Relationship between settlement environmental quality and socio-economic conditions in Kwadungan Permai Housing, Kediri Regency

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Abstract. Kwadungan Permai housing is subsidized housing in the industrial zone of Kediri Regency aimed at helping low-income people. This phenomenon has an impact on socio-economic conditions and increases the potential for environmental problems that can determine settlement environmental quality. The high demand for settlements supported by rapid population growth without being accompanied by land expansion will cause environmental and social problems. Therefore, a study on the settlement environmental quality that includes socio-economic conditions is needed to formulate regional policies on settlements. This study aims to (1) assess the settlement environmental quality, (2) analyze the relationship between socio-economic conditions and the settlement environmental quality. Data obtained from structured interviews with respondents selected by stratified random sampling. Data were processed by scoring method and analyzed by mixed method. The results showed that Kwadungan Permai Housing was dominated by a moderate class 37%. All parameters of socio-economic conditions have a significant relationship with the settlement environmental quality. Then the bad quality class reached 32.9% and the good quality class reached 30.1%. The variables of the last education level and the level of income have a positive relationship, while the number of family dependents has a negative relationship.

1 Introduction

The increasing human population goes along with the evolution of landuse due to human needs [1]. Shelter is one of basic human needs, which means higher human population is in line with increasing demand for housing. Settlement is a residential zone equipped with all facilities and infrastructure for a community of people as the first place to interact with each other to survive, preserve, and develop life that is formed because of human interaction with their environment [2, 3]. Each settlement has a different quality [4].

Settlement environmental quality is a level of the ability of a settlement to meet the basic needs of all its residents. Settlement environmental quality is assessed by some factors, such as building’s physical conditions, residential environment conditions, and socio-economic conditions. Socio-economic conditions include education, income, health, and occupation levels [5]. The socioeconomic status of the population can have an impact on the unequal distribution of public facilities that support human life quality and settlement environmental quality [6, 7].

The socio-economic condition of residents is related to the socioeconomic status of residents who represent their living habits [8]. Socio-economic status refers to the ability of an individual to put themselves in their environment. It can also influence the selection of attitudes in accordance with their assets and capacities, including the choice of settlement and efforts to improve the quality of their settlements [9, 10]. Residents of a settlement usually have similar socioeconomic conditions [11].

Kwadungan Permai Housing is one of the subsidized Housing Ownership Credit (KPR) housing located in the industrial zone of Ngasem District, Kediri Regency. The subsidized KPR program is intended to assist Low Income Communities (MBR) in getting decent housing at a relatively affordable price. Its location in the industrial zone has an impact on the settlement environmental quality, which has a good impact on the economic aspects of the residents by increasing the income of the
surrounding residents. Settlement locations that are relatively close to industry and have greater employment opportunities can attract many immigrants [12]. However, its existence can also have a negative impact on the surrounding environment [13]. Some of these reasons cause the condition of Kwadungan Permai Housing to become more complex.

There are several previous studies that examine the quality of the settlement environment and are used as references in this research, namely [5, 14, 15, 18]. These studies examined the quality of settlements using the scoring method, but the locations and results of the studies were different.

Especially in urban zones and industrial zones, the high demand for housing is coupled with rapid population growth without being accompanied by land expansion. If not handled with qualified policies, many environmental and social problems will potentially occur. This is where a study that aims to assess the settlement environmental quality and analyze the relationship between socio-economic conditions and the settlement environmental quality is important to conduct.

2 Methodology

This research was conducted in Kwadungan Permai Housing which is subsidized KPR housing and in the industrial zone of Ngasem District, Kediri Regency. Data was collected using a structured interview method which aims to obtain data on socio-economic conditions, physical buildings, and residential environment from respondents.

![Fig. 1. Map of the study area - Kwadungan Permai Housing, Kediri Regency. [19]
Source: Google Satellite, 2023 (processed)](image)

The sample determination used stratified random sampling method because within population, there are significant between-group variations. The population is divided into 2 groups, namely KPR subsidy recipients and non-recipients of KPR subsidies. The separation of these strata has been adjusted to research purposes, thus the results can be more accurate. The total sample was 146 households.

