Communication and transportation as quality of life determinants based on cities in Central Java Province and Special Region of Yogyakarta

S Subanti\textsuperscript{1,2,5*}, Hartatik\textsuperscript{1,2}, A R Hakim\textsuperscript{6,7*}, A Daerobi\textsuperscript{3} and R R Setiawan\textsuperscript{4}

\textsuperscript{1}Department of Statistics, Faculty of Mathematics and Natural Science, Universitas Sebelas Maret, Indonesia  
\textsuperscript{2}Research Group for Applied Statistics, Universitas Sebelas Maret, Indonesia  
\textsuperscript{3}Department of Economic Development, Faculty of Economics and Business, Universitas Sebelas Maret, Indonesia  
\textsuperscript{4}Department of Economic Development, Faculty of Economics and Business, Universitas Ahmad Dahlan, Indonesia  
\textsuperscript{5}Center for Research and Development for Tourism (PUSPARI), Universitas Sebelas Maret, Indonesia  
\textsuperscript{6}Faculty of Economics and Business, Universitas Indonesia, Indonesia  
\textsuperscript{7}Institute for Research and Social Services, Universitas Sebelas Maret, Indonesia

Corresponding author: sri\_subanti@yahoo.co.id, arhaqkm@gmail.com

Abstract. The quality of life become a concern for individuals and communities seeking to find their sustainable life. Some people in industry, consumer groups, academics, and policy makers have sought to better understand how communication and transportation contributes on quality of life. Thus, this paper aimed to calculate quality of life based on transportation and communication. Indicator of transportation such as road surface condition and the availability of public of transportation; while indicator of communication such as the availability of television signal, post services, cable phone, and internet cafes. Cities involved in this study were Magelang, Surakarta, Salatiga, Semarang, Pekalongan, Tegal, and Yogyakarta. This paper used national socio-economic survey data and the potential of village data. Estimation techniques using multiple regression method. The findings of this paper, (1) transportation and communication were linked to Quality of Life; (2) the highest quality of life obtained by the city of Magelang, while the lowest was occupied by the City of Pekalongan. Suggestion from this paper, local government should have to prioritize infrastructure development such as transportation and communication because it can improve the quality of life whose lived in the city.

1. Introduction
Quality of life of the city has been concern, not only in developed countries but also developing countries. So, it’s not surprising that studies the quality of life was constantly envolved both in terms of methods, size, as well as its own role for the welfare [1,2]. Quality of life need to be monitored,
according to Mercer, due to higher domestic and global security threats accompanied by the displacement of population as a consequence of social unrest, seems to have made the challenge more complex and increasing uncertainty facing every business person. Thus, they need the accurate data and the objective method for determining the cost due to the deteriorating standards of living and personal safety issues [3].

Periodically, calculation of the quality of life has been done some institutions. In 2016, Mercer, one of the agency made publication about the quality of life among countries. In this year, Indonesia was represented by Jakarta, ranked 142, down two places from the previous year. This rating is lower if we compared with other cities in Southeast Asia. Singapore (Singapore) and Manila (Philippines) ranked 26 and 136, was relatively constant if it compared with the previous year. Kuala Lumpur (Malaysia) and Bangkok (Thailand) ranked 86 and 129, it tend to decrease over previous year (rank 84 for Kuala Lumpur and rank 117 for Bangkok) [6]. Based on the background above, this paper aims to measure quality of life from the perspective of the amenities of the city, especially transportation and communications.

2. Methods
2.1. Data
The data in this study using national social-economic data (Susenas) and potential villages (Podes). It is used in this paper based on the same year. Data for transportation and communication obtained from potential village data. The data consist of education, health, employment, and housing as well as household’s consumption and households expenditure obtained from national socio-economic data. This data includes on information on age, gender, employment status according to the industry, the main employment status, characteristics of the region, and the highest education level attained.

