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RESIDENTS' SATISFACTION WITH THE INDOOR ENVIRONMENTAL QUALITY OF RE-ENGINEERED AFFORDABLE HOUSING SCHEMES IN MALAYSIA

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ABSTRACT

Malaysia is currently focusing on providing affordable housing all over the country, as part of the plan to tackle the problem of the rising costs of house ownership due to reasons such as the economic crisis and land limitations. However, a limited number of methodical studies have been conducted on residents’ feedback on the indoor environment of affordable housing. Indoor Environmental Quality (IEQ) is an important aspect of occupants’ wellbeing, as it affects their health and productivity. Therefore, evaluating residents’ feedback on IEQ is an important step in gauging building performance and conditions. In addition, the health and productivity of residents needs to be evaluated in order to identify the effect of IEQ on them. A questionnaire survey was used to achieve the study objectives and to gain access to the respondents’ views and feedback. The pilot questionnaire study was conducted at two housing apartments in Kuala Lumpur, Malaysia, and the data collected were evaluated and analyzed using SPSS software. The outcome of this pilot study is significant, as it shows the residents’ dissatisfaction level towards IEQ factors such as noise, glare and privacy, and other aspects of IEQ that are important, such as ventilation. Additionally, it has been found that the IEQ of the residents does affect their health and productivity. It is anticipated that the outcome of this study will serve as an indicator of building performance improvements needed to achieve a better indoor environment quality for affordable housing in Malaysia.

Keywords: Affordable housing; Indoor Environmental Quality; Satisfaction

1. INTRODUCTION

Affordability is mainly defined as the relationship between a household’s expenditure and income (Musa et al., 2011; Menshawy et al., 2016). Affordable housing schemes have become a common method to deal with housing issues in the various housing markets in Malaysia. Affordability is perceived to be related to income, housing costs, housing availability, employment, maintenance of the existing affordable housing stock, and patterns of new construction. Affordable housing not only focuses on providing affordable shelter, but also on

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the quality of life of the occupants living in the dwelling. In the modern environment, housing policies have several objectives, and are rarely confined to a box labelled ‘housing’. They encompass, for example, macroeconomic and environmental objectives and reach into the territory of policies that come under such headings as ‘health’, ‘social exclusion’ and ‘urban regeneration’ (Winston, 2008; Houk et al, 2015). According to Baqutaya et al. (2016), the policy on housing is not only for housing access and affordability, but is also due to the effect of housing expenditure on inflation, growth and economic stability.

Over the years, the Malaysian government has been providing affordable housing to help solve the housing issues in Malaysia, and according to their Eleventh Malaysian Plan (2016–2020), they are planning to increase the quantity of affordable housing and introduce housing schemes such as MyHome and RR1M. This is a positive development in Malaysia, not only for the welfare of the citizens, but also for the economy of the country and its developers. However, the increase in the quantity of affordable housing does not guarantee improvements in the quality of the indoor environment (IEQ), which commonly affects people’s comfort, health and productivity (Haghighat & Donnini, 1999; Lai et al., 2009; Frontczak & Wargocki, 2011; Al Horr et al., 2016). For example, one of the aspects of IEQ that influences residents’ well-being is the thermal comfort of the space, such as temperature and ventilation (Persily, 2015; Nimlyyat & Kandar 2015).

Despite the fact that the newly built buildings and housing are deemed to have satisfied the recommended standards, however, there are still complaints regarding their indoor environmental quality of the building and housing in Malaysia. The World Health Organization (WHO) recorded that in 1984 30% of occurring buildings were subject to complaints concerning their IEQ. Dr Judith H. Heerwagen, an environmental psychologist, (as cited in Kolleeny, 2003) points out that several factors, such as exposure to daylight, air quality, temperature, odors, noise, ergonomics, opportunities for social gatherings, and relaxation, and exercise, affect residents’ productivity and well-being. The Environmental Protection Agency (1991) labelled this effect as sick building syndrome (SBS), whereby occupants experience acute health problems and discomfort only when they are in the building or space, and based on the time spent in the building. Therefore, buildings and space affect the well-being and productivity of the occupants residing in them. Hence, it is essential that the indoor environment of affordable housing is adequate for the health and productivity of the residents.

Hashim (2010) points out that no specific studies or research have been conducted on affordable building, especially regarding the issues arising around it. Furthermore, the Malaysian government plans to continue the building of affordable housing in Malaysia in order to satisfy the demand for it, as well as to overcome the housing issues in the country. Therefore, it is important to investigate the IEQ of affordable housing in Malaysia to improve its quality. Moreover, it is critical that sustainable development results not just in resource conservation, but also in increasing productivity and residents’ well-being. This study hopes to inform the design community on residents’ perception of affordable housing performance based on the IEQ criteria. It will add to the growing body of research on sustainable design and residents’ perception of indoor environmental quality.

2. AFFORDABLE HOUSING SCHEMES IN MALAYSIA

The Malaysian government has introduced several schemes and initiatives to provide affordable housing for the population. They allocated a budget for it in their Tenth Malaysia Plan (2011–2015) and Eleventh Malaysia Plan (2016–2020). In the latter, they intend to construct a total of 653,000 affordable housing units under programmes such as PBR, PR1M and PPAIM. Table 1 summarises the number of units for each programme.
Table 1 Targets for public affordable housing

<table>
<thead>
<tr>
<th>Programme</th>
<th>Housing Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>PBR</td>
<td>47,000</td>
</tr>
<tr>
<td>PPR</td>
<td>50,000</td>
</tr>
<tr>
<td>PRIMA</td>
<td>380,000</td>
</tr>
<tr>
<td>PPAIM</td>
<td>88,000</td>
</tr>
<tr>
<td>RMRIM</td>
<td>55,000</td>
</tr>
<tr>
<td>RUMAWIP</td>
<td>33,000</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>653,000</strong></td>
</tr>
</tbody>
</table>

Furthermore, the government has developed several strategies for affordable housing to efficiently and productively fulfil the Eleventh Malaysia Plan. This plan used a Blue Ocean Strategy (BOS) formulation tool called the strategy canvas. It is a diagnostic and action framework to visualize the strategies for the Malaysia Plan. As stated in the Eleventh Malaysia Formula document, the strategy canvas (as shown in Figure 1) portrays the current situation against the new strategic direction that will be taken by the government. The strategy canvas represents the strategies developed by the government for efficient affordable housing and productivity in order to fulfil the Eleventh Malaysia Plan. The canvas highlights the parameters that need to be reduced, eliminated, raised or created in order to achieve an effective plan strategy.

![Strategy canvas for providing adequate and quality affordable housing](Plan, 2015)

3. **INDOOR ENVIRONMENTAL QUALITY CATEGORY**

The Centers for Disease Control and Prevention (CDC) (2013) define IEQ as the quality of the building environment that relates to the health and well-being of the occupants. Kolleeny (2003) stated that Heerwagen points out that elements of IEQ affect residents' productivity and well-being, while the Institute of Medicine (IOM) (2011) agrees that IEQ should be an area of consideration as it affects the comfort and health of residents. Moreover, scholars such as Crump (2011) and Kamaruzzaman et al. (2011) concur that IEQ has a significant impact on residents' health and productivity.