Development of socioeconomic indicators for measuring the population wellbeing in lembah klang-langat extended metropolitan region, malaysia

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Abstract. This paper aims to develop a socioeconomic indicators to measure the wellbeing of the people in Lembah Klang-Langat Extended Metropolitan Region (EMR). A total of 400 respondents comprised heads of household in 15 settlement centres in Lembah Klang-Langat Extended Metropolitan Region (EMR) were selected as study sample. Quantitative approaches using SPSS and AMOS software were in this study. The data were analysed using factor analysis, namely exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). The results showed that after EFA and CFA had been applied, only two sub-constructs of socioeconomic construct which were i) social, and ii) economy, and six items of B7_3, B7_4, B7_5, B7_7, B7_10 and B7_11 presented high validity values of CR exceeding 0.6. The analysis found that the measurement model met the measurement criteria for measuring suburban wellbeing. The study findings also showed that the similarity index value was equal to p=0.000, chi-square relative value of 3.553, 0.991 for GFI value, 0.983 for CFI value, 0.968 for TLI and RMSEA value of 0.051. Therefore, the findings of this study have successfully prepared a set of socioeconomic indicators that can be used by future researchers for analysing the wellbeing of socioeconomic aspect of metropolitan region's extended area.

1. Introduction

Urban transformation process is rapidly developing around the metropolitan area of Southeast Asia. Urban transformation has formed settlement patterns in the Peri Urban area of extended metropolitan region (EMR) in most countries such as Singapore, Malaysia and Indonesia. Based on [1] study, the most rapid transformation process in Malaysia is in Kuala Lumpur which is the city centre, and has sprawled to its outskirt areas like Selangor and other suburbs including Lembah Klang.

Urban transformation is a changing process as well as application of urban features to an area and this process will involve the migration of rural populations, changes in economic activity, urban development, increased provision of urban facilities, social changes, value and character of traditional society to modern society as well as general land use changes [2]. The urban transformation process that took place has resulted in the spreading to the suburban areas [3]. In general, there are several indicators
that can be used to illustrate the transformation process which are land use change, transportation, infrastructure, socioeconomic and population [4], [5], [6] and [7].

Even though in general, transformation is commonly seen as bringing in positive changes but at the same time, it sometimes has a negative impact on development due to the lack of local preparations in the process of accepting the changes resulted from the development [8]. Therefore, the society needs to be prepared for the changing process received because sometimes economic progress may exceed the physical environment's ability to maintain its sustainability.

The suburban area (Peri Urban area) is a complex entity which is an agricultural area that has been through a very strong mix of industrial activity, housing expansion and other land use [9]. In the past, the development of rural areas used to be more traditional and were labelled as poverty areas [10] and [11]. Most of the metropolitan suburbs in South East Asia exhibit six main characteristics of [12] which are densely populated with people primarily engaged in agriculture, the rapid increase of non-primary sector workers, the level of good infrastructure provision, the cheap and diverse human resources, conducive goods mobility and the presence of grey perceptions among the rulers that it resulted in a lack of attention given. However, it is a transitional area that becomes the focus of various interactions for the region's economy. Therefore, this suburban area is important for the rural population in order to improve the standard of living because suburban areas serve as the centre of commerce and business [2].

The population in the suburbs are people who enjoy a variety of modernisation in terms of infrastructure resulted from the rapid development in the core area (main). All necessities and facilities can be easily supplied to as a result of the degree of accessibility and reachable facilities provided in the urban areas. The sub-urban communities carry out their daily activities in the village atmosphere while enjoying the modern urban facilities provided [8] and the lives of people in the suburban area are not as busy as in the urban areas. They can even perform their favourite activities at any time. Hence, the development done in the suburbs is bound to experience changes as a result of the modernisation in the surrounding areas. To a certain extent, the sprawling process definitely has either negative or positive impact. The bad and good changes of the development can only be judged by the locals who reside in the suburban areas before and after urbanisation takes place.

According to [13] wellbeing is a stress-free feeling, long-term happiness over sadness, positive feelings towards life and achieving what is desired in line with the goals. [14] refer to wellbeing as an optimum condition measured on the basis of satisfaction, confidence, resilience and physical health. [15] opines that wellbeing is an individual or group response to happiness, life satisfaction and charity, while [16] states wellbeing as a concept capable of explaining various forms of wellbeing such as work, material or marriage. Thus, the wellbeing of life can be summarised as a measurement of the quality of life, measured psychologically or internally involving several dimensions such as happiness, satisfaction, self-esteem, self-efficacy, family life, employment, education and finance.