Data processing was conducted using scoring method. Primary data is processed and weighted in Microsoft Excel. Then, composite index calculations must be conducted to balance each variable. The scoring results then calculated before being classified. Residential environmental quality classes were classified using Sturgess classification method into three classes, which are good, moderate, and bad settlement environmental quality.

The results of the scoring on the socio-economic condition variable which includes the number of family dependents, income level, and education level are tested with the settlement environmental quality class using the Spearman's rank correlation coefficient method on SPSS. The correlation results are analyzed to conclude the research.

3 Result and discussion

3.1 Settlement environmental quality

The three variables to determine the settlement environmental quality need to be calculated using a composite index. This is intended to balance the proportion of each variable. The following is the composite index value of each variable:

### Table 1. Composite index of settlement environmental quality variables.

<table>
<thead>
<tr>
<th>Settlement Environmental Quality</th>
<th>Socio-economic Conditions</th>
<th>Building's Physical Conditions</th>
<th>Residential Environmental Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good Quality</td>
<td>122.67</td>
<td>137.57</td>
<td>105.65</td>
</tr>
<tr>
<td>Recipients</td>
<td>90</td>
<td>101</td>
<td>80.76</td>
</tr>
<tr>
<td>Non-recipients</td>
<td>32.67</td>
<td>36.57</td>
<td>24.88</td>
</tr>
<tr>
<td>Moderate Quality</td>
<td>114.67</td>
<td>162.71</td>
<td>121.94</td>
</tr>
<tr>
<td>Recipients</td>
<td>114.67</td>
<td>162.71</td>
<td>121.94</td>
</tr>
<tr>
<td>Bad Quality</td>
<td>72.67</td>
<td>141</td>
<td>96.06</td>
</tr>
<tr>
<td>Recipients</td>
<td>72.67</td>
<td>141</td>
<td>96.06</td>
</tr>
<tr>
<td>Total</td>
<td>310</td>
<td>441.29</td>
<td>323.65</td>
</tr>
</tbody>
</table>

Source: SPSS processed results, 2023.

Based on the table above, the building’s physical condition is variable with the highest score. It can be said that overall, the building’s physical condition in Kwadungan Permai Housing is in good condition and is suitable for residents. This phenomenon is since the housing units provided by developers with the help of the Government are built similarly with adequate quality. The score of the moderate quality is greater than the good quality because the number of residential units classified in the moderate quality is more than the good quality. The same applies to the condition of the residential environment.

On the other hand, socio-economic conditions have the lowest total value, indicating that the socio-economic conditions of residents are still below average. This statement is in accordance with the fact that low-income residents dominate in Kwadungan Permai Housing [19]. The phenomenon that there are still many low-income residents but the condition of the physical quality of the building is good indicates the success of the KPR program in realizing decent and affordable home ownership by low-income residents [19].
Based on the map above, Kwadungan Permai housing is dominated by the moderate settlement environmental quality. It also can be identified that block A is classified as good quality. Blocks B, C, D and F are classified as moderate quality. The bad quality is only in block E.

Block A is never flooded and the socio-economic conditions of its residents are above average. Unlike block E which is often flooded. In addition, block E is also close to the railroad tracks which are a source of noise pollution [19]. Due to differences in socio-economic conditions, the physical condition of buildings, and the condition of the residential environment of each respondent's house is different, making differences in the settlement environmental quality. This matches the statement from research [4].

### 3.2 Relationship between settlement environmental quality and socio-economic conditions

Socio-economic conditions are influential in determining the choice to build a residence [14]. Socio-economic conditions are evaluated from three factors, including education of the head of the family, income level, and the number of household dependence. The socio-economic conditions of the residents of Kwadungan Permai Housing are divided into KPR recipients and non-recipients.

