Assessment Of Public Space QualityUsing Good Public SpaceIndex(Case study of Merjosari Sub District, Municipality of Malang, Indonesia)

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Abstract

Kampong is a form of complex residential area which dominated in Indonesia cities. This kind of residential area usually has mixed use arrangement of parcels that enables the more vibrant public space. Municipality of Malang is one of medieval cities in Indonesia that has kampongs with diverse public space characteristics. Located in a block of sub district of Merjosari, this research tried to explore characteristics of public space in the adjacent local roads and inner part of residential block. From this exploration then could be assessed the public space quality and its relationship with physical features of observed public space. Goals of this research were assessing quality of public space and evaluating the quality in relation to existing physical feature. Valuation of public space quality on this research used the Good Public Space Index (GPSI) concept. Data for this analysis came from observations on day time. Then, the measured GPSI was analyzed using multiple linear regression in relation to build environment components and gain result that of local traffic condition as the main predictor of public space quality.

*Keywords:*Public space; Good public space index; multiple linear regression

1. Introduction

   A city is usually characterized with a dense of population and it makes land use becomes more various that triggers accumulation of transportation networks. Land use and transportation network then influence how the build environment should be established and becomes the realm of public activities. People live in urban space as a container of humanity needs. Mankind as social creature has the need of social interaction with a whole range from domestic to neighborhood scale. Children need to interact with their parents and so does a wife with her husband

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and their relatives as well. In broader means of interaction, a person also needs to interact with his/her friends and makes a social group (Stangor 2004 p.3). These samples of interaction need spaces to make them occurred with the more private one for domestic interactions and public space for community interactions.

Urban space should have sufficient public space to maintain social interaction between its inhabitants. The public spaces itself comprise from all range of build and natural environment (Carmona et al. 2008) with ease of accessibility as main prerequisite. As the increase of accessibility, it makes outdoor activities more feasible to take place and thus generates social integration. Accessibility of public space could be influenced by physical design, environmental quality, traffic condition, environmental beautification and other build environment components that support people's preference to do some outdoor activities like chatting with friends, walking, lingering and other forms of interaction. The existence of outdoor activities then can be indicator of quality of urban public spaces (Gehl 1987 p.13).

Merjosari is one of Kampung in Malang City that has urban characteristic and located between several important sub districts. Under this condition, Kampung Merjosari becomes a busy area with various land use and a dense of local transportation networks. Land uses in Kampung Merjosari area comprised of education, local trading, neighborhood service, small industry and residential. Local roads of Kampung Merjosari serve neighborhood and broader urban mobility as well. These conditions make Kampung Merjosari becomes crowded in certain time with deteriorated environmental quality. Then, can be asked some questions that how could outdoor activities be evolved in such conditions and then how can it be related with measurement of public space quality. This research tried to uncover how public space could serve people needs and their relation to build environment components. With theoretical assumption as Gehl (1987) has argued, this research focused on characteristics of outdoor activities as indicator of public space quality and social interaction.

Aims of this research were assessing quality of public space and studying it in relation to physical build environment of study location. Good public space index method as proposed by Mehta (2007) was utilized with a range of data from in depth observations using behavior maps. Indices produced by this method then were analyzed using multiple linear regression to evaluate its correlation with several build environment components.

2. Findings

As the result of measurement process, Good Public Space Indices (GPSI) were in the range of 2.52 up to 3.62. The highest GPSI was on segment block C1 (3.62), followed by segment B1 (3.47), A2 (3.30), A3 (3.15), A1 (2.95), C2 (2.87), B2 (2.77) and the lowest on is B3 (2.52). These values indicated that only one of the blocks had high quality of public space by means accommodate outdoor activities with high durability, multifunctional, high accessibility and socially utilized. We will elaborate characteristics of each block and segmentsin regard to GPSIs as follows.

2.1. Block A

Block A comprised three segments those of lied on western street corridor (A1), northern street corridor (A2) and located on southern corridor street (A3). Each of these segments had moderate value of GPSI whereas segment A1 had the lowest index (2.95) and A2 has the highest one (3.30). Distribution of values of each variable are described as follows:

Segment A1. This segment had high values in temporal diversity of use (0.65) and diversity of users (0.79); moderate values in people's duration of stay (0.42) and variety of use (0.58); and low values in intensity of users (0.21) and intensity of social use (0.30). The high values imply this segment has good durability in outdoor activities in equal distribution over observation time and can be accessed equally by users. High durability of outdoor activities implies usefulness of outdoor public spaces in this segment as it is indicated that the spaces have physical configurations suitable to public needs. From observation, it was found that wide diversity of users took place on public spaces on the age groups of 0-5 years old to 56-65 years old of woman and 0-5 years old to 36-55 years old of man. It is presumably that physical conditions have contribution in coordinating all user groups. However, something was existed that made people do not linger in very long periods as it is showed in moderate value of people's duration of stay. So as it does in variety of use. Outdoor spaces have supported variety of outdoor activities

but still there were domination in walking, chatting and trading. It is interesting to discuss that walking and trading can be conducted in the same time with chatting. The low values can be interpreted as underused and individually of space appropriation as it has been observed that domination of individually walking activity on most of unit analyses.

Fig.1. Physical condition of segment A1

From photographs above, it was observed that pedestrians were not on intended space. There are no proper boundaries between space for vehicles and pedestrians. However, it seems that people have accustomed to this condition since there were still some people lingering and neutral perception on feeling of secure from traffic accidents. Some buildings are attached directly to road and the others have fenced front courtyards. There is no intended open public space that makes road as space for public activities. This segment has various land uses but still dominated by low scale public and commercial facilities. Connectivity between houses and those facilities give high average perception value of ease on access environmental services. The outdoor spaces look well maintained with no scattered garbage outside.

