

CHAPTER 1 INTRODUCTION

1.1. Problem Background

Sea level rise (SLR), the gradual rise in global sea level, is one of the most significant and far-reaching consequences of climate change. The UN 2023 report identified Bangladesh, China, India, and the Netherlands as facing severe risks from rising sea levels, with nearly 900 million people residing in vulnerable low-lying coastal zones (Lederer & McDermott, 2023). NASA reports that global sea levels have risen by over 10 centimeters between 1993 and 2024, a rate unprecedented in the last 2,500 years (NASA, 2024). The rate of global sea level rise has more than doubled since the 20th century, accelerating from 0.06 inches (1.4 millimeters) per year to 0.14 inches (3.6 millimeters) per year between 2006 and 2015 (Lindsey, 2023). This phenomenon, meticulously documented by scientific institutions and research bodies, poses a major threat to coastal communities worldwide. Low-lying islands and regions with extensive coastlines face a heightened risk of inundation, jeopardizing infrastructure, ecosystems, and the lives and livelihoods of millions. Rising sea levels lead to more frequent and severe coastal flooding events, jeopardizing infrastructure, disrupting ecosystems, and displacing populations (Deguenon, Adade, Teka, Aheto, & Sinsin, 2022). The encroaching ocean erodes coastlines, threatening beachfront properties, natural habitats, and cultural heritage sites. The situation is particularly dire for island nations and regions with extensive coastlines. Places like Taiwan, with its vibrant coastal communities, face a significant threat from rising sea levels.

The island nation of Taiwan faces a growing threat from climate change, particularly in the form of rising sea levels and increasingly severe weather events. Scientific studies indicate that sea levels around Taiwan are rising at an alarming rate, exceeding twice the global average (Yang, 2020). This rapid rise translates to a heightened risk of coastal flooding, inundating low-lying areas and jeopardizing infrastructure, ecosystems, and human settlements. Climate change is also leading to more frequent and intense typhoons, rainstorms, and storm surges in Taiwan. These events exacerbate the impact of rising sea levels, causing flash flooding, landslides, and coastal erosion. A significant portion of Taiwan's population resides in coastal areas, making them particularly vulnerable to flooding. These communities face the risk of displacement, property damage, and loss of life due to rising sea levels and extreme weather events.

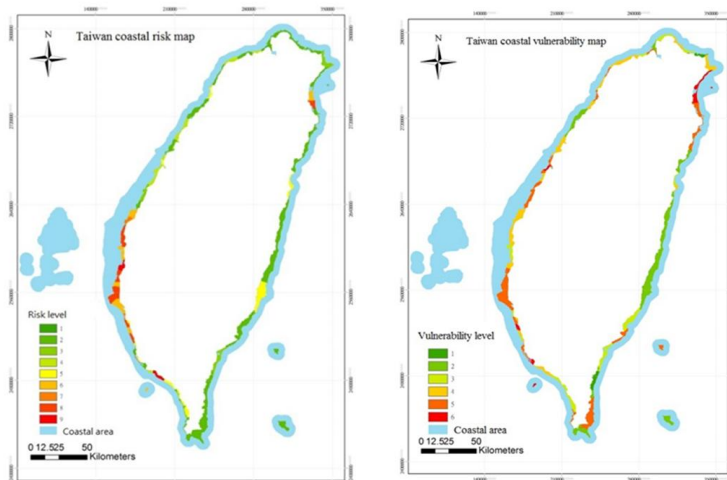


Figure 1.4.1-1 Vulnerability Map of Taiwan Coastal Areas

Source: (CHIEN, HUANG, HSU, HSIEH, & FANG, 2017)

