



RESEARCH ARTICLE

Analyzing Architectural and Cultural Dong Minority Ethnic Wisdom through Dong Villages' Drum Towers at Tongdao County in the Pingtan River Basin

Chen Yuzhong^{1*}, Thanasit Chantaree², Kittisan Sriruksai³, Arunee Sriruksa⁴

^{1,2,3,4}Department of Culture Fine Arts and Design Research, Faculty of Fine and Applied Arts, Khon Kaen University, Khon Kaen, Thailand

ARTICLE INFO	ABSTRACT
Received: May 12, 2024	<p>Designing a qualitative research method to gain an in-depth understanding of the wisdom, and embedding in the Dong ethnic minority village group's Drum Towers, selected six representative villages from Tongdao County in the Pingtan River Basin, and to investigate the wisdom surrounding their Drum Towers indicates that understanding the rich cultural connotations to be achieved toward their perspectives and evidence by the local craftsmanship wisdom roles who have designed, invented, and built them. A comprehensive analysis and review of architectural and traditional cultures from historical, cultural, and societal perspectives to shed light on various components of Dong ethnic heritages. It was strongly affected by factors: the total output value of industrial enterprises above the designated size, and the sculpture values. The wisdom of the Drum Towers is divided into six components: selecting a location, materials, craftsmanship, decoration, functionality, and believable. Combinations of the theories: human-land relationship, field research, and literature collection, predominantly synthesized these six components of the Dong monitory villages' group wisdom are differentiated into two architectural pattern designs. The main components are inventive architectural pattern styles by the previous generation to the next general, continuously. The creation and planning to design an architectural tower with a solid foundation and local wood for Dong's traditional and architectural cultures, and inventing advancement, preservation, and development sustainable. The local pearls of wisdom of the Drum Towers in Dong villages' architectural group are comprehensive, practical, and inheritable.</p>
Accepted: Jul 29, 2024	
Keywords	
Architectural and cultural minority	
Ethnic wisdom	
Drum Towers' architectural six villages' group	
Tongdao village	
Grain and investigate historical background	
Pingtan river basin	
*Corresponding Author:	
chenyuzhong@kkumail.com	

INTRODUCTION

Historical Background

The Drum Tower was built in 1272 during the Yuan dynasty. At that time the city was called Khanbaliq and the tower was named the Tower of Orderly Administration (Chinese: 齐政楼; pinyin: Qízhènglóu). In 1420, during the reign of the Yongle Emperor, the building was rebuilt to the east of its original site. The Qing dynasty carried out important renovations in 1800. Following the Beijing Coup in 1924, Feng Yuxiang removed the official status of the towers, replacing them with Western time-keeping methods, and renamed the building the Tower of Clarifying Shame (Chinese: 明耻楼;

pinyin: Míngchǐlóu) (China Internet Information Centre, 2022) [1]. In the 1980s, after much repair work, the Bell and Drum Towers were opened to tourists. During the 2008 Summer Olympics, held in Beijing, three people were stabbed at the Drum Tower, resulting in one death (Lim, 2008) [2].

The Drum Towers that loom over Dong village look like giant cedar trees winding their way to the sky. Drum Towers are a triumph of Dong architecture and are deeply culturally significant to the Dong ethnic minority. They are where the elders meet, socialize, and, at one point in history, even pass judgment. They are an important social hub in any Dong community and are thus the perfect place to experience authentic Dong culture. There is a Drum Tower in every Dong village and, though they all bear basic similarities, every two towers are always different (Cai, 2007) [4]. Dong people drum towers own two kinds -- pagoda types and hall types, and the pagoda types are more popular. The most typical tower is the Zengchong Drum Tower in Congjiang. It is an octagonal pagoda-type drum tower with odd story eaves. On the top rises a multiheaded, octagonal finial pavilion. The eave angle is upturned, and the overall outline is changeable, and beautiful in style. Dong legend has it that the drum tower was built by the "King of Cedar." The overall outline of the Dong people's drum tower looks like a cedar, embodying the concept of worshipping big trees (China Internet Information Centre, 2022) [1].



Figure Captions 1: Architectural and Cultural Dong Minority Ethnic Wisdom through Drum Towers at Tongdao Village.

Source: Shiruo Wang (2023) [3]

Drum: Musical Instrument

The drum is a member of the percussion group of musical instruments. In the Hornbostel-Sachs classification system, it is a membranophone. Drums consist of at least one membrane, called a drumhead or drum skin, that is stretched over a shell and struck; either directly with the player's hands or with a percussion mallet to produce sound (Groves, 2001) [5]. This custom is no longer practiced, although some small disputes still be handled by the council of elders within the Drum Tower. Nowadays, it is a place where villagers can gather to entertain each other by singing, playing instruments, dancing or simply meeting and socializing. The Drum Tower is still the main venue for important festivals (Musical Instrument Guide, 2020) [6].

The first drums made from natural objects such as alligator skin appeared during 5500 BC. They first came about in Neolithic cultures originating from China but later spread to appear all over Asia. This period also saw the creation of Bronze Dong Son Drums in Vietnam during 3000 BC. The discovery of the first drum set occurred in the late nineteenth century. At the time, it usually took multiple people to play all the parts, including the snare, cymbals, bass, and other percussion instruments (Drum Centre of Portsmouth, 2020) [7].

Drum Towers

Historically the Drum Tower has always had an important social function within any Dong community. In the past, the council of elders in a Dong village would gather in the tower whenever someone from the village's people had violated one of the village rules. There they would confer and decide upon a suitable punishment for that individual. Once they had been designed decision, the local elderly people would beat the drums and the villagers would gather to hear the verdict. Most of the Drum Towers will have a square base but these towers will usually be hexagonal or octagonal. The stories of the tower get wider as they go from top to bottom, giving the tower a tapered appearance. Drum Tower will have an odd number of stories, as the Dong people believe they are the symbols of good fortune (Wang, 2020) [8]. Dong minority village group culture is an ethnic minority culture with strong minority village group characteristics, whose typical architecture represents the drum tower, which is the product of the essence and image of the material culture and spiritual culture of the Dong people and has a very high status at home and abroad. In the processing formation and development of Dong minority village group society, the design thought of Dong minority village group is gradually formed and shaped. (Pan, 2019) [8].

The drum towers provide venues for all villages to discuss and settle important matters and hold important festivals or entertainments such as singing and playing wind instruments. A leather drum is placed in the drum tower. When there are important things to talk about, the drum is beaten by a respected village to summon the villagers. There is a fire on the ground where a fire burns almost all year round. There are two types of Drum Towers: single-pillar and multi-pillar towers (Figure 2). As the name suggests, single-pillar towers are braced by only one pillar. They are the less popular of the two types. Multi-pillar towers are braced by four main pillars and 12 smaller pillars, which are believed to represent the four seasons and the 12 months of the year (China & Asia Cultural Travel, 2020) [9].

Dong Minority Drum Towers' Styles

To the Dong people's worship of trees, the outline of the Drum Tower is supposed to look like a large tree, specifically a cedar tree. The tower's shape is supposed to represent the legendary Cedar King from Dong folklore. The tower's interior and exterior will be lavishly decorated with carvings and paintings of animals, famous historical figures, flowers, and tableaus of legendary stories, festivals, and daily life. The first story is usually the most elaborately decorated. In most villages, the local clan have built their own Drum Tower. The size of the tower and the artistic beauty of its decoration indicate the status of the clan who built it, so a large and extravagantly decorated Drum Tower is a sign of a wealthy and powerful Dong community (China & Asia Cultural Travel, 2020) [9].