Segment A2. This segment had high values in temporal diversity of use (0.69), variety of use (0.75) and diversity of users (0.74); moderate value in intensity of social use (0.43); and low value in people's duration of stay (0.35); and very low in intensity of users (0.15). The high values imply that public spaces have been utilized along the day equally. These spaces also have good access for users since they can do various outdoor activities, respectively. Moderate value in intensity of social use shows that almost all people do outdoor activities in group of two persons or more. Physical settings have been arranged properly to support these communal activities. However, it was also found that people still do short time - outdoor activities and in small number than it should be.

Fig. 2. Physical condition of segment A2

As its location on road junction, it was observed that there were accumulations of activity on this segment. This segment has residential neighborhood with domination of house parcels, fenced front courtyards and narrow space at the side of road. Although there is no specific constructed pedestrian way, this narrow space provides enough access for people in lingering between homes and reach nearby public or commercial facilities. Outdoor spaces of this segment are good maintained. It was also observed that this segment served the more domestic movements than segment A1.

Segment A3. This segment had high values in temporal diversity of use (0.72), variety of use (0.76) and diversity of users (0.68); moderate value in people's duration of stay (0.50); and low values in intensity of users (0.21) and intensity of social use (0.28). Just like on the segment A2, this segment also has been utilized properly with good access and equal diversity of outdoor activities. People tend to be rather pleased in public spaces as it showed by moderate value of people's duration of stay. However, this segment still underused. It does not accommodate

amounts of people than it should be. It is inferred that a small number of people has dominated this segment in moderate time periods just for individually walking activities. It seems that spatial setting of this segment only suitable for walking.

Fig. 3. Physical condition of segment A3

This segment has mono land use that of high education (university). As its main function, this segment has better outdoor space with maintained shaded side walk and yard. Its road serves local transportation that makes connection between university and some neighboring rent houses.

2.2. Block B.

This block comprised three segments, those of B1, B2 and B3. Segment B1 and B2 were located in center of this Kampung and connected by passageways with outer local roads. All of these segments were valued in moderate of GPSI. B1 is valued in 3.47, B2 in 2.77 and B3 in 2.52, respectively. Public spaces have been functionally served users but not in the best way.

Segment B1. Extreme differences of value existed as the very low values and very high one occur on this segment. The very high value was variety of use (0.87). The other variables were high values in temporal diversity of use (0.71) and diversity of users (0.79); moderate values in intensity of social uses (0.43) and people's duration of stay (0.51); and very low in intensity of users (0.16). The very high and high valued variables depict how physical setting of this segment accommodates diversity of outdoor activities. Wide ranges of process activities, physical contacts and transitional activities occurred properly in equal distribution over observation time. High value in diversity of users implies that public spaces of this segment have good publicity as they can be accessed by wide range of users from the age groups of children (6-15 years old) to seniors (56-65 years old) of woman and man. Appropriation of public spaces occurred moderately wherein users acted in several groups and in some rather short periods. However, there was a little number of user observed that implies people prefer to make most activities indoor.

Fig. 4. Physical condition of segment B1

Segment B2. This segment had very high value in diversity of users (0.83); high values in temporal diversity of use (0.68) and variety of use (0.63); low values in intensity of social use (0.24) and people's duration of stay (0.35); and very low value in intensity of users (0.05).

Predominantly, characteristics of segment B1 and B2 are alike in regard to their very high and high values in diversity of users, temporal diversity of use and variety of use. These common features may be as the effect of similarity of location. However, there was no moderate value at all. The rest of variables were valued in low and very low. These very low and low values imply that this segment is not the vibrant one. Desolateness made this

segment easy to be utilized for various activities but still, public spaces do not work properly as it should assemble people for outdoor activities.

Fig. 5. Physical condition of segment B2

Segments B1 and B2 had several common characteristics those of mono land use and exclusive outdoor spaces i.e. gated neighborhood. They had neighborhood scale roads that also serve as outdoor public space for the inhabitants.

Segment B3. This segment had the lowest GPIS that of 2.52 with high values in temporal diversity of use (0.71) and diversity of users (0.73); and the rest of variables have low value. It is certainly the most desolate segment. From observation, it was found that outdoor spaces of this segment are only used for walking. Physical setting of this segment makes it compatible for only certain uses.

Fig. 6. Physical condition of segment B3

2.3. Block C.

This block comprises from two segments that of C1 which was located on the southern street corridor and C2 on the eastern street corridor. Unlikely segment C1, C2 had two street junctions on it. Segment C1 had high value of GPSI and C2 has the moderate one.

Segment C1. This segment had high values in both temporal diversity of use (0.72) and diversity of users (0.68); moderate values in intensity of users (0.59), intensity of social use (0.45) and variety of use (0.42); and low in people's duration of stay (0.38). This segment had the highest GPSI than the other ones. It can be inferred this value of GPSI represents physical setting that urge people to utilized public space properly. Low value in people's duration of stay did not have any effect in this valuation because it only shows average of time consumption in appropriating public space.

Fig. 7. Physical condition of segment C1

This segment comprised from mono land use that of residential area. This area did not have specific space for people's gathering like public yards but it had linear spare spaces at the side of road. Although these linear spaces were not in the form of pedestrian way, people intensely utilize it for making social contact with neighbors and walk to adjacently places.

Segment C2. Contradictory with previous segment, C2 had the lