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**PROJECT 1: CASE STUDY**

**The Restoration and Development of Symbiosis Theory  
in  
Design and Planning of Belum Rainforest Resort**

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## **Abstract**

The development of Belum Rainforest Resort and its implementation into the field of sustainable development is outlined with a particular focus on its position of symbiosis theory in achieve harmonic development with environment. Symbiosis theory play the role of mediator in order to approach sustainable development and reduce impact with surrounding environment. This theory emphasizes in human and environmental processes over space and seek for long term sustainable development. The purpose of this paper is to investigate the synthesis between design principles and design strategies of Symbiosis theory in design and planning of Belum Rainforest Resort. In order to validation this research, will draws upon mostly primary sources about Kisho Kurokawa's Philosophy of Symbiosis including architecture books, website journal as well as online researches. The intention of this analysis is to explore in depth of understanding how the design and planning of Belum Rainforest Resort being restored and developed with Symbiosis theory. Through this case study paper, readers will gain a new perspectives and more understand about Symbiosis theory in practical way of architecture. Finally, the result is the design and planning of Belum Rainforest Resort collaborative with the essence design strategy of Symbiosis theory in achieve for a long term of sustainability will be explored.

## 1.0 Introduction

Belum Rainforest Resort is one of Malaysia's premier ecotourism holiday destinations. This resort is located within the Belum-Temengor Rainforest Complex on the serene Pulau Banding. Belum-Temengor is believed to have been in existence for over 130 million years making it one of the world's oldest rainforests, older than both the Amazon and the Congo. In the heart of the forest lies the manmade lake of Tasik Temengor, covering 15,200 Hectares which is dotted with hundreds of islands.

EMKAY Group, one of the Malaysia's premier property developers, which involved in residential and commercial properties, resort development and green buildings. In year 2007, EMKAY Group spotted the opportunity in the market of resort development and they planned to develop 112-room three-star resort with a total Gross Development Value (GDV) of RM635 million at 600-acre of Pulau Banding Island. (Tan, 2012) stated that the Belum Rainforest Resort Phase 1 Development, which was completed in June 2009, comprises the 70-room Belum Rainforest Resort, the Pulau Banding Rainforest Research Centre and the Sungai Enam Base Camp as shown in Figure 01. In March 2013, EMKAY Group invested RM29 million to completed Phase 2 of Belum Rainforest Resort. The Phase 2 development of Belum Rainforest Resort is consist of 36 more deluxe suit rooms, six kampung-style houses and new facilities such as larger main lobby, swimming pool, convenience store and an administrative centre as shown in Figure 02.



**Figure 01 Phase 1 Development Site Plan (Source: EMKAY Group, 2009)**



**Figure 02 Phase 2 Development Site Plan (Source: EMKAY Group, 2009)**

Undoubtedly, in this large scale of resort project development in Pulau Banding Island, the greatest challenge is minimize the impact to surrounding environment and blend it to nature. EMKAY Group adopted the concept of preserve the environment and achieve sustainable development. The concept of Belum Rainforest Resort blends built elements within the natural surroundings of Pulau Banding. This approach is to ensure the development will be sustainable and reduce the impact on the surrounding environment, the Belum Temengor Rainforest Complex. They planned landscaping projects merging with the built environment, blending into the view towards the exterior. Forest planting is recreated in the vicinity of the resort to compliment the surroundings. The design also takes advantage of the majestic lake view and surrounding natural areas, bringing patrons closer to the spectacular views on offers.

All of these design strategies is absolutely similar with the Symbiosis theory in architecture. Symbiosis theory in architecture looks at the need to respond sensitively to the limitations or potentials of the environment. It just like the design strategies of Belum Rainforest Resort, preserve the environment to achieve sustainable development.

This paper will investigate the similarity between Symbiosis theory in architecture and the design concept in Belum Rainforest Resort by responding to the following research questions:

1. What is the significance of the Symbiosis Theory in Architecture?
2. How is the Symbiosis Theory developed in Belum Rainforest Resort?
3. How is the Symbiosis Theory restored in Belum Rainforest Resort?
4. How does the Symbiosis Theory affect sustainability in Belum Rainforest Resort?
5. How does the value of Symbiosis Design Influence human perception in Belum Rainforest Resort?