Drum Towers are often considered holy shrines by the local people and so, in Zengchong village, be sure to note what is hanging from the village gate. If there is a thatch design hanging from the gate, this means religious celebrations are taking place and only residents are permitted entrance to the Drum Tower. The Zengchong Drum Tower is regarded as one of the archetypal Dong-style Drum Towers, the largest Drum Tower in Guizhou province. There are three doors into the tower, on the south, north, and west sides respectively, and a horizontal tablet on the ground floor. This tablet was carved in 1830 and has four Chinese characters inscribed on it, which read: "Ten-Thousand-Li Soft Breeze." (Trip.com Travel Singapore Pte. Ltd., 2024) [10].



Figure Captions 2: Two styles of the architectural and cultural Dong Minority Drum Towers

The second style of architectural and cultural Dong Minority Drum Towers, the Yashang Drum Tower in Tongdao County (Figure 2(c)) is recognized as part of the National Key Architectural Heritage of China's traditional heritage on the UNESCO World Heritage Tentative List. However, it is surprising that its conservation condition is poor. In addition, the material characteristics of this particular type of vernacular heritage have remained virtually unexplored. Wood also serves as the only construction material of the structural frame, and various types of damage cause great structural stability and material property risks due to poor conservation and maintenance. Previous contributions that highlight was recorded of the historical and cultural context have discussed the technical aspects of wooden structures (Yu, 2001) [12].

The Dong Minority Drum Tower is an essential element of the Chinese wooden structural heritage architecture and culture. Drum Tower is a representative Dong Minority wooden structure and aims to understand the current conservation condition of this piece of vernacular heritage today. The first technical results of an *In Situ* material investigation wherein the wood species and the physical and mechanical properties of two samples were identified. A macroscopic inspection and visual classification were conducted, and the moisture content and the internal qualities of the wooden structures were detected via non-/minor-destructive tests (Liao, 2007) [13].

Dong Minority People

The Dong Minority people are one of China's 56 ethnic groups, who live in the region delineated by southwest Hunan, southeast Guizhou, and north Guangxi. With a population of nearly three million, the Dong people have a long historical time of more than 1,000 years dating back to the Tang Dynasty. The Dong people live in a mountainous area with a landscape of rice terraces, bamboo forests, and tea plantations that are still predominantly intact. Their architecture is intrinsically connected with the land and the topography, generating a harmonious relationship between nature and man-made structures. The Dong Minority Drum Tower is an example of the most crucial type of wooden structure and a landmark cultural element, and the Dong people strongly identify themselves with the Drum Tower (Wang, 2021) [14].

Among the traditional Dong settlements, Chuan-dou (穿斗式, a column-tie typology) and Tai-liang (抬梁式, a post beam typology) serve as the two primary structural typologies in traditional Dong construction (Cai Citation2007). The Chuan-dou Drum Tower has a dense multi-eave roof that creates a pyramidal morphology, while the Tai-liang resembles the Han main hall. The Yashang Drum Tower is located in Yutou village, Tongdao county, Hunan, and is a typical Tai-liang typology originally built in 1789 and restored during the Emperor Daoguang period (1821–1850) and again in 1871. The primary beams rest on the two peripheral columns and are loaded by two short columns supporting five purlin beams. The purlins, or horizontal members that support the rafters, are positioned along the stepped shoulders of the wooden frame (see Figure 1) (Wang, 2023) [3].

The Pingtan River Basin in Tongdao County

The Pingtan River Basin in Tongdao County is situated between 25°52' to 26°20' North latitude and 109°26' to 110°1' East longitude, belonging to the subtropical monsoon climate zone of South Asia. It originates from the northern slope of Badoupo in Longcheng Town, southern Tongdao County, Hunan Province, China. It converges with another tributary, Yanglan River, in Pingtan Township, where its water volume increases, and the river widens. The river maintains an average width of about 80 meters throughout the year. It then turns northwards through Huangtu Township and flows to Shuangjiang Town, where it merges with another tributary, Malong River, forming the Shuangjiang River, which eventually joins the Yangtze River. It has many typical architectural heritages mainly composed by 6 Drum-Towers, 2 Wind-Rain Bridges as well as other Han minority village group's buildings, a reflection of its rich cultural heritage and importance in the region (Wang, Augelli, Cai, & Ferretto, 2018) [15]. Therefore, it is part of the Yangtze River system. The Pingtan River basin in Hunan and the Jiudong area in Guizhou are two typical Dong minority settlements in the southern Dong area. However, an evident difference was revealed during the field survey from a global (village level) and local (architecture level) view. The main sources of water supply are surface rainwater and limited groundwater recharge (Wang, 2022) [16].

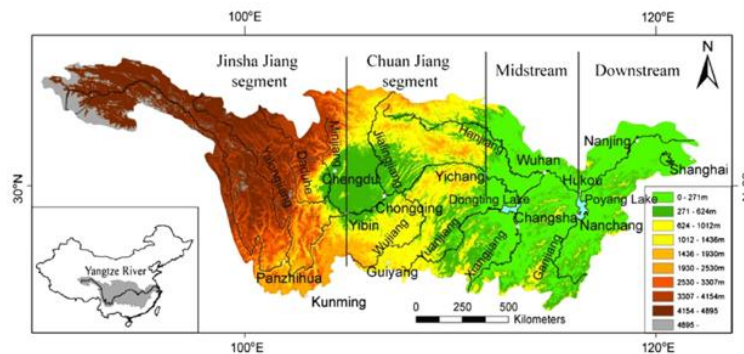


Figure 3: The landscape of the Yangtze River drainage basin. It can be divided into four parts: the Jinsha Jiang segment, Chuan Jiang segment, Midstream, and Downstream.

Source: Shiruo Wang (2022) [16].

Dong ethnic minority cultural villages in Tongdao County constitute 78% of the total natural villages, with 242 large settlements having over 50 households, 87 with over 100 households, and 24 with over 200 households. These villages are primarily distributed in the main area of the Pingtan River Basin. Thus, the Pingtan River plays a significant role in forming the "Hundred-Mile Dong Culture Corridor" of Tongdao County. Choosing the "Pingtan River Basin" as the geographical scope of this study can reflect the representative features of traditional Dong ethnic architecture in Tongdao, Hunan. Among the clustered settlements of the Dong ethnic group, the Drum Tower is the most important public architectural type. It serves as the focal point of settlement order, holding crucial social, political, cultural, and religious functions. Therefore, studying the main of Drum Tower holds value for researching Dong ethnic architecture traditional styles, and villagers' lives (The Editors of Encyclopedia Britannica, 2020) [17].

Dong, an ethnic minority of China was found in southeastern Guizhou Province and the neighboring Zhuang Autonomous Region of Guangxi and Hunan Province. According to most linguists, the Dong speak a Kam-Sui language, closely related to the Tai languages, and call themselves Kam (Department of Linguistics & Tesol, the University of Texas at Arlington, 2012) [18]. The Dong ethnic minority cultural group's Drum Architectural and Traditional Tower Styles consist of six villages: Yutou, Pingtan, Hengling, Yanglan, Zhongbu, and Gaobu villages (Xiang, Xiang, Qin, Xie, & Zhou, 2022) [19]. These six Dong ethnic villages are outstanding in the Pingtan River Basin in Tongdao County, Hunan Province. Connected by the Pingtan River, they are situated along the riverbanks, harmoniously combining to form a linear cultural heritage corridor. The chosen villages have a long history and

have been relatively less affected by external influences due to factors such as geography and transportation. As a result, they have preserved their original spatial forms, architectural styles, and simple local customs to a certain extent. They have retained a significant historical evolution, with the architectural environment, layout, and village locations largely maintaining their original appearances, while continuing unique folk traditions and traditional ways of life.

