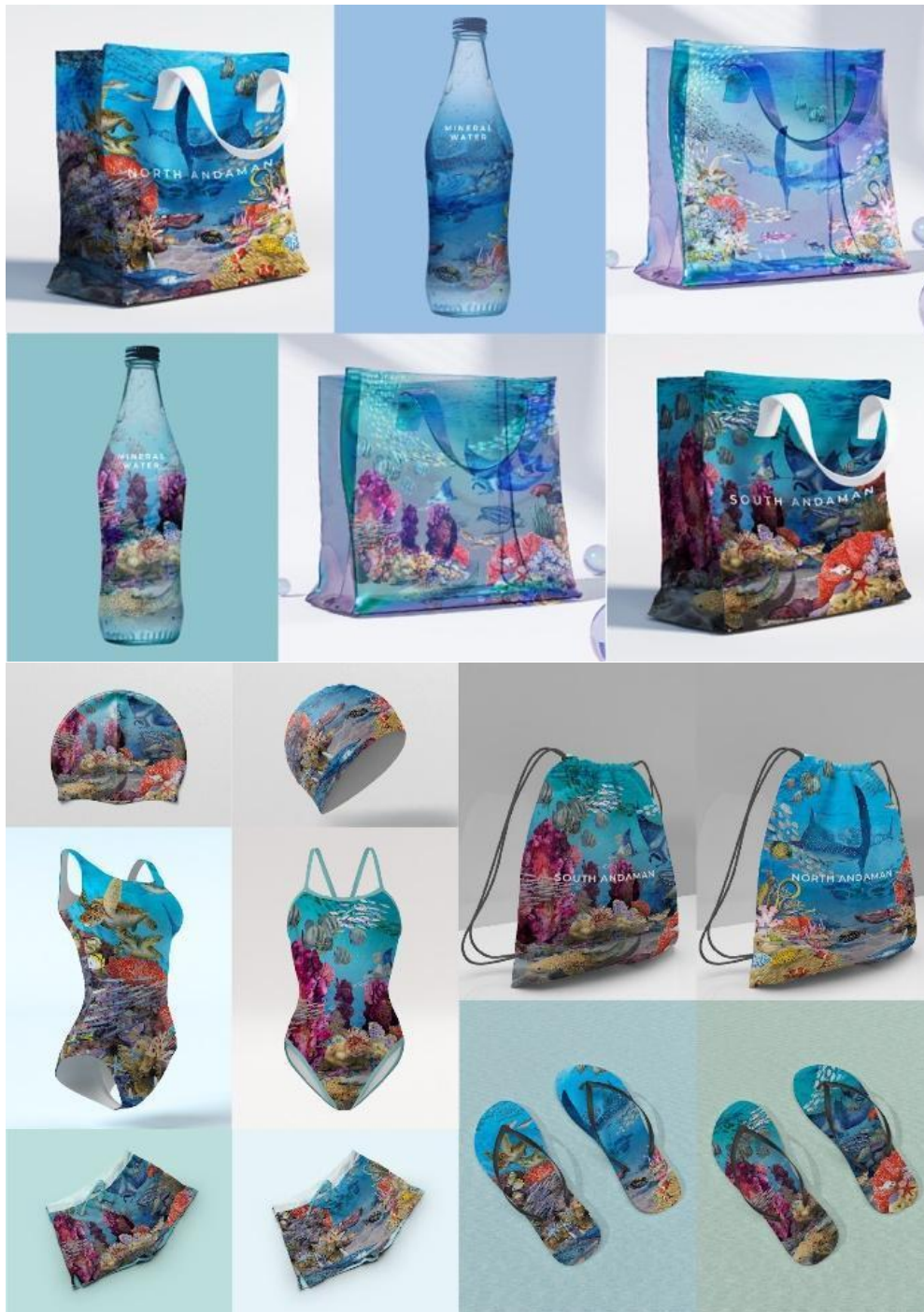


Figure 13. Product Development from Fabric Pattern
Source: Nuttida Pujeeb, 2024

DISCUSSION

The North and South Andaman Seas analysis highlighted distinct ecological characteristics that informed the design process. The North Andaman Sea's deep blue waters and steep seabeds harbor rare species such as whale sharks, manta rays, and orcas, while the South Andaman Sea's greener, turbid waters support species like dugongs and dolphins. These findings underscore the need for targeted conservation measures, especially as issues like pollution and coral bleaching continue to threaten these ecosystems (Thamrongnawasawat & Saisaeng, 2007; Marine and Coastal Resources Research & Development Institute, 2015; Jintasaeranee & Piyapong, 2022).