Several risk assessments on flood risk maps in Taiwan have been done by previous researchers. Chen, et. al., (2022) provided a framework of flood risk map assessment under the RCP8.5 scenario by using different spatial scales to integrate the projection climate data of high resolution, inundation potential maps, and indicator-based approach at the end of the 21st century in Taiwan, and found that higher risk areas are distributed mainly in northern and southern parts of Taiwan and the hazard indicators significantly increase in the northern, north-eastern, and southern regions under the RCP8.5 scenario. Moreover, the near-riparian and coastal townships of central and southern Taiwan have higher vulnerability levels. Another research by CHIEN, et. al. (2017) did a risk assessment with hazard analysis (with indicators of sea-level rise, land subsidence and storm surge flooding) and vulnerability analysis (includes physical factors, natural environmental conditions, social economics, and resilience), which concludes that high vulnerability and high hazard regions are located along the South-Western Taiwan Coast and the Yilan Coast.

Situated on Taiwan's northeastern coast, Yilan faces the brunt of typhoons and storm surges, making it particularly susceptible to coastal flooding. The convergence of rising sea levels and intense weather events amplifies the flood risk for Yilan's coastal communities. Yilan's coastal plains are relatively low-lying, with some areas situated below sea level. This topography exacerbates the impact of rising sea levels, increasing the likelihood of inundation during flooding events. Typhoons pose the biggest natural disaster threat. Between April and October, these storms brewing in the Pacific often track westward, putting Yilan, directly in their path, at high risk. Typhoon Clara (1967) and Typhoon Saola (2012), which tracked through Yilan, were 2 of the 10 wettest tropical cyclones in Taiwan. The total length of Yilan County's coastline is about 111 kilometers, which consists of a rocky coast in the north of Shicheng and a sandy coast in the south of Shicheng (Water Resources Agency, MOEA, 2024). During every typhoon on this section of coast, the coast near Wushi Port and the mouth of Lanyang River is severely eroded by typhoon waves (國立中山大學, 2012).

The Northeast and Yilan Coast National Scenic Area (NEYC) stands as a premier destination in Taiwan, valued for its spectacular natural coastal beauty, diverse geological formations, and rich biodiversity. This region serves as a vital hub for tourism, offering an extensive array of recreational and cultural experiences that draw visitors from across the globe. Crucially, the NEYC operates with an unwavering commitment to sustainable tourism, actively supporting local communities and diligently preserving its invaluable ecological and cultural heritage. The Northeast Coast of Taiwan, particularly the area spanning from Toucheng to the Lanyang River estuary, is characterized by a dynamic coastal environment facing significant challenges from coastal erosion. The "Ilan County Second-Class Coastal Protection Plan" indicates that this region is classified as a medium potential coastal erosion zone, further exacerbated by the impacts of climate change and the need to balance development with environmental preservation. Embankment projects are being implemented as a primary strategy to mitigate these challenges and protect coastal communities and infrastructure. Coastal development, including the construction of Wushi Port with its breakwaters and jetties, and embankment projects at Waiao Beach for erosion control, has introduced significant artificial structures into this environment. These structures, while serving functional purposes (e.g., harbor operation, coastal protection), have the potential to alter the visual aesthetics of the scenic area, impacting visitor experience and the overall character of the landscape. Understanding the extent and nature of this visual impact is crucial for informed coastal management and sustainable tourism development in the region.

1.2. Research Question

Based on the background description above, the research question that is appropriate to the research on "Research on Visual Impact of Coastal Structures on the Landscape - A Case Study of the Five Fishing Villages in Toucheng" is:

What are the perceived visual impacts of coastal erosion management structures on the scenic quality of the Toucheng Five Fishing Villages?

1.3. Purpose of Study

This research aims to assess the visual impact of these specific artificial structures on the scenic quality of the Toucheng Five Fishing Villages, contributing to a better understanding of the aesthetic implications of coastal protection measures in this culturally and environmentally significant region. To reach the main objective, the specific objectives are:

- A. To assess the visual characteristics of these structures (e.g., scale, form, color, materials) and their relationship to the surrounding natural coastal environment and the built environment of the villages.
- B. To evaluate the degree to which these coastal erosion management structures contribute to or detract from the scenic quality of the villages and the broader coastal landscape.
- C. To analyze visitor perceptions regarding the visual impact of coastal erosion management structures on the landscape of the Toucheng Five Fishing Villages.

