

## **CONSERVATION AND PROMOTION OF HERITAGE: MANGROVE ECOLOGY AND INFORMAL ON-STILT COASTAL WATER-BASED COMMUNITY OF THE SOUTHERNMOST TIP OF ASIAN CONTINENT**

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**ABSTRACT:** *TanjungPiai and Kukup are prominent mangrove retreats in the district of Pontian, Johor, Malaysia. TanjungPiai is significant place as it is the southernmost point of the Asian Continent while Kukup is unique due to its informal coastal on-stilt community settlement. TanjungPiai and Kukup are mainly for tourism and mostly guided by mangrove conservation program, thus the development is more of complimentary to the natural setting placing more emphasis towards mangrove ecology whilst blending well with the surrounding villages. Kukup on the other hand is an exciting fishing and seafood town but its accidental development is sometime seen as unruly to many visitors and government agencies. Thus, new constructive thinking must be introduced to conserve these two unique locations and at the same time redevelop TanjungPiai and Kukup Town as sustainable tourist landmarks. This paper reviews existing conformist development of both places and later discusses two different architectural thesis proposals of contemporary idea to revive and promote the two unique places. The first proposal employs sculptural architectural solution as new landmark of TanjungPiai. The defensive water edge architecture guarded the sensitive mangrove ecology by incorporating erosion control structures to improve the coastal mangrove ecology. The second proposal is in the form of interpretative heritage center for both TanjungPiai and Kukup incorporating poetic images of nature and traditional built forms into contemporary architecture expression. The paper concludes that both contemporary proposals illustrate the idea of conserving and translating the local natural and built heritages for promoting the areas as unique prime tourist locations.*

**Keywords:** *natural and built heritage, sustainable ecology, organic coastal settlement, contemporary idea.*

### **Introduction**

TanjungPiai and Kukup are prominent mangrove retreats in the district of Pontian, Johor, Malaysia. TanjungPiai is significant as it is the southern-most point of continental Asia. Kukup on the other hand is a unique fishing town with its on-stilt coastal water community including Kukup Island, the largest

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inhabitant mangrove island in Asia. Figure 1 illustrates the location of these two neighbouring sites.

Large numbers of migratory birds often been seen frequenting this area annually (seasonal migratory birds), as the intertidal mudflats are a haven for food such as crabs, shrimps, worms and small fishes. The wetlands support many threatened and vulnerable species. Marine clay and silt found throughout the coastline and along the rivers. The water quality is generally fair. The mangroves along TanjungPiai prevents excessive sediments from entering the water ways, thus sediment trapping is one of the most significant roles of the mangroves. The occurrences of firefly species at night times have attracted visitors to the site and become the added attraction. The Kukup Island and 50-100 m strip of mangroves surrounding TanjungPiai is considered as having a buffer of good layers of mangrove trees, which helps to stabilize the shoreline against huge tidal waves. Thus with their unique ecology and size of the mangrove area, TanjungPiai and Kukup Island are now considered internationally important wetlands protected by RAMSAR.



**Figure 1:** The strategic location of Kukup and southern tip point of TanjungPiai.

However, currently the activities around and within the two areas may have an adverse impact to the unique ecology and its natural functions. The danger faced by the mangrove swamp is due to the mismanagement of waste and oil spills that kill off mangroves for up to 20 years and expose the shoreline to the forces of waves and currents. This can be seen on the western side of TanjungPiai as the most affected area, then the coastal lines

of Kukup town and Kukup Island. Dynamic changes have also occurred at TanjungPiai with the tip moving westward in the last 20 years and some 70 hectare of the mangrove forest reserve have eroded due to natural erosion processes. In addition, the new port will likely lead to increased wave energy reaching the east shore of TanjungPiai by shipping and cruising activities, thus accelerating coastal erosion and eventually threatening the bunds behind the mangroves. Sea-based water pollution in the coastal areas of the park may also arise from the development of the new Port that involves large dredging and reclamation works. These activities will directly affect the shores of TanjungPiai and Kukup.

Thus, the development of these areas in the future must put considerations on the protection and conservation of the natural mangrove and wetland ecology whilst encouraging the tourism activities that drive their economy.