2.2. Model and method
The model in this paper built on the model written by Blomquist et all (1988) and Djamaluddin (2013). According to the authors, the general framework of measuring the quality of life is the hedonic approach where this method makes it possible to estimate the prices of goods that do not have a market. The approach can be observed through the use of data from the market regarding the quality or environmental comfort. Here, the market is categorized into two groups: the labor market and the housing market. Representation of the housing market is reflected in the rent model while the labor market is reflected in the wage model [4,5]. The basic model determined as follows:

\[ LR_i = f(C_i, T_s, W) \]  
\[ LW_i = f(C_i, T_s, W) \]

Where, \( LR_i \) is the rents in logarithm to \( i \); \( LW_i \) is the wages in logarithm to \( i \); \( C_i \) is the infrastructure of communication and telecommunication to \( i \); \( T_s \) is the infrastructure of transportation to \( s \); and \( W \) is the socio-demographic characteristics of the household. This paper uses multiple regression techniques where \( \beta \) parameter estimated by the least squares method, the ways that can be done by minimizing the sum of squared errors [5-7]. Then, some variables description is explained in Table 1.

| Table 1. Variable description of communication and transportation infrastructure |
|-----------------|------------------|
| Variable        | Description                                |
| Roadsurface     | Road surface condition; 1 = asphalt road and 0 = others |
| Pubtrans        | Availability of public transportation       |
| Hhcablephone    | Number of household that have phone cable   |
| Warnet          | Number of internet café                     |
| Wartel          | Number of wartel                            |
| Post services   | Availability of post services               |
| Tvsignal        | Availability of tv signals                  |
From regression results, we take \( \frac{dLW}{dC}; \frac{dLW}{dT}; \frac{dLR}{dC}; \) and \( \frac{dLR}{dC} \), then we can multiply with 12 (we assumed that 1 year equal to 12 month and rent cost is fixed among this period) and average value of wage and rent. So, we have get the households compensation per year on housing market and the households compensation per year on housing market. Then, we can summarize each item to get the quality of life value. This value can be negative or positive; if positive that means the households willing to pay a nominal value to get some amenities in the cities but vice versa if the value is negative [5].

3. Results and discussion
In the third section, we want to explain about demographic profile of households in Central Java Province based on Susenas data. From previous studies, we have three sociodemographic variables are commonly used. These variables are, (1) Age, this variable is often used for socio-demographic variable, as long as, it is used in individual or households modelling studies. (2) Income can be measured with numeric variable or dummy variable, it is another frequent regressor in individual or households modelling too. (3) Gender, commonly measured as a set of dummies, where 1 represents male, and 0 represent female. The demographic profile of respondents such as sex, age, marital status, respondent origin, education, and monthly income are explained in Table 2.

| Table 2. Demographic Profile of Households |
|-------------------------------------------|
| Characteristics | Freq. | Percentage | Characteristics | Freq. | Percentage |
| Sex | | | Respondent Origin | | |
| Male | 765 | 79.85 | Rural | 32 | 3.34 |
| Female | 193 | 20.15 | Urban | 926 | 96.66 |
| Age | | | Education | | |
| 16 – 25 | 138 | 14.41 | Junior High School or Less | 415 | 43.32 |
| 26 – 35 | 152 | 15.87 | Senior High School | 390 | 40.71 |
| 36 – 45 | 210 | 21.92 | Diploma | 142 | 14.82 |
| 46 – 55 | 221 | 23.07 | Sarjana or Over | 11 | 1.15 |
| > 55 | 237 | 24.74 | Monthly Income | (in Rupiah) 1US$ = Rp 13000 |
| Marital Status | | | <= 1.5 million | 437 | 45.62 |
| Not Married | 316 | 32.99 | 1.51 - 3 million | 101 | 10.54 |
| Married | 642 | 67.01 | > = 3,01 | 420 | 43.84 |

Based on Table 2, the proportion of male respondents (79.85%) is higher than female respondents (23.33%). The marital status of respondents with married status represent 67.01%. It’s higher than other status (not married), represent 32.99%. Age groups were also relatively distributed, except for people age 26 or lower. Majority respondents have attended junior high school, eventhough many respondents have attended colleges or university graduates. Respondents that have attended junior high school or less, represent 43.32% of respondents, whereas 14.82% of the respondents had diploma degree. Based from respondent origin, majority respondents do not come lived in urban with 96.66% and in rural only 3.34%. Persons with a monthly household income of 1.51 – 3 million rupiah and 3 million rupiah or above, it’s accounted for 10.54% and 43.84%. While those, respondents with incomes less than 1.5 million rupiah represented 45.62%.

