INTERNATIONAL COOPERATION IN URBAN RESIDENTIAL UPGRADING IN JAKARTA[1]

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1. Introduction

International financial institutions such as the World Bank (WB), the Asian Development Bank (WB) and aid agencies such as the Japan Bank for International Cooperation (JBIC) and Japan International Cooperation Agency (JICA) in cooperation with the Government of Indonesia (GOI) have been implementing urban residential upgrading schemes in Jakarta. The focus of this assistance is the provision of both financial and technical assistance to programmes aimed at improving the urban environment. Among such programmes are the construction of multi-storey housing, site and services with single-detached housing, and the *Kampung* Improvement Programme (KIP).

2. Application to Urban Residential Upgrading

We employ the analytic hierarchy process developed by Saaty to determine the best alternatives among the three housing types, given the goal of urban residential improvement. The formal model can be stated as follows: Suppose A_1, A_2,..., A_n be the set of elements and w_1, w_2,..., w_n be the importance of each element with respect to some attribute. Pairwise comparison score between elements A_i and A_j, a_{ij}^* can be defined as $a_{ij}^* \equiv w_i / w_j$, or in the matrix form as shown below.

$$\mathbf{A}^* = \left(a_{ij}^*\right) \equiv \begin{pmatrix} w_1/w_1 & w_1/w_2 & \cdots & w_1/w_n \\ w_2/w_1 & w_2/w_2 & \cdots & w_2/w_n \\ \vdots & \vdots & \ddots & \vdots \\ w_n/w_1 & w_n/w_2 & \cdots & w_n/w_n \end{pmatrix} \quad (1)$$

By multiplication of matrix $\mathbf{A}^*$ on the right hand side by the vector, $\mathbf{w}=(w_1, w_2, ..., w_n)^T$ becomes $n\mathbf{w}$. The resulting equation is given below:

$$(\mathbf{A}^* - n\mathbf{I})\mathbf{w} = 0 \quad (2)$$

Note that equation (2) is the characteristic equation of matrix $\mathbf{A}^*$ and n is the maximum eigen value.

The importance w_i is supposed to be unobservable but pairwise comparisons of elements are possible with minimum errors. In other words, we have to estimate weight vector $\mathbf{w}$ from observed pairwise comparison matrix $\mathbf{A}$. Because observed matrix $\mathbf{A}$ contains inconsistency, equation (2) should be rewritten in a more relaxed form as:

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$$(\mathbf{A} - l_{\max}\mathbf{I})\mathbf{w} = 0 \qquad (2')$$

Where $l_{\max}$ is a maximum eigen value. The weight vector **w** is estimated as an eigen vector with respect to the maximum eigen value. The inconsistency ratio (CR) is defined as:

$$\text{CR} = \text{CI/RI where} \quad \text{CI} = \frac{l_{\max} - n}{n-1} \qquad (3)$$

RI, Random Index, is defined in Saaty (1980).

3. Survey Design

A hierarchical structure of our problem (urban residential upgrading in Jakarta), is constructed as follows (Figure 1): Level 1. goal Level 2. actors Level 3. criteria Level 4. alternatives in the study area

Questionnaires were administered on a total of 30 experts made up of 14 international and 16 Indonesian experts involved in urban residential upgrading schemes in the study area (Batubara, M, 2002). The household data were obtained from selected sample who are living in case study areas. There were a total of 403 valid respondents who answered the questionnaire. With regard to level of residential satisfaction, each household in the case study areas asked to state its level satisfaction with its dwelling unit. Responses were scored on four points scale ranging from 1 for absolutely satisfied, 2 for partially satisfied, 3 for mediocre, and 4 for dissatisfied.

3. Conclusion

This paper presents a novel approach to evaluating alternative urban residential housing schemes in an attempt to upgrade the deplorable housing situation in many parts of Jakarta city. We found the methodology employed (AHP) quite appropriate in building consensus among those involved in the conception and implementation of such schemes. It was found that accessibility to work place and multi-storey housing were the most dominant criterion and alternative respectively in the search for appropriate urban residential upgrading schemes in metropolitan Jakarta.

The priorities of alternatives with respect to the urban residential upgrading program show that multi-storey housing is the most preferred housing type among the three typologies in the opinion of residents. The examination of the three typologies of urban residential upgrading indicated that majority of residents living in multi-storey housing were largely satisfied.

References

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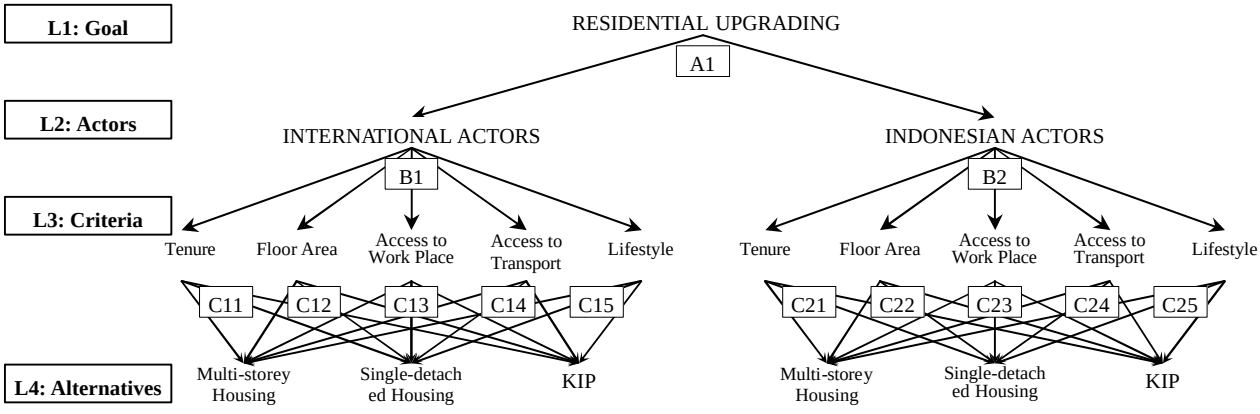

Figure 1. Hierarchy of the Model