## **2.0 Symbiosis Theory in Architecture**

Symbiosis refers to a positive relationship in which the participants try to understand each other despite mutual opposition. Symbiosis in architecture refers to mutually beneficial between the environment and building structure to achieve harmonic development in high quality human space with environment. This theory emphasize in architecture need to blend the nature surrounding to creates a great impact to the environment aesthetic, which will affect the whole planning and design. Kurokawa & Whyte (2000) stated that Symbiosis is an interactive relationship of give and take. As can be understood from the above, the philosophy of symbiosis differs completely from concepts like harmony, coexistence, and compromise. My definition of symbiosis encompasses opposition and contradiction, it refers to a new, creative relationships through competition and tension. The philosophy of symbiosis comprises various dimensions: the symbiosis of history and of the latest technology, the symbiosis of nature and man, the symbiosis of different cultures, the symbiosis of art and science, and the symbiosis of regionalism and universalism. From the perspective of Kisho Kurokawa, the opposition and contradiction element can create a relationship to achieve mutually beneficial with the theory of Symbiosis. Nowadays, in the trend of sustainability architecture around the world, people gradually realize that the importance of preservation of environment. Therefore, Symbiosis theory in architecture play an importance role to achieve harmoniously development between environment and building structure.

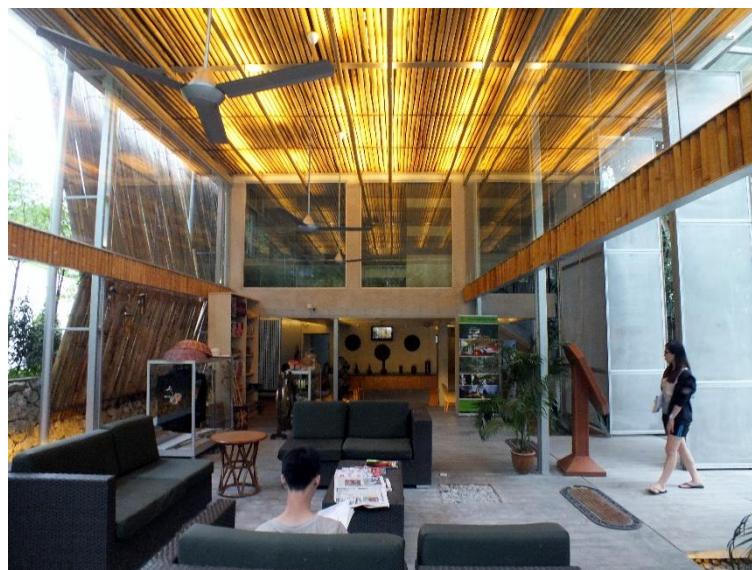
## 2.1 Design Strategies of Symbiosis Theory

In the case of Belum Rainforest Resort, Symbiotic relationship of mutual benefit between natural landscape and building structure achieve a harmoniously sustainable development. This symbiosis relationship of mutual benefit that ensures continued survival and seek for long term of sustainability. The relationship will be expressed with the architecture that emerges from language of intensity that reveals from symbiosis aspirations. The similarity design strategies of Symbiosis Theory and design concept of Belum Rainforest Resort is harmoniously blend in with nature and integration with nature environment and building structure. For example in the planning of Belum Rainforest Resort, the developer control the proportion of natural landscape and building structure built up area to preserve the surrounding natural environment equally or more than the ratio of building structure with the way of integration the natural landscape with the man-made building structure. The second similarity design strategy is Integration present & new, traditional & modern to achieve less contrast and equal value. For example in the Phase 2 development, the developer constructed two different style of resort room nearby the lake, which are the Modern concrete Deluxe Suit Room and the traditional timber kampong-style house in consideration of integration traditional and modern to achieve less contrast and equal value as shown in Photo 01. Other than that, the third one is encompasses opposition and contradiction, by create an intermediate space to neutralize the relationship between two opposition space. Lahaye (2010) highlighted that Symbiosis creates a dynamic relationship between two elements while allowing them to remain in opposition. For example, a veranda is an intermediary zone between the garden or the street and the house. Through opposing forces, the spaces are linked in symbiosis. The Last one is create unobstructed Interpretation space, emphasize Material and expression with Perception. For example the reception area of Belum Rainforest Resort, the building designed with flexibility unobstructed of space to let the user more easy to appreciate the surrounding environment and used of on-site material for building structure like bamboo as ceiling, tree sapling as façade and rammed earth wall to emphasize material and expression with perception as shown in Photo 02.





