



الجامعة الإسلامية العالمية ماليزيا
INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA
بِوَيْبَرِضِيَّتِي اِسْلَامًا اَنْبَارًا اِيْجَسِبًا مِلْدِيْنِيَّا

**AN ECOLOGICAL APPROACH OF RIVER LANDSCAPE ON CAMPUS
A CASE STUDY OF SUNGAI PUSU AT IUM**

**By
KAMARULARIFFIN BIN AB. RAHIM
(0016017)**

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KULLIYAH OF ARCHITECTURE AND ENVIRONMENTAL DESIGN
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Abstract

ABSTRACT

An ecological approach of river landscape on campus:

A case study of Sungai Pusu at IIUM

Towards achieving a garden city by the year 2005, initiative and commitment from public are needed. The least that they can contribute is to have concerned on the environment condition. Preserving existing ecosystems such as river is also part of the activities that can be incorporated in realism the idea of the garden city. The ecosystem should be in proper order to avoid any disaster such as land sliding, flooding, land erosion and so forth. Tragedy of Highland Towers happened due to the interruption of underground water source. The phenomena had led to unstable foundation, which eventually failed the whole structures. World is a place where human being live. But they are not alone in this world. World consists of humans, animals and plants. All of the elements help to form ecosystem. Human needs animals and plants in order to survive and so do animals and plants. Due to excessive developments that are not properly controlled by authority, many disasters have occurred. It is not denied that development is important but it should run parallel with the environment preservation. Therefore, when designing the landscape, ecosystem condition must be taken into consideration. A good design is a design where it is beneficial to human and simultaneously preserves the nature. Healthy living environment is a treasure to the coming generations. They also desire for healthy environment such as unpolluted river, green forest and scenic mountains. Hence in this paper, an ecosystem approach is taking into consideration in designing a river landscape.

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Chapter 1

Introduction

1.0 Relationship between man and river

Ecosystem consists of many elements and one of them is river. Rivers have always been of great use to man. They provided early man with water to drink and source of food. When man had learned to build and manage boats, rivers supplied a cheap and easy way to travel. Rivers also float down timber from the forests to the sawmills. Their flood-plains have provided man with fertile soil for his crops and he can draw off the river water to irrigate these crops. In many places, rivers have been set-up to produce electric power.

In addition, river is also a habitat for many animals and other organisms such as alga. Hence, river is interrelated with ecology and their relationship is important for the environment as well as for human being. Without river, the ecology is not functional. Relevant with this fact, an ecological approach is needed in designing the river landscape to maintain the functionality of the river and to preserve the ecology of river.

1.1 Research background

This paper is concentrated on the importance of maintaining the functionality of the rivers by applying the ecological approach. The purpose of this research is to propose a design of river landscape with an ecological approach and campus as the focal point. Ecology is defined as study of relationship of organisms to one another and to their surroundings and also the study of interaction of people in their environment (The Oxford Dictionary of current English, 1996). Campus by definition is ground of the university or college (*Oxford Fajar, 1991*). The reason why campus as a focal point is the community in the campus consists of students, administration staff and academicians who can

appreciate the value of river. Furthermore, campus is designed to suit student life where river landscape can give benefit to their studies.

The beautiful river landscape on campus can be an alternative recreational educational space to students. This outdoor space can act as relaxation area. In Malaysia, it is hardly to find higher educational institutions that have river to function as part of educational ground. In this research, International Islamic University Malaysia (IIUM) which is located at the district of Gombak, Kuala Lumpur had been selected to be a case study. IIUM is a campus that incorporates its existing rivers as part of its study for planning and development. There are two rivers which flow along the academic and administration buildings. One is call Sungai Anak Pusu, flows from Mariam College, Female Sport Complex, and Central up to the lake in front of Kulliyyah of Architecture and Environmental Design (KAED). Another one calls as Sungai Pusu, and selected as case study. It flows from Convest parking area and continues flows between Kulliyyah of Laws and Kulliyyah of Economics, through in front of Administration buildings and combined with Sungai Anak Pusu at the lake in front of KAED. The rivers can be an element to control the ecosystem of the surrounding areas. Definitely, without proper planning and development, to sustain river ecosystem which is important to human being and other species is worthless.

In Quran surah Ali Imran: 198,

"Whereas those who remain conscious of their Sustainer shall have gardens through which running waters flow, therein to abide: a ready welcome from God".

This ayah mentioned about the river underneath of Eden (garden) becomes a reward for them from their good deeds. In fact, rivers give us a lot of benefits. It provides

us with food, fresh water and even recreational area that can give us a feeling of relaxation and enjoyment. Either we will sustain and preserve the ecosystem or change it as Sungai Kelang is experiencing. The water becomes polluted and its appearance looks awful because of our own fault. This situation makes difficult of conservation work. Ever since cities formed, streams have been sewers for industrial and municipal wastes. The wastes, choked many streams with sediments and chemically poisoned them. However, streams are resilient. They can recover impressively when pollution is controlled. It is our task to safe environment. Narrated Anas bin Malik: the Prophet said,

"If any Muslim plants any plant and a human being or animal eats of it, he will be rewarded as if he had given that much in charity".

