Exploring the Activation Pathways of Lingnan Water-System Cultural Genes in the Urban Regeneration of Jinwan District

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Abstract: In the Lingnan region, watercourses function not only as physical-geographical elements but also as repositories of rich historical memory and multifaceted cultural value. Based on the theory of cultural landscape genes, this study proposes that the cultural genes of Lingnan's water systems comprise three dimensions: "core regional symbols," "spatial carriers," and "reproduction mechanisms." The research demonstrates that, in the waterfront regeneration of Jinwan District, it is essential to leverage the existing water-network configuration and historic port symbols of Jinwan. By establishing waterside corridors and curating cultural–creative IP events, a systematic activation of the water-system cultural genes can be achieved, thereby infusing new vitality of "water culture" into the city's brand identity and its public spaces.
***Keywords*:** Lingnan water system; cultural genes; Jinwan District; activation pathways; urban regeneration

1. Introduction

Jinwan District, situated in the southwestern sector of Zhuhai City, historically developed a distinctive interlaced water-land pattern owing to its network of streams crossing Jinwan Bay and its port infrastructure [1]. In recent years, many locales have consciously excavated and re-enacted historical water-system symbols during waterfront renewals to reconstruct a city's "water culture" identity, integrating these symbols as core components of urban branding and public life [2]. Although Jinwan District's urban regeneration increasingly recognizes the cultural value of its waterfront spaces, it lacks a systematic study on the identification of "cultural genes" and the pathways for their activation [3]. Against this backdrop, the present paper aims to systematically extract the cultural genes of Lingnan water systems and analyze their activation pathways within contemporary regeneration practices in Zhuhai, thereby enriching regional cultural-landscape scholarship and formulating practicable activation strategies.

2. Theoretical Foundation

2.1 Cultural Landscape Gene Theory (CLGTS)

The concept of "cultural landscape gene" (Landscape Gene Theory) was first introduced by Professor Liu Peilin, emphasizing the extraction of cultural elements across three levels — "symbols, carriers, and structures" — to interpret the long-term co-evolution of humans and their environment [4]. In traditional settlements, these genes often manifest as toponyms, ancestral halls, or ancient bridges; within the urban context of Jinwan District, they extend to relics such as the former Hongqi Port site, the Bay Area Canal, and fishing raft wharfs.

2.2 Water-Culture Perspective in Jinwan District

Studies of water-culture in Jinwan District often concentrate on the conservation of waterfront spaces and leisure tourism, revealing the central role that water systems play in residents' collective memory and regional identity [5]. Amid rapid urbanization, the interpretation of water culture in Jinwan has transcended mere rural tourism development, increasingly integrating into the renewal of waterfront public spaces and the reshaping of urban lifestyles.

3. Three-Dimensional System of Lingnan Water-System Cultural Genes and Their Activation Pathways

3.1 From Core Regional Symbols to Spatial Embedding

Core regional symbols serve as vessels of cultural memory and anchor points for a city's brand image. They represent the "original texts" underlying historical recollection and communal identity, consolidating the community's collective imagination of their "waterborne homeland." Grounding all subsequent spatial designs and public activities in this foundational

"symbol pool" ensures conceptual fidelity. For instance, the "Pearl River Night Cruise," one of Guangzhou's most influential city-brand activities since the 1980s, fuses traditional riverside architecture with contemporary skyscrapers through nocturnal light shows, forging a singular "waterside-cultural" visual identity [6]. In Foshan's Shunde district, the former "Bijiaowei" water-village settlement now stages dragon-boat races—recognized as a national intangible cultural heritage—where the surrounding walled houses and ancient wharf remains have become natural stages for museums and festivals, thereby cementing water-village symbols in communal memory. Accordingly, Jinwan's authorities might reconstruct a "Tidal Observation Platform" at the former Hongqi Port site or install thematic sculpture plazas at fishing-raft landing points. Employing dynamic lighting and projection mapping to reenact tidal-festival scenes would realize the first step of translating symbols into spatial form.

