

# FROM BOATS TO BUILDINGS: THE IMPACT OF URBANIZATION ON MALAY SETTLEMENT IN PULAU DUYONG, TERENGGANU

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## ABSTRACT

*This study examines the socio-economic and cultural impacts of urbanization on Pulau Duyong, Terengganu, traditionally known for its boat-making industry. The research aims to understand how infrastructure growth, land reclamation, and improved access have transformed the island's physical and socio-economic landscape. Using historical analysis, surveys and observations, the study finds that urbanization has expanded educational and healthcare facilities and economic prospects while reducing traditional trades and causing youth migration. The study also explores eco-tourism and cultural tourism as potential solutions for maintaining local industries and preserving Malay cultural identity. This study demands united efforts between sustainable development approaches to create an equilibrium between Malay economic expansion and community preservation. Recommendations focus on promoting eco-tourism, investing in sustainable infrastructure, supporting traditional trades, developing educational programs, and engaging the Malay community in planning processes in the future.*

**Keywords:** Cultural preservation, Eco-tourism, Socio-economic impacts, Urbanization



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## **INTRODUCTION**

The pace of urbanization is a fundamental transformation of the 21st century that transforms both geographic terrain and the way society's function and cultures evolve globally. The worldwide population expansion, specifically in developing countries, drives cities to grow rapidly. The United Nations Population Fund (UNFPA) anticipates that global population numbers will increase from 6.1 billion in 2001 to 9.3 billion by 2050 while developing countries will host more than 60% of this population growth in their urban centers (United Nations, 2021). The pace of urban development in Southeast Asia particularly affects Malaysia through strong impacts on Malay local communities and their traditional way of life.

The urban landscape of Malaysia demonstrates a special balance between economic progress and cultural heritage. The emergence of Kuala Lumpur and Penang as megacities shows a dual trend of increasing skyscrapers and growing economic development (Jong et al., 2018). The modernity of Malaysian society conceals multiple challenges for Malay communities because their traditional customs, farming ways, and cultural traditions face serious threats. The expanding urban landscape that enters rural territory creates multiple critical problems, including forced population movement and destroyed agricultural fields, which damage local cultural traditions (Nadarajah et al., 2017; Kamaruddin, 2019; Abdullah et al., 2022). This transition has come under serious scrutiny about the sustainability of urban development in Malaysia. Population growth means that the growing cities need affordable housing, adequate public services, and infrastructure development (World Bank, 2022). Rising property prices and gentrification push Malay families into an ever-widening housing disadvantage that cleaves the urban affluent from economically marginalized groups (Tan et al., 2020; Shamsuddin et al., 2021). Due to larger social inequalities and social stratification (Khan et al., 2021; Lau et al., 2018), new settlements without adequate infrastructure have proliferated rapidly in cities. Urbanization causes profound cultural changes on top of its other effects. Urban development projects by Malay communities result in the dissipation of historically significant cultural sites. As such, modern urban development in Kampung Baru Kuala Lumpur illustrates this battle between pursuing modern development and defending historic communal roots and cultural identity (Mustafa et al., 2020; Bakar et al., 2019). Urban growth leads to

pressing development challenges for urban communities, requiring that dialogues incorporating community voices into planning decisions be implemented immediately (Abdullah et al., 2022). In order to bring together both the preservation of cultural heritage and meeting population growth needs through inclusive practices, policymakers and urban planners need to rethink and revisit the ways development is pursued (Ramli, 2021; Ahmad & Wong, 2022). The increasing discourse of sustainable urban development seeks to bridge the tension between socio-economic development needs and the preservation of community identity and ecosystems (Lechner, 2020). According to urban design from the Congress for New Urbanism (CNU), mixed-use neighborhoods and walkable streets support social contacts and protect ecological systems (CNU, 2023). By adopting such principles, Malaysian urban areas will gain sustainable growth without sacrificing culture (Nor et al., 2019). This research aims to examine the impact of rapid urbanization on the realization of sustainable planning approaches that incorporate cultural heritage and social equity for the Malaysian Malay community. The study examines the modern patterns along with challenges for development and discusses various concepts of inclusion to promote adequate urban growth processes that consider human and environmental communities (Smith & Brown, 2024; Zainuddin & Khairuddin, 2019).