QUALITATIVE RESEARCH METHODOLOGY

Generally, qualitative research uses several techniques, including interviews, focus groups, and observation. Interviews may be unstructured, with open-ended questions on a topic, and the interviewer adapts to the responses. Structured interviews have a predetermined number of questions that every participant is asked to design.

Research Objective

To gain an in-depth understanding of the wisdom, and embed in the Dong ethnic minority group's Drum Towers in the Pingtan River Basin of Tongdao County through a comprehensive analysis and review of architectural and traditional cultures from historical, cultural, and societal perspectives to shed light on various components of Dong ethnic heritage.

Research Methods

This paper primarily employs a combined approach of the Man-Land Relationship theory, field research, and literature collection to investigate the wisdom behind the Dong ethnic group's Drum Towers in the Pingtan River Basin. The Man-Land Relationship theory is a fundamental concept in human geography, exploring the interconnectedness, mutual influence, and constraints between human society and the natural environment. As the core of geographical research, man-land relationship research runs through each development stage of geography (Li, Yang, & Liu, 2017) [20] through on-site investigations, relevant measurement data and image materials for the surveyed Drum Towers in the research area were collected and organized.

Using the man-land relationship theory to study the wisdom of the Dong ethnic group Drum Towers in the Pingtan River Basin offers three distinct advantages. Firstly, the theory allows multidimensional analysis of the formation, distribution, functions, and features surveyed of the Drum Towers, the interplay and impact between these structures, the natural environment, and human society. The geographical significance and value of Drum Towers through spatial analysis, regional studies, environmental determinism, possibility theory, and cultural landscape theory. Secondly, the theory enables the application of spatial information technologies such as Geographic Information Systems (GIS) and remote sensing to acquire, process, analyze, and visualize spatial data related to Drum Towers, facilitating quantitative and qualitative assessments and comparisons.

Recording remote sensing imagery and digital elevation models were utilized to extract information such as the position, height, and morphology of Drum Towers and their relationships with surrounding terrain, vegetation, and water systems. Thirdly, the man-land relationship theory can be integrated with knowledge and theories from other relevant disciplines to provide deeper insights into the historical evolution, economic value, social significance, cultural connotations, and regional and temporal variations of Drum Towers.

Finally, employing the man-land relationship theory to delve into the wisdom behind the Dong ethnic group Drum Towers in the Pingtan River Basin offers a unique perspective and methodology, underscored by its comprehensiveness and interdisciplinary nature. This research supplements and refines the existing studies on Drum Towers by examining their complex relationships with the natural environment and human society and their variations across different spatial and temporal scales. Thus, applying the man-land relationship theory to analyze the contribution of the

contribution of the Dong ethnic group, Drum Towers, enhanced our understanding and preservation of Dong's cultural heritage.

Research Procedures

Step I: A vital facet of China's traditional culture, embodying unique historical and cultural traditions specific to the region was present.

Step II: As a cultural resource, the Drum Towers hold rich historical information to contribute to tourism and societal progress was promoted.

Step III: The wisdom encapsulation in these Drum Towers reflects the collective memory and spiritual symbolism of the Dong ethnic group interviewed.

Step IV: The wisdom of the Drum Towers not only enhances our comprehension of the profound essence of Dong culture, providing fresh perspectives and evidence for historical research in the region but also fosters the development of cultural tourism and encourages exchange and integration among diverse ethnic groups were reviewed.

Step V: The Dong ethnic group's Drum Tower wisdom in the Pingtan River Basin can offer valuable research methods and case studies for other academic disciplines. Additionally, the research findings can contribute new theories and approaches to related fields of study that results were planned and designed.

Step VI: Unearthing the historical value and cultural significance of the Dong ethnic group's Drum Tower wisdom in the Pingtan River Basin can contribute to local societal development, elevate residents' quality of life, improve economic conditions, enhance the self-awareness and identity of the Dong ethnic community, and promote mutual understanding and respect among different ethnic groups were discussed.

Step VII: The preservation of Dong ethnic architectural culture, there has been a growing body of research on the Dong Ethnic Group Drum Towers in the Pingtan River Basin. Existing studies, conducted mainly from perspectives such as architecture, ethnology, and art, have employed methods including literature collection, organization, and analysis, as well as field surveys to interpret documentary and survey materials that serve as a multifunctional space for collective activities, decision-making, religious beliefs, and cultural heritage, embodying the spirit and ethnic characteristics of the Dong people were reviewed.

Step VIII: An architectural perspective, analyses, and evaluations have primarily focused on the forms, techniques, and artistry of Drum Towers, considering aspects such as architectural structure, function, and decoration were observed and analyzed.

Step IX: A novel classificational method of the structural forms, and analyzing the structural forms and their historical evolution was investigated in the overall planning of the Pingtan River Basin's construction and the design system of Drum Towers, establishing mathematical models to digitize the design of Drum Tower structures.

Step X: The perspective ethnology, a comprehensive exploration and interpretation, of cultural essentials and values of drum towers was conducted, focusing on aspects like historical culture, social organization, religious beliefs, and folk customs were approached.

Step XI: The perspective of art studies, comprehensive research, and assessment has been conducted on the decorative art of drum towers, focusing primarily on decorative themes, styles, techniques, and more on formal beauty, cultural aesthetics, and artistic value for Dong's people understand of their architectural art, the cultural essential, and aesthetic significance of Dong ethnic drum towers were enhanced.

Step XII: The summarized dissemination of drum tower architectural art promotes the preservation and inheritance of Dong ethnic drum tower architecture, fosters cultural awareness and ethnic confidence among the Dong people, and advocates for the protection of traditional architectural cultural heritage.

Interpreting Qualitative Research Findings

Interpretation of qualitative research is a craft that requires a deep understanding of the subject matter, a flair for pattern recognition, and a creative mindset to make connections between seemingly unrelated pieces of information. Interpreting qualitative research is a highly interpretive and subjective process; the researcher needs to delve into the data, uncover patterns, develop themes, and draw conclusions based on the context.

RESULTS

The wisdom embodied in the Dong ethnic group's Drum Towers in this study encompasses six aspects: site selection, material selection, craftsmanship, decoration, functionality, and belief. The following analysis and research on the wisdom reflected in the Pingtan River Basin Drum Towers will be conducted to design the main conjunctions with relevant aspects of the Man-Land Relationship theory.




Wisdom in Site Selection

The Drum Tower is often the only significant building within the village to serve as the first constructed structure, situated at the centre of the settlement due to its core importance. Influenced by defensive functions, the openness of the field of vision is a crucial factor in Drum Tower site selection. Therefore, locations near the river, steep slopes, main entrances, and elevated areas commonly serve as preferred sites. The Drum Tower acts like an invisible magnet, drawing buildings towards a central arrangement. The "magnetic force" of the Drum Tower diminishes with distance, resulting in a limited number of buildings revolving around it. Consequently, when the number of structures surpasses this limit, expansion gradually ceases. New buildings may separate from the original village to create new clusters, with a new Drum Tower at the heart. For the entire village, adjacent clusters are often nearby to fulfill needs such as territorial alliances, mutual vigilance, and information exchange.

According to research surveys, that achieved effective information transmission, the distance between newly constructed and nearby Drum Towers typically remains around 100 meters. The constructing newly Drum Towers are often sited in locations with broad visibility, such as the riverside or elevated terrain, facilitating mutual surveillance. In contemporary social development contexts, placing the Drum Towers in prominent positions can establish them as landmarks for villages, endowing them with unique images and characteristics. This can help attract more tourists and investment, enhancing the village's visibility and reputation. The Drum Tower Site Selection is reported in Table 1.