The wellbeing of the people in the suburban area is important to be analysed because of two things, namely (i) this area is an important area that generates economic growth of the region (ii) this area is considered as a 'grey' area by the government thus attention to aspects such as facilities, infrastructure, security and others are often overlooked.

2. Rural Urban Transformation Construct
Urban transformation process is rapidly developing around the metropolitan area of Southeast Asia. Urban transformation has formed settlement patterns in the Peri Urban area of extended metropolitan region (EMR) in most countries such as Singapore, Malaysia and Indonesia. Based on [1] study, the most rapid transformation process in Malaysia is in Kuala Lumpur which is the city centre, and has sprawled to its outskirt areas like Selangor and other suburbs including Lembah Klang.

2.1. Socioeconomic

According to [4] urbanisation is a process of convergence of people inhabiting an area considered to be a city. Nowadays, people prefer to settle in urban areas because of the mobility to economic and social spaces is wider than in rural areas. In recent years, urban sprawling has taken place rapidly. This will affect the development of rural areas and small towns located in metropolitan areas such as Banting, Salak Tinggi, Sungai Pelek, Banting, Tanjung Sepat, Jenjarum, Telok Panglima Garang, Semenyih, Dengkil, Sepang and Nilai in Selangor Southern Corridor; and Rawang, Serendah, Batang Berjuntai, Batang Kali and Rasa in Selangor Northern Corridor. With the high average of population growth rate at above 6.0 per cent (during the 1991-2000-2010 period) [17] this rate far exceeds the Kuala Lumpur population growth rate over the same period. This indicates that this Peri Urban zone is experiencing rapid urbanisation. Urbanisation has accelerated the process of rural-urban transformation in Lembah Klang-Langat EMR.

According to a study conducted, the changing pattern of urbanisation is a process of changing the environment of an area that involves the economic, social and political aspects of the local population. This change can be seen in terms of increasing population size, changes in physical environment and land use change. He added that pressure on a particular area will shift the focus of the industry, economy and business to suburban areas that would benefit the suburban residents. However, the rapid urbanisation has led to economic vulnerability such as an increase in the cost of living and the rate of rented houses as well as the land prices.

The social state of suburban areas also tends to exhibit unique characteristics, especially abiding to and practising religious teachings as religious practices can help to control social and criminal issues from spreading [18]. The rapid urbanisation has transformed not only the land use but also the social and economic patterns of the population, especially in the suburban area [17]. In this study, he emphasised the impact of urbanisation on the lives of the community, especially the suburban community both in terms of health and social. Racial composition in a particular area can also enhance social wellbeing in carrying out daily activities. A study by [19] looked at social aspects as one of the measurements for development in urban or suburban areas. For him, social problems such as crime are caused by imbalance in terms of income, social mobility, migration of residents from rural to urban area as well as family relationship play a major role in the increase of crime rates.

3. Research Method

This study applied the quantitative research design using questionnaire as a research instrument. Quantitative method was selected as it involved many respondents with a wider and more comprehensive range [20].
3.1. Study Area

The study population involved the residents of 15 suburban areas in Lembah Klang-Langat EMR based on [12] namely Semenyih, Beranang, Mantin, Nilai, Salak Tinggi, Dengkil, Banting, Telok Panglima Garang, Kuala Selangor, Bukit Beruntung, Serendah, Batang Kali, Rasa, Kuala Kubu Bharu and Hulu Bernam. Based on the population census data released in 2010, the total population of the fifteen study areas was 548,424. Of that total number, the recommended minimum number of samples as according to [21] is 387 persons. Therefore, this study set the number of respondents to 400 people and the sample fractions by area is as shown in Table 1. The selected respondents were heads of the household.