## **Urbanization on Duyong Island, Terengganu**

Pulau Duyong, located in Terengganu, Malaysia has been selected as a case study to examine these impacts. The island, traditionally known for its boat-making industry, has undergone significant changes, due to pace of urbanization. This study aims to understand how infrastructure growth, land reclamation, and improved access have transformed the island's physical and socio-economic landscape.



**Figure 1. The Map of Pulau Duyong, Kuala Terengganu**

Source: Author, 2025

Located in Terengganu, Malaysia, Pulau Duyong began its urbanization and sociological changes under the late 19th century British colonialism (Figure 1). Pulau Duyong developed into an administrative center, bringing infrastructure, economic activities, and population diversification. During colonial rule, the establishment of land policies worked against the Malay community while breaking down their established land tenure practices (United Nations, 2022; Hussin, 2013; Khalid, 2016). After independence, Pulau Duyong witnessed rapid urban growth driven by government modernization efforts (Aziz, 2021). The expanding economy transitioned the local economy from agricultural production to various industries, opening up new business opportunities, yet many Malays maintain traditional occupations such as fishing (World Bank, 2020; Chua, 2023). The fishing industry is a core cultural and economic element that formed Pulau Duyong's historical development (Lee, 2019; Kong, 2020). The island's strategic location at the mouth of the Terengganu River made it suitable for fishing. Over time, boat building became a major cultural practice, with skilled craftsmen constructing durable boats without nails (Shamsuddin, 2011; Loh, 2019). This traditional practice and annual fishing festivals celebrate Pulau Duyong's fishing heritage and strengthen community bonds (Hassan, 2021). However, the fishing industry faces major challenges from urbanization, environmental degradation, pollution, overfishing, and the exodus of young generations from fishing (Kong, 2020; World Bank, 2020). Despite external pressures, the fishing heritage faces preservation initiatives that document boat-building methods and promote environmentally responsible fishing practices (Fauzi & Osman, 2022). The urbanization process has created conflicts regarding Malay Reserve Land ownership rights, according to the International Land Coalition (2021). The worsening tension between developers and local people has become more severe due to development projects and land encroachment, requiring new land policies for resident rights protection (UN, 2021; Fauzi & Osman, 2022). The economic difference between traditional and modern sectors creates substantial challenges for cultural preservation projects (Aziz, 2021). Eco-tourism and cultural tourism initiatives developed by local communities provide sustainable methods to protect the cultural heritage of Pulau Duyong against modernization and urban migration threats (Hassan, 2021). The island's cultural heritage skills and traditional practices should be handed down to upcoming generations through this dual approach that satisfies economic development requirements while fixing social inequality

(Chua, 2023; Khalid, 2016; Shamsuddin, 2011).

Urbanization has brought major physical and economic changes to Pulau Duyong in Terengganu. Pulau Duyong used to maintain a boat-building industry. However, its cultural and economic landscape has changed due to urbanization, resulting from sedimentation, infrastructure development, and land reclamation projects. The combined island of Pulau Duyong Besar and Pulau Duyong Kecil now connects more easily to the mainland through the Sultan Mahmud Bridge, providing better access to urban facilities and economic resources (Ismail, 2017; Karim & Zawawi, 2019). Urbanization has improved resident lives through better services, including education and healthcare. However, it demands new challenges for residents. The traditional boat-making business that sustained local economic growth has diminished because the younger generation pursues improved opportunities in urban areas (Koh, 2020). Traditionally practiced art forms face severe decline because fewer artisans remain to carry the craft forward (Mohamed & Mohamad, 2018). Modern infrastructure has created environmental changes on the island by causing land encroachment, polluting the environment, and destroying natural habitats, diminishing the island's aesthetic value (Omar & Zakaria, 2021).

Urbanization has brought positive and negative effects on the socio-economic conditions of Pulau Duyong. The establishment of new infrastructure alongside tourism sector development opened the gates to economic possibilities (Ng & Tan, 2016). Salleh (2019) demonstrates how eco-tourism combined with cultural tourism enables the maintenance of local industries and cultural preservation through economic growth benefits. The island faces two major challenges: urban youth migration and local culture commercialization (Zaini, 2020). Economic inequality is worsening because modern economic opportunities work favorably for individuals who adapt. Nevertheless, traditional industry workers experience financial struggles (Chong, 2018). Urban development and cultural preservation balance require integrating cultural heritage into development plans (Ahmad & Shamsudin, 2017). Through eco-tourism and cultural tourism, the traditional crafts on the island can secure economic sustainability. Nonetheless, festivals and cultural events help unite the community and enhance local identity (Rashid 2020). Establishing cultural heritage sites and interactive exhibitions serves two purposes: it raises awareness about the island's historical background.