1.4. Scope of Study

1.4.1. Focus

This research assesses the visual impact of existing artificial structures within a defined scenic area in Toucheng, the five fisheries and railways villages, utilizing both observational data and public perception to offer a comprehensive understanding of aesthetic changes.

1.4.2. Locus

The main object of this study is in Yilan of Taiwan, mainly in one of the coastal townships in Yilan, which is Toucheng Township, specifically Shicheng, Dali, Daxi, Gengfang, And Waiao Villages, the five fishing villages encouraged to become the new sustainable tourism attraction in Yilan. It is also part of Taiwan's Northeast Coast National Scenic Area. Coastal erosion, especially south of Wushi Port, has been significant due to typhoons and port construction, leading to coastline retreat; protective measures such as rock slope construction have been implemented to mitigate erosion.

1.4.3. Time

The study proceeded in distinct phases from April 2025 to June 2025. April was dedicated to preliminary research, encompassing a literature review of relevant studies from the past decade. On-site data collection, the second phase, was planned for May, specifically between 15:00 and 18:00 when conditions were sunny. Data analysis was then conducted in June.

1.5. Research Method

1.5.1. Data Collection

Qualitative Method

- Site Visits and Observations: Examining existing embankments and how it affects the landscape and community livelihoods.
- Literature Review: Relevant studies on visual impact, coastal erosion, national scenic area, etc. Analysing government reports and national scenic area plans or regulations related to the site to provide valuable background information.

Quantitative Method

- Questionnaire/Survey: Gather data on public perceptions of the visual impact of coastal erosion management structures.

1.5.2. Data Analysis

- Visual impact assessment: Assess the visual impact of the coastal structures on its landscape from the pictures collected.
- Descriptive Statistics: For the Likert scale questions on visual contrast/harmony and intrusion/enhancement, descriptive statistics (e.g., mean, median, standard deviation, frequency distributions) will be calculated to summarize the overall perceptions of the respondents.
- Qualitative Analysis: The responses regarding preference and reasons for ratings will be analyzed using thematic analysis to identify recurring themes, justifications, and nuances in public perceptions.

1.6. Work Flow

Phase 1: Literature Review and Initial Planning (Month 1)

Activities:

- Literature Review: Conduct a comprehensive literature review on:
 - Northeast Coast National Scenic Area
 - Coastal Erosion Management
 - Visual Impact Assessment
- Develop a detailed research plan: outlining methodology, data collection strategies, and analysis methods.
- Literature Review (Focused): Briefly review existing information on the visual impact of coastal structures, coastal aesthetics, and any available visual resources (photos, videos) of the five fishing villages before and after significant development.
- Define Specific Viewpoints: Identify and map 6 key viewpoints at each that offer representative views of the structures and the surrounding scenery.
- Develop Visual Assessment Framework: Create a simple checklist or set of criteria for documenting visual elements (scale, form, material, color, view obstruction, perceived harmony/disharmony).

Phase 2: Data Collection (Month 1-2)

Activities:

- **Site Visits and Photography:** Conduct initial site visits. Capture systematic photographs from the defined viewpoints under consistent lighting conditions. Take detailed observational notes.
- **Organize and Label Data:** Organize and clearly label all collected photographs and notes
- **Questionnaires:** Construct and distribute questionnaires to gather data on public perceptions of the visual impact of coastal erosion management structures

Phase 3: Data Analysis (Month 2-3)

Activities:

- **Visual Analysis:** Begin the systematic analysis of the photographic data and observational notes, applying the developed assessment framework. Categorizing the types and extent of visual impact (e.g., obstruction of natural vistas, contrast in materials and forms, scale incongruity).
- **Visitor Perception Analysis:**

Phase 4: Findings and Assessment (Month 3)

Activities:

- **Qualitative Synthesis:** Synthesize the findings from the visual analysis and any secondary data (visual resources, informal observations) to develop an overall assessment of the visual impact of the artificial structures on the scenic area.
- **Review and Finalization:** Review and refine the report.