3.2 From Spatial Carriers to Mechanism Extension

Symbols only "land" once embedded within physical space—through waterside promenades, coastal corridors, or waterfront cultural centers—acquiring tangible and participatory qualities. These venues facilitate direct engagement with water culture, forming cultural-scene nodes within the urban fabric. During the renewal of Dongguan's Humen Canal Cultural Belt, Qing-era trading wharfs were preserved and integrated into modern waterside walkways, where sculptural installations and interpretive panels recreate nineteenth-century maritime scenes, allowing visitors to "touch" port history as they stroll. At Zhaoqing's Seven Star Crags Scenic Area, newly added lakeside pavilions and viewing platforms blend natural karst formations with ancient corridor bridges; cultural galleries at corridor nodes use bas-reliefs and murals to narrate fishermen's legends, achieving a seamless fusion of landscape culture and public space [7]. After visitors gain immersive experiences along these promenades and corridors, the government can convert singular recreational visits into sustained cultural-consumption models by staging long-term dragon-boat races during the Dragon Boat Festival, organizing the Jinwan Seafood Festival, hosting floating-raft art markets, and curating boatmen-culture exhibitions—thus closing the reproduction loop from "space to mechanism."

3.3 From Reproduction Mechanisms to Regional Resonance

Spaces carry symbols while experiential activities embed these symbols in the public psyche. Jinwan District can employ festivals, cultural–creative IP development, and public-art performances to reactivate the preceding two layers. For example, developing a "Jinwan Fishermen's Song" IP — including handcrafted boat models and tidal-themed video exhibitions — combined with online streaming and offline workshops can replicate and disseminate the cultural genes more broadly. Guangzhou's Zhujiang New Town Riverside Plaza, using the "urban water axis" narrative, regularly hosts light shows and musical fountain performances, transforming "waterside culture" into contemporary public entertainment that attracts tourists and strengthens residents' emotional ties to river culture [3]. The Nanhai Dragon-Boat Museum, by curating exhibitions that brand dragon boats as a "mariner IP" and launching derivative cultural–creative merchandise alongside Dragon Boat Festival experience camps, forges deep linkages between traditional celebrations and modern tourism, thereby commercializing cultural-gene propagation. Moreover, IP and festival collaborations need not remain localized; during the Dragon Boat Festival or peak travel seasons, synchronized dragon-boat races or light festivals across Shunde, Nanhai, and Guangzhou can establish a cross-city "Lingnan Water-Rhythms Circle," drawing greater tourist flows and investment, and achieving regional resonance that synergizes cultural consumption with industrial linkage.

4. Results and Discussion

A literature review of exemplary Lingnan water-system regeneration cases confirms that Lingnan water-system cultural genes indeed conform to a three-dimensional system of "symbols–spaces–mechanisms." From this classification, three primary cultural-gene dimensions were identified: core regional symbols, spatial carriers, and reproduction mechanisms—each progressively activated in urban-regeneration practice. Core regional symbols provide cultural anchors; spatial carriers afford symbols with tangible venues; reproduction mechanisms ensure the sustained propagation of cultural genes.

These cultural genes not only forge a distinctive "waterside-culture" identity for Lingnan cities but also offer actionable pathways for public-space design and cultural heritage preservation. Future research might integrate cultural-gene analysis with ecosystem-service frameworks to explore an integrated "culture–ecology–society" model for Lingnan water-system spatial regeneration. Given this study's reliance on extant literature and public cases without first-hand interviews or fieldwork, sample limitations may have obscured subtle experiential nuances at the community level. Additionally, the multifaceted influence of cultural genes resists singular quantitative measurement; developing universal evaluation frameworks—such as a "Symbol Influence Index" or a "Cultural-Consumption Hotspot Map"—constitutes a promising direction for future inquiry.

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