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Article

Conceptual Design of Ecotourism Products Proposal at Mangrove Forest in Ketam Island, Malaysia

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Abstract: Mangrove offers a unique and functional characteristic that proves to be beneficial to its surrounding ecosystem. It also benefited the local communities positively in the socio-economic growth via the increase in ecotourism product varieties. Ecotourism activities must not further deteriorate, but, be able to protect and preserve the mangrove ecosystem via a deliberate mangrove ecosystem management. In the effort to conserve mangrove ecosystem, increase public awareness and promote socio-economic growth, this study therefore seeks to highlight the existing ecotourism product (physical products, activities, facilities and services) at Ketam Island Mangrove Forest, Selangor, Malaysia and proposed ecotourism product suitable to feature mangrove forest. With sustainable development, a conceptual design is proposed for the future development of ecotourism research center and its urban enclave at the location, supplementing suitable ecotourism product to the existing product. A site survey of the location is conducted to observe the mangrove ecosystem. Further information is collected from supporting existing publications. Computer software such as AutoCAD and Adobe Photoshop are used to draw out the 2-Dimensional, 3-Dimensional, and render the proposed design to visual representations. Significantly, the supplementary ecotourism product conserves the mangrove ecosystem, promote socio-economic growth and benefit all stakeholders; visitors, local community.

Keywords: conceptual design; mangrove ecosystem; ecotourism product; Ketam island in Malaysia

1. Introduction

Worldwide the tourism industry makes a generous contribution towards socio-economic prosperity and advancement of tourism-led economies (Azam et al., 2018). In Malaysia, the tourism industry ranked the third highest foreign income contributor to the country's Gross National Income (GNI) raking in RM58.4

billion in 2014 and RM73.3 billion for the year 2016 (Malaysia Tourism Promotion Board, 2019). Tourism is highly linked with the natural environment as it is the important core feature as a tourism product, and nature-based environmentally responsible tourism is termed as ecotourism (Choy & Nurul, 2013). Malaysia tourism is pillared by a range of nature offerings such as natural resources, including lakes, waterfalls, marine parks, calcareous caves, tropical forests and mangroves (Yusof & Jamaludin, 2014).

Mangrove ecosystem plays an important role in its surrounding nature's cycle of life. Mangrove plants exist at the tidal zone, in saline soil and brackish marine environment, at the coast strip starting from lowest to the highest water level (Jusoff, 2013). Malaysia placed third in the world for large mangrove forests throughout the country, boasting 45% total mangrove forest area worldwide, with the highest mangrove plant species diversity (NewStraitsTimes, 2018). As of 2004, 69% of the mangrove forest has been gazetted (Abdul Shukor, 2004).

In 2018, it is estimated that Mangrove forest is approximately 2% of total land in Malaysia. The 2% equates to 575,000 ha existed in Malaysia comprises of 57% in Sabah, 26% in Sarawak and 17% in Peninsular Malaysia (Abdul Shukor, 2004), as compared to the 1970's total mangrove forest land of 695,000 ha. The 17% reduction is due to various man-made and nature cause factors; land reclamation and conversion for agricultural and aquaculture purposes, urbanization and development of infrastructure and natural coastal erosion. Mangrove deterioration can be seen occurring globally due to activities such as land clearing, natural resources overharvesting, river changes, overfishing, coral reef destruction, pollution and climate change. It is reported that starting from 1990 to 2010, Peninsular Malaysia mangrove lost is at 1% rate (approximately 1282 ha) annually due to mainly agriculture, aquaculture land conversion and coastal erosion (Hamdan et al., 2010; Omar et al., 2020; Romañach et al., 2018), contrary to Peninsular Malaysia mangrove lost at 2.83% rate (approximately 15,800 ha) from 2000 to 2012 due to mangrove forests deforestation for rice, oil palm plantations and aquaculture (Ward et al., 2016).

