Environmental quality model to have sustainable environment

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Abstract. The aim of this study is to propose environmental quality model in order to have sustainable environment. This survey study distributed the questionnaires to 375 persons of local community in Jakarta in Indonesia using Structural Equation Modeling (SEM). The research found that model suggested was good fit for the data. The study result presents that socio-economic domain have significant positive association with of environmental quality. However, the positive associations between ecological domain and meteorological domain was not confirmed in this study. The use intensity of water resources and food production have significant positive association with ecological domain. However, the relationship between waste management and ecological domain was not supported in this study. Air pollutant, water pollution, and earth temperature have significant positive connection with meteorological domain. Water shortages, human health problems, and community environmental awareness have significantly positive relationship with socio-economic domain. It can be concluded that environmental quality model hypothesized can be used for local community in Jakarta in Indonesia in order to have sustainable environment.

1. Introduction
The dimensions of environmental quality consist of ecological domain, meteorological domain, and socio-economic domain [1]. Identification of factors affecting perception of public environmental quality is conducive to environmental protection and risk management [2]. Intensification of human activities including deforestation and urbanization influencing environmental quality [3-7]. Humidity, greenness, heat, and dryness monitor environmental quality changes [8]. Indicators of environmental quality are measured by the emission of waste gas, waste water, and waste solids [9]. Both clean and non-clean technologies affect level of environmental quality [10]. However, most studies don’t give a more detail explanation about indicator measurement of environmental quality.

Environmental quality may be predicted by ecological domain, meteorological domain, and socio-economic domain [1]. However, this research doesn’t give detail indicator measurement of ecological domain, meteorological domain, and socio-economic domain.

Ecological domain, meteorological domain, and socio-economic domain estimate environmental quality [5]. The summary of relationships hypothesized is represented in a model seen in figure 1.
2. Methods
This survey research was done for 375 persons of local community in Jakarta in Indonesia. Data collected in this research were related to environmental quality. Analysis of content was utilized to literature of environmental quality involves ecological domain, meteorological domain, and socio-economic domain [1]. These dimensions were derived into the questionnaire provided to 375 persons of local community in Jakarta in Indonesia.

The three aspects of environmental quality consist of ecological domain, meteorological domain, and socio-economic domain. The three dimensions stimulate ecological domain are waste management, use intensity of water resources, and reduced food production. The indicators of meteorological domain include air pollutant, water pollution, and earth temperature. The dimensions of socio-economic domain involve water shortages, human health problems, and community environmental awareness.

In this study, data analysis used Structural Equation Modeling (SEM) with IBM SPSS Statistics 24 and SPSS AMOS 24 with 2017 Edition. SEM was used to estimate the relationship between ecological domain, meteorological domain, and socio-economic domain with environmental quality. Data collection was done from 375 persons of local community in Jakarta in Indonesia inputted in excel using responses with “strongly agree” scored 5, “agree” scored 4, “neutral” scored 3, “disagree” scored 2, “strongly disagree” scored 1 for positive questions, and “strongly agree” scored 1, “agree” scored 2, “neutral” scored 3, “disagree” scored 4, “strongly disagree” scored 5 for negative questions.

3. Results and discussion
The goodness of fit statistical analysis confirmed that Normed Fit Index (NFI) value reached 0.924 showing that the model proposed in this research is good fit. The value of Comparative Fit Index (CFI) attained 0.968 showing that the model offered is good fit. Incremental Fit Index (IFI) value arrived at 0.969 stating that the model is good fit. Relative Fit Index (RFI) value reached 0.887 showing that the model is good fit. Based on SEM measurement result, the model offered in this study is a fit model.
Table 1. Measurement model test (Regression weights: Group number 1 – Default model).

| Label   | Estimate | Standard Error | Critical Ratio | Probability | Label |
|---------|----------|----------------|----------------|-------------|-------|
| ED      | <--- EVQL | 6.876          | 3.937          | 1.746       | 0.081 |
| MD      | <--- EVQL | 6.776          | 6.092          | 1.112       | 0.266 |
| SE      | <--- EVQL | 1.000          |                |             |       |
| EQ3     | <--- ED   | 1.000          |                |             |       |
| EQ2     | <--- ED   | 0.354          | 0.110          | 3.221       | 0.001 |
| EQ1     | <--- ED   | 0.000          | 0.056          | 0.002       | 0.999 |
| EQ6     | <--- MD   | 1.000          |                |             |       |
| EQ5     | <--- MD   | 0.858          | 0.112          | 7.685       | ***   |
| EQ4     | <--- MD   | 1.637          | 0.203          | 8.055       | ***   |
| EQ9     | <--- SE   | 1.000          |                |             |       |
| EQ8     | <--- SE   | 0.870          | 0.128          | 6.816       | ***   |
| EQ7     | <--- SE   | 0.976          | 0.145          | 6.733       | ***   |

Table 2. Measurement model test (Standardized regression weights: Group number 1–Default model).

| Estimate | ED <--- EVQL | 0.549 |
|----------|--------------|-------|
|          | MD <--- EVQL | 0.928 |
|          | SE <--- EVQL | 0.132 |
|          | EQ3 <--- ED  | 0.984 |
|          | EQ2 <--- ED  | 0.334 |
|          | EQ1 <--- ED  | 0.000 |
|          | EQ6 <--- MD  | 0.530 |
|          | EQ5 <--- MD  | 0.514 |
|          | EQ4 <--- MD  | 0.914 |
|          | EQ9 <--- SE  | 0.654 |
|          | EQ8 <--- SE  | 0.564 |
|          | EQ7 <--- SE  | 0.654 |

Notes:
- EVQL = environmental quality
- ED = ecological domain
- MD = meteorological domain
- SE = socio-economic domain
- EQ1 = waste management
- EQ2 = use intensity of water resources
- EQ3 = food production
- EQ4 = air pollutant
- EQ5 = water pollution
- EQ6 = earth temperature
- EQ7 = water shortages
- EQ8 = human health problems
- EQ9 = community environmental awareness

In Table 1 and Table 2, it can be seen that socio-economic domain has significant positive association with environmental quality of 0.132. However, the positive associations between ecological domain and meteorological domain was not confirmed in this study. Table 1 and Table 2 indicated that use intensity of water resources and food production have significant positive association with ecological domain of 0.334 and 0.984, respectively. However, the relationship between waste management and ecological domain was not supported in this study. In Table 1 and Table 2, it can be pointed out that air...
pollutant, water pollution, and earth temperature have significant positive connection with meteorological domain of 0.914, 0.514, and 0.530, respectively. It can be seen in table 1 and table 2 that water shortages, human health problems, and community environmental awareness have significantly positive relationship with socio-economic domain of 0.654, 0.564, and 0.654, respectively. These findings were similar to the study found that socio-economic domain is positively associated with environmental quality [1]. However, this result is different from the study presented that ecological domain and meteorological domain predicted environmental quality. The structural model is shown in figure 2.

Figure 2. The structural model.

4. Conclusion
Environmental quality model proposed in this research is a fit model. Socio-economic domain has significant positive association with environmental quality. However, the positive associations between ecological domain and meteorological domain was not confirmed in this study. It can be concluded that the environmental quality model offered can be used for local community in order to have sustainable environment in Jakarta in Indonesia specifically for the association between socio-economic domain and environmental quality.

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