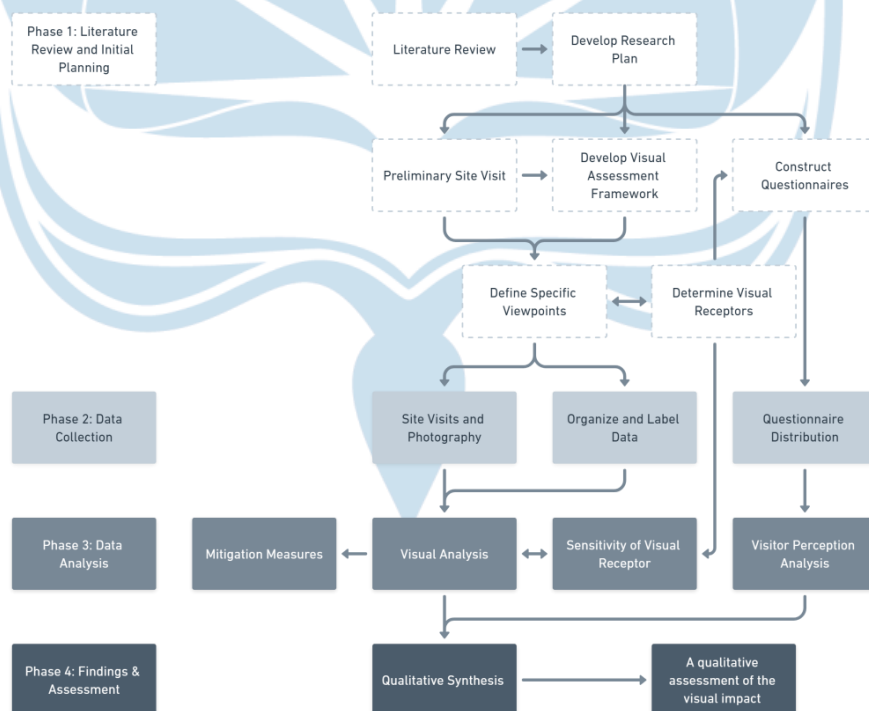


Figure 1.5.2-1 Work Flow Chart

Source: Produced by writer

1.7. Significance of the Research

The research in consideration of how artificial structures visually affect the five fishing villages (Shicheng, Dali, Daxi, Gengfang, Waiao) in Toucheng, Yilan County, is of particular importance for various important reasons. Most obviously, it is directly concerned with reconciling development for utilitarian ends (like fisheries development and anti-erosion) with maintaining the natural beauty of the landscape that makes the Northeast and Yilan Coast National Scenic Area such an attraction. Analyzing systematically how such structures as breakwaters and sea walls affect the visual environment, this research can serve to offer important guidance in reconciling development demands with maintaining beauty, which is essential to both the tourism economy and to general tourist satisfaction in the area.

Second, this research assists in providing more integrated coastal management. The physical and ecological consequences of artificial features are examined in many studies, but the visual aspect is rarely considered or touched upon lightly. The present work presents an in-depth examination of the visual implications, giving those making plans for coastal development and planning a more complete picture to work with. The outcomes can aid in the creation of more aesthetically considerate guidelines for coastal development schemes in the future, with a good chance that such guidelines will produce solutions which are more in tune with nature and reduce adverse visual intrusions.

Finally, an awareness of public perception, even based upon limited initial observations, contributes an important social element to the evaluation. Scenic value in many cases is associated with how one experiences and enjoys a place as visitor or local resident. Through examining how artificial features impact visual appreciation of the coast of Toucheng, this study can make way for more human-oriented coastal management, where development is not only based upon function and environmental considerations but upon also upon those aesthetic and leisure values cherished by stakeholders of this important scenic area. Ultimately, this study can offer useful information that can assist in more socially conscious, sustainable, visually appealing development of the Toucheng coast.

