



Pathways and Strategic Planning for Coastal Culture–Ecology Integration in Daishan, China

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Abstract Daishan County, located in the central Zhoushan Archipelago of eastern China, contains a diverse coastal landscape of tidal flats, rocky shores, village settlements, and fishing-based cultural resources. Its coastline is also under growing pressure from ecological fragmentation, uneven tourism development, limited cultural interpretation, and weak mechanisms for community participation. This brief report presents the principal findings and proposed actions of a 2025 social science project on the integration of coastal ecology and culture in Daishan. The project combined field observation, document review, comparative case study, and structured consultation with experts in coastal ecology, spatial planning, cultural tourism, and local governance. It found that long-term policy coordination and coastal ecological restoration are the main enabling conditions for integration; spatial connectivity and cultural conversion are the key links between resources and visitor experience; and community participation and local identity are the most important indicators of lasting benefit. The report proposes a development approach described as a “Slow Coast, Living Fishing Heritage,” centred on resilient coastal restoration, connected public spaces, culture-based experiences, community co-operation, and light-touch digital management. The report provides a practical framework for Daishan and other island communities seeking to balance environmental protection, cultural continuity, and local livelihoods.

Keywords Coastal governance, Island culture, Ecological restoration, Community participation, Cultural tourism

1. Introduction

Coastal areas are shaped by the interaction of ecological processes, settlement patterns, local economies, and cultural practices. This relationship is particularly pronounced in island communities, where shorelines support fishing and aquaculture, protect settlements from coastal hazards, influence local mobility, and provide settings for everyday life and cultural activity. Tidal flats, wetlands, coastal vegetation, and natural shorelines also contribute to biodiversity conservation, wave attenuation, environmental regulation, and climate adaptation [1-3]. These ecological functions underpin recreation, environmental education, cultural interpretation, and small-scale tourism.

Daishan County, located in the central Zhoushan Archipelago of Zhejiang Province, China, has a varied coastal environment comprising tidal flats, rocky shores, semi-natural waterfronts, artificial embankments, fishing villages, and adjacent nearshore waters. Its coastal landscape is closely associated with fishing livelihoods, maritime beliefs, salt-related traditions, vernacular settlements, local food culture, and seasonal festivities. Together, these resources provide a strong

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basis for a distinctive island-based cultural and tourism economy.

However, coastal development in Daishan remains uneven. Tourism activity is concentrated in a limited number of scenic and leisure sites, while many coastal spaces and cultural resources remain disconnected. Cultural heritage is often presented through static displays or occasional events rather than continuous and participatory experiences. In some locations, hard shoreline treatments, fragmented vegetation, and limited public access have weakened ecological continuity and reduced the visual and functional connection between villages and the sea. Local residents are involved in accommodation, catering, and tourism services, but their participation in planning, management, and benefit-sharing remains limited.

Research on sustainable coastal tourism suggests that the long-term quality and resilience of coastal destinations depend on the coordinated integration of environmental protection, cultural interpretation, and locally embedded tourism activities [4]. Studies of community-based coastal tourism further show that meaningful resident participation can strengthen local ownership, enrich visitor experience, and create more durable benefits for host communities [5]. These considerations are especially relevant in island settings, where limited land resources, ecological sensitivity, and reliance on local livelihoods make coordinated development essential.

Against this background, the Daishan project examined how ecological protection, spatial organisation, cultural activation, tourism development, and community participation could be integrated into a coherent coastal development pathway. It proposes a locally grounded approach described as “Slow Coast, Living Fishing Heritage.” The concept promotes low-impact and walkable use of coastal space while treating fishing culture as an active component of contemporary island life. It provides the basis for strengthening ecological resilience, improving visitor experience, and expanding sustained opportunities for local residents.

2. Materials and Methods

2.1. Study Area and Project Materials

This report is based on the 2025 Zhoushan Social Sciences Empowerment Action Project, Pathways and Strategic Planning for Coastal Culture–Ecology Integration in Daishan, China. The study covered Daishan’s principal natural shorelines, fishing villages, and adjacent nearshore area (Figure 1). The coastal system was treated as an interconnected social–ecological landscape rather than as a collection of separate environmental, cultural, or tourism resources.