Table 1: The Drum Tower Site Selection

Drum Towers at Village Name	Drum Tower Name	Drum Tower	Site Selection Element	Nearest Drum Tower Distance (M)	Construction Time	
<p>Taro Dong Village</p> 	Longshi Tower	Drum Tower	The main entrance, Highland	105	Built in 1787, the 52 nd year of Qianlong in the Qing Dynasty	
	Yashang Tower	Drum Tower	Riverside, highland	105	Built-in 1789 of the Qing Dynasty and repaired in 1871 of the Qing Dynasty	
	Lusheng Tower	Drum Tower	Centre, riverside	98	Built-in the Qing Dynasty (1829) and rebuilt in 1994	
	Tianzhong Tower	Drum Tower	Centre	98	Built in 1972 and rebuilt in 1995	
<p>Hengling Dong Village</p> 	Hengling Tower	Drum Tower	Main entrance	80	During the Xianfeng Period of the Qing Dynasty	
	Neizhai Tower	Drum Tower	Centre	80	Reign of Emperor Guangxu of the Qing Dynasty	
	Xiaozhai Tower	Drum Tower	Riverside	125	Reign of Emperor Guangxu of the Qing Dynasty	
<p>Yanglan Dong Village</p> 	Zhongxin Tower	Drum Tower	Centre	59	Reign of Emperor Qianlong of the Qing Dynasty	
	Yanglan Tower	Drum Tower	Riverside	59	The fifty-second year of Emperor Qianlong in the Qing Dynasty	
Gaobu Village	Dong	Shangtun Tower	Drum Tower	Main entrance, Riverside	119	Daoguang years in the Qing Dynasty

	Yangtian	Drum	Main entrance	131	Reign of Emperor Guangxu of the Qing Dynasty	
	Longxing	Drum	Centre	95	Reign of Emperor Guangxu of the Qing Dynasty	
	Heshang	Drum	Riverside	95	Qing dynasty	
	Kezhong	Drum	Centre, Riverside	114	Qing dynasty	
	Pingtang Village	Dong	Pingtang Drum Tower	Main entrance	—	Reign of Tongzhi in the Qing Dynasty
	Zhongbu Village	Dong	Zhongxin Drum Tower	Centre, Highland	100	Qing dynasty
			Zhaitou Drum Tower	Main entrance, Highland	100	Qing dynasty

Source: Photos by Li Shangyin and Shi Menglei of Dong Minority village group Stockaded Village Building Group (2023) [21]

As in Table 1, the drum towers provide venues for all villages to discuss and settle important matters and hold important festivals or entertainments such as singing and playing wind instruments. A leather drum is placed in the drum tower. When there are important things to talk about, the drum is beaten by a respected village to summon the villagers. There is a fire on the ground where a fire burns almost all year round.

Wisdom in Selected Materials Made for Inventing the Drum Towers

In the Dong ethnic villages of the Pingtan River Basin, the materials made for inventing the Drum Towers are primarily categorized into several parts. Firstly, the covering and shaping materials for the top portion; in the early stages, cedar bark was used for covering, serving as a locally sourced natural material. It was not only easily accessible and sustainable but also possessed insulation and thermal properties, ensuring suitable room temperature conditions throughout different seasons. As Dong's ethnic understanding of building materials' properties progressed, vulnerable and perishable cedar bark became unsuitable. To ensure long-term stability, the Dong people replaced cedar bark with small blue tiles for covering, and the ridges and decorative elements were shaped using plaster, and then coated with white lime. This transformation reflects the Dong people's adaptation and application of wisdom across various periods.

Secondly, for the structural materials of the Drum Tower, cedar wood, due to its strength and durability, was chosen as the ideal material in supporting and load-bearing components. Although cedar wood is relatively common in the area, the Dong people also considered the ecological impact on sustainability, particularly when selecting the main central column. The wood is planned months in advance to avoid waste and environmental damage. Thirdly, the foundation plays a crucial role in the Drum Tower. Its primary function is to enhance stability and earthquake resistance. Given that the Drum Tower is a tall wooden structure, a sturdy foundation is essential to support its weight and withstand external forces like wind and earthquakes. Additionally, the Pingtan River Basin is characterized by high humidity and rainfall. As Drum Tower's wooden columns directly contact the ground, they are susceptible to erosion from soil moisture, humidity, and pests, leading to decay and deformation of the columns, affecting both structural integrity and aesthetics. To address this, the Dong people mainly employ materials, such as stones, stone slabs, or cement as the foundation to extend the Drum Tower's lifespan significantly.



Figure Captions 4: Dong wisdom ethnic village of the Pingtan River Basin, the materials made in the invention of the Drum Towers are primarily categorized into several parts.

Source: Pu, Fan, Liang, & Huang (2020) [22].

Fourthly, Drum Towers' door and window materials, influenced by the local climate conditions, Drum Towers' doors and windows need effective insulation and ventilation to adapt to varying temperatures and humidity levels throughout different seasons. Therefore, door and window materials for Drum Towers are often cedar or pine wood, shaped in squares or circles to increase ventilation area. Iron rings or hooks are added to doors and windows for stability, and ease of opening. Finally, for the flooring materials, considering the Drum Towers often have a central hearth, the ground floor is typically constructed using fire-resistant materials such as stone or loess to mitigate the risk of fire burn.

Dong minority village group culture is an ethnic minority culture with strong minority village group characteristics, whose typical architecture represents the drum tower, which is the product of the essence and image of the material culture and spiritual culture of the Dong people and has a very high status at home and abroad. Process of the formation and development of the Dong minority village group society, the design thought of the Dong minority village group is gradually formed and shaped. From the point of view of social dynamics, the essence of analyzing the design thought of the drum tower of the Dong minority village group is also the process of analyzing the design thought of the Dong minority village group is made designs using the original materials as reported in Table 2.

Table 2: Selected Materials for Designing the Dong Group Villages of the Drum Tower Architectural Styles

Names of Villages	Covering Materials	Structural Materials	Door and Window Materials	Flooring Materials	Column Foundation
Taro Dong	Cedar Bark, Blue Tiles, Plaster, Gypsum	Cedar Wood	Cedar wood、Pine wood	Cedar wood、Loess	Stone slab
Hengling Dong	Cedar Bark, Blue Tiles, Plaster, Gypsum	Cedar Wood	Cedar wood、Pine wood	Cedar wood、Loess	Stone block
Yanglan Dong	Cedar Bark, Blue Tiles, Plaster, Gypsum	Cedar Wood	Cedar Wood	Cedar wood、Pebble、Cement	Stone block
Gaobu Dong	Cedar Bark, Blue Tiles, Plaster, Gypsum	Cedar Wood	Cedar wood、Pine wood	Cedar wood、Loess	Cement block
Pingtang Dong	Cedar Bark, Blue Tiles, Plaster, Gypsum	Cedar Wood	Cedar wood	Loess	Stone block
Zhongbu Dong	Cedar Bark, Blue Tiles, Plaster, Gypsum	Cedar Wood	Cedar wood	Cedar wood、Loess	Cement column、Stone block

As reported in Table 2, the materials used for Dong's Drum Tower architectural designs are very complex; the large structure overlaps the small structure, and the small structure overlaps the smaller structure. This approach accords with the system theory in theory and is easier to realize in practice reflects the wisdom of the Dong people. The connections between the structures are made entirely by chisel and tenon connections.

Craftsmanship Wisdom

Craftsmanship, as a philosophy, is the bringer of peace and the maker of civilization. Why is the idea of craftsmanship significant at this epochal moment in time? Because it is about shaping their future, and the 'engaged' craftsman brings the full power of humanity to bear upon his or her work. Among the six Dong villages surveyed, most drum towers exhibit a meticulous, orderly, symmetrical, and flexible exterior design. They are originally primarily categorized into three distinct types: pagoda-style drum towers, pavilion-style drum towers, and hybrid-style drum towers. Due to the subtropical monsoon climate of the Pingtan River Basin, characterized by hot and rainy summers and dry and cold winters, the Dong people need to select appropriate architectural forms based on varying climatic conditions.