1.8. Novelty

This research specifically focused on the visual impact of existing artificial structures within a defined scenic area in Toucheng. It aimed to integrate observational data with potential public perception insights to provide a more holistic understanding of the aesthetic changes. While studies might have existed on the physical impacts of these structures (e.g., erosion, sediment transport), a focused investigation on the visual dimension and its potential implications for the scenic value of the area offered a specific contribution. The research contributed to a more nuanced understanding of the trade-offs between coastal engineering and the preservation of visual amenity in a nationally recognized scenic area.

Table 1.5.2-1 Literature Review for Novelty

No.	Title & Writer	Context and Methods	Findings
1.	Assessment of the Visual Impact of a Tall Building on a Unesco Listed Historic Urban Landscape (Czyńska, 2023)	The paper studies visual impact of tall buildings near UNESCO sites. Digital analyses determine visibility and architectural dominance in urban landscapes. The study used a 3D Digital Surface Model (DSM) for analysis. Visual Impact Size (VIS) determined	The proposed methodology is based on the combination of visual impact analysis using the

No.	Title & Writer	Context and Methods	Findings
		visual impact fields. Analyses included strategic view simulations and visual impact maps.	VIS method and the simulation of selected cityscape exposures.
2.	Audio-Visual Analysis of Visitors' Landscape Preference for City Parks: A Case Study from Zhangzhou, China (Gan, Zheng, & Zhang, 2022)	The study compares visual and soundscape preferences in parks. Field questionnaires were used to gather visitor data. Statistical analysis utilized IBM SPSS 20.0 software. Reliability and validity of questionnaire data were tested. Correlation analysis compared VLP, SP, and OLP relationships. Stepwise multiple linear regression analyzed contributions of VLP and SP.	Visual landscape preference is generally higher than soundscape preference. Older visitors rated overall landscape preference lower than younger visitors.
3.	Effects of Visual Attributes of Flower Borders in Urban Vegetation Landscapes on Aesthetic Preference and Emotional Perception (Zhuang, Qiao, Zhang, Su, & Xia, 2021)	Flower borders enhance aesthetic preference and emotional perception in urban landscapes. The study aims to improve urban greening designs for public emotional health. One-way ANOVA and correlation analysis examined emotional perception and aesthetic preference. Levene's test assessed homogeneity of variance in the data. SPSS 20 software was used for all statistical analyses.	Cool colors and visual richness positively influence preferences and emotional responses. Aesthetic preference significantly correlates with emotional valence.
4.	Evaluation of rural areas in terms of landscape quality: Salacik Village (Trabzon/Turkey) example (Düzgüneş & Demirel, 2015)	Increased urbanization drives interest in rural landscape preservation. Visual landscape quality assessed using Scenic Beauty Estimation method. Visual quality evaluated using Gestalt Theory principles. Average visual quality values identified for each landscape type. 32 specialists completed a questionnaire for visual landscape evaluation. Visual landscape quality assessed through a 4-point Likert scale	Seven landscape types identified and evaluated for visual quality. Natural characteristics enhance rural area attractiveness and economic development.
5.	Free Standing Billboards in a Road Landscape: Their Visual Impact and Its Regulation Possibilities (Lithuanian Case) (Kamičaitytė-Virbašienė & Samuchovienė, 2014)	The paper reviews problems and proposes regulatory guidelines. It emphasizes the importance of visual impact assessment Literature analysis and field survey were conducted for the. Issues of outdoor advertisement regulation were explored in various countries. FSBs' impact on landscape types was assessed during the field survey. Methodological guidelines for visual impact assessment were proposed.	Free standing billboards negatively impact landscape visual quality. Regulation of billboard construction is inadequate in Lithuania.