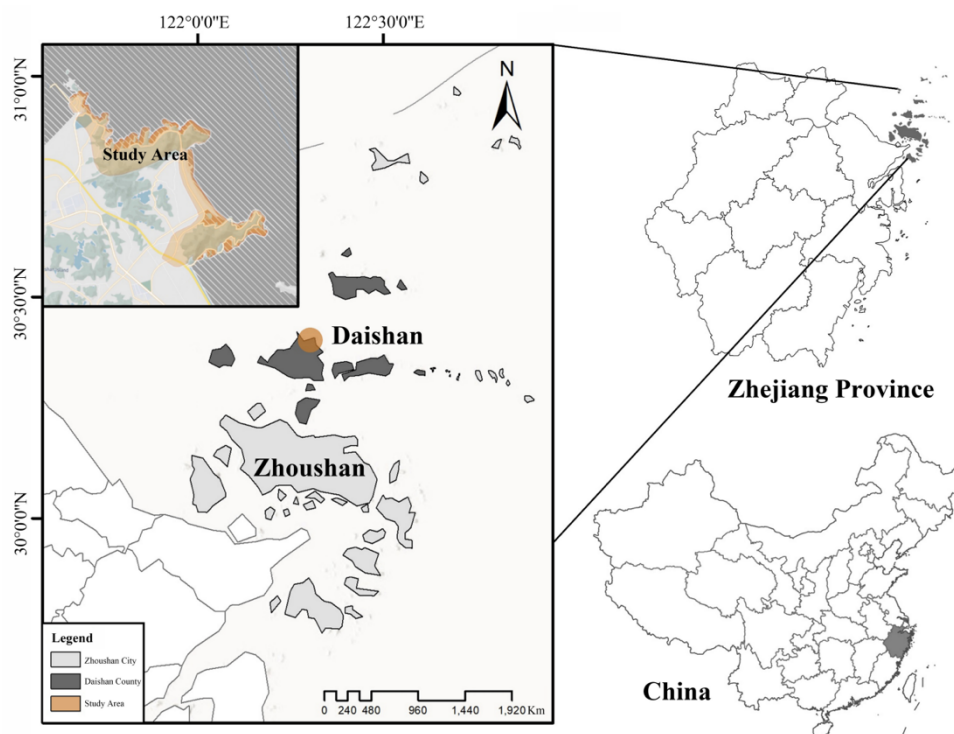


Figure 1. Study Area Analysis

The project drew on four sources of evidence. First, field investigation was undertaken to identify shoreline conditions,

ecological sensitivity, village–waterfront relationships, public accessibility, tourism facilities, and community activity spaces. Second, relevant planning documents, local development materials, cultural-resource records, and project information were reviewed to understand existing policies and ongoing initiatives. Third, selected island and coastal regeneration cases were examined to identify lessons relevant to Daishan, especially in ecological restoration, culture-led revitalisation, slow mobility, and community-based operation. Fourth, structured consultation was conducted with experts in coastal ecology, spatial planning, cultural tourism, and public governance.

2.2. Integrated Assessment Framework

The assessment covered six dimensions: ecological resources and resilience; land–sea spatial coordination; cultural experience and tourism integration; community participation and social benefit; governance and management; and investment and operational capacity. These dimensions were represented by 18 factors, including coastal ecological restoration, cultural authenticity, environmental carrying capacity, blue–green spatial connectivity, transport accessibility, cultural interpretation, tourism diversification, resident participation, local identity, policy support, cross-sector coordination, and long-term operational capacity. The assessment framework and factor set are summarised in Table 1.

Fifteen experts from coastal ecology, cultural tourism, spatial planning, and public governance participated in the assessment. An integrated AHP–DEMATEL–ISM–MICMAC framework (Analytic Hierarchy Process, Decision-Making Trial and Evaluation Laboratory, Interpretive Structural Modeling, Matrice d’Impacts Croisés Multiplication Appliquée à un Classement) was used to identify factor priorities, causal roles, hierarchical relationships, and driver–dependency characteristics. All comparison matrices met the accepted consistency threshold, with consistency ratios ranging from 0.024 to 0.081. The findings are interpreted here as a practical basis for coastal development and governance.