**Photo 01 Deluxe Suit Rooms (Left) and Kampung-Style Houses (Right)**



**Photo 02 Reception Area of Belum Rainforest Resort**

### **3.0 Symbiosis Development in Planning**

In the symbiosis development in planning of Belum Rainforest resort, the symbiotic relationship had been applied in everywhere of development. For example In the case of Deluxe Suit rooms and Kampung-Style houses arrangement is along with the terrain level of topography to minimize impact to the environment. The Orientation of the Deluxe Suit rooms and Kampung-Style houses also planned to faces to the lake side, bringing patrons closer to the spectacular views on offers. The development in planning also concern about the allocation of building services. Due the different level of topography, all the building services like Tenaga Nasional Berhad (TNB) substation, water cistern and refuse chamber were built at the high area where nearby the main road to easier the services process supply to lower level resort building and the



electrical cable also easier to have connection along the road as shown in Figure 03. The staff accommodation also built at higher level to easier the staff to do management.



**Figure 03 High Level Services Area (Yellow) Staff Accommodation (Orange)**  
**(Source: EMKAY Group, 2009)**

Furthermore, in the planning of circulation, the resorts planning encourage the people to walking within the area of the resort to increase nature awareness. Because the resort planning do not allow visitor car to access to resort area, when the visitor arrive to reception centre, their car can only allow to park at the parking nearby the reception. This is a good way to increase the nature awareness of people by encourage them to walk more and at the same time they also can appreciate the surrounding environment. Other than that, the symbiosis development in planning also concern about the proportion ratio between natural landscape and building structure. According to the ratio of site plan, the development of Belum Rainforest Resort preserved approximately 55% of natural landscape and development approximately 45% of resort man-made structure. This ratio of development present the harmoniously interaction relationship between natural landscape and resorts man-made structure as shown in Figure 04.



**Figure 04 Coverage of Natural Landscape (Yellow) Coverage of Resort Building (Orange) (Source: EMKAY Group, 2009)**

The last one is intermediate space, intermediate space is important when conceiving of architecture. Symbiosis creates a dynamic relationship between two elements while allowing them to remain in opposition. For example in the case of planning Phase 2 Deluxe suit rooms, Phase 2 consist of 9 block in separate two storey 36 deluxe suit rooms. In these 9 block of concrete Deluxe Suits room is designed with a lot of veranda, gathering area and lounge to serve as intermediate space to linking the public space and private deluxe suit room space. Lahaye, P. (2010) by placing an intermediary space between two opposing spaces and a neutral zone linking public and private spaces, ambiguity and ambivalence are introduced and a rich and suggestive architecture is created.

#### **4.0 Symbiosis Restoration in Design**

In the symbiosis restoration in design of Belum Rainforest resort. (Wines & Jodidio, 2000) stated that the integration of architecture and landscape, the fusion of buildings with context, and using the elements of earth and vegetation in such a way that they seem to be part of the raw material of construction. (Teo & Martin, 2011) The resort adopted the 3R Concept Reduce, Reuse, Recycle, which is clearly reflected in every part of the resort's design and architecture. Old Bricks are recycled to be part of the landscape and for building feature walls. For Example, the design of Hornbills restaurant is adopted demolition debris from dilapidated rest house, were given a new breath of life as a featured wall. Other than that, material such as tree branches are used as furniture and building exterior furnishings. For example, the reception building fully make use of on-site material. The bamboo as ceiling of reception and tree sapling as façade of the reception building as shown in Photo 03.



**Photo 03 Ceiling Material in Reception Area of Belum Rainforest Resort**



Recycled bottles are also used as part of the decorative lighting fixtures in the restaurant. The concept of Belum Rainforest Resort blends built elements within the natural surroundings of Pulau Banding. This approach is to ensure the development will be sustainable and reduce the impact on the surrounding environment, the Belum Temengor Rainforest Complex.