It allows artists to display their artistic talents (Samsudin, 2017).

In conclusion, the urban development of Pulau Duyong brings forth both beneficial aspects and difficulties that need to be addressed. The advancement of modern development has increased living standards but simultaneously caused the disappearance of traditional businesses alongside cultural customs. Sustainable urban planning, along with other initiatives like eco-tourism and promoting local craftsmanship to protect cultural heritage and, at the same time, traditional practices while accompanying modern development plans, must be safeguarded. Pulau Duyong's sustainable approach will protect against the different urbanization pressures that could potentially erase the region's traditional cultural heritage (Tan, 2019; Abdullah et al., 2022).

## **RESEARCH METHODOLOGY FOR UNDERSTANDING THE DEVELOPMENT OF PULAU DUYONG**

This paper calls for a multidisciplinary approach to the socio-economic, cultural, and environmental transformation of Pulau Duyong. The types of methodologies employed — historical analysis, survey research, mixed methods approaches, and observational techniques — provide a broad framework for examining these complex developments. Using this case study approach can help demonstrate how these methods function in practice by providing a nuanced understanding of the island's transformation from colonial settlement to contemporary community.

Historical studies are important in providing knowledge on how the social and economic degeneration that characterizes Pulau Duyong came to be via the colonial modes of governance that underlie the causes. The growth of cash crops and tin mining operations under British colonial programs transformed land usage and impacted settlement patterns as well as economic systems in the region. Archival documents, government records, and oral histories examined by researchers let them reconstruct the lasting impact these policies had on the development of villages. The historical record shows that colonial effects continue to shape present-day difficulties and possibilities for Pulau Duyong, revealing knowledge about the basic economic and social village framework. Through survey

research, scientists gather quantitative information about population changes, migration movements, and public opinions in the community. The surveys of Pulau Duyong yield useful information regarding how demographic patterns, including urban migration of younger people, impact local economic activities and community solidarity. Surveys generate vital insights about residents' opinions regarding infrastructure changes and employment trends, which develop concrete recommendations for future growth. The method allows researchers to discover wider community patterns that support the development of strong policy recommendations. Ethnography serves as a qualitative approach that requires extensive field studies to research community practices as well as cultural customs and social relationships among people. When attending community-based festivals and family functions, ethnographic researchers going to Pulau Duyong can observe how residents balance cultural heritage preservation and modern development. This allows for a better understanding of how community members maintain social bonds and traditions to navigate changes in infrastructure and economy. Researchers can gain direct observations of resident life through ethnographic research, which would describe how Pulau Duyong residents navigate a fine balance between cultural heritage and economic development.

Using mixed methods analysis, researchers combine quantitative survey data and qualitative information to form comprehensive longitudinal accounts of community patterns. In these and other complicated contexts, the approach can prove useful. Surveys produce statistical economic information about tourism. However, in-depth interviews and focus groups provide personal stories and reflections regarding cultural and social change. Such hybridization in the lines of research enables scientists to build a coherent vision of the impacts of modernization in various niches of their communities. Methods of observation produce qualitative information instantly on social behaviour and the way community members interact. Because resident interactions with and perceptions of their environment are key to assessing anthropogenic effects, researchers on Pulau Duyong should consider daily life activities in addition to public events and meetings. This method makes the informal social systems that constitute local governance observable and allows researchers to track cultural adaptations to modernization trends. By adopting the case study method, researchers are able to combine research strategies and develop a comprehensive



account of Pulau Duyong's transformations. Scientists study the evolution of fishing villages into modern settlements: parting ways with traditional growth methods yet maintaining and connecting the original culture through a combination of historical analysis, survey research with ethnography, and observation. The integrated methodology allows researchers to comprehensively examine changes in community-built environment features alongside residential life in the community. As a result, a comprehensive understanding of Pulau Duyong's development can be achieved by applying a combination of historical analysis, survey, ethnography, mixed methods, and observation.