The tourism industry's growth has had a direct and indirect impact on the surrounding local communities (Salleh et al., 2014). Although tourism causes environmental degradation and pollution (Azam et al., 2018), overuse of natural resources, large quantity of tourist, overdeveloped facilities to accommodate tourism activities (Robinot & Giannelloni, 2010; Yusof & Jamaludin, 2014) and ecotourism products endure the potential threat of being damaged by the mayhem of excessive tourism activities [14], a proper ecotourism maintenance management can preserve and conserve nature and its surrounding wildlife (Choy & Nurul, 2013). if planned and carried out comprehensively. As an act of exemplary, Malaysia pushes for a comprehensive mangrove management, practice, protection and conservation, in addition to continuous effort on mangrove research (NewStraitsTimes, 2018). It is essential to explore existing ecotourism products (physical products, activities, facilities and services) at a mangrove forest location to identify what ecotourism products that are already offered and the potential products that can be introduced. The purpose of this study is to highlight existing ecotourism products at mangrove forest location, Ketam Island Mangrove Forest, Selangor, Malaysia and supplement other potential ecotourism products to boost the surrounding socioeconomics.

2. Materials and Methods

2.1. Site survey and physical observation

A walkthrough investigation conducted on the chosen site (Ketam Island Mangrove forest) to further understand the subject matter in its natural habitat. Ketam Island Mangrove forest (2365 ha) is located within the vicinity of Klang Islands Forest Reserve with Type IV classification by the IUCN (International Union for Conservation of Nature), which is a habitat / species management area, with the aim to protect particular species or habitats and management. It will need regular, active interventions to address the requirements of particular species or to maintain habitats, which is the mangrove area. Ketam Island Mangrove forest is categorised as actively inhabited, specifically at its Southern part which makes out two human village; Pulau Ketam village and Sungai Lima village. Payne & Payne (2004) highlights the importance of data collecting via visual images as a method to capture research information.

2.2. Computer Software

AutoCAD 2D/ 3D 2010, Adobe Photoshop - These computer software's are used to draw the proposed overall design in the form of 2-Dimensional, progress to the 3-Dimensional and lastly, render it to achieve a presentable image quality.

3. Results

This Existing basic amenities and facilities are (1) Telecommunication services. (2) Information Communication Technology. (3) Police Station. (4) Pulau Ketam Volunteer Fire Brigade. (5) Banking; Maybank Pulau Ketam Service Centre. (6) Basic banking services and ATM services. (7) Hospital Desa Pulau Ketam and Klinik Kesihatan. (8) Post Office, (9) Education Institution; 3 kindergartens, 3 primary school and 1 secondary school here. (10) Water Supply. (11) Electricity Supply. (12) Motels and inns. (13) Recycling centre. (14) Seafood restaurants and local cuisine eateries and (15) Grocery shops and stalls (Boat ticketing, bicycle rentals, and many more). On-site circulation - Walking or Bicycle (Normal bicycle or electric bicycle). No cars or 4-wheel vehicles on site. All circulation pathways are on stilts or concrete columns. Figure 1 shows the existing management plan for visual representation. Mangrove condition, existing management, program and activities, animal management plan and recreational management plan for the site.

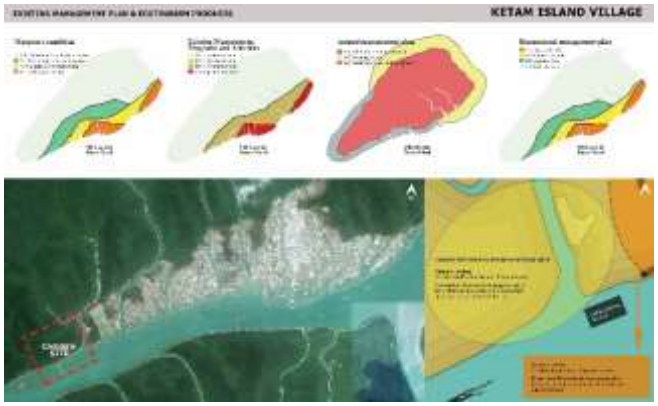

Figure 1. Existing management plan and eco-tourism products.