Table 1 Assessment Framework for Coastal Culture–Ecology Integration in Daishan

Primary factors	Secondary factors
1. Ecological Resources and Resilience (A1)	Coastal ecological restoration (C01) Cultural resource authenticity (C02) Environmental carrying capacity and resilience (C03) Blue–green spatial connectivity (C04)
2. Land–Sea Coordination and Spatial Planning (A2)	Transport facilities and accessibility (C05) Public-service space provision (C06) Island cultural IP conversion capacity (C07)
3. Cultural Experience and Tourism Integration (A3)	Diversification of cultural tourism products (C08) Digital empowerment and smart operation (C09) Resident participation and sense of gain (C10)
4. Community Co-operation and Social Well-being (A4)	Local identity and brand influence (C11) Social capital and enterprise collaboration (C12) Policy guidance and institutional safeguards (C13)
5. Policy Guidance and Governance Mechanisms (A5)	Cross-sector coordination mechanisms (C14) Talent support and knowledge investment (C15) Investment intensity and funding security (C16)
6. Economic Drivers and Funding Efficiency (A6)	Resource-use efficiency and output performance (C17) Operation, maintenance, and cost control (C18)

3. Results and Discussion

3.1. Ecological Resilience and Governance Are the Main Priorities

The assessment indicates that Daishan’s coastal culture–ecology integration should begin with ecological resilience and institutional coordination rather than with tourism facilities or short-term marketing initiatives. The global priority ranking of the 18 factors is shown in Figure 2. At the dimension level, ecological resources and resilience received the highest weight of 0.245, followed by governance and management at 0.212 and cultural experience and tourism integration at 0.178. Spatial coordination, community participation, and economic capacity also remained relevant, but received lower relative weights in the assessment.

At the factor level, policy guidance and institutional safeguards were ranked first, with a global weight of 0.110. Coastal ecological restoration followed closely with a weight of 0.103. Cultural authenticity, cultural conversion capacity, blue–green spatial connectivity, and cross-sector coordination were also highly ranked. This pattern suggests that Daishan should not

begin by expanding tourist attractions or adding conventional waterfront amenities. Its first task is to establish a stable governance framework and strengthen the ecological base of the coast.

Policy guidance is particularly important because coastal development in Daishan involves multiple departments and multiple scales of action. Coastal protection, ecological restoration, village renewal, fisheries, tourism, transport, public facilities, and cultural programming often operate through separate administrative channels. Without coordination, individual projects may be reasonable in isolation but inconsistent at the landscape scale. Ecological restoration may be disconnected from tourism planning, cultural activities may have no relationship to public-space investment, and community participation may be introduced only after major decisions have already been made.

Coastal ecological restoration is equally significant. Tidal flats, vegetation belts, wetland patches, and natural shorelines are not simply environmental assets to be protected at the edge of development. They are the physical foundation for public access, nature education, coastal recreation, and cultural interpretation. Where shoreline habitats are fragmented or heavily engineered, the opportunity to build a distinctive coastal experience is reduced. The project therefore recommends that restoration be integrated with public-space improvement, rather than treated as a separate environmental programme.

