1.0 Introduction

- Topic – application of ecological design (ED) concept in planning a university campus in a sustainable manner
- Assessing the level of compliance of ED as a tool in UPM Serdang campus
- ED brings together human convenience by sustainable use of natural resources.
- Very timely in Malaysia - Pertubuhan Arkitek Malaysia (PAM) and Univ. Putra Malaysia (UPM) signed MoU to develop Green Building Index (GBI).

Study Objectives

1. To determine the present ED features that are being practised in education buildings in UPM campus.
2. To improve the current situation by applying the principles of ED in creating sustainable environment.
3. To recommend the health check of existing building by applying the principles of ED.

Research Problems

1. Lack of application of environmental-friendly approach in local education buildings has contributed environmental problems.
2. The current building design of education buildings demonstrates that it has decreased the indoor environmental quality locally.
3. The recognition of ED approach is very low in Malaysia that needs more attention if we want to support sustainable development.

3.0 Analysing The Implementation Of Ecological Design Concept In UPM Serdang

- Assessing the level of ED concept in planning faculty buildings in UPM Serdang campus.
- The analysis methodology used starts from the overall picture, before narrowing it down to each factor.
- Based on a set of rating system in a simplified method that suits the overall study.

Figure 3: Ecological Design Rating System for UPM in the observation study covering a total of 23 buildings

Table 2: Overall Results According to Factors

<table>
<thead>
<tr>
<th>Factor</th>
<th>Lowest point</th>
<th>Highest point</th>
<th>Total Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sustainable Site Selection</td>
<td>10.5</td>
<td>20.5</td>
<td>30.5</td>
</tr>
<tr>
<td>Water and Energy Efficiency</td>
<td>2.5</td>
<td>5</td>
<td>7.5</td>
</tr>
<tr>
<td>Materials and Resources</td>
<td>10.5</td>
<td>20.5</td>
<td>30.5</td>
</tr>
<tr>
<td>Indoor Environmental Quality</td>
<td>10.5</td>
<td>20.5</td>
<td>30.5</td>
</tr>
<tr>
<td>Productivity, comfort &amp; wellbeing</td>
<td>10.5</td>
<td>20.5</td>
<td>30.5</td>
</tr>
<tr>
<td>TOTAL POINTS</td>
<td>50.0</td>
<td>100.0</td>
<td>150.0</td>
</tr>
</tbody>
</table>

4.0 Findings

1. The compliance level to the concept of ecological design - the majority buildings in UPM Serdang campus complied with the concept of ecological design and can be considered as moderate level-newer buildings responded rather satisfactory compared to the older buildings.
2. The strongest factor of UPM management
   - The indoor environmental quality is the strongest factor of the ecological design concept. The application of these elements shows that the management of UPM has started this good effort and should be enhanced further in the future.
3. The weakest factor of UPM management
   - Water and energy efficiency is the weakest factor - the management of UPM did not find this factor as a priority in constructing the faculty buildings.

5.0 Conclusion

- The undertaken research has proved that the concept of ecological design can be used as a tool towards achieving the notion of sustainable development.
- The research held in UPM Serdang campus however did not produce encouraging results as it can be considered as moderate satisfactory only as compared to the desired expectation.
- The recommendation that had been formulated can be of some assistance to the management of UPM that would improve the current condition of buildings in terms of designing, planning, and management.