### **Aim and Objectives**

The aim and objective of this paper is to highlight three different solutions towards conservation and preservation of natural and cultural heritages unique to TanjungPiai and Kukup:

- The conformist and informal approach with typical low key, humble and light solution blending with the natural setting.
- The sculptural architectural solution as new landmark of TanjungPiai by having defensive water edge architecture to guard the sensitive mangrove ecology by incorporating erosion control structures to improve the coastal mangrove ecology.
- The poetic interpretation in the form of interpretative heritage center for both TanjungPiai and Kukup incorporating poetic images of nature and local traditional built forms into contemporary architecture expression.

The conformist development of existing State Parks of TanjungPiai and Kukup Island and the informal organic expansion of on-stilt coastal houses is another example of conformist approach albeit the contemporary use of material and owners expression are being challenged by two design thesis students as new ideas to promote the two unique places. The two students design thesis proposals are more iconic. The first proposal by Fadlullah (UTM alumni 2004) utilizes contemporary solutions of creating landmarks depicting the 'local spirit' within the sensitive ecology. The second proposal by Ong (UTM alumni 2009) respects the local and natural heritage by detaching itself away from disturbing the ecology thus allowing the iconic expression to be less controversial.

### **The Conformist and Informal Attitude of Existing Tourism Developments**

The Johor State Government earmarked and proposed TanjungPiai and Kukup Island as a State Park for eco-tourism. The Kukup town is promoted by the state as seafood haven with many home-stay accommodations provided by the community. TanjungPiai has been developed as a visitor center with a 325m boardwalk completed near the southern-most tip of this park complete with small interpretative board walks about 300 meter long in total. The existing design is considered as conformist solution. The visitor's center acknowledges the mangrove in two ways. Firstly, promotes the eco-system underpinning the mangrove swamp. The visitor centre has facilities for researchers to stay overnight and conduct scientific studies. Although it is not a proper field station, bird watchers frequent the area. Interpretative exhibit has a small museum on mangroves and migratory birds. There are facilities for school visits as they can use the visitor center for talks and take the children through the guided walks. It is also intended indirectly to reacts as barrier, control the erosion, and stabilize the shoreline against huge tidal waves. The conservation of mangrove through replanting exercise (figure 2) and placement of geo-tubes had been introduced by the park keeper or entrusted authority however, the mitigation strategy could not really help in controlling the erosion. What if, the mangrove swamps were first carefully studied and only less sensitive areas are exposed to exploitation. Thus, the majority of the swamp would have remained an important lung for the coastal zone habitat.



**Figure 2:** One of the picnic pavilion, notice the damage coastal area and conventional replanting of new mangrove using bamboo poles technique.



**Figure 3:** View of the 300 meter long covered boardwalk



**Figure 4:** Another view of damaged mangrove ecology of TanjungPiai.

Eco-sensitive development means the maintenance of balance between the man-made and natural environments. The man-made environment should be compatible with the natural environment and both should respect each other's right to continue and survive. This idea has been employed to the fullest in the existing development in TanjungPiai and the expansion of on-stilt coastal village community in Kukup as illustrated in figure 5 and 6.



**Figure 5:** Informal & Organic Development of On-Stilt Coastal Community in Kukup

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The comprehensive concept is to develop the area as natural as possible using less dominant architecture. However, the approach even though aesthetically complimenting to natural setting, but it could not conserve the sensitive ecology. The idea that it is a landmark currently is not due to the architecture but more of its significant location and community effort.



**Figure 6:** Typical Image of On-Stilt Coastal Houses

Further, the major visible incidences that are of major concern is the intrusion of seawater leading to resettlement of the infill area for development such as tram track and associated bunds. If this is not taken care of the future of it being the landmark of significant location can shift to TanjungPengelih in Desaru. Thus, existing approach of letting nature take its own defend and ecological conservation may need to be rethink. The phobia on conservation as hindrance to development needs to be reviewed and redefined. On the other hand, another significant aspect of eco-sensitive development that TanjungPiai has not been testing is the concern on human ecology - the psychological interrelation between the man and his environment especially on the importance of conserving the intrinsic qualities, characteristics, memories and symbols of the particular environment. It is about 'living' settlements, about life and its sustenance. Perhaps the possibility of 'revitalization' of the sensitive wetland would be a better option; hence, it requires the infusion of vigor into the existing system, its activities, image and structures. This throws some light on another dimension of ecosphere, - the 'regional spirits' evolved through long associations with history and socioeconomic and political forces behind towards creating architectural intervention of a landmark.