AHP Global Weight Analysis: Ranking of Factor Importance

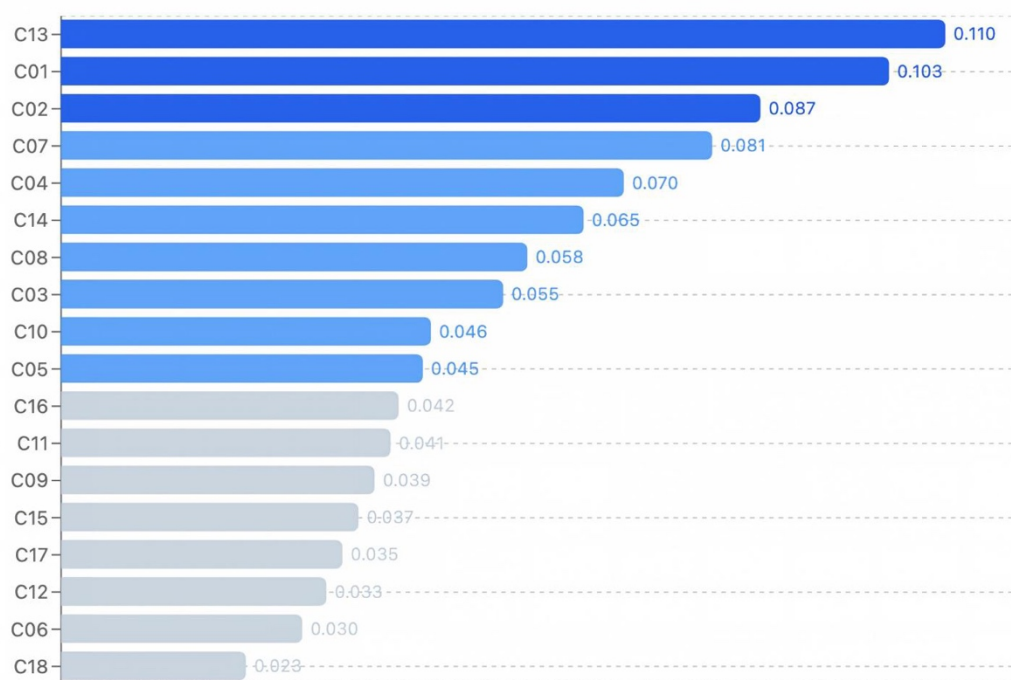


Figure 2. Global priority ranking of factors influencing coastal culture–ecology integration in Daishan

3.2. Development Follows a Clear Driver–Linkage–Outcome Sequence

The causal analysis further clarifies how coastal culture–ecology integration should proceed. The cause–effect distribution of the factors is presented in Figure 3. Policy guidance and institutional safeguards had the highest centrality score of 11.43 and the highest positive cause score of 2.85. Cross-sector coordination ranked second in cause strength, with a score of 2.42, followed by coastal ecological restoration at 1.88. These factors serve as the main drivers of the system because they influence other conditions while depending relatively little on them.

The analysis also demonstrates that community participation and local identity are mainly outcome factors. Resident participation and sense of gain had the strongest negative cause score, at -2.15, indicating that they depend on improvements elsewhere in the system. Local identity and brand influence also appeared as dependent outcomes. This does not mean that community participation is unimportant. On the contrary, it shows that community benefit is the ultimate test of whether governance, ecological restoration, spatial connectivity, and cultural programming have worked together.

DEMATEL Cause–Effect Distribution: Centrality versus Causal Influence

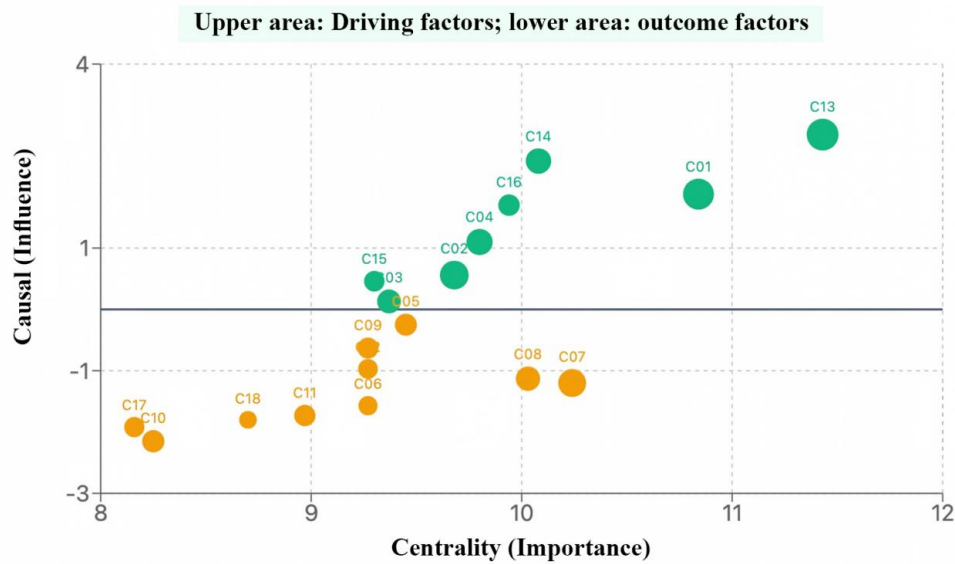


Figure 3. DEMATEL cause–effect distribution of factors influencing coastal culture–ecology integration in Daishan