No.	Title & Writer	Context and Methods	Findings
6.	Living with shore protection structures: A review (Nordstrom, 2014)	The research involves qualitative assessments of coastal adaptation options. It evaluates ecological impacts of coastal defense structures. The methodology includes numerical simulation models for beach response evaluation. Field data is utilized to analyze submerged groin construction effects. The study assesses habitat modifications in dynamic environments. Collaboration among disciplines is essential for effective shore management. Management must consider human influence on coastal evolution.	Residents prioritize shore protection; tourists value aesthetic views. Seawalls reduce intertidal habitat complexity and biodiversity. Beach nourishment can restore pre-wall beach dimensions but not biodiversity. Structural changes over time affect biotic community evolution.
7.	Seeing the unseen: adapting Landscape and Visual Impact Assessment (LVIA) to examine Neolithic stone circles in the English Lake District (Ibbotson, 2024)	The paper explores LVIA techniques in landscape archaeology. Visual magnitude measures a project's prominence in the landscape. 3D landscape analysis techniques offer potential for landscape archaeology. GIS software creates terrain models for visual analysis. The study connects archaeological features with their visual environment. The paper explores 3D techniques in landscape archaeology	Specific stone circles may integrate topographical elements in their landscapes. Later stone circles adopted overt entrances, reducing landscape feature usage
8.	Testing the Correlation between Prior Knowledge of - and Visualisation Guided WTPs for Reducing the Visual Impacts Visual from Offshore Wind Farms (Ladenburg, 2020)	Previous studies often used simplistic visualizations, affecting validity. The paper analyzes correlations between perceptions and preferences for visual impacts. The study analyzes respondents' prior perceptions and stated preferences for visual impacts. It compares visualizations' effects on preferences and willingness to pay. Certainty levels in choices were assessed on a scale from 0 to	Visual external costs significantly impact wind farm location decisions. Respondents' perceptions influence their willingness to pay for visual impact reductions
9.	The contribution of key observation point evaluation to a scientifically rigorous approach to visual impact assessment (Palmer, 2019)	The study evaluates visual impacts of two alternatives at 22 KOPs. Scenic value and visual contrast are assessed by six evaluators. The representational validity of photographs is evaluated. Methods include measuring cumulative and incremental visual impacts.	Cumulative impacts are unreasonably adverse at many KOPs. Burial of 84 km improves some KOPs but unreasonable impacts remain

No.	Title & Writer	Context and Methods	Findings
10.	The implications for visual simulation and analysis of temporal variation in the visibility of wind turbines (Bishop, 2019)	The visual impact of wind turbines affects public. Guidelines for visual simulation and impact assessments are widely used. The paper addresses knowledge gaps in visibility and visual impact over time. Recommendations are made for more nuanced simulation approaches	Temporal changes in visibility significantly affect visual impacts.
11.	Valuation of aesthetic ecosystem services of protected coastal dunes and forests (Urbis, Povilanskas, & Newton, 2019)	Study focuses on aesthetic ecosystem services of coastal landscapes. Utilizes a 'quali-quantitative' methodology for valuation. Curonian Spit, Lithuania, serves as the case study. Face-to-face semi-structured interviews were conducted for qualitative data. Quantitative data involved systematic pairing of landscape images. Normalised aesthetic values were calculated using preference analysis. The study analyzed preferences of domestic visitors and local stakeholders.	Domestic summer visitors prefer open landscapes of the Curonian Spit. Most attractive landscapes include white and grey dunes. Visual coherence explains aesthetic appeal for local stakeholders.
12.	Visual Effects of Structuring on Coastal Landscape: Evaluation from Çanakkale-Güzelyalı Case (KIZILARSLAN, ŞENGÜL, BAYRAK, & SAĞLIK, 2023)	Uncontrolled construction and visual pollution of coastal construction in Güzelyalı harms tourism and ecology. The study reviewed previous research and collected theoretical data. Aerial photographs were analyzed to identify coastal problems. Recommendations include removing worn structures and using lighter paint.	Worn-out piers and structures negatively impact coastal aesthetics. Legal decisions have led to environmental degradation in coastal settlements.
13.	Visual Impact Analysis of Large Urban Investments on the Cityscape (Czyńska, 2019)	The paper assesses visual impact of low-rising buildings on cityscapes. It presents a methodology using digital analyses for urban investments. The study utilized the Visual Impact Size (VIS) method for analysis. A Digital Surface Model (DSM) was employed for urban modeling. The study focuses on Gdańsk's historical cityscape and planned developments. Results may aid in cityscape protection and development.	Major visual impacts were identified, affecting cultural cityscape values. The methodology is applicable to low-rising buildings as well
14.	Visual Impact Assessment Method for Cultural Heritage: West Lake Cultural Landscape in	Current VIA methods face subjectivity and low public participation challenges. The study develops a methodological framework for visual impact assessment. It integrates visual sensitivity and public participation assessments. The	The framework is validated through the Shangri-La East Building project. Effective public participation