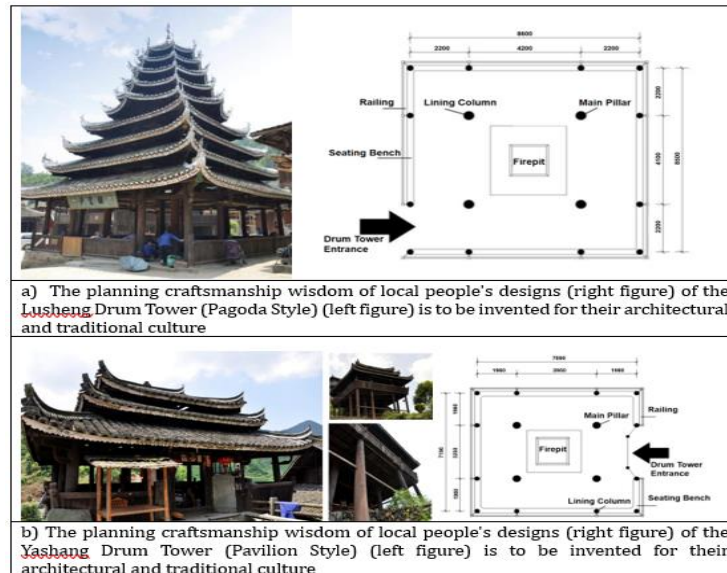


Figure Captions 5: The planning craftsmanship wisdom of local people's designs of Lusheng Drum Tower (Pagoda Style) (a) and the Yashang Drum Tower (Pavilion Style) (b) were to be invented for their architectural and traditional culture

Pagoda-style drum towers stand tall and graceful, featuring a tower-like structure with pointed roofs that facilitate drainage and ventilation, making them suitable for hot and rainy summers. An example is the Lusheng Drum Tower (Figure 5(a)) Pavilion-style drum towers possess a concise and elegant design with a simple and generous appearance, surrounded by corridors that aid in insulation and soundproofing, making them suitable for dry and cold winters, an example is shown of the Yashang Drum Tower in Figure 5(b). Hybrid-style drum towers amalgamate design elements from both pagoda-style and pavilion-style structures. This approach combines the vertical nature of pagoda-style architecture with the practicality of pavilion-style design. Such a hybrid approach results in a distinctive and versatile drum tower design that fulfills both functional and symbolic requirements, as an example by the Hengling Drum Tower (Figure Caption 6).

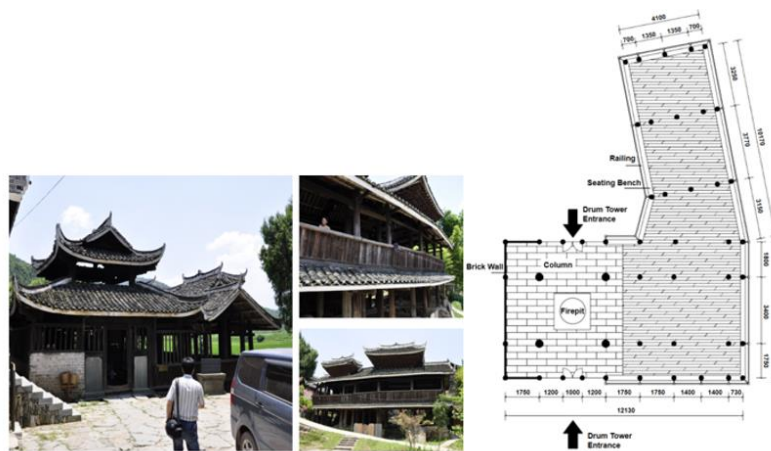


Figure Caption 6: The planning craftsmanship wisdom of local people's designs (right figure) of the Hengling Drum Tower (Hybrid-style Style) (left figure) is to be invented for their architectural and traditional culture

The basic structural elements of a drum tower consist of columns, lintels, and beams. The columns include a golden column, an exterior eave column, and a melon-shaped column, which provide structural support, while lintels and beams serve as horizontal connectors. The columns are mortised, and the lintels are tenoned, with mortise-and-tenon joints used to connect the two, forming the structural framework. This is a fundamental characteristic of drum towers and even all Dong ethnic architecture. The variation in structure and craftsmanship of drum towers directly leads to distinct regional differences in their architectural features. The drum towers can be classified into two types of structural designs: a combination of raised-beam and through-tenon structures, and a through-tenon structure at the group village in the Pingtan River Basin.

While the Dong ethnic drum towers may have diverse forms, they share common characteristics in their overall structural design from an external perspective. A drum tower is a multi-story wooden pavilion-like structure. The plan shape of the drum tower is usually an even number, such as a quadrilateral, hexagonal, or octagonal structure, with an odd-numbered multi-eaved facade composed of three, five, seven layers, and more. The largest drum towers can have as many as twenty-seven layers. Regardless of scale, most drum towers consist of three sections: the upper part is the tower's crown, often a semi-open umbrella-like structure that symbolizes the Dong ethnic spirit and becomes a focal point for showcasing craftsmanship; the middle section features multi-eaved roofs where Dong ethnic sculpture and painting art are prominently displayed; and the lower section is an open, airy, square space framed by load-bearing column networks, with a height of 5 to 6 meters, serving as the primary activity area. The Drum Tower is a 47-meter (154 ft)-tall two-story building made of wood. This story of the building housed 24 drums, of which only one survives. New drums have been made to replace them. Nearby stands the Bell Tower, a 33-meter (108 ft)-tall edifice with gray walls and a green glazed roof. The upper story of the Drum Tower currently serves as the People's Cultural Hall of the Dongcheng District. The drum tower structure and craftsmanship styles are reported in Table 3.

Table 3: The Drum Tower Structure and Craftsmanship Tyle Styles

Name of Village	External Planning Form	Roof Elevational Form	Component	Façade Styling Tyle	Structural Type
Taro Dong	Four and Six	One, Three, Five, and Nine	One, Two, and Three	Pagoda, and Pavilion Styles	Mixed-style, and through Tenon Style
Hengling Dong	Four, Six, and Ten	Three, and Seven	One, Two, and Three	Pagoda, Pavilion, and Hybrid-style Styles	Mixed-style, and through Tenon Style
Yanglan Dong	Four	One, and Three	Two	Pagoda, Pavilion, and Hybrid-style Styles	Mixed-style Style
Gaobu Dong	Four and Six	Seven	Three	Pavilion, and Hybrid-style Styles	Through Tenon Style
Pingtang Dong	Four	Five	Two	Pagoda Style	Mixed-style, Style
Zhongbu Dong	Six	Five, and Nine	Three	Pagoda Style	Through Tenon Style

As reported in Table 3, the combination of different parts of the drum tower is harmonious, with a smooth external contour, a well-organized interior space, and an overall impressive beauty. Constructed entirely of wood, drum towers are held together without a single nail or rivet. Thanks to their solid and sturdy construction, they can remain intact and upright for centuries. This fully demonstrates the exceptional architectural craftsmanship and skills of the Dong ethnic people. Up in the 46-meter-high tower, the great drums would beat to sound the curfew after nightfall in the Qing dynasty and thereafter every two hours to coordinate the patrols of the city's night watch.