Man must realise that he is one of the members in ecology who needs to fulfil the chain of ecosystem. Hopefully, the proposal can benefit the community of IIUM as an alternative of recreational area that still maintain its ecology.

1.2 Problem statements

The functions of river in IIUM are still being underestimated. It seems like nobody bother it existence. The function of river in IIUM is limited only as water flow. It flows alone deadly. All those fascinating views such as monkeys hanging from one tree to another tree and the existence of kingfisher dives in for fish are missing. Perhaps there will also be flamingos resting on tree watching for fish. It looks like we limit their habitats. We suppose have a relationship with the river. Therefore, river will live with it ecosystem. Actually river has many functions such as recreational place for canoeing, kayaking, fishing and it can be a centre of attraction to students and outsiders. But, from my observation, it is hardly to see people appreciating the value of river. From my opinion, it happens because the design of river landscape in IIUM is lacked with shady trees. Activities on riverbank are also limited. The activities I found during site visit are fishing and watching the *river resident* from the distant. Probably the fish are common Tilapia and red Tilapia since the colour is black and also red.

River in IIUM can be designed in such educational environment where the implementation of environmental friendly design can take place. The meaning of environmental friendly design is the design of river landscape with an ecological approach where the ecology of the river is a part of the design.

1.3 Goal

1. To propose an alternative recreational area for International Islamic University Malaysia (IIUM).

1.4 Objectives

1. To propose suitable flora and fauna that embraces the river condition.
2. To up-grade rivers in IIUM and make it as centre of attraction.
3. To study the river ecology in IIUM and provide alternative feeding area for fauna.

1.5 Methodology

a. Literature Review

In the early stages, some references, which are related to the topic, were excerpted. This is very important to support and explain the main idea of the proposed topic. A literature review may help to build a basic foundation and to get evidence or support from other sources. There are a lot of books and writing on ecology however there are only a few books that are related to river itself. Among the books that mainly used as references for this study is *Earthscape. A manual of environmental planning and design* by John O. Simonds, 1978. The contents are explaining on the alternatives, suggestions and recommendations to solve problems about environmental planning. And some of that are concentrating by ideas on how to balance the ecosystem and respect the nature when proposing any developments. Another one is *Water Bioengineering Techniques for Watercourse Bank and Shoreline Protection* by H. M. Schiechl and R. Stern, 1997. The contents are useful to adapt in proposing ecological design. There are lots of construction methods focusing the ecology construction using live timber and others but beneficial to preserve and balance the ecosystem with minimal damaged to the environment. The material it self will react as a part of nature when it decompose, then changed as fertilizer. All the creepers and groundcovers that planted on this riverbank

treatment will use this natural compost to grow and strengthen the construction by natural. Lastly to be stated is *Biology concepts and applications* by Cecie Starr, 2000. This book mainly discuss on explaining the definitions, ideas, concepts, thoughts and philosophies about biology and anything related with biology.

b. Case Study

There are two case studies have been selected. First is the National Zoo, Hulu Kelang. It was selected because the design is directly has a relationship between recreational and ecology. It provides habitats for animals especially that depend a lot on water such as flamingo. They use the manmade lake as their natural habitat. One animal that attract me a lot is tortoise because this reptile is flexible in adapting their new environment.

Secondly is IIUM main campus itself. It was selected because it is potentially to be up-graded with ecological approach and the rivers still looked nature. However, the river is not a part of student life because they not used the river to perform their leisure time even during their break. This happens due to the elements or design of the river landscape is not provide activities that interrelationship with river such as seating areas, that directing the views to the river.

c. Data collection

Data collection is other method use in this research to ensure that the goal and objective of this research can be achieved. In this paper, method of observation will incorporate with site inventory and analysis during design process. There will be few

interviews with Development Unit of IIUM, and with some experts from ecology background probably by sending e-mail. The major part of data collection is from observation from photograph. It consists on the idea on how to create an ecological approach on selected particular area. Therefore, the photograph may concentrate on the elements of design, plant and animal species that probably use in the design of this paper. Perhaps it can illustrate the environment in the background.

d. Data Analysis

Analysing the data is the last step of inventory to achieve a result findings or synthesis. The data and information will be gathered and analysed to find the constraints that make this proposal success or not. Data analysis is made from data collection. Except from that, the analysis will be done on the base map of IIUM and inventory reports from management unit IIUM.