The last one is creating unobstructed Interpretation space, unobstructed Interpretation space in Symbiotic architecture is the most efficient way to allow user to appreciate surrounding natural environment. For example in the Bistro area of Belum Rainforest Resort, this building is fully unobstructed constructed with deep over hang roof to prevent inclement weather as shown in Photo 04.



**Photo 04 Unobstructed space in Bistro Area of Belum Rainforest Resort**

## **5.0 Factors Affecting in Sustainability**

Symbiosis theory emphasizes in human and environmental processes over space and seek for long term sustainable development. The first factor that affect in sustainable development of Belum Rainforest Resort is use of on-site and recycled materials. (Wines & Jodidio, 2000) highlight that in environmental architecture today, use of recycled and renewable materials. This directive proposes that a great deal of attention should be paid to the original selection of construction materials which have recycling potential as a result of their production technology and thereby assuring a built-in potential to be used over and over again in perpetuity. For example in this façade wall of Hornbills Restaurant in Belum Rainforest Resort is adopted demolition

debris from dilapidated rest house, were given a new breath of life as a featured wall as shown in Photo 05.



**Photo 05 Hornbills Restaurant, Demolition Debris  
From Dilapidated Rest House**

The Bistro walkway also applied the recycled glass bottle as skylight, create a special feature for the walkway by use of recycled material. The tree sapling façade in reception building also serve as renewable material in this natural forest area. The next factor is unobstructed space will allow natural lighting to provide adequate lighting to interior and allow cross ventilation flow through the building. The third factor is minimize impact to the surrounding natural environment. In the entire development of this resort, the planning is all concern about preservation of natural landscape and minimize impact to the environment. For example in this reception building is designed to make use the existing plant as barrier rather than create man-made structure as barrier. Preservation rather than recreate to seek for better sustainable way in architecture as shown in Photo 06.



**Photo 06 Reception Building, Preserved Existing  
Vegetation as Natural Barrier**

## **6.0 Factors Influencing Human Perception**

When the symbiosis theory creates a dynamic relationship between two elements, it will generate a linkage of harmonic which will influence to human perception through journey or five senses and converse with poetics of the human soul. In the whole symbiosis development of planning in Belum Rainforest Resort, all the design approach will influence human perception in increase nature and sustainable awareness for visitor. Hosack (2011) stated that appreciate architecture as a medium to reveal, engage and treasure higher human values; individuals who express awareness of and sensibility towards our living environment and the significant impact of any projection both physical and metaphysical attributes of its context. The use of recycled material is one of the factor influencing human perception, for example in the restoration of design in Bistro walkway which designed with recycled glass bottle skylight will influence the human perception as shown in Photo 07. When the people walkthrough the Bistro walkway space will lead circulation by the recycled bottle skylight to continue the journey.





**Photo 07 Bistro Walkway, Recycled  
Glass Bottle as Skylight**

The last factor is comfort vision inspire by relationship of environment material. For example in the design of reception building is totally make use of on-site material, like bamboo as ceiling, rammed earth as seating area, tree sapling as façade and use of on-site stone as retaining wall with preservation of existing plant as barrier. The warm colour condition of material provided comfort vision to interior of building. It just like bring the outside natural environment to interior of reception building as shown in Photo 08. Arcspace. (2006) stated that the details are considered become aligned in expression and meaning. In design, the meaning of materials and their assembly plays a key role in our approach. Each material carries a quality and a spirit. The selection of appropriate materials and the method of assembly dictate a resultant quality to spatial resonance. Select raw and rough materials and express primitive assemblies to appeal to primal grounding qualities. Details are seen as the imprint of the intellectual culture of a building.





**Photo 08 Reception Area,  
Comfort Vision Area**

## **7.0 Conclusion**

In Conclusion, Symbiosis theory in architecture looks at the need to respond sensitively to the limitations or potentials of the environment. It play as a solution to solve sustainability issue of modern development. With all the benefits in planning and design of Belum Rainforest Resort mentioned above proven its practicality in both development in planning and restoration in design. This theory utilizes holistic philosophy stemming from the field of phenomenology and the higher ideologies of transcendentalism applied to meaningful living environment. Symbiosis theory in architecture is an ideal theory to archive sustainable development to create a better world in future architecture towards challenging and shifting paradigms into a new landscape of built environment.

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