| No. | Area                       | Number of population | Number of sample | Percentage (%) |
|-----|----------------------------|----------------------|------------------|----------------|
| 1.  | Semenyih                   | 49,076               | 90               | 9              |
| 2.  | Beranang                   | 163,560              | 299              | 29.8           |
| 3.  | Mantin                     | 25,341               | 47               | 4.8            |
| 4.  | Nilai                      | 38,612               | 71               | 7.0            |
| 5.  | Salak Tinggi               | 21,764               | 41               | 4.0            |
| 6.  | Dengkil                    | 6,066                | 12               | 1.0            |
| 7.  | Banting                    | 26,062               | 49               | 4.8            |
| 8.  | Telok Panglima Garang      | 6,504                | 13               | 1.0            |
| 9.  | Kuala Selangor             | 11,649               | 22               | 2.3            |
| 10. | Bukit Beruntung            | 40,877               | 76               | 7.5            |
| 11. | Serendah                   | 83,099               | 152              | 15.3           |
| 12. | Batang Kali                | 32,783               | 61               | 6.0            |
| 13. | Rasa                       | 2,999                | 7                | 0.5            |
| 14. | Kuala Kubu Bharu           | 13,361               | 25               | 2.5            |
| 15. | Hulu Bernam                | 26,671               | 50               | 4.8            |
|     | **Total sum**              | **548,424**          | **1015**         | **100**        |
3.2. Study Instrument

This study is a survey study by using questionnaire instrument. The selection of this instrument involved a large number of respondents and was comprehensive [20]. In this context, the questionnaire survey method was selected to obtain data on housing construct. The study instrument developed had two parts, namely respondents’ background and housing construct. The scale of the item measurement for each variable was by using the 5-point Likert scale which were 1=Strongly disagree, 2=Disagree, 3=Moderate, 4=Agree and 5=Strongly agree. A sub subsection. The paragraph text follows on from the sub subsection heading but should not be in italic.

Table 2. Items and Question Items of the Questionnaire

| Item  | Question item                                                                 |
|-------|-------------------------------------------------------------------------------|
| B7_1  | I am aware of the social issues that occur in this area                        |
| B7_2  | The benefits of recycling bottles, aluminium and old newspapers can generate income |
| B7_3  | *Gotong-royong* programme can strengthen the relationship between the local residents |
| B7_4  | Social and community facilities are better than 10 years ago                    |
| B7_5  | There are various health centres to facilitate the residents in getting treatment |
| B7_6  | The current development takes into account the needs of future generations      |
| B7_7  | Social problems are widespread among teenagers in this area                    |
B7_8 Government assistance in easing financial burden
B7_9 Working overtime can generate income following the rising cost of living
B7_10 I will work part time if there is spare time especially on Sunday
B7_11 In recent years, the primary sector (agriculture/livestock) has been increasingly less developed

Table 3. Study Instrument

| Construct          | Sub Construct | Number of Item | Source of Item                                                                 |
|--------------------|---------------|----------------|--------------------------------------------------------------------------------|
| Socioeconomic      | Social Economy| 6 items        | Developed by modifying the references from Abdul Samad (2010), Nurasyikin & Haryati (2013), [8], Shaharudin et al. (2016) and Yazid et al. (2017) |
|                    |               | 5 items        |                                                                                 |

3.3. Data Analysis Methods

The data used in this study were analysed using Statistical Package for the Social Sciences (SPSS) version 22.0 and AMOS version 20.0. The data analysis comprised two stages. The first stage was to analyse the reliability. This analysis was performed on each variable to examine the level of reliability of the data obtained. The second analysis involved exploratory factor analysis of the items in the study to see how the items used were classified according to certain factors [22].

3.3.1 Internal Reliability Analysis

Prior to testing the significant relationships in the structural model, the measurement model needs to have a satisfactory validity and reliability levels [23]. According to [24] the higher the coefficient value of Cronbach's alpha, the higher the internal reliability is. By referring to Table 4, the reliability with the Cronbach's alpha values for the whole items are greater than 0.7.
3.3.2 Internal reliability analysis

Factor analysis is a statistical approach used to identify, reduce and restructure a large number of questionnaire items into specific constructs, under specific variables. Factor analysis is a statistical approach used to summarise the information contained in some of the original variables into smaller or general dimensions, into specific constructs [25]. The approaches for factor analysis can be grouped into two fundamentally different approaches, namely exploratory factor analysis and confirmatory factor analysis.

The theme used in this factor analysis is factor loading that gives information on to what extent the factor that determines the test score is built by comparing it with other measurements. If comparisons are made with other measurements measuring the same constructs, the high factor loading provides evidence of convergent validity whereas if comparisons are made with other measurements measuring different constructs, the moderate and low factor loadings provide evidence of differential validity for construct validity [26].

3.3.3 Exploratory Factor Analysis – EFA

The following are the findings of the construct purification process based on EFA and the reliability test conducted on the pre-test data of the study. The construct purification analysis was conducted on the study variable which was housing. The purpose of this EFA analysis was to identify and restructure a large number of questionnaire items into components under each particular variable from the study sample which really represented the study variables [22]. The factor structure formed was based on the feedback findings of the study sample.