Figure 1 displays the existing ecotourism product (physical products, activities, facilities and services) available on the site includes: (1) Floating fish farms and food restaurant - There are a few floating fish farms near the site. Fishing farm involves raising fish commercially in an enclosure, usually for food. These floating fishing farms also provide overnight experience which provides lodgings for sleeping arrangements. (2) Mangrove boat ride around the island(s). (3) Bicycle for rent – Local transportation on land is mostly by foot or bicycle (electric or normal). There are no cars on site as the pathway on columns are narrow.

3.1. Proposed Conceptual Design

Figure 2. Proposed site plan and conceptual design.

Figure 2 shows the proposed site plan with the overall design scheme for the site. The proposed urban framework consists of different types of buildings and structures with different functions to cater for a variety of ecotourism product as follows;

3.1.1 Jetty - For Boat to Dock the Passenger Down

Figure 3. Jetty with a "Crab/ Ketam" symmetrical layout.

Figure 3 shows the visual representation of the proposed structural design. When a boat almost reaches the jetty, the visitor is welcome with a bold structural form of the jetty, acting as an Arch. The welcoming form provides a sense of identity to the overall design as it carries the regional identity of "KETAM" or Crab. The form and its symmetrical layout are inspired by Crab. Jetty assure a safe walkway for visitors. The boat docks at the designated area and visitors walk up the staircase to the platform.

3.1.2. Mangrove Research Centre

Figure 4. Mangrove research center.

Figure 4 shows the visual representation of the proposed structural design. It provides an educational opportunity for visitors to learn about the mangrove forest and creates awareness on the fragile ecosystem. The centre is responsible to manage the whole mangrove site and its ecotourism activities such as to conduct indoor/ outdoor programme for educational visits which may include (but not limited to): (i) Participate in In-Lab nature programme, (ii) Flora/ Fauna educational programme, and (iii) Glass display with live exhibits of Mangrove and its ecology for education purpose.

3.1.3. Lodging type A

The 1 Bedroom Lodging has an overhead living space/ attic for leisure or extra sleeping arrangements to the open and nature.

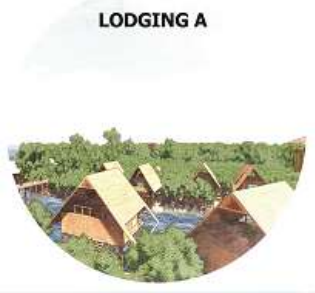

Figure 5. Lodging type A for one to three people.

Figure 5 displays the visual representation of the proposed structural design. The balcony is having an open view towards the river. The overhead living space view is open to both the Mangrove forest and the river.

3.1.4. Lodging type B

The 3 Bedroom Lodging is for group visits and family. Each room is capable to fit 2-3 people maximum. It has an overhead living space/ attic for leisure or extra sleeping arrangements to the open and nature. The balcony has an open view towards the river.

Figure 6. Lodging type B for group/ family.

Figure 6 shows the visual representation of the proposed structural design. The overhead living space view is open to both the Mangrove forest and the river. The right-side window view is also available.

3.1.5. Mangrove Adventure Park

Figure 7. Mangrove adventure park.

Figure 7 for visual image of the Mangrove adventure park. The aim is to bring the public closer to the natural environment through fun and educative eco-recreational activities for all ages by providing facilities involving forest activities that meets the international safety standards and practices. It is constructed by giving great respect to the environment and provides a better management of forest for better conservation.

3.1.6. Viewing Tower

Viewing tower is a necessity to share with visitors the wonders of nature, so that society, too, feels the need to protect its fragile and priceless resources.