Wisdom of Decorative Components

The ancient Dong group's village becomes a bustling place. As one of the largest villages where Dong people live in China, with only six Dong village groups, southwest China's Guizhou Province is a perfect spot to take a sip of authentic Dong culture, which refers to the five traditional virtues of benevolence, righteousness, manners, wisdom, and trustworthiness. There is a saying that goes, 'The drum tower is built before the village.' In the past, when villagers encountered bandits or fires, people would climb to the top of the tower and beat the drum to alarm the whole village. Nowadays, the drum tower remains a public space for villagers to play chess, chat, or rest. By analyzing the site layout, residential buildings, public space water adaptation, thermal adaptation, wind adaptation, and light adaptation, the "seven characteristics" of the living space environment. Landscape and natural environment factors are the dominant factors of village location and planning through the trend mountain, which determines the layout form, and spatial texture of the village as shown in Figure Caption 7.

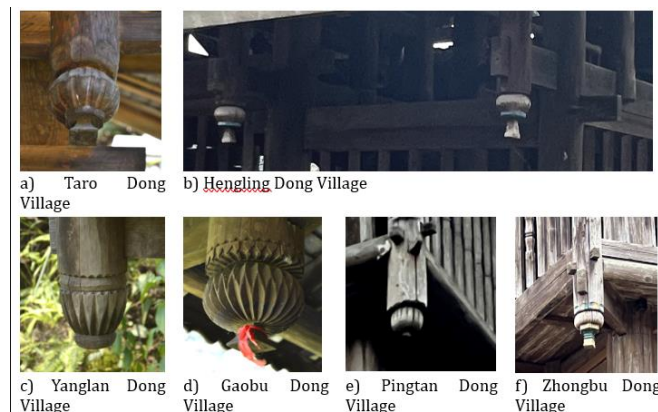


Figure Captions 7: Column Base of Hanging Pillars of the Architectural and Traditional Cultures of the Dong Drum Towers at Taro Dong (a), Hengling Dong (b), Yanglan Dong (c), Gaobu Dong (d), Pingtan Dong (e), and Zhongbu Dong (f) Villages, respectively.

Their structures and exteriors not only exhibit practicality but also display a strong decorative quality. These drum towers showcase rich ethnic styles' different colours, sculptural forms, and decorative themes. These decorative elements reflect the Dong people's adaptation and utilization of their natural environment, their understanding of geographical influence, and their considerations and expressions of social functions. In Caption, Figure 7, showed the columns and brackets of the drum towers exhibit diverse decorative features. For instance, the hanging columns of the drum tower, with their column bases suspended in the air, come in various vivid shapes. The caption figures 7 (a, b, c, d, e, and f) of the column base of hanging pillars at the six Dong Villages' Drum Towers.

The exposed ends of the beams and brackets on the columns are often carved into shapes such as dragon heads, fish heads, elephant heads, phoenix heads, and gourds. These carvings are concise and vivid in form, sparking one's imagination. For example, in the case of the Lusheng Drum Tower, the ends of the beams and brackets are carved into colourful phoenixes, displaying vivid forms and vibrant colours (Figure Captions 8(a)). In the case of the Yashang Drum Tower, the ends of the beams and brackets are meticulously carved into complete fish shapes, exhibiting intricate and lifelike details (Figure Captions 8(b)), both expressing a yearning for a better life. Most drum towers have Tai Chi patterns carved at the centre of their ridge beams, conveying reverence for the heavens and nature and embodying the concept of "harmony between man and nature." Other beams and brackets also bear finely carved diagonal patterns or water wave motifs (Figures Captions 8(c, d, e, and f, respectively).

In addition, some of the brackets are also carved into the shapes of animals. For instance, in the case of the Yashang Drum Tower, a short column at one corner is carved into a playful monkey holding up fruit (Figure Captions 9(a)), portrayed with lively expression and vividness, symbolizing abundance and prosperity.



Figure Captions 8: Carvings on Beams and Rafters of the Architectural and Traditional Cultures of the Dong Drum Towers at Taro Dong (a), Hengling Dong (b), Yanglan Dong (c), Gaobu Dong (d), Pingtan Dong (e), and Zhongbu Dong (f) Villages, respectively.

In a certain sense, the drum tower is not merely a lofty public structure but also a convergence of artistry. The main central column and the eave columns around the drum tower are usually reinforced with moisture-resistant column bases to enhance the stability of the drum tower.



Figure Captions 9: Shows the Drum Tower Sculptures (a) and Drum Tower Column Base at Taro Dong Village

The column bases often resemble the shape of a drum (Figure Catons 9(b)), carrying symbolic meanings of warding off evil spirits, dispelling negativity, and subduing malevolent forces, showcasing a sense of smooth yet robust beauty. Some column bases feature bas-reliefs that depict local folk customs, characterized by interesting and somewhat exaggerated compositions, which to some extent enrich the historical and cultural charm of the drum tower.

The hall of the drum tower is situated differently in various cases: some are located on the first floor, some on the second floor, and certain ones have gathering halls on both the first and second floors (utilized on the first floor during winter and on the second floor during summer). In the centre of the hall, there is a hearth, surrounded by inlaid bluestone slabs in a square shape, corresponding to the central Tai Chi pattern on the drum tower's roof beam. This symbolizes the unity of "Heaven and Earth" and "Circular Heaven, Square Earth." Wooden benches are placed between the main central columns.



Figure Captions 10: Seating Benches (a) and Sleeping Platforms (b) of a Dong Drum Tower at Hengling Village

Furthermore, the spaces between the eave columns around the gathering hall are often connected by wooden boards on the lower part and railings on the upper part. In the case of a drum tower with an attic, benches are positioned between the eave columns. In some instances, platforms are placed on the transverse beams connecting the eave's columns and hanging columns, with railings around the platforms (Figure Captions 10a and 10b). During the summer, many Dong people gather on the benches and platforms to seek shade.

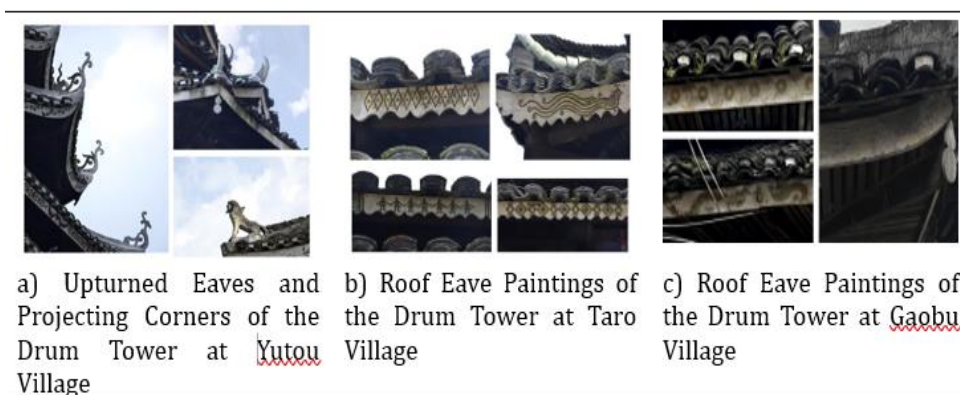


Figure Captions 11: An example of the Eaves and Projecting Corners of the Drum Tower (a), and Roof Eave Paintings (b) and (c) at Yutou, Taro, and Gaibu Villages, respectively.

At the eave's corners of each level of the drum tower, there are upturned eave tips, and at the outer ends of the eave's corners, protruding corners are also installed. The decorative protruding corners give the drum tower a unique and imaginative external artistic design, adding to the sense of the

tower's desire to soar. At the foremost tip of the overhanging eaves, there are often carved sculptures of birds, lions, gourds, and other animals or plants (Figure 18), showcasing the delicate beauty of the drum tower. Additionally, the lower part of the drum tower's overhanging eaves is typically fitted with fascia boards, which are coated with lime and tree sap to create a white background for painting. These paintings are vibrant in colour and diverse in content, depicting aspects of village life, exotic birds and animals, and intricate auspicious patterns (Figure Captions 11(a), 11(b), and 11(c)).