Stakeholder feedback, particularly from national park authorities and marine operation centers, highlighted the importance of designs that incorporate both the ecological diversity and cultural aspects of the region, such as the traditional lifestyle of the Moken people. This input led to the incorporation of realistic and symbolic patterns

inspired by the natural colors of the Andaman Sea, aligning with Thailand's policies to promote the creative economy (Office of the National Economic and Social Development Board & Thailand Creative & Design Centre, 2009). Additionally, some stakeholders expressed a desire for designs that reflect the unique identities of the Andaman Sea's north and south, focusing on representing diverse marine species. There is concern that focusing solely on rare marine species would accidentally increase interest in keeping such species as pets, potentially disrupting the local environment and leading to invasive behaviors. This view aligns with Baxter's (2014) observations on the risks associated with featuring rare species in product imagery, which may unintentionally promote conservation-harming practices. To address these issues, stakeholders suggested featuring commonly observed marine species from the North and South Andaman Seas in designs that would better meet tourists' expectations for interactions during diving excursions.

The consumer preference study provided additional guidance for textile design. Asian and European consumers ranked "variety" and "proportion" as top design principles, with Asians prioritizing "balance" and Europeans valuing "contrast." This reflects the textile design preferences of Asian and European consumers, who, while sharing comparable interests, exhibit unique cultural differences that shape their design perceptions (Pearce et al., 2009). These preferences align with Wansiri's (1997) design principles, which emphasize the importance of creating adaptive patterns that appeal to a heterogeneous market. Additionally, color was identified as a significant factor influencing purchasing decisions in both markets, which is consistent with findings from Labrecque and Milne (2013). Asians preferred texture and value, while Europeans emphasized form and space. These insights informed the development of fabric patterns incorporating variety and storytelling through color, aligning with cultural narratives and enhancing consumer engagement. This approach is also compatible with Ellen Luton's (2019) discussion on gathering insights to craft product narratives that address consumer needs by involving relevant stakeholders in the design process.

The design process focused on presenting insights gained from interviews, field surveys, and questionnaires, using a color palette that reflected the natural blues and greens of the Andaman Sea. This approach, informed by on-site observations and expert consultations, ensured that the developed design accurately reflected the region's distinctive maritime identity. The findings are also in line with national policies that focus on promoting the development of creative industries (National Economic and Social Development Board and Thailand Creative and Design Center, 2009), emphasizing the potential to harness the natural and cultural resources of the Andaman Sea to support Thailand's creative economy.

Ultimately, the research highlights the potential of the Andaman Sea as both a natural treasure and an economic asset. Integrating the region's distinct marine identity into fabric designs not only celebrates its beauty but also raises awareness about the necessity of preserving these ecosystems for future generations.

Study on fabric pattern design preferences of Asian and European consumers revealed six key points as follows. These findings informed the development of fabric patterns, emphasizing variety, color, and storytelling to align with consumer preferences in both Asian and European markets.

Design Principles: Asian and European consumers ranked variety as the most essential design principle, followed by proportion. Asian consumers identified balance as the third key element, while European consumers valued contrast. These preferences guide the creation of fabric patterns, aligning with Wansiri's (1997) principles of design elements and artistic composition.

Specific Design Elements: Color was the most influential element in purchase decisions in both regions. Asians also valued texture and value (lightness/darkness of a color), while Europeans prioritized value and form, with space ranking third.

Storytelling: Both groups valued the narrative or meaning conveyed through fabric patterns, significantly influencing their purchase decisions.

Color Preferences: Asian consumers preferred monotone colors and pastel and colorful designs. Conversely, Europeans preferred colorful designs, followed by pastel and then monotone.

Pattern Style Preferences: Asians favored abstract designs, followed by realistic and surrealist styles. Europeans preferred realistic patterns, followed by abstract and surrealist designs.

Product Preferences: Asians showed the highest demand for clothing, followed by scarves and bags. Europeans, however, overwhelmingly preferred scarves, followed by apparel and bags.

Representing the distinct identities of the North and South Andaman Seas reveals further differences. The North Andaman Sea is characterized by its clarity and vibrant blue hue, attributed to strong currents and distance from the coast. In contrast, the South Andaman Sea, dominated by estuaries and mangrove forests, features muddy coastlines that lead to turbid waters. Additionally, coral formations vary significantly across these regions. The data collection and analysis process aimed to generate innovative ideas that resonate with the target audience, aligning with Luton's (2019) concept of data-driven storytelling. Luton emphasized the importance of stakeholder involvement in the design process and the application of design principles to enhance visual appeal. This method involves using vibrant coral colors that stand out against the sea's blue tones, with color gradients to add depth to

the patterns. The diversity of marine life, both common and rare species, is illustrated with a sense of movement, guiding the viewer's eye and encouraging appreciation of intricate details, fostering a positive emotional response.