In this context preservation of both macro and micro aspects of a significant and symbolical coastal mangrove ecological region, TanjungPiai, is equally important. Macro level of the place means the geographical significance of

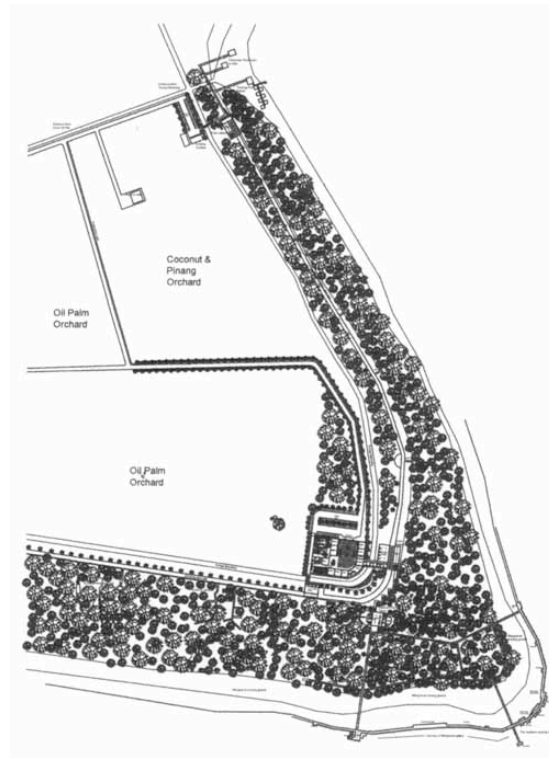
the place that has gained world reputation. These become the major references for the outsiders and suburb dwellers. The micro level of significance is related to the ecological system and the everyday experiences of the dwellers of the core area itself. For the uplift of life, their minor associations and interactions with the area must also be studied and preserved. Thus, it leads the author to experiment new ideas for TanjungPiai and Kukup with the design thesis students.

### **The Sculptured Ecological Architecture**

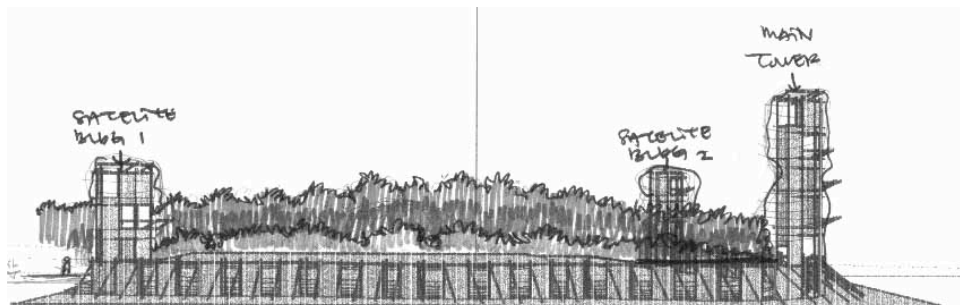
Sculptural Architecture (figure 7, 8 and 9) by Mohd Fadlullah Gimat is a bold idea that addresses and conserves the uniqueness of TanjungPiai. The main design constraints are the ecological sensitive environments, which any development is treated as unacceptable and threat to the eco system. On the other hand, the geographical significance of the place emphasizes an architecture that celebrates the “regional spirit” of being the tip of Asia that evolved through long association with history and socio-economic forces behind. The fast accelerating coastal erosion also is another fact need to be dealt in the design. With these two diversifying constraints, Fadlullah promote interesting hypotheses, thus to create a landmark highlighting the geographical significance of the place while being sensitive to the eco-system that exist in the context.

The design was carefully detailed along the coastal edge of the site thus creating a barrier to control the erosion of the mangrove swamp. Further, the three vertical forms extrude through the mangrove at carefully selected locations along the edge of the site. These forms create a monumental image thus possessing a sense of permanence. Proper articulation between elements, inside and outside gives the design a unique appearance. The hierarchical arrangement of the three vertical forms and the structural system that acts as a device to protect the erosion brings about a regularity and by it's continuous presence creates a unified whole.