The strength of the relationship between socio-economic conditions and residential environmental quality is determined from the results of the Spearman correlation test conducted on each factor of socio-economic conditions.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Pearson Correlation</th>
<th>Significance value</th>
<th>Significance value 5%</th>
<th>Test Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education level</td>
<td>0.734</td>
<td>0.000</td>
<td>0.2111</td>
<td>Correlated</td>
</tr>
<tr>
<td>Income level</td>
<td>0.786</td>
<td>0.000</td>
<td>0.2111</td>
<td>Correlated</td>
</tr>
<tr>
<td>Number of family dependents</td>
<td>-0.760</td>
<td>0.000</td>
<td>0.2111</td>
<td>Correlated</td>
</tr>
</tbody>
</table>

Source: SPSS processed results, 2023 [19].
3.2.1. Relationship between family head’s education level and settlement environmental quality

According to correlation test result, education level factor is correlated with settlement environmental quality. Correlation coefficient value of 0.734 indicated that the two variables are strongly and positively correlated [19]. This finding is consistent with researches conducted by [5, 17,18].

Education level has a major impact on settlement environmental quality. Education is needed to improve the quality of human resources [15]. Education can influence the way a person behaves and thinks. Therefore, the level of education can affect how the head of the family chooses a settlement to settle in. A high level of education can increase knowledge of good settlements, so individuals with a high level of education tend to take better care of their residential environment to make it safer, more comfortable, and cleaner [5, 16, 18].

In addition, family heads with a high level of education tend to have a high income so that the percentage of income used to improve the quality of the residential environment is also greater [17]. Hence, the education level affects the settlement environmental quality.

3.2.2. Relationship between income level and settlement environmental quality

The correlation test results show that the level of income and the quality of the residential environment have a very strong positive correlation. This finding is consistent with research conducted by [12,16,18,20]. With this situation, it can mean that residents’ income can be used to improve the quality of their residential environment and can still be used to fulfill their other life needs [18].

The correlation coefficient value of this variable is the highest compared to the correlation coefficient value of the education level variable and the number of family dependents [19]. This can be due to significant differences in population characteristics in Kwadungan Permai Housing, where these differences are directly related to income. The amount of income is a determination in the classification of low-income residents. This is one of the requirements in taking the KPR subsidy offered by the government.

Income levels affect the prosperity level [5]. The perspective of people with high income on the settlement environmental quality is also more complex, which includes comfort, safety, and cleanliness [16]. High income levels can widen the scope of a person’s ability to afford housing prices with better residential environmental quality [20]. This is in accordance with this research result that all non-KPR recipient residents who in fact earn more than KPR recipient residents have dwellings with good settlement environment quality classes. But there are many residents with lower incomes who have better quality residential environments because with KPR subsidies they can buy housing with good quality standards. This indicates that the government’s KPR subsidy program can be said to be successful [19].

3.2.3. Relationship between the number of family dependents and settlement environmental quality

The correlation test of these two variables resulted in a correlation coefficient value of -0.760 which indicates that these two variables have a strong correlation. The minus sign on the value indicates that the two variables are negatively related. This is in line with research conducted by [2, 5, 14]. This means that the higher the number of family dependents, the worse the settlement environmental quality. And vice versa [19].

The large number of family dependents can also mean an increase in population density, which will affect the creation of settlements that are not conducive or can be said to have poor environmental quality [19]. In addition, the demand for basic needs will be higher [21]. Therefore, the number of family dependents can have an impact on settlement quality, but it is only one of many variables that should be considered when evaluating and improving settlement living conditions.

4 Conclusion

The result shows that Kwadungan Permai housing is dominated by the moderate settlement environmental quality class, which is 37%. Then the bad quality class reached 32.9% and the good quality class reached 30.1%. However, the study of the settlement environmental quality is also conducted with a housing block analysis unit. Block A is classified as a good quality class. Blocks B, C, D, and F are classified as moderate quality class. The bad quality class is only in block E.

The three socioeconomic condition factors, which include the education level, income level, and number of family dependents are correlated with the settlement's environmental quality. The Pearson correlation values of the education level and income level factors show a positive relationship, while the number of family dependents factor is negatively related.

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References
4. C. I. Sik, B. D. Kriznik, Community-Based Urban Development Evolving Urban Paradigms in
5. M. Mayasari, S. Ritohardoyo, Jurnal Bumi Indonesia, 1, 3 (2012)
18. I. Hidayati, Jurnal Geoedusains, 2, 2 (2021)