This approach aligns with Norman's (2007) Emotional Design Theory, which asserts that products fulfilling emotional needs are more likely to engage users and prompt reflection. Moreover, consumers who maintain a positive attitude toward the environment and demonstrate eco-conscious consumption behaviors are likelier to connect with designs that emphasize environmental preservation. This connection is stronger among consumers who believe that personal sacrifices can lead to meaningful ecological change, as opposed to those who perceive individual actions as having minimal impact. Financial status also plays a crucial role in supporting these products (Filho et al., 2009).

To enhance Thailand's creative economy internationally, it is beneficial to develop fabric pattern products that visually evoke nature and connect with experiences related to the environment. This approach raises awareness of the inherent value and beauty of the natural world (Breckler, 1986; Pattamampassakul, 2019). Designs that reflect the identities of the North and South Andaman Sea—significant natural tourist attractions and economic assets for Thailand—can be developed into a creative economic initiative. This endeavor can be realized through a collaborative process involving customers and local communities, simultaneously promoting environmental conservation and raising awareness about the importance of nature (Weerapatttharatwararaa, 2014). Additionally, this aligns with 14 - Life Below Water, which focuses on the conservation and sustainable use of oceans, seas, and marine resources for sustainable development, as well as SDG 8 - Decent Work and Economic Growth, which emphasizes the promotion of sustained, inclusive, and sustainable economic growth (United Nations, n.d.).

Additionally, standardizing color values, as recommended by experts, enhances production accuracy (Figure 14). This practice allows for a broader range of color applications in the design process while ensuring a shared understanding between designers and manufacturers (Clyne, 2017).



Figure 14: Fabric Patterns of the Northern and Southern Andaman Sea with Color Codes Based on Expert Recommendations
Source: Nuttida Pujeeb, 2024

CONCLUSION

In summary, the identities of the underwater ecosystems in the Andaman Sea regions to the north and south differ in oceanographic characteristics, which impact the ecological conditions of each area. Observational evidence further reveals differences in landscape and marine species between the North and South Andaman Seas, making them appealing natural tourism destinations. The survey conducted with two sample groups (Asian and European) revealed similarities in their considerations for textile design. However, preferences also diverge due to cultural variations influencing consumer decisions to support products. These statistical findings provide suggestions for designing textile patterns that may contribute to elevating Thailand's creative economy on a global scale (Office of the National Economic and Social Development Council, 2022). This approach aligns with international sustainable development goals, including ocean conservation, sustainable utilization, and promoting inclusive, continuous economic growth (SDG Move Team, 2015).

RESEARCH IMPLICATIONS

This study's findings have significant implications for conservation, cultural representation, and economic innovation through textile design.

1. **Conservation and Environmental Awareness:** The distinct ecological identities of the North and South Andaman Seas emphasize the need for targeted conservation strategies. By integrating marine diversity into textile designs, this research can raise awareness of these ecosystems' unique environmental characteristics and threats. For instance, designs featuring common marine species rather than rare or endangered ones can help mitigate the unintended consequences of promoting conservation-harming behaviors, such as increased interest in capturing rare species.
2. **Cultural Representation and Heritage Preservation:** Incorporating the cultural aspects of the Andaman region, such as the Moken people's traditional lifestyle, into textile patterns promotes cultural preservation. The study supports Thailand's creative economy strategy by creating designs that reflect the region's ecological and cultural identities, leveraging local heritage to compete in global markets.
3. **Consumer-Centric Design Innovation:** Insights into Asian and European consumer preferences, such as Asians favoring balance and texture and Europeans prioritizing contrast and form, provide a framework for developing market-oriented textile designs. These findings highlight the importance of culturally adaptive designs to meet the diverse tastes of global consumers.
4. **Economic and Sustainable Development:** The study supports Thailand's policies to enhance its creative economy by linking textile designs to the natural and cultural identities of the Andaman region. This approach aligns with the United Nations' Sustainable Development Goals (SDG), particularly those focusing on sustainable tourism (Goal 8), ocean conservation (Goal 14), and fostering cultural and creative industries (Goal 12).
5. **Stakeholder Collaboration:** The involvement of stakeholders such as national park authorities and marine operation centers underscores the importance of collaborative approaches in product development. This ensures that designs are ecologically sensitive, culturally authentic, and economically viable, addressing multiple aspects of sustainable development.

This research bridges ecological and cultural identities with market demands, contributing to innovative textile designs that support conservation, cultural preservation, and economic growth.

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