This finding has direct practical implications. Daishan’s coastal transformation cannot rely on isolated pilot projects alone. A village cultural centre, a new walking route, or a seasonal event may attract short-term attention, but such interventions will remain fragmented without ecological restoration, stable funding, and coordinated management. The project therefore identifies policy coordination, ecological restoration, and investment capacity as the first layer of action.

The hierarchical relationships among the principal factors are further illustrated in Figure 4. The ISM analysis confirms that governance and ecological conditions form the underlying structure of the system, while spatial connectivity, accessibility, and cultural conversion operate as intermediate links between foundational investment and development outcomes.

ISM Hierarchical Structure (Recursive Reachability Model)

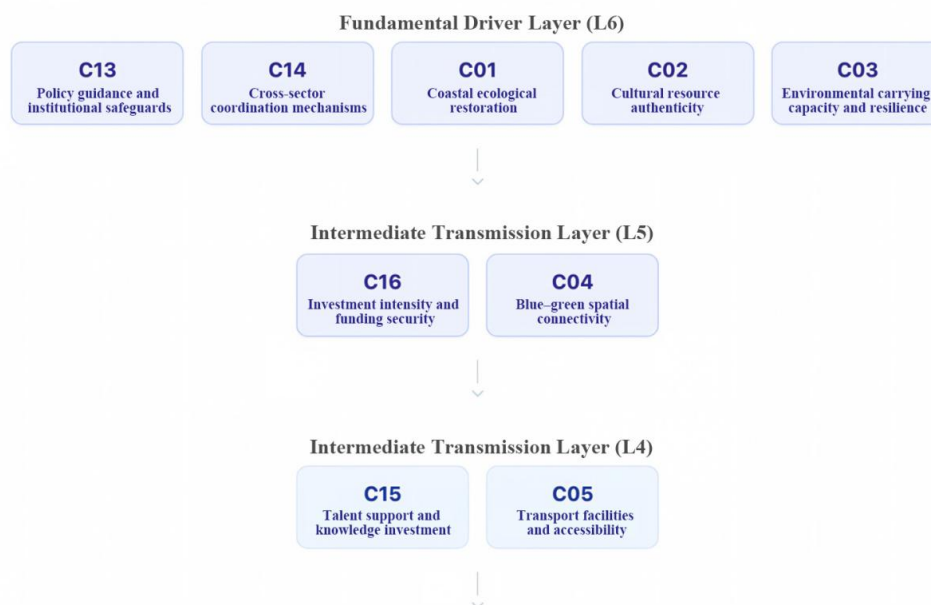


Figure 4. ISM hierarchical structure of factors influencing coastal culture–ecology integration in Daishan

MICMAC classification further distinguishes the management roles of the factors (Figure 5). Policy guidance and institutional safeguards (C13), cross-sector coordination (C14), coastal ecological restoration (C01), and investment intensity and funding security (C16) are independent factors with high driving power and relatively low dependence. These factors require stable institutional support and sustained investment. Blue–green spatial connectivity (C04), transport accessibility (C05), cultural conversion capacity (C07), and tourism diversification (C08) are linkage factors. They are highly sensitive because they both influence and depend on changes elsewhere in the system, making them important leverage points for planning and implementation. Resident participation and sense of gain (C10), local identity and brand influence (C11), resource-use efficiency (C17), and public-service space provision (C06) are dependent factors, reflecting the eventual performance of the wider system. Operation and maintenance (C18), talent support (C15), and environmental carrying capacity and resilience (C03) are relatively autonomous factors that can be adjusted according to specific project conditions.