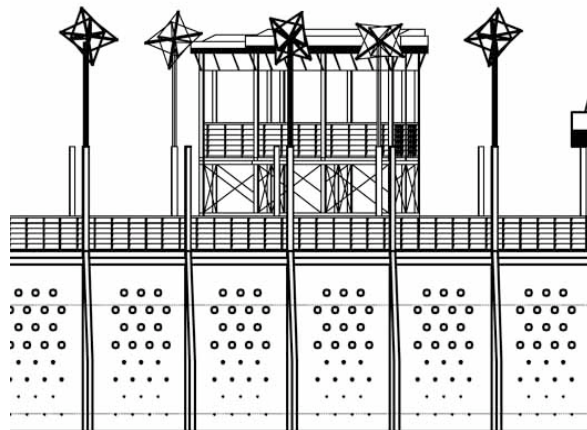
**Figure 7:** Master plan proposed by Fadlullah



**Figure 8:** Schematic idea proposed by Fadlullah illustrating vertical icons and parameter marine ecology healing concrete

Although this is an academic example based on hypothesis, the design idea promotes that architecture become a catalyst for conserving ecologically sensitive environments. The result may be iconic and intruding the nature architecturally but in total it is engineered to replenish the damage ecology. Thus it should be a viable option to explore and put into reality.





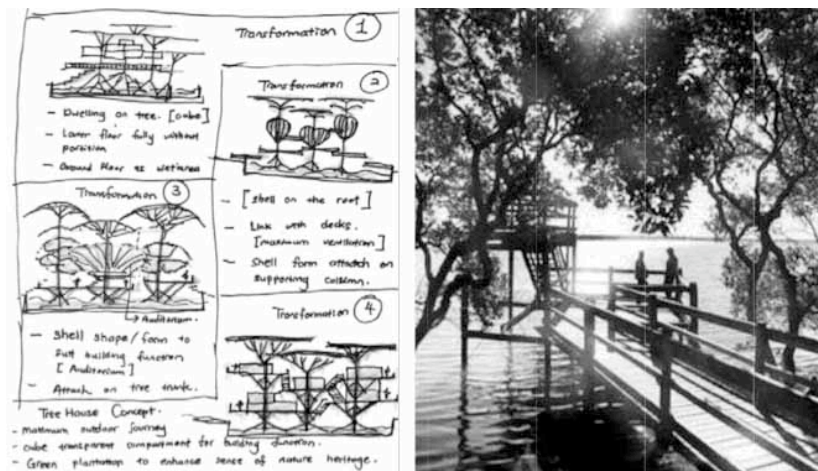
**Figure 9:** Proposed parameter concrete wall for erosion control and marine ecology healing idea.

### **The Interpretative Poetic Architecture**

The more recent thesis by Ong Ken Pin takes slightly different approach by interpreting appreciation of nature and existing built forms as well as cultural expressions of both TanjungPiai and Kukup. He coins it as finding the genius expression of 'Piainess' and 'Kukupness'. He decides not to interfere with the sensitive mangrove ecology and unique informal setting of the on-stilt coastal community. The design approach for the heritage centre is divided into three major components:

- The connection and relationship of TanjungPiai and Kukup into 'Heritage Trail' that forms the eco-tourism masterplan. The idea is to encourage the participation of the community as part of the tourism chain providing related activities and services.
- The design of architectural expression towards identity of TanjungPiai and Kukup through poetic interpretation of 'Piainess' of TanjungPiai and 'Kukupness' of Kukup. See Figure 10.
- The planning of memorable journey and experience throughout the building for visitors within the interpretative centre as if they are on actual journey within mangrove forest and surrounding villages. See Figure 11.

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**Figure 10:** Poetic Interpretation of Nature and Manmade Form by Ong