No.	Title & Writer	Context and Methods	Findings
	Hangzhou, China (Kou, Zhang, & Zhang, 2024)	assessment framework combines objectivity and subjectivity. The Shangri-La East Building project serves as a case study.	enhances visual perception assessments.
15.	Visual impact assessment method for wind parks: A case study in Crete (Kokologos, Tsitoura, Kouloumpis, & Tsoutsos, 2014)	The paper develops a methodology for assessing wind parks' aesthetic. It combines quantitative indicators with dynamic 3D computer simulation. The methodology evaluates visual impact and supports public decision-making. Large wind parks raise concerns about visual impact in their locations	Large wind park installations increase landscape value concerns and local community impacts.
16.	Visual impact assessment of the Istanbul Land-wall (Öğçe, Müderrisoğlu, & Uzun, 2020)	The study involved public and expert sample groups for surveys. Questionnaires evaluated coherence, imageability, stewardship, and historicity. ANOVA tests assessed sample groups' effects on preferences. Photographs were used for visual impact assessment	Historicity received lower scores despite the area's historical significance. The visual quality of the Land-wall is inadequate
17.	VISUAL IMPACT ASSESSMENT OF WIND TURBINES ON LANDSCAPE IN ŠILALĖ REGION (ABROMAS, GRECEVIČIUS, & PIEKIENĖ, 2015)	Cartography material was analyzed for wind turbine impact assessment. GIS data of turbine locations was utilized in the analysis. Visual impact assessment considered landscape characteristics and observation points. Empirical research compared theoretical sizes of visual influence zones	Wind turbines significantly alter local landscapes and visual. Visual impact depends on size, color, shape, and distance.
18.	Visual landscape preferences in Mediterranean areas and their socio-demographic influences (López-Martínez, 2017)	The paper studies visual landscape preferences in Mediterranean areas. It assesses socio-demographic influences on landscape perception. An online survey assessed landscape preferences using photographs. Participants evaluated 22 photographs on a Likert scale. Non-parametric tests analyzed differences in preferences by demographics. Mann-Whitney U test used for two-category characteristics. Kruskal-Wallis test applied for age group comparisons.	Population's visual perception aligns with previous studies. Water bodies and vegetation enhance landscape evaluation. Human impact negatively affects landscape scenic beauty.
19.	Visual preferences for simulated restorations of disturbed coastal landscapes (Ahn,	This study aimed to identify which man-made elements negatively impact the aesthetic quality of moderately disturbed coastal landscapes. Researchers created 32 simulated photos by adding combinations of five common man-	A natural coastal landscape was most preferred, while a disturbed landscape with all five structures was least