② MICMAC Driver–Dependence Quadrant Analysis

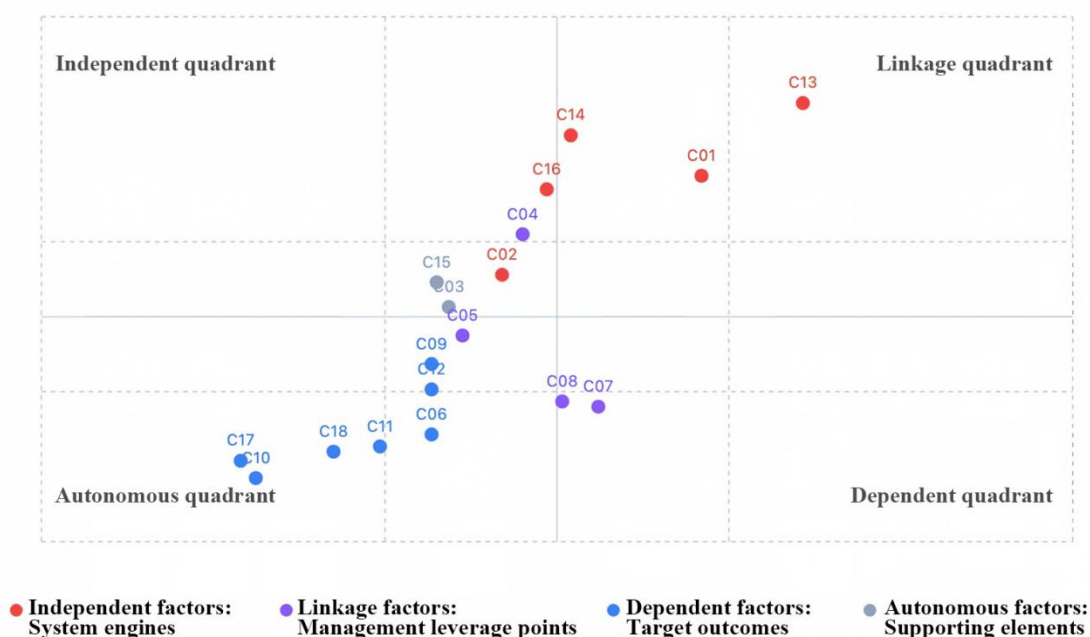


Figure 5. MICMAC Driver–Dependence Quadrant Analysis

Overall, the integrated analysis indicates that coastal culture–ecology integration in Daishan follows a progressive development logic. Governance and policy support provide the institutional basis for action, while ecological restoration establishes the environmental foundation. Spatial connectivity, accessibility, and cultural conversion then connect coastal resources, villages, and public spaces, creating conditions for local culture to be translated into accessible experiences and products. These combined efforts ultimately strengthen community participation, local identity, and shared benefits. This sequence is consistent with the project principle of treating ecology as the foundation, culture as the core, and community benefit as the intended outcome.

3.3. From Ecological Space to Cultural Experience

The analytical findings are translated into a development approach described as “Slow Coast, Living Fishing Heritage.” The approach moves coastal development away from rapid sightseeing, isolated projects, and standardised resort facilities towards a slower, place-based experience that connects ecological landscapes, fishing villages, cultural sites, and public spaces.

“Slow Coast” promotes low-impact movement and longer stays through walking, cycling, short-distance public transport, and carefully managed nearshore activities. Coastal walking routes, cultural exploration routes, and selected nearshore routes should link tidal landscapes, village waterfronts, scenic points, community spaces, and small cultural venues. Their effectiveness depends on safe, comfortable, and well-interpreted access to both coastal landscapes and village life.

The spatial strategy distinguishes among three interconnected areas: core experience areas for cultural activities, visitor services, education, and managed events; ecological buffer areas for habitat protection, low-intensity access, and

environmental interpretation; and community interaction areas for everyday life, local food, homestays, small businesses, and public services. Ecological restoration should be integrated into this framework through habitat conservation, shoreline recovery, wetland restoration, and vegetation continuity. Where appropriate, low-impact facilities such as boardwalks, viewing points, and nature-education spaces can improve access without undermining ecological functions.