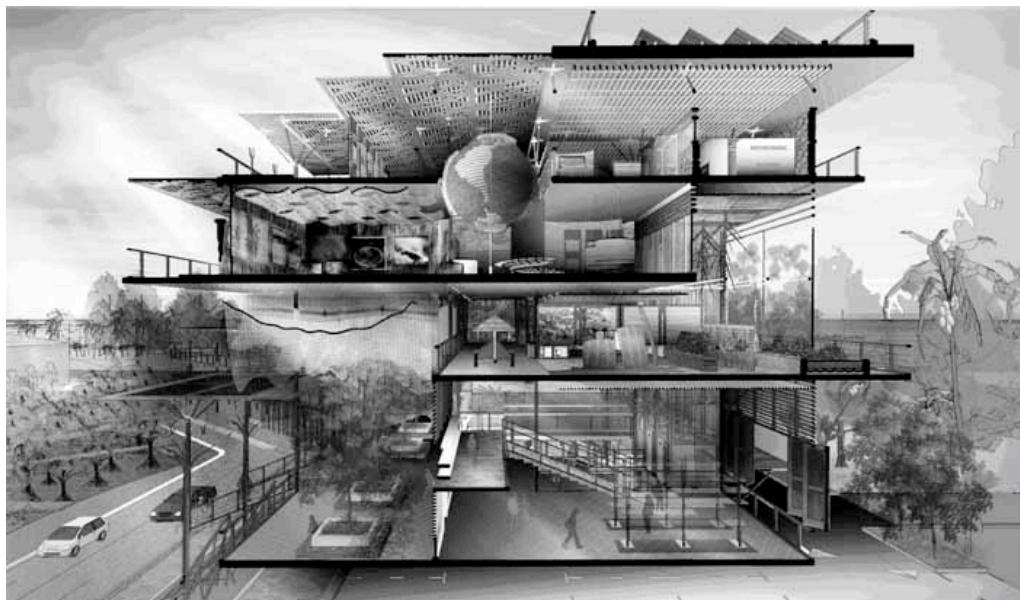
The overall design outcome shows that the heritage centre as an exciting environment for visitors to experience variety of activities which contribute to knowledge inquisition and enhance public awareness towards the heritage value of TanjungPiai and Kukup. The sensitivity of the design should reach the heart of the visitor from various design aspects including environmental friendly, nature ambience, metaphor of structural systems and experiential journey throughout the visit. The final image of the heritage centre gives the sense of “Piainess” and “Kukupness” through the expression of architecture that blend in with the surrounding environment as illustrated in figure 11.



**Figure 11:** Poetic Expression of TanjungPiai and Kukup into Building Form by Ong

The consideration of designing local activities in some spaces provide a sense of pride and belonging to the local community in order to welcome the

tourist as part of the host of the heritage centre. The concept of creating experiential environment for the visitors throughout the heritage centre is to have a planning system with the theme of interpretative journey. The journey would be a storyline that lead visitor step by steps, level by levels, space by spaces with a thematic designed sequence. The storylines begin with past to present and to the future. The story would begin with telling the valuable history of TanjungPiai and Kukup, exploring the past by exhibiting the artifacts and storyboards in order to create an initial image of this land in visitor's heart. Then the story continues to present situation where the heritage of TanjungPiai and Kukup are facing various threats and negative impacts, some caused by human development and others such as human taken granted of the resources without proper control in balance.



**Figure 12:** The Interior Cut Section showing the Experiential Heritage Journey to Visitors by Ong

The outside or outdoor ambience of the building is important in creating heritage atmosphere that integrate with the experiential journey along the visit. The design theme for creating heritage ambience is wetland environment and local social element of TanjungPiai and Kukup. Based on the observation and detail study done by Ong, the wetland of TanjungPiai and Kukup and fishing activity are common sights. There fore, both these elements are included as one of the decorative elements inside the heritage centre. The natural lighting and natural ventilation are emphasized in the design as to promote environmental building and to enhance the ambience of

natural setting of Wetland Park. The overall impression of the heritage centre is designed to express the integration of modern and local architecture for the purpose of creating better identity for future architectural development for TanjungPiai and Kukup.

## Conclusion

The paper concludes that both conformist and contemporary proposals illustrate the idea of conserving and translating the local natural and built heritages for promoting the areas as unique prime tourist locations. Eco-sensitive development solutions can revitalize the concept of “place” infusing the regional spirit. It generates a set of better values and a basis for regulatory measures that leads to qualitative development. However, complementing strategy may not have an impact of a strong landmark of the ‘place’. The iconic strategy through sculptured and poetic architecture as proposed by the design thesis students can be carefully employed and with appropriate design consciousness towards maintaining the ecology, the landmark idea can be put easily onto the place. Further, an iconic architectural landmark that regenerate and restore the damage ecology as in the TanjungPiai proposal would be more appreciated. Otherwise the strong belief that no disturbance at all by not touching and building within the sensitive site such as creating interpretative centre away from the site would be most appropriate and surely less damaging allowing nature to take its own course of sustainable cycle.

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