Figure 8. Viewing tower.

The viewing tower allows eye-level panoramic views so visitors can see the beauty of nature in its closeness. The visual representation of the proposed structural design as seen in Figure 8.

3.1.7. Bird Observation Tower

The bird observation tower shows great potential to promote human interaction with surrounding birds. With eye-level panoramic views, the bird observation tower welcomes lengthy visits, camouflaging users so as not to alarm flying birds or wandering animals on the ground.

Figure 9. Bird observation/ viewing tower.

The design's sombre form and colour, timber structure, and enclosure of timber convincing and feasible. Wall panels are louvered for ventilation purpose. The visual representation of the proposed structural design as seen in Figure 9.

3.1.8. Shop and Mini Stalls

Visitors can window shop at the souvenir shop, choose to rent bicycles or rent equipment/ gear for the adventure park.

Figure 10. Booth/ stalls for local product sales.

Tickets for boat rides is available here. Figure 10 displays the visual representation of the proposed structural design. It is for the sale of local goods. Local people can have the opportunity to display the goods and products to the visitors.

3.1.9. Amphitheatre

Amphitheatre is a cascading structure for seating, with open-air layout to accommodate group gatherings for the purpose to hold events such as for entertainment, performances or outdoor lectures. Act as focal point to view towards the sea.

Figure 11. Cascading amphitheaters for group gatherings and events.

Encapsulates replanted mangrove trees. The outdoor amphitheatre surrounds the Mangrove forests and allows visitors to experience it. The visual representation of the proposed structural design can be seen in Figure 11.

3.1.10. Open Deck

Open deck is an open-air deck to accommodate group visitation or activities such as yoga, exercise, relaxation and other potential activities that requires an open space. The outdoor open deck surrounded by Mangrove forests allows visitors to interact with surrounding nature (see Figure 12).

Figure 12. Open deck for group activities.

Other independent ecotourism product not attached to the building structural function are (1) Mangrove replantation programme - To rectify deforestation during construction period, a Mangrove Replantation programme is introduced.

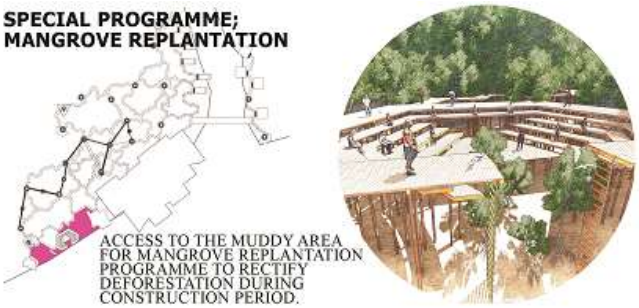

Figure 13. Mangrove replantation programme.

Figure 13 shows there will be ladders going down from the amphitheatre and open deck to the ground/ muddy area for the Mangrove replanting programme. (2) Nature route tour through the mangrove forests via the timber pathways and connecting bridges.

4. Conclusions

In conclusion, to acknowledge the richness of nature in Malaysia and its architectural potential, it is important to ensure the livelihood of the mangrove and its ecosystem. As the mangrove forest is thinning terribly, it is vital for humans to understand mangrove and its ecosystem in depth. The importance of education to create awareness among humans is needed to ensure that the mangrove forest is treated responsibly and with respect. Humans and authority body need to advocate practices that are sustainable and not harmful to the surrounding mangrove environment. The intention is not to over shine the surrounding tourism strategy and its existing facilities, but, to enhance the surrounding context by the introduction of a well-thought urban enclave that not only will educate visitors on the importance of mangrove ecosystem, but, giving the opportunity for visitors to be close to it by providing them with building structures and facilities close to nature. Some proposed product allows visitors to appreciate nature while having adventurous fun activities around it. The new proposal product offers visitors new tourist attractions, indirectly it will boost tourist numbers and may benefit the socio- economic aspects of the area.

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