“Living Fishing Heritage” treats local culture as an active part of everyday island life. Fishing traditions can be incorporated into village routes, food spaces, workshops, education programmes, and seasonal events. Underused houses and former production spaces may support small interpretation centres, craft workshops, community kitchens, and marine education activities. Experiences such as net-making, seafood processing, tide observation, storytelling, and local food workshops should be led or co-led by residents. A year-round programme combining fishing traditions, marine education, outdoor recreation, local food, village markets, and quieter winter activities can reduce dependence on a single tourism season and support more stable community-based businesses.

3.4. Community Co-operation and Operational Safeguards

The final stage of the pathway concerns community participation and long-term operation. Local residents are the long-term users and custodians of the coast. They possess practical knowledge of fishing grounds, weather, tides, village customs, food traditions, and cultural memory. Their involvement should therefore extend beyond basic tourism services.

The project recommends a community co-operation model involving village collectives, residents, local government, and market operators. Village collectives may participate in public-space management, venue operation, parking management, event organisation, and local branding. Residents may contribute houses, land, skills, stories, food, craft practices, guiding services, or environmental stewardship. Market operators can provide investment, marketing, quality management, and operational expertise, but should work within ecological limits and community agreements.

A transparent benefit-sharing mechanism is essential. Co-operative shareholding arrangements can enable village collectives and residents to participate in tourism and cultural projects through the contribution of sites, buildings, use rights, labour, or local knowledge. Revenue should support both individual livelihoods and collective priorities, including public-space maintenance, cultural activities, environmental management, and services for older residents and children.

The project also proposes a “smart platform + community co-operation + long-term safeguards” model. A lightweight digital platform could provide booking services, route information, tide alerts, parking guidance, visitor-flow monitoring, event calendars, ecological warnings, and resident feedback channels. Its role should be practical rather than decorative. It should help managers prevent overcrowding, improve safety during extreme weather, and provide small local businesses with greater visibility.

Implementation should proceed in stages. The initial stage should focus on ecological sensitivity assessment, governance arrangements, pilot restoration, cultural-resource mapping, and community training. The second stage should develop walking routes, public-service nodes, small cultural venues, and community-operated experiences. The third stage should connect coastal nodes, village spaces, low-carbon mobility, cultural branding, and digital services into a wider coastal network.

Risk management should be integrated into every stage. Extreme weather requires early-warning systems, evacuation procedures, safe shelters, and post-disaster recovery plans. Tourism overload should be addressed through timed booking, visitor caps, route dispersal, and real-time monitoring. Funding risks should be reduced through phased investment, public funds, social capital, co-operative participation, and reinvestment of operating income.

4. Conclusion

This brief report shows that coastal culture–ecology integration in Daishan should not be understood as a simple combination of ecological restoration and tourism development. It is a structured process in which governance, ecological resilience, spatial connectivity, cultural activation, and community benefit depend on one another.

The assessment identifies policy guidance, cross-sector coordination, and coastal ecological restoration as the principal drivers of change. Blue–green connectivity, transport accessibility, cultural conversion capacity, and diversified tourism products are the key factors that translate resources into public and economic value. Resident participation, local identity, and shared benefits are the longer-term outcomes through which the success of the overall system should be judged.

The proposed “Slow Coast, Living Fishing Heritage” pathway provides a practical way to connect these elements. It supports nature-based shoreline restoration, slower and more connected coastal movement, active interpretation of fishing culture, community-based operation, and light-touch digital management. Rather than relying on high-intensity construction or isolated tourism attractions, the pathway focuses on improving the ecological quality of the coast, strengthening everyday public spaces, and enabling local residents to participate in and benefit from development.

For Daishan, the most important task is to ensure that ecological restoration, cultural experience, spatial planning, and community livelihoods are implemented as parts of one coordinated system. This approach can help the county develop a coastal model that is environmentally resilient, culturally distinctive, and locally grounded. It may also provide a useful

reference for other island and coastal communities facing similar challenges of ecological pressure, cultural fragmentation, and uneven local benefit.

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