### **Analysis in Comparative Study of Key Themes in the Socio-Economic Development of Pulau Duyong**

Located in Pulau Duyong, it is used as a research site that analyses multiple socio-economic elements within the seven different aspects, namely, Colonial Legacy, Post-War Dynamics, Community Cohesion, Demographic Change, Re-composition of Search Points, and Sustainability Trends. Each of these themes is a major influence on the present and future development path of the island. This research confirms the main findings and offers strategic directions and ways of study regarding these subjects (Table 1).

#### **Colonial Legacy and Post-War Dynamics**

Table 1 explores how British colonial policies shaped the socio-economic structures of Pulau Duyong through the introduction of cash crops and tin mining. Historical analysis is implemented to understand these long-lasting effects on Malay settlement pattern and economic practices. Survey research provides quantitative data on population growth and infrastructure development during the post-war era, highlighting shifts from subsistence agriculture to diversified economies. The combination of historical analysis and survey helps to reveal how colonial and post-war dynamics continue to influence the island's development.

When the British colonized Pulau Duyong, they radically transformed the local socio-economic structure through cash crops and tin mining. These economic activities significantly altered how the land was utilized and



where people chose to settle, establishing the foundations for the current island’s economic activities. The economic patterns initiated in colonial times, such as tin extraction and agribusiness, shaped economic activities that have persisted into the present. It can be said that what happened in the island’s past still dictates the manner in which people live, build their communities, manage their finances, and develop their budget for life processes in the present and the future. Development strategies need to be studied widely to determine how the colonial era land use and mining policies impacted current-day development. Historical knowledge can be applied to modern-day urban development strategies. Researching past land use patterns should play a foundational role.

World War II brought significant growth and expansion to the post-war dynamics, and the Post-War Dynamics featured major infrastructure improvements. The economy began to move away from subsistence farming and into other sectors of the economy that drove industrial and service growth. After the war, many communities improved their road networks and utility services, which improved living standards and increased connectivity between places. A sustainable economic system was established in Pulau Duyong as new industries emerged and the local economy shifted from agriculture to industry. The focus of future development should combine infrastructure support that fulfills local requirements with sustainable growth initiatives through industrial transformation and sectoral diversity.

The socio-economic structure of Pulau Duyong experienced major changes after the Colonial Legacy and Post-War Dynamics. However, the colonial period emphasized resource extraction and land management. At the same time, the post-war era brought diversity to infrastructure and economic development. However, both periods contributed to the island’s long-term economic resilience, suggesting that future development should consider historical and modern factors in policymaking.

**Table 1. Comparative Study: Colonial Legacy and Post-War Dynamics**

Aspect	Colonial Legacy	Post-War Dynamics
Key Insights	British colonial policies shaped socio-economic structures, introducing cash crops and tin mining.	Post-war population growth and infrastructure development shifted from subsistence agriculture to more diversified economies.

Implications	Altered settlement patterns, transformation in economic practices.	More diversified economy; infrastructure improvements.
Strategies for Future Development	<ul style="list-style-type: none"><li>- Review historical land use and mining impacts on modern development.</li><li>- Incorporate historical knowledge in urban planning.</li></ul>	<ul style="list-style-type: none"><li>- Support infrastructure development with a focus on local needs.</li><li>- Promote sustainable urbanization strategies for long-term growth.</li></ul>
Research Methodologies	<ul style="list-style-type: none"><li>- Historical analysis of archival records and documents.</li><li>- Qualitative analysis of oral history from local elders.</li></ul>	<ul style="list-style-type: none"><li>- Comparative case study with other post-war communities.</li><li>- Economic analysis using national census data.</li></ul>
Impact on Local Economy	Introduction of cash crops and tin mining had long-lasting effects on local economic practices.	Shift from subsistence agriculture to a more industrialized, service-oriented economy.
Community Adaptability	New economic activities led to altered community dynamics, including settlement patterns.	Infrastructure growth and diversification allowed for community adaptability and modernization.