1.6 Conclusion

River brings a lot of significant to human life especially as source of freshwater. The civilization of man mostly begun at the river areas since it is easily provided for man food and water. When man knows how to manipulate water, river has been modified to generate electricity. However, because of excessive desire of men, they destroy many habitats and ecosystem to fulfil their ravenousness. For instant, the advantages of electricity had been over developing to fulfil today modern world. Many hectares of the forest had been demolished to build dam. They had forgotten their children in the future.

Their children also want to know the species that had been extinct because their habitats were destroyed. For that reason, river ecology should be preserved for future generations.

To realise this fact, campus has been selected to originate the ideas of conserving and preserving the nature since the communities of the campus are educated persons and supposedly be the module to be followed by society. Perhaps the results from conducting this study will educate people how to appreciate nature and be a part of the nature. When they seat with the nature, having a communication with the animals, breathing the breeze and embellished with the smell of fragrant trees, perhaps will alert them how to respect the nature and love to keep it in balance. Without any doubt, we as human always disturb the habitat of many species flora and fauna in the reason of developments.

Allah said in surah Al-Baqarah: 60

"...So eat and drink of the sustenance provided by Allah and do no evil nor mischief on the (face of the) earth".

We as a Muslim hold a big responsibility as vicegerence to maintain the sustainability of earth. Even though we cannot ensure this will happen all over the world, at least we must ensure it can be done in our territory therefore we can live in better environment.

Chapter 2

research topic.

2.0 River

Rivers on campus have become significant ecosystem because they help enhancing the campus landscape. The selected site is in the International Islamic University of Malaysia (IIUM) campus, which is located in the district of Hulu Langat water catchments. The two main rivers that run within the campus are Sungai Pusu and Sungai Anak Pusu. Sungai Pusu was selected for case study, since it has potential to be developed as student recreational site.

Actually, river in IIUM has beautiful setting of landscape. Elements of nature and man-made are nicely blended together. However, the activity is dull. Students would not like to expand their leisure time at river area. River is abandoned. Therefore, the purpose of this study is to create a relationship between man and his environment. Perhaps this relationship may harmonise the environment.

In addition, river is also habitats for many animals and other species like alga. Hence, river is interrelated with ecology and their relationship is important for the environment as well as human being. Without river, the ecology is not functional. In relevant with this fact, an ecological approach is needed in designing the river landscape to maintain the functionality of the river and preserving the ecology of river.



Figure 2.1 Algae.

In strengthening the relationship between man and environment, I take a quotation from P. Taylor, "How humans should live with other species, and even whether humans should live at all, are matters that require the making of normative and evaluative

judgments. The biological sciences can give us the relevant factual knowledge, but those sciences cannot provide the standards on which our normative and evaluative judgments are grounded.... The claim is frequently made that ecology shows us how to live in relation to the natural environment.... The conclusion drawn from these considerations is that the science of ecology provides us with a model to follow in the domain of environmental ethics.... This line of reasoning is not sound from a logical point of view. It confuses facts and values, 'is' and 'ought'. . . . But the ethical question, 'how should human culture fit into the order of nature?' is no a question of biological fact. It is that confronts humans as moral agents, not as biological organisms, since it asks: which way of relating we to nature, among various alternatives open to our choice is the ethically right one to adopt" (Taylor, 1986, pp. 51—52).

There is also an interesting statement by him which stated that sciences provide factual knowledge but cannot provide a measurement to state the effectiveness of the relationship between man and the environment. I agree with him because we as human beings have different levels of satisfactions to fulfil our own desire. Some people would like to spend their times by shopping and sleeping while some like to spend their time observing the nature.

2.1 The needs of water for human life

Man, wherever he lives, what ever his culture, waits for the rain. Often he waits in hope, sometimes in fear, sometimes in vain, for the waters of the world do not always suit man's needs or desires as they move through their predestined circle to and from the sea. Yet if he is wise, man has within his power the ability to exercise a measure of control over the movement of waters, and in so doing, he may, to a significant degree, control his own destiny.

While the laws that control our water cycle cannot be changed, they can be understood and made to work in man's behalf. The blending of natural law and human endeavour is the essence of resource management.

Leroy L. Preudhomme. Editor, River of Life. U.S. Department of the Interior. 1970

The statement above is describing the impotency and value of water to human life. The main element that man will consider to build their territory is to find a strategic area which is nearby to the source of freshwater. River since the ancient times was selected as primary area to begin a civilization. When man gets the knowledge to manipulate the source of water, they start to build irrigations to irrigate their crops. Due to the needs of electricity in modern world, dam was built to support the capacity of electrical power used by man. Whether we realise or not, the design of the dam that applies today are disturbing even destroying many habitats of flora and fauna. There are many species that extinct because of the carelessness of man. Unfortunately, this dam is built at the catchments area where the source of streams and river today may affected.