A STUDY ON THE EXISTING PHYSICAL ENVIRONMENT OF
THE PROPOSED SUNGAI BATU RESORT,
LUNDU

ALAN ANAK SERI

This project is submitted in partial fulfillment of
the requirements for the Bachelor Degree of Engineering with Honours
(Civil Engineering)

Faculty of Engineering
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2004
Special to my beloved son and wife,
and also my great parents
ACKNOWLEDGEMENT

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Finally, the author would like to express his gratitude to his family for their support and encouragement in finishing this report.
ABSTRACT

This research study looks into the existing physical environmental of the Proposed Lundu Resort located at Sg. Batu, Lundu. This study can be used as a planning tool to predict the likely environmental consequences of a proposed development project. The objectives of this study helps predict impacts of a proposed project on the environment identify appropriate abatement and mitigating measures of the impacts and incorporate these into the project plan; to predict significant residual environmental impact and determine appropriate measures to mitigate the impact; and to identify environmental costs and benefits of the project to the community. The physical environment study includes the topography, geology and soils, hydrology, water quality, meteorology, air quality, noise quality and also climatic conditions that probably occur at the proposed project site.
ABSTRAK

Kajian ini dijalankan ke atas keadaan fizikal persekitaran yang wujud di Cadangan Pembangunan Lundu Resort bertempat di Sg. Batu, Lundu. Kajian ini boleh digunakan sebagai asas perancangan untuk persekitaran bagi sesuatu projek pembangunan. Objectif kajian adalah untuk menilai kesan daripada pembangunan yang dijalankan serta mengenalpasti cara-cara yang terbaik untuk mengatasi masalah ini kepada komuniti yang wujud di persekitaran tersebut. Kajian fizikal persekitaran ini termasuklah topografi, geologi dan tanah-tanah, hidrologi, kualiti air, meteorologi, kualiti udara, pencemaran bunyi dan juga keadaan kritikal yang mungkin wujud di kawasan cadangan pembangunan tersebut.
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CHAPTER 1

INTRODUCTION
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INTRODUCTION

1.1 Location of Proposed Resort

Sungai Batu Holiday Resort located on Lot 916, Block 5, Gading Lundu Land District, Kuching. This proposed resort about 5 miles away from Lundu, encompasses an area of approximately 3.788 hectares of agricultural land. The site is still covered with trees and bushes. The project site can easily accessible by car, while basic accommodations like electricity, road and water supply are available. Figure 1.1 shows the locality of the project site and Figure 1.2.

Basically, Lundu area is very famous with place for holiday. For example, Gunung Gading with natural view suitable for jungle trekking and Pandan Beach for visitors come to explore the beautiful beach.

1.2 Proposed Structures for Development

The proposed development and structures comprises the following elements:-

- A double-storey main building
- 9 units of Detached chalets
- 4 blocks of clustered type chalets
➢ 5 blocks of terrace chalets
➢ A recreational park
➢ A mini golf course
➢ 86 units of car park

1.3 **Main Objectives of Proposed Resort**

The main objectives of the development include the following:-

i. To promote tourism, to encourage both local and oversea visitors come to explore the beautiful beach

ii. To provide a better facilities and services for local and foreign visitors at the region

iii. To provide facilities like lounge, restaurant, meeting area to serve both guest and local general public. Furthermore, more mini-golf recreational parks like water skiing, pool, jogging track, camping and playground are introduced, which add attraction to this development

iv. To provide a reasonable cost accommodation to serve the general public

v. To create a profitable and sustainable business environment

vi. Maximize profits and reduce cost

vii. Enhance or maintain the environment if it helps in the business

1.4 **Land Characteristics and Design Consideration**

From geological aspects, the site is sloping from access point towards the centre of the site. A small stream called Sg. Batu is cutting through the site and terminates at the South
China Sea. The sloping site and the stream proffer a special feature for design consideration. The important design considerations are as follows:-

i. The stream is to be utilized and created into recreational lakes. As a result, chalets are oriented to face the lakes, and sited according to the contour, in order to maximize the views.

ii. This development takes the environment issues into consideration by maintaining the greenery as much as possible. Furthermore, Recreation Park is created to complement the development and liven up the resort.

iii. The building design takes the “Kampung Style” concept, thus local constructions, materials and method like building sitting on stilts are employed. Verandah and terrace is the main feature to link living space to the nature.