Source: Author, 2025

Community Cohesion and Demographic Change

Table 2 examines the strong kinship ties and social networks that preserve cultural identity amidst external influences. Participant observation of local festivals and events provide insights into how community cohesion is maintained. These qualitative methods allow for a deeper understanding of how cultural practices and community events strengthen local heritage and protect against the erosion of local values. These data provide quantitative insights into the impact of younger generations migrating to urban areas. This migration creates demographic shift that blend traditional and modern values, posing challenges to community cohesion.

Community Cohesion in Pulau Duyong exists due to its powerful family relationships and social connections, which sustain cultural identity against outside forces. The community uses traditional festivals, social gatherings, and ceremonies to preserve local heritage, ensuring cultural sustainability. The cultural practices of Pulau Duyong act as resistance against external cultural influences that stem from modernization and urbanization. The preservation of cultural heritage depends on active community participation

for its future development. Local artists, entertainers, and cultural activities should receive support from the community to help preserve the cultural heritage of Duyong Island and allow it to meet present needs. The population of Pulau Duyong undergoes substantial demographic changes due to major migration patterns that affect especially young residents. Rural populations across Pulau Duyong have diminished significantly because many young people migrated to urban areas for improved job prospects. The island's social structure underwent changes because its population relocated, leading to the combination of traditional and modern cultural values. Young people who migrate to Pulau Duyong bring urban values that might threaten traditional practices because of their values, which change how a community practiced maintaining coherence. These demographic changes necessitate community-based retention efforts, as well as economic opportunities that will draw migrants back into rural areas and balanced development investment of urban over rural population centers. Migration directly affects community identity and social cohesion related to Community Cohesion and Demographic Change. The challenge for Pulau Duyong lies in bridging the generation gap between those who stay behind and those who migrate, ensuring that cultural identity is preserved while embracing modernity (Table 2).

**Table 2. Comparative Study: Community Cohesion and Demographic Changes**

Aspect	Community Cohesion	Demographic Changes
Key Insights	Strong kinship ties and social networks preserve cultural identity amidst external influences.	Younger generations are migrating to urban areas, creating demographic shifts.
Implications	Cultural practices, and community events strengthen local heritage, protecting against the erosion of local values.	Changing social fabric with younger generations blending traditional and modern values.
Strategies for Future Development	<ul style="list-style-type: none"><li>- Foster community engagement in cultural preservation.</li><li>- Support local artisans and performers.</li></ul>	<ul style="list-style-type: none"><li>- Develop youth programs to retain younger generations.</li><li>- Address the rural-urban migration gap with targeted incentives.</li></ul>
Research Methodologies	<ul style="list-style-type: none"><li>- Ethnographic studies of local community interactions.</li><li>- Participant in observation of local festivals and events.</li></ul>	<ul style="list-style-type: none"><li>- Survey of migration patterns and demographic data.</li><li>- Longitudinal study on population changes.</li></ul>

Impact on Cultural Identity	Resilience of community identity helps protect against the erosion of local values.	Aging population in rural areas leads to a potential loss of community cohesion.
Community Sustainability	Strong kinship networks and festivals sustain cultural pride.	Potential imbalance in community dynamics due to the aging rural population and migration.

Source: Author, 2025

### Livelihood Diversification and Sustainability Trends

Table 3 examined through case studies of local business in tourism and agriculture. This method provides detailed insights into how the island’s economy has shifted from agriculture to more diversified sectors, including tourism, education, and services.

Diversification of livelihoods is one of the key outcomes of the economic evolution of Pulau Duyong. Originally dependent on agriculture, the island has shifted towards a more diversified sector, including tourism, education, and services. This diversification has reduced the island’s reliance on a single sector and increased economic resilience. Tourism growth provides fresh business opportunities across hospitality establishments, the education system, and the retail industry. The economic transition introduced new management issues about balancing development and cultural heritage protection. The implementation of sustainable tourism models should be a priority because economic growth must not destroy cultural heritage or harm the environment. Local entrepreneurs in the tourism and technology sectors need development to help establish diverse economic opportunities. The Sustainability Trend evolved due to escalating environmental concerns, global eco-conscious behaviors, and changing patterns of livelihoods. Pulau Duyong places a growing emphasis on sustainable agricultural farming techniques and responsible tourism operations, which protect its existing natural resources. The long-term development of tourism agriculture and construction requires the implementation of sustainability practices. People from communities actively participate in sustainable initiatives, including waste management and resource conservation projects. The global sustainable development wave creates a path for Pulau Duyong to emerge as an eco-tourism and sustainable development leader. The meeting point of biodiversity and sustainability trends proves essential for Pulau Duyong’s future development. Pulau Duyong needs economic

diversification strategies that support sustainable operations that protect the environment and stimulate economic development. Pulau Duyong can build an economically sustainable future through environmental-friendly agricultural practices and tourism activities that will help the local people and the ecosystem (Table 3).