From Table 3, It can be known that the value of quality of life that consist of road surface until television signal. Components incomplete means that these components are already available in the city. Conversely, components are incomplete shows that there are variations in the availability of
every city. Transportation component such as an asphalt road and vehicle access, it’s seen that households in Pekalongan have the highest willingness to receive compensation if the road surface has not asphalt. Meanwhile, vehicle access, only households in Semarang give willingness to receive compensation if it has not vehicle access. Communication component consist of cable phone, post services, internet cafe, telephone, and television signal. For cable phone and post services, households in Salatiga have the highest willingness to receive compensation; whereas television signals, households in the city of Yogyakarta have the highest willingness to receive compensation. Then wartel, only households in Pekalongan have willing to pay additional compensation compared to other cities if it has not wartel.

| Variable       | City         |
|----------------|--------------|
|                | Yogyakarta   | Magelang    | Surakarta   | Salatiga    |
| Roadsurface    | n.a          | n.a         | n.a         | n.a         |
| Pubtrans       | n.a          | n.a         | n.a         | n.a         |
| Hhcablephone   | 0.00         | 0.00        | 0.00        | -0.01       |
| Warnet         | -0.22        | 2.70        | -0.94       | 10.05       |
| Wartel         | n.a          | n.a         | n.a         | -12.08      |
| Postservices   | 0.04         | -1.11       | -0.09       | -1.15       |
| Tvsignal       | -7.67        | -3.36       | -9.28       | -7.64       |

Based on Table 3, we can argue that the growing concern for individuals and communities seeking to find sustainable life satisfaction in a technologically changing world besides infrastructure of transportation. Globalization and rapid advances in information technology came to us, unprecedented opportunities to improve life quality. Thus, this opportunity may also be burdened with undesirable consequences. With the internet, people living in the most plugged-in and mechanized society in history, it may be working harder than ever. Rather than creating time for leisure, our technology is creating ways that make it possible to undertake more work at home. Cellular phones, palmtops, and Internet access devices may be making it virtually impossible to escape our jobs. Technology may diminish our leisure time, not increase it [8]. Eventhough the internet as part of communication amenities, it has become an important resource for information and entertainment, we should not respecting about the ways in which individuals use this technology, they have play a role in influencing “social support” i.e emotional support, instrumental support, information support, affectionate support, and social companionship [9]. Some research show that the domain of social support from family, friends, and marriage has the most effect on life quality and has the most positive influence on QoL for a diverse range of social groups [8-10].

In Table 4, we can show that if there was a movement of households from Pekalongan to Magelang, the household is willing to pay the average compensation amounted to 20.72 million rupiah per year, or 1.73 million rupiah per month to enjoy the amenities in Magelang. If the movement of households towards Magelang, the local government of Pekalongan can create incentives policy with a minimum value of 20.72 million rupiah per year, equivalent to 1.73 million rupiah per month. Instead, the local government of Magelang can restrict the entry of domestic migration from Pekalongan, the
local government can create disincentives policy with maximum values of 1.73 million rupiah per month.

Table 4. Estimation results: total value for quality of life (million rupiah)

| City     | Per Year | Per Month | Position |
|----------|----------|-----------|----------|
| Yogyakarta| -7.851 | -0.654 | 2        |
| Magelang  | -1.776  | -0.148 | 1        |
| Surakarta | -10.311 | -0.859 | 4        |
| Salatiga  | -10.821 | -0.902 | 5        |
| Semarang  | -9.464  | -0.789 | 3        |
| Pekalongan| -22.500 | -1.875 | 7        |
| Tegal     | -17.676 | -1.473 | 6        |

Next, from the same table, if there was a movement of households from Magelang to Semarang, they were willing to accept compensation for the disamenities in Semarang, the value amounted to 641 thousand rupiah per month. Instead, to encourage the entry of households from Magelang, the local government of Semarang can create incentives policies at a minimum of 641 thousand rupiah per month.

4. Conclusion
The findings of this paper that (1) transportation and communication were linked to Quality of Life (QoL); (2) the highest score was occupied by the town of Magelang while the lowest score was occupied by the town of Pekalongan. Based on forming quality of life, households in Pekalongan have the highest willingness to accept additional compensation for asphalt road. Then, households in Tegal have the lowest willingness to receive additional compensation for cable phone. Next, households in Semarang have the highest willingness to pay for signal television, while households in Surakarta has the lowest willingness to pay for cable phone. Suggestions, local governments should need to prioritize infrastructure development because it could improve the quality of life whose lived in the city.

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