1.5 Existing Physical Environment Study as Mandatory Component of an Environmental Impact Assessment (EIA) Study

When a new project or development is planned which might affect environment quality, an Environment Impact Assessment (EIA) should be carried out. In most jurisdictions, an EIA is mandatory before permission is given to proceed with designated classes of engineering works (P.R Trivedi & Gurdeep Raj: 1996).

There are a number of means by which project selection for EIA. Specified development types accompanied, in some instances, by thresholds of size, cost or power
requirement, may automatically require EIA. A list of development projects that may require on EIA is given in *Table 1.1*.

**Table 1.1: Development Projects that may require an EIA**

<table>
<thead>
<tr>
<th>Type of Project</th>
<th>Example</th>
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<tbody>
<tr>
<td>1. Land use and transformation</td>
<td>Urban; industrial; agricultural; airport; transportation; transmission lines; offshore structures</td>
</tr>
<tr>
<td>2. Resource extraction</td>
<td>Drilling; mining; blasting; lumbering; commercial fishing and hunting</td>
</tr>
<tr>
<td>3. Resource renewal</td>
<td>Reforestation; wildlife management; fertilization; waste recycling; flood control</td>
</tr>
<tr>
<td>4. Agricultural processes</td>
<td>Farming; ranching; dairying; feedlots; irrigation</td>
</tr>
<tr>
<td>5. Industrial processes</td>
<td>Iron and steel mills; petrochemical industry; smelters; pulp and paper plants</td>
</tr>
<tr>
<td>6. Transportation</td>
<td>Railway; aircraft; automobiles; trucks; shipping; pipe lines</td>
</tr>
<tr>
<td>7. Energy</td>
<td>Artificial lakes; dams; oil exploration; refining, and transmission; coal and nuclear power stations</td>
</tr>
<tr>
<td>8. Waste disposal and treatment</td>
<td>Ocean dumping; landfill; environmental contaminants and toxic substances; underground storage; biological emissions</td>
</tr>
<tr>
<td>9. Chemical treatment</td>
<td>Insect control (insecticides); weed control (herbicides)</td>
</tr>
<tr>
<td>10. Recreation</td>
<td>Hunting areas; parks; resort development; all-terrain vehicles</td>
</tr>
</tbody>
</table>

Source: P.R Trivedi & Gurdeep Raj: 1992
1.6 **The Aim of the Study**

According to *UNEP (June 1996)*, the objectives of an EIA are to determine the potential environmental, social and health effects of a proposed development. For the purposes of this paper, it is assumed that the main objectives is to establish the existing status of the biophysical and human environment components within and in the vicinity of the Proposed Sg. Batu Holiday Resort to determine the potential impacts of activities related to site investigation, construction, operation and maintenance stages and there on identify appropriate mitigation and abatement measure for impact considered potentially adverse to the surrounding environment.

1.7 **The Objectives of the Study**

The objectives of the existing physical environment study are:-

A. To quantitatively and/or qualitatively assess or establish the existing conditions of the physical, environment within and the surrounding area of the Proposed Sg. Batu Holiday Resort.

B. The specific areas to be addressed include:

- Climatic conditions
- Geological, geotechnical and land use feature
- Hydrological characteristics and drainage
- Water quality (nearby water courses)
- Air quality
- Noise levels
- Human environment including demography and cultural properties
Solid waste and Biomass collection and disposal, and
Wastewater management

1.8 The EIA Process

Figure 1.3 shows five activities in the EIA process. Certain basis, which required accomplishing an environmental assessment are related to the description of the environmental setting, impact prediction and assessment and preparation of the Environmental Impact Statement (EIS).