**Table 3. Comparative Study: Diversification of Livelihoods and Sustainability Trends**

Aspect	Diversification of Livelihoods	Sustainability Trends
Key Insights	A shift from agriculture to a diversified economy, including tourism.	Growing emphasis on environmental sustainability, aligning with global eco-conscious practices.
Implications	Economic resilience and broader livelihood opportunities, reducing dependence on a single sector.	Commitment to preserving natural resources while balancing economic growth with environmental concerns.
Strategies for Future Development	<ul style="list-style-type: none"><li>- Encourage local entrepreneurship in the tourism and tech sectors.</li><li>- Develop sustainable tourism models that protect local culture.</li></ul>	<ul style="list-style-type: none"><li>- Integrate eco-friendly practices in agriculture, tourism, and construction.</li><li>- Create educational campaigns to encourage sustainable habits.</li></ul>
Research Methodologies	<ul style="list-style-type: none"><li>- Case study of local businesses in tourism and agriculture.</li><li>- Mixed-methods approach combining qualitative interviews and economic analysis.</li></ul>	<ul style="list-style-type: none"><li>- Environmental impact assessments and sustainability audits.</li><li>- Surveys of local environmental practices and behavior.</li></ul>
Impact on Local Economy	New opportunities in hospitality, education, and retail sectors due to diversified livelihoods.	Reduced environmental impact while creating awareness and alignment with global sustainability trends.
Community Sustainability	Diversification of livelihoods enhances community resilience and flexibility.	Focus on sustainability ensures long-term ecological and economic health.

Source: Author, 2025

**Conclusion: Integrating Themes for Future Development**

Various historical heritage factors, post-war growth patterns, community cohesion, demographic shifts, diverse livelihood strategies, and sustainability patterns influence the socio-economic development of Pulau Duyong. The Colonial Legacy established the economic framework, which Post-War Dynamics transformed into industrial and service-based economic activities. Community Cohesion helps preserve cultural identity,

while Demographic Change creates difficulties due to population shifts and social organization changes. Modern economic trends have led the island to adopt Diversity of Life as a primary direction, yet Sustainability Trends remain essential for its environmental well-being.

The future development plans for Pulau Duyong must strive to achieve balance among all these factors. Policymakers need to prioritize historical integration in all facets of contemporary planning and sustainable growth/living alongside sustaining local cultural practices and managing demographic shifts among the three areas mentioned. This article suggests that the principles of local development planning and community participation are welcomed to promote inclusive growth and retain Pulau Duyong's heritage. These methods can ensure that Pulau Duyong will be able to navigate economic change efficiently in a way that heritage is maintained while bringing the people together. This comparative study delineated strategies that will determine Pulau Duyong's development trajectory going forward. Pulau Duyong will become the vessel for a sustainable socio-economic model that will conserve future generations with historical context, demographic trend analysis, and diversified sustainable economics as its main vehicle.

## **SUMMARY & FINDINGS**

Various historical, cultural, and demographic factors have caused significant socio-economic transformations in the Southeast Asian island region of Pulau Duyong. Particularly, the economy and land-use structure of the island were significantly reshaped by the British colonial administration, which introduced cash crops and tin mining into the section. Pulau Duyong began its urbanization and sociological changes under British colonial rule starting in the late 19th century, specifically around 1887, and continued until Malaysia's independence in 1957 (Ahmad, 2025). The introduction of cash crops significantly altered the socio-economic structure of Pulau Duyong (United Nations, 2022; Hussin, 2013; Khalid, 2016). The foreign economic policies under colonial rule were responsible for the creation of modernizing commercial industries on the island's terrain. However, they also laid a basis for expanding economic opportunities. These industries continued shaping land distribution, resource extraction, and settlement