No.	Title & Writer	Context and Methods	Findings
	Kim, Jung, Oh, & Hur, 2002)	made structures (houses, roads, power lines, embankments, and aquaculture facilities) to a base photo of a natural coastal landscape. Eighty-six subjects, including landscape architecture professionals and non-professionals, evaluated these photos using a seven-level Likert scale for visual preference.	preferred. Power lines had the most significant negative visual impact, followed by embankments.
20.	Which Factors Affect the Visual Preference and User Experience: A Case Study of the Mulan River Greenway in Putian City, China (Zheng, Chen, & Guan, 2024)	The study identifies factors affecting user experience in the Mulan River greenway. Key factors include site leveling, plant aesthetics, and air. The green view index significantly influences visual preference. The analytic hierarchy process method (AHP) was employed for analysis. Questionnaire experiments were conducted to gather user experience data. Reliability and validity were analyzed using SPSS 24.0. KMO and Cronbach alpha tests ensured data quality	User experience is influenced by site leveling and plant landscape aesthetics. Air quality significantly affects user experience in greenways. The green view index is crucial for visual preference. Green visibility index promotes visual preference up to 60%

Source: Writer's Analysis

Previous research on Visual Impact Assessment (VIA) has employed a range of methodologies to evaluate landscape changes resulting from development. These methods typically involve a systematic analysis of potential environmental impacts, including spatial, quantitative, and qualitative aspects. Key techniques include visibility analysis, such as intervisibility analysis, and the assessment of local scenery factors like distance depth cueing and land cover. The field has also seen a significant integration of digital technologies, including GIS and 3D modeling, for more accurate and objective assessments. Furthermore, some approaches incorporate public participation through methods like the Analytic Hierarchy Process (AHP) and questionnaire surveys to capture public perception, leveraging the established reliability of public input via visual simulations.

However, previous research, particularly in Taiwan, has predominantly focused on the physical impacts of coastal structures, such as erosion and sediment transport, using methods like bathymetric analysis and numerical simulation. These studies have highlighted issues arising from insufficient environmental consideration during construction. Despite the methodological advancements in VIA, existing practices often face limitations due to subjectivity, low public participation, and a lack of generalizability. A notable gap also exists in formal training for professionals in assessing the human impact of visual changes, even with proven methods available.

This research is crucial as it specifically addresses the visual impact of existing artificial structures within a designated scenic area in Toucheng. By focusing on the visual dimension and integrating observational data with public perception insights, this study will provide a more holistic understanding of the aesthetic changes. This targeted approach is essential because, unlike prior research concentrated on physical impacts, a direct investigation into

visual and aesthetic alterations and their public perception offers a unique and vital contribution. Ultimately, this research can foster a more nuanced comprehension of the delicate balance between coastal engineering and the preservation of scenic beauty in a nationally recognized area.

1.9. Structure of Study

To facilitate a clear understanding of research on the “*Research on Visual Impact of Coastal Structures on the Landscape - A Case Study of the Five Fishing Villages in Toucheng*”, this section outlines the systematic approach employed in the research. The following details the structure of this study:

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| CHAPTER 1 | INTRODUCTION
The introductory chapter consists of research background to provide an initial description of the phenomenon that will be the research topic, then there is an explanation of the problem formulation, research objectives, scope of study, research questions, methodology, work plan, research significance, novelty, and research systematics. |
| CHAPTER 2 | LITERATURE REVIEW
The literature review contains a discussion of theoretical reviews as well as several literatures that support the research process. The theories used will be used to determine variables and indicators that are appropriate to the research. |
| CHAPTER 3 | OVERVIEW OF STUDY AREA
This chapter will provide a general overview of the research target location, Yilan and specifically Toucheng. It will describe the research area in terms of its geography, physical conditions, demographics, and climate resilience. |
| CHAPTER 4 | RESEARCH METHOD
The research methodology chapter outlines how the study was conducted, detailing the research design, participants, data collection methods and instruments, data analysis techniques. |
| CHAPTER 5 | RESULTS AND DISCUSSION
This chapter discusses the research findings obtained and analyzed from various data collection. |
| CHAPTER 6 | CONCLUSION
This chapter summarizes the main points, restates the research problem and objectives, and highlights key findings. It also discusses the implications of the research, limitations of the study and suggests directions for future study. |