Figure 1.3: The Environmental Assessment Process
Figure 1.4 shows the essential pathway towards arriving at the category of EIA. To complete an EIA in an efficient manner and achieve the desired EIA objectives, the following steps ought to be followed in sequence:

i. Describe the proposed project as well as the available options
ii. Describe the existing environment
iii. Select the impact indicators to be used
iv. Predict the nature and extent of environmental impacts
v. Identify the relevant human concerns
vi. Access the significant of the impacts
vii. Specify post-monitoring programme and environmental management plan
viii. Specify and prescribe appropriate mitigating and abatement measures for the impacts
ix. Identify the cost components involved in the monitoring programme and
x. Report on the EIA.

When the sequence is followed, the EIA study would be accelerated and the findings enhanced.
Figure 1.4: Essential Pathway for an EIA

Project Initiator

Project Screening

NO

EIA

YES

YES

Detailed EIA

More Information required

NO

Preliminary EIA

Report Review (NREB)

NO

Report Accepted?

YES

YES

Report Accepted?

YES

Project Implementation

Post-Monitoring and Auditing

NO

Report Review (NREB)

NO

Report Accepted?
Figure 1.1: Locality Plan of the Proposed Resort
Figure 1.2: Site Development Plan
CHAPTER 2

METHODOLOGY
CHAPTER 2

METHODOLOGY

2.1 Overview

The increasing use of environmental impact assessment in the appraisal of major projects, programme and policies has led to considerable research into the development of methods to aid analysis. Government regulation regarding environment also require agencies to use systematic and inter disciplinary approaches and to develop methods and procedures to ensure that presently unquantified environment amenities and value may be given appropriate consideration in decision making along with economic and technical considerations.

An impact can be defined as many change in the physical-chemical, biological, cultural and/or socioeconomic environmental system that can be attributed to human activities relative to alternative under study for meeting a project need, impact methodologies provide an organized approach for predicting and assessing these impact.

The methodology is the complex of procedures, technique and tools that together help to fulfill this purpose of EIA. The preparation of an Environment Impact Statement (EIS) is only one element in this methodology; any procedural provision that improves the influence of environmental concerns in the planning and decision-making process can also be part of methodology. In general one can distinguish:-
In this study, a study on one of the most important components, i.e., a study on the existing physical environment of the proposed project was conducted. A more detailed EIA function of study is illustrated in Table 2.1 below.

Table 2.1: Classification of Methodology for Environmental Impact Assessment

<table>
<thead>
<tr>
<th>Function</th>
<th>Methodology</th>
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<td><strong>Identification</strong></td>
<td>Description of the existing environmental system. Determination of the components of the project. Definition of the environment modified by the project (including all components of the project).</td>
</tr>
<tr>
<td><strong>Prediction</strong></td>
<td>Identification of environmental modifications that may be significant. Forecasting of the quantity and/or spatial dimensions of changes in environment identified. Estimation of the probability that the impact (environment change) will occur (time period).</td>
</tr>
<tr>
<td><strong>Evaluation</strong></td>
<td>Determination of the incidence of costs and benefits to user groups and populations affected by the project. Specification and comparison of the trade offs (cost or effects being balanced) between various alternatives.</td>
</tr>
</tbody>
</table>

*Source: P.R. Trivedi & Gurdeep Raj (1992)*
2.2 Project Activities

This EIA study consists of analyze the effects on the project activities. There are three main stages of project activities:

- Pre-construction (Site Investigation) Phase
- Construction Phase
- Operation Phase

2.2.1 Pre-construction (Site Investigation) Phase

During this stage, the activities include:

A. Construction of access road and tracks
B. Site survey
C. Engineering investigation; boreholes to collect the soil samples for laboratories test and in situ test to check the soil characteristics under the proposed structures
D. Project planning and design

2.2.2 Construction Phase

At this stage, construction works and machinery equipments are involved:

A. Heavy machines and equipment transportation
B. Construct temporary access road and tracks
C. Site clearance
D. Construct new building and disposals of solid wastes
E. Establishment of workers quarters