patterns throughout Pulau Duyong. Economic activities produced adverse environmental impacts such as land degradation and an over-reliance on specific commercial industries. Understanding historical factors driving development is critical for contemporary urban planning because it allows officials to develop policies that lessen existing problems. Post-war development, with extensive infrastructure constructions on Pulau Duyong, i.e., changing from subsistence farming, paved the way towards economic diversification through the occupation of vessel shipyard in bringing in economic sectors. This allowed for an increase in standards of living and easy access to the island as better roads and utilities were built alongside public services. It was a transition to industrialization with urbanization that supplied those opportunities yet diminished simple everyday jobs. As it continues to move towards a more industrialized society, the island must find ways to balance its industrial development with preserving its cultural heritage. New growth sectors, including services and manufacturing, must be carefully managed to shield cultural traditions from development-related pressures. One of them, a paradox of the island, is infrastructure development for the economy's success. Nevertheless, it struggles with the preservation of historical and cultural elements. It is one of the demographic transformations happening in Pulau Duyong, where the younger generations migrate to the urban areas in pursuit of better opportunities. Instead, migration has resulted in an aging population that poses social and economic challenges. Along with the associated cultural practices that would have been passed down through the generations, the younger generations' absence from the island has led to a loss of key cultural knowledge. The shifting local demographics reduce productive capacity on the island, which undermines economic growth. The demographic transition offers new growth opportunities. Similarly, local populations of older people who remained on the island possess important cultural knowledge to help preserve their culture. Local jobs must be created to stop youth from out-migrating from the island, as well as to improve educational opportunities and incentives for young people to go home. When contemporary economic industries combine with cultural heritage preservation strategies, they become a catalyst for retaining youth and serving as resident spectators.

In this respect, Pulau Duyong is resilient in maintaining its cultural heritage amidst the external forces that impacted the region. Combined



with cultural celebrations, traditional social networks and bonds of family sustain community cohesiveness. These cultural practices play critical roles in preserving the island's cultural identity and providing a stable foundation for its sustainable development. In addition to ceremonies, local festivals are also important as cultural tools. They bring people together into stronger communities and help cultural traditions survive through time. Cultural heritage conservation relies on local pride but vice versa. This practice also provides economic benefits. Cultural tourism programs in Pulau Duyong need to be utilized to teach residents and visiting tourists about the island's historical and traditional aspects to create economic development opportunities and safeguard its various forms of identity. If done properly to avoid harming the community and respecting local traditions, sustainable tourism combined with local culture is also an excellent way to promote a region. Pulau Duyong is also strongly related to the expansion of economic activities, which is a development factor. Tourism, educational services, and service-based industries now serve as the primary generators of revenue for an island that was originally established on agricultural foundations. Diversification has reduced the island's reliance on agricultural activity and created several economic opportunities. New industries like tourism pose a new set of environmental sustainability challenges for the island. Tourism development requires closer attention if natural environments are to be retained and natural and traditional cultural practices conserved. An organic farming, local business, and eco-tourism economy leads to a sustainable economy. The economic benefits have to be shared equitably by involving local communities in tourism management methods and cultural heritage protection. Lastly, Pulau Duyong's greatest challenge exists in the form of modern attributes versus traditional values. Such modern-day development on the island must be harmonized with the cultural and historical identity encapsulated in Pulau Duyong. Architectural elements and historical preservation must blend seamlessly with modern infrastructure development that comprises housing and road construction as well as utility services. The island needs zoning laws and urban planning plans to protect cultural sites while protecting its historical architectural elements. Only a careful layering of elements that are the most traditional with those that are the most modern, which protects the cultural heritage and provides the basis for future economic growth, can lead to success in developing Pulau Duyong. To this end, Pulau Duyong's evolution involves addressing a number of challenges and opportunities, all whilst striking the

right balance between modernity, cultural preservation, and sustainability. The island needs to cross paths to address colonial legacies with community power-building and sustainable economic strategies to usher it into a prospective future. With thoughtful planning, community involvement, and conservation efforts, Pulau Duyong can look forward to a sustainable, prosperous future with a rich cultural heritage.