As reported in Figure Caption 11, A series of gourd-shaped tops represent the pagoda's spire, piercing the sky. The eaves are four-sided, with each gable face covered by layers of gable panels, like dragon scales, which are joined in an orderly fashion from the bottom up. Together with the ridge of the roof, it is sculpted into a fish-tailed beast with a dragon's head and a fish's tail, which in ancient Yue times was known as the Chi (scops) tail. Some drum towers have a mud sculpture resembling a string of gourds at their tops, while others are constructed using stacked iron-topped clay jars. This sense of aesthetic appreciation is closely tied to the cohesive tendencies and holistic perspectives of the entire ethnic group (Figure Captions 12(a), 12(b), and 12(c)).



Figure Captions 12: Architectural Sculpture Styles at the Roof Top of the Dong Drum Towers' Group

The Drum Towers that loom over the Dong villages look like giant cedar trees winding their way to the sky. Drum Towers are a triumph of Dong architecture and are deeply culturally significant to the Dong ethnic minority. They are the place where the elders meet, socialize, and, at one point in history, even pass judgment. They are an important social hub in any Dong community and are thus the perfect place to experience authentic Dong culture. There is a Drum Tower at the whole of Dong villages, and architectural sculpture styles though all bear basic similarities, the drum tower decorations as detailed in Table 4.

As reported data analysis in Table 4, the Dong ethnic group was spawned by the unique terroir of the Dong region and shaped through the skillful construction of Dong craftsmen. Because of the Drum Tower, the architectural culture of the Dong people has become more mellow and splendid. The richness and variety of the images of the drum towers surviving today significantly reflect the cultural diversity of the Drum Tower decorations' sculpture styles.

Table 4: Architectural sculpture styles of the Drum Tower decorations

Village Name	Roof Sculpture	Decorations of Roof Pattern Style	Beam and Column Sculpture	Beam and Column Sculptural Decoration Pattern
Taro Dong	Flying Birds & Wild Animals	Diamond, Phoenix, & Human Figure	Lantern, Elephant Trunk	Water Ripples
Hengling Dong	Dragon & Flying Birds	-	Elephant Trunk	Water Ripples
Yanglan Dong	Gourd	-	Elephant Trunk	-
Gaobu Dong	Flying Birds & Gourd	Dragon, Phoenix, & Sun	Gourd & Pumpkin	Water Ripples
Pingtang Dong	Flying Birds & Gourd	-	Elephant Trunk	Water Ripples
Zhongbu Dong	Flying Birds	Floral Patterns	Lantern	Water Ripples

Wisdom of Functionality

Gathering for deliberations due to the influence of the natural environment, Dong villagers require a comfortable indoor setting to engage in various deliberative activities throughout different seasons. From ancient times to today, Dong society has maintained an organizational structure characterized by rich legendary elements. The drum tower serves as the "kuan shou" (headquarters) for establishing regulations, resolving internal disputes, discussing production matters, and conducting social activities. Today, in certain Dong villages, some of the older drum towers have transformed into local public institutions, providing a convenient space for villagers to communicate, exchange information, coordinate relationships, and uphold unity. This signifies the continuity of the drum tower's public functions.

Drumming for the Alarm Function Positioned at the centre of the village, the drum tower stands as the tallest structure and houses a large drum, serving as a tool for communication and alarm. In times of urgency or significant events, villagers ascend the tower to beat the drum and attract attention from the villagers. The rhythm and intensity of the drumbeats distinguish between alarms and good news, allowing villagers to discern the purpose of the drumming. In the present day, with societal development and changes, Dong villagers are no longer threatened by external enemies or natural disasters, eliminating the need for drumbeats to convey messages and seek assistance. As a result, the drums within the drum tower have lost their original alarm function, transitioning into musical instruments or props used for cultural activities and traditional celebrations were checked and reported in Table 5.

Table 5: The functional current status of Drum Tower

Village Name	Gathering for Discussions	Celebratory Events	Leisure & Entertainment	Hosting Ceremonies
Taro Dong	√	√	√	√
Hengling Dong	√	-	√	√
Yanglan Dong	√	-	√	√

Gaobu Dong	√	-	√	√
Pingtang Dong	√	=	√	√
Zhongbu Dong	√	√	√	√

The functional current status of the Drum Tower is detailed in Table 5, the political and military functions of the drum tower, and the cow skin drum are set up on the drum tower. Whenever there is a big event, the sound of the drum towers must be a big event in Dong minority village group stockaded village of their experience aid, the economic centre of legal judgment, and the name of the drum tower will also be from it. Generally speaking, the main social functions of the drum tower include deciding important matters, political and legal, a military command centre against foreign enemies, an economic centre for the exchange of production, and a cultural centre for sacrificial and cultural activities.

Wisdom of Faith

The drum towers in the Pingtan River Basin Dong villages are highly representative of the Dong ethnic people's cultural heritage and their aspirations for a better life. These drum towers serve as symbols of the ethnic identity of Dong villages, representing the totems and religious beliefs of the Dong ancestors. They stand as the centre and origin of village life, showcasing the deepest cultural accumulation, the strongest expression, and the most emblematic cultural symbol of the Dong ethnic group. Dong ethnic drum towers visually emulate natural elements such as cedar trees, dragons, and fish nests, expressing reverence and admiration for the natural world. Due to the high quality and importance of the cedar trees, these saplings are respected by the Dong people for their vigorous vitality and ability to continuously produce new saplings, symbolizing the prosperity and continuity of families.

Dragons, a totem of the ancient southern Chinese Yue people, are the symbols of water culture. This represents the Dong people's reliance on and respect for water. Fish nests are where the Dong people raise fish and serve as important offerings during ancestor worship, embodying nostalgia and gratitude towards their ancestors. The facade and planning floor of the drum towers are combined with odd and even numbers, with the Dong people associating odd numbers with positivity (yang) and even numbers with negativity (yin). As the most solemn structure within the village, the drum tower is believed to harmonize yin and yang, reflecting a symbiotic balance and harmony.

Finally, Dong culture is also called "drum tower architecture and culture" by many nationality scholars. Drum Tower of the Dong villages' group not only embodies the excellent architectural skills of the Dong people in the field of architecture but also, more importantly, bears all the material, spiritual, and cultural elements of the Dong villages group, which is also the most representative and interpretable cultural symbol in Dong architectures and cultures are reported and provided with the qualitative analysis.

DISCUSSION

This study, centred on the Drum Towers of Dong ethnic villages in the Pingtan River Basin, provides a theoretical foundation for the inheritance and development of traditional architectural wisdom in this region. The preservation, protection, and development of local traditional and architectural pearls of wisdom require the indispensable participation of local villagers. However, some villages have relocated their residents to areas outside the villages. While vigorously developing tourism. While this may lead to immediate improvements in villagers' living conditions, it interrupts the ongoing development of traditional wisdom and has significantly negative impacts on the continuity and renewal of ethnic culture. Nevertheless, this study also exhibits' limitations, such as a relatively small sample size that cannot fully represent all Dong ethnic Drum Tower architecture in the region.

Further, meticulous research in other areas is needed to enhance the comprehensiveness of our findings.

Through on-site investigations and the analysis of collected data, this study reveals that the wisdom embedded within the Drum Towers of Dong ethnic villages in the Pingtan River Basin is not merely a reflection of the Wisdom of a specific era. Therefore, an accumulation of the local Wisdom is passed down through generations as society evolves. This wisdom is not fixed and unchanging; it is dynamic and requires continuous refinement and development. This aligns with the principles of environmental adaptation in the theory of human-environment relationships, whereas human societies adapt and adjust to their natural surroundings through various means. From this perspective, the wisdom embodied in Dong ethnic village Drum Towers emerges from their responses to different geographical pressures, reflecting their resilience and improvement of the natural environment (Fan, 2022) [23].