Several steps and procedures have been implemented to carry out the EFA as suggested by [24], [27] and [28]. Refer to goodness-of-fit for EFA procedures in Table 5.

Table 4. Internal Reliability Values of the Study Questionnaire

| Section | Variable | No. of Items | Cronbach's Alpha Value |
|---------|----------|--------------|------------------------|
| Housing | Social   | 6            | 0.749                  |
|         | Economy  | 5            | 0.723                  |

Table 5. Goodness-of-fit

| Goodness-of-Fit of Exploratory Factor Analysis (EFA) | Suggested value |
|-----------------------------------------------------|-----------------|
| Barlett’s Test of Sphericity/x² (sig. <0.005)        | < 0.05          |
| Keiser-Meyer-Olkin (KMO) sample adequacy test        | > 0.06          |
Factor loading value \( \geq 0.50 \)
Communality value \( \geq 0.30 \)
Eigenvalue \( \geq 1.00 \)
Variance percentage change value \( \geq 8.00 \)
% contribution of variance towards factor \( \geq 3.00 \)

Source: [24], [27], [28] and [29].

4. Results and Discussion

4.1. Factor Analysis of Socioeconomic Variable

The results of the Exploratory Factor Analysis (EFA) on transformation indicator, namely socioeconomic, explained that the anti-image correlation analysis procedure showed the correlation value exceeded 0.5 and this gave the impression that factor analysis can be continued. Kaiser Meyer-Olkin (KMO) sampling adequacy measurement and Barlett's Test of Sphericity obtained showed that the KMO value was 0.832 while Barlett's Test of Sphericity was significant with the value of Chi-Square 993.705 at 55 degree of freedom. Refer to Table 6.

Table 6. Suitability Test on the Use of Factor Analysis and Item Communality of KMO and Barlett's Test on Socioeconomic Variable

| Measure of Sampling | Kaiser-Meyer-Olkin | Measure of Sampling Adequacy |
|---------------------|-------------------|-----------------------------|
| Barlett's Test of Sphericity | Approx. Chi-Square | 2658.484 |
| df | 55 |
| Sig. | .000 |

Factor analysis was carried out by the researcher by setting the number of factors to be extracted to three as categorised. Table 7 shows the component matrix with varimax rotation. The varimax rotation method was performed as it could reduce the number of complex variables and increases yield prediction. From the results, it was found that item B7_6 had been dropped as it had an anti-image correlation matrix value of less than 0.5. Whereas the values of B7_1, B7_2, B7_3, B7_4, B7_5 and B7_6 belonged to component 1 which was social while component 2 which was economy included B7_8, B7_9, B7_10 and B7_11. The values shown in Table 7 are the coefficient or factor loading for each item that tends to each factor. These values show the correlational relationships between the items and the factors that have been formed and it is the key to understanding the nature of these factors.

Table 7. Component Matrix with Varimax Rotation of Socioeconomic Variable
| Item  | Social | Economy |
|-------|--------|---------|
| B7_1  | .569   |         |
| B7_2  | .668   |         |
| B7_3  | .689   |         |
| B7_4  | .744   |         |
| B7_5  | .605   |         |
| B7_7  | .587   |         |
| B7_8  |        | .546    |
| B7_9  |        | .558    |
| B7_10 |        | .773    |
| B7_11 |        | .790    |

**Figure 2.** Factor Analysis on Socioeconomic Construct

### 4.2. Factor Analysis of Socioeconomic Variable
Socioeconomic Exploratory Factor Analysis involved the fit of one-factor congeneric model, second order confirmatory factor analysis model of population and study construct validity assessment of socioeconomic.

4.2.1 Internal reliability analysis

The index modification process was conducted on the one-factor congeneric model factor of CFA for two socioeconomic dimensions, namely social and economy. Table 8 shows the goodness-of-fit value of the one-factor congeneric model of socioeconomic. The findings showed that each dimension met the accepted value for the indicators.

| Acceptable Indicator/ Dimension Value | CMIN | DF | CMIN/DF | PROB (p-value) | GFI | CFI | TLI | RMSEA |
|-------------------------------------|------|----|---------|----------------|-----|-----|-----|-------|
| Social                             | 18.110 | 3  | 6.037   | 0.000          | 0.991 | 0.980 | 0.960 | 0.71  |
| Economy                            | 14.135 | 2  | 7.067   | 0.001          | 0.993 | 0.979 | 0.936 | 0.78  |

In this modification process, several items had been dropped. Two items were dropped from the economic dimension of B7_8 and B7_9. As for social dimension, two items had been dropped, namely B7_1 and B7_2.