## **CONCLUSION**

The history of Pulau Duyong has been jointly molded by several historical demographic, infrastructural, and cultural elements that include socio-economic development. The colonial era introduced cash crops and tin mining operations, which heavily influenced the island's economic framework and land pattern. Allowable inequality under the guise of economic diversification policies under colonial governance has adverse effects on the environment, which need to be addressed given the good economics held out by further integrating historical heritages with current realities of providing development approaches. In the post-war era, infrastructure fundamental changes in Pulau Duyong have also brought major economic transformation from primary-based agriculture, services, and manufacturing to the tourism industry. As a consequence of modern urbanization, new challenges have occurred since it necessitates eradicating traditional living resources and causing particular cultural practices to fade with the disintegration of social structures. Strategic planning in Pulau Duyong is needed to unite the interior development with the protection of cultural heritage, as well as balance modernity and tradition. The shift to cities among the younger generation leads to an older population and potential socio-economic inequalities in the demographic distribution. These shifting demographics open up opportunities for employing time-honoured knowledge passed down through the generations to maintain the heritage of Pulau Duyong. To ensure the sustainable population growth of future generations, economic opportunities need to be created while attracting higher numbers of youth returnees to support Pulau Duyong's economic, educational, and infrastructural developments. Pulau Duyong, a rural island on the east coast of Malaysia, has preserved its powerful cultural identity and its community remains bonded by traditional celebrations and family and tribal ties. Cultural practices are preserved, and continuity is maintained

through tourism functions, leading to social integration and economic motivation through cultural tourism functions. Cultural preservation as a development agenda is a more sustainable form of development that will delineate tourism activities in line with community empowerment and align with the economy while preserving the island's identity. Pulau Duyong demonstrates better resistance to economic challenges as it prioritizes education in tourism and service-based industries. Thus, tourism development needs to be strategically managed in relation to other sectors to avoid negative impacts on environments and cultures. Key components of sustainable development include responsible tourism practices, eco-friendly initiatives, and sustainable agricultural practices that maintain the safety of the ecosystem and protect culture. The island puts environmental sustainability ahead of nearly all else, not only because its natural resources underpin its economic system but because those resources are also the bedrock of its cultural heritage. We need to prioritize sustainable development practices like organic farming and waste management to save these resources, and urban planning should follow sustainability principles. Environmental education and community engagement are key to creating an environmentally conscious society capable of sustainable development.

The rapid urban development in Pulau Duyong reflected emerging demands of real estate and business that clashed with the need to conserve the cultural heritage sites. It calls for a practical approach to urban planning that adopts zoning policies to balance the preservation of cultural heritage with development through sustainability and green infrastructure design. The development strategy of Pulau Duyong is based on balancing traditional values with modern progress. In considering how new technologies can be integrated with traditional practices, urban planning should help to protect heritage sites. However, it is also necessary to embrace modernization. A harmonious development of the island can be achieved by inclining cultural heritage through community participation and sustainable economic systems through the sustenance of erudition from the past as a means to develop in the future. Integrative approaches like these will protect the island's cultural heritage, natural resources, and historical wealth for the benefit of future generations. Insights from the questionnaire data provide a detailed picture of the socio-economic and cultural realities of Pulau Duyong. A relatively transient population, increasing occupational diversity, widespread perceptions of change, recognition of key challenges, and moderate

community engagement are all factors shaping the community's future. To address these challenges, a holistic approach is necessary—one that balances economic development with the preservation of cultural heritage. Strategies that promote eco-tourism and cultural tourism can provide economic benefits while ensuring that traditional knowledge and skills are passed down to future generations. Increasing community engagement is vital because it develops shared identity and active participation in heritage preservation activities. By preserving its cultural traditions, Pulau Duyong will become sustainable and resilient in modern times. Urbanization has brought significant physical and economic changes to Pulau Duyong in Terengganu. While it has improved access to education and healthcare, it has also led to the decline of traditional trades and caused youth migration. The island's boat-building industry, once a cornerstone of its cultural and economic landscape, has diminished as younger generations seek opportunities elsewhere. In order to ensure sustainable development and cultural preservation, it is crucial to implement strategies that create local employment opportunities, promote eco-tourism, and support traditional practices. By balancing modern infrastructure development with community conservation, Pulau Duyong can achieve a harmonious and prosperous future.

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## **AUTHOR CONTRIBUTIONS**

The author contributed to the design of the research, the questionnaire,

and the write-up. The author have read and approved the final manuscript.

## CONFLICT OF INTEREST

An author declare no conflict of interest.

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