Furthermore, the portion of the Drum Tower's wisdom also encompasses early passive wisdom influenced by natural factors. This outcome is consistent with the theory of environmental determinism in human-environment relationships. The early wisdom embedded in Dong ethnic village Drum Towers reflects their adaptation and utilization of various geographical elements such as climate, topography, and hydrology. Thus, the wisdom of Drum Towers in the Pingtan River Basin is a comprehensive, practical, and inheritable entity.

CONCLUSION

Qualitative research method grains for analyzing architectural and cultural Dong Minority Ethnic Wisdom through Drum Towers at Tongdao County in the Pingtan River Basin. The Dong minority village group, in its formation and development process, has created the rich and colourful characteristics of a minority village group's various architectures and cultures. Its achievements today and its influence on international and domestic levels cannot be underestimated. The design idea with the six minority village groups imprinted from the perspective of social dynamics and development was analyzed. The forms of social development and design ideas can be traced.

In today's reverence for traditional culture, it is one of the important ways to develop the national culture to study the path of the development of the minority village group culture and the law of the formation of design thought. As reported by six Dong villagers including wisdom in site selection, selected wisdom in material, craftsmanship wisdom, wisdom of decorative components, wisdom of functionality, and wisdom of faith are the empirical data significance. Suggestions of the result findings that the Dong minority village group, in its formation and development process, has created the rich and colourful characteristics of a minority village group architecture and culture. Its achievements today and its influence on international and domestic levels cannot be underestimated. The design idea with a minority village group imprinted from the perspective of social dynamics and development was analyzed. The forms of social development and design ideas can be traced. In today's reverence for traditional culture, it is one of the important ways to develop the national culture to study the path of the development of the minority village group culture and the law of the formation of design thought.

REFERENCES

- [1] CHINA INTERNET INFORMATION CENTRE. 2022. The Drum Tower and the Bell Tower. Retrieved January 26, 2022. <http://www.china.org.cn/english/features/beijing/31182.htm>

- [2] LOUISA LIM. 2008. Safety in Beijing A Concern for Some, Not All". NPR.org. Retrieved August 11, 2008). <https://www.npr.org/2008/08/11/93506997/safety-in-beijing-a-concern-for-some-not-all>
- [3] SHIRUO WANG. 2023. Conservation of Dong Minority Wooden Structures: In Situ Material Investigation of the Yashang Drum Tower in Hunan, China. *Studies in Conservation*, 69(2): 67-76. <https://doi.org/10.1080/00393630.2023.2225293>
- [4] LIN CAI. 2007. Traditional villages and architecture of Dong Nationality's Habitation Region. Beijing: China Architecture & Building Press.
- [5] GEORGE GROVE. 2001. Stanley Sadie (ed.). *The New Grove Encyclopedia of Music and Musicians* (2nd ed.). Grove's Dictionaries of Music, 5: 638-649.
- [6] MUSICAL INSTRUMENT GUIDE. 2020. In ancient China, drums were a tool for communicating public discontent. YAMAHA Make Waves. Retrieved July 21, 2020. https://www.yamaha.com/en/musical_instrument_guide/drums/trivia/trivia2020.html
- [7] DRUM CENTRE OF PORTSMOUTH. 2020. History of Drums: A brief history lesson for Drummers. Retrieved November 5, 2020. <https://drumcentrenh.com/blogs/news/history-of-drums>
- [8] YING PAN. 2019. Social dynamics: An analytical method of Drum Tower design for Dong Nationality. *Advances in Social Science, Education, and Humanities Research*, 310, the 3rd International Conference on Culture, Education and Economic Development of Modern Society (ICCESE 2019).
- [9] CHINA & ASIA CULTURAL TRAVEL. (2020). Drum Towers. Retrieved August 8, 2020. <https://www.asiaculturaltravel.co.uk/drum-towers/#:~:text=As20year>.
- [10] TRIP.COM TRAVEL SINGAPORE PTE. LTD. (2024). Zengchong Drum Tower highlights Must-see features and attractions. Retrieved on January 25, 2024. <https://www.trip.com/travel-guide/attraction/congjiang/zengchong-drum-tower-82147/>
- [11] TRIP.COM TRAVEL SINGAPORE PTE. LTD. (2024). Zengchong Drum Tower highlights: Must-see features and attractions. Retrieved on January 25, 2024. <https://www.trip.com/travel-guide/attraction/congjiang/zengchong-drum-tower-82147/>
- [12] WANG YU. 2001. Walk into the Drum Tower, Dong South Community Culture Oral History. Guiyang: Guizhou People Press.
- [13] CHUNYAN LIAO. 2007. Traditional Cultural Characteristics of Southern Dong Minority. Beijing: Nationalities Publishing House.
- [14] SHIRUO WANG. 2021. Damage classification to historical wooden structures: A preliminary survey and recommendation for Dong Minority Drum Towers. *The International Archives of the Photogrammetry Remote Sensing and Spatial Information Sciences*, XLVI-M-1-2021: 821-827. DOI:10.5194/isprs-archives-XLVI-M-1-2021-821-2021
- [15] SHIRUO WANG, FRANCESCO AUGELLI, LING CAI, & PETER W. FERRETTO. (2018). Regeneration and preservation practice on Dong Minority Gaobu Village of Hunan, China. The Open University, is supported by CORE Members. Retrieved January 1, 2018. https://core.ac.uk/outputs/160050923/?utm_source=pdf&utm_medium=banner&utm_campaign=pdf-decoration-v1
- [16] SHIRUO WANG. 2022. Tradition and transmutation: A comparison study of Dong Minority Villages and Drum Towers between the Pingtan River Basin and Jiudong Area. *Journal of Asian Architecture and Building Engineering*, 202222(3). DOI:10.1080/13467581.2022.2122831
- [17] The Editors of Encyclopedia Britannica. 2020. Dong people. To be written and fact-checked in the article history. Retrieved August 8, 2020. <https://www.britannica.com/topic/Dong>
- [18] DEPARTMENT OF LINGUISTICS & TESOL, THE UNIVERSITY OF TEXAS AT ARLINGTON. 2012. Lesser-known indigenous languages of Northern Vietnam: Map & language descriptions. Retrieved February 7, 2012. <https://ling.uta.edu/~jerry/research/map.html>

- [19] HUIWEN XIANG, HUIWEN XIANG, YU QIN, MINGJING XIE, & BO ZHOU. 2022. Study on the “Space Gene” diversity of traditional Dong villages in the Southwest Hunan Province of China. *Sustainability Journal*, 14(21), 14306. <https://doi.org/10.3390/su142114306>
- [20] XIAOYUN LI, YU YANG, & YI LIU. 2017. Research progress in man-land relationship evolution and its resource-environment base in China. *Journal of Geographical Sciences*, 27(8): 899-924. DOI:10.1007/s11442-017-1412-6
- [21] LI SHANGYIN & SHI MENGLEI: DONG NATIONALITY STOCKADED VILLAGE BUILDING GROUP. 2023. Picturesque scenery of Dong village. The People's Government of Retrieved August 14, 2023. Hunan
- [22] SHUANG PU, LANGBO FAN, BO LIANG, & CHUANTENG HUANG. 2020. Comparative analysis of the structure and construction of the Central-Column Drum Tower and the “Hui” Type Drum Tower of Dong Nationality in the Southeast of Guizhou Province.
- [23] YING FAN. 2022. Interpreting the symbolic meaning of Dong Drum Towers—Taking Sanjiang Ma Fat Drum Tower as an example. *Open Access Library Journal*, 9(5), May 2022. Scientific Research: An Academic Publisher.