4.2.2 Second-Order Confirmatory Factor Analysis Model for Socioeconomic

Figure 2 shows the second-order CFA model for socioeconomic construct that has achieved the goodness-of-fit. This model is a combination of all dimensions of socioeconomic constructs retained in the first order analysis.
Figure 3. Second-Order Confirmatory Factor Analysis Model for Socioeconomic

The model analysis in Table 9 shows that the model has achieved the goodness-of-fit level based on the specified indicators (CMIN = 28.421, DF = 8, CMIN/DF = 3.553, p = 0.000, GFI = 0.991, CFI = 0.983, TLI = 0.968 and RMSEA = 0.051).

Table 9. Model Fit Indicators of Second-order Confirmatory Factor Analysis for Socioeconomic Construct

| Indicator            | Acceptable Indicator Value | Second-order Confirmatory Factor Analysis |
|----------------------|----------------------------|------------------------------------------|
| Absolute Fit Indices |                            |                                          |
| CMIN                 | 28.421                     |                                          |
| DF                   | 8                          |                                          |
| CMIN/DF              | <.5                        | 3.553                                    |
| PROB (P-val)         | >0.05                      | 0.000                                    |
| RMSEa                | <0.08                      | 0.051                                    |
| Goodness of Fit Index (GFI) | >0.90             | 0.991                                    |

Legend:
SE : Socioeconomic
S : Social
### Comparative Fit Index (CFI)

|     |     |     |
|-----|-----|-----|
| CFI | >0.90 | 0.983 |

### Tucker-Lewis Indices (TLI)

|     |     |     |
|-----|-----|-----|
| TLI | >0.90 | 0.968 |

### 4.2.3 Construct Validity Assessment

Table 10 shows the factor loading (λ) values of the items retained for the dimensions that exceeded the specified factor loading value of 0.5. The factor loading values for social are between 0.501 to 0.736 and economic dimension between 0.657 to 0.756.

The Average Variance Extracted (AVE) value for each dimension must reach the value of AVE ≥ 0.4 [22]. As for social dimension (AVE=0.40) and for economic dimension (AVE=0.50). Whereas for the composite reliability (CR) indicator, both dimensions reached a good value that exceeded 0.6. This shows that both dimensions and items contained in the CFA measurement model have convergence validity.

### Table 10. Descriptive Statistics and Construct Validity of Population

| Dimension | Item | λ | SMC | AVE | CR |
|-----------|------|---|-----|-----|----|
| Social    | B7_3 | 0.649 | 0.421201 |
|           | B7_4 | 0.736 | 0.541696 | 0.40 | 0.73 |
|           | B7_5 | 0.629 | 0.395641 |
|           | B7_7 | 0.501 | 0.251001 |
| Economy   | B7_10 | .756 | 0.571536 | 0.50 | 0.67 |
|           | B7_11 | .657 | 0.431649 |

Note:

- λ = factor loading
- SMC = Squared Multiple Correlations
- AVE = Average Variance Extracted
- CR = Composite Reliability

### 5. Conclusion
This study has been conducted to evaluate the reliability and validity of socioeconomic construct by using both the exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). The results of the EFA and CFA showed that there were two sub-constructs of the socioeconomic construct and six items with high validity values where the CR exceeded 0.6. The two socioeconomic constructs were i) social, and ii) economy. While the six items were B7_3, B7_4, B7_5, B7_7, B7_10 and B7_11.

These findings indicate that the measurement model met the measurement criteria for measuring the wellbeing in the suburban area. The study findings also show that the fit index value was equal to p=0.000, relative chi square value of 3.553, 0.991 for GFI value, 0.983 for CFI value, 0.968 for TLI and RMSEA value of 0.051. The rural-urban transformation indicators for the resulting socioeconomic construct met the requirements for developing a structural equation modelling (SEM). Hence, this model is suitable for measuring the transformation of suburban areas in Malaysia from the socioeconomic aspect of the population.

In conclusion, this study has succeeded in developing a socioeconomic indicators to measure population wellbeing in the suburban area of metropolitan region. These indicators have been tested and have high reliability and validity. Thus, it can be applied by future researchers in analysing socioeconomic wellbeing of population in the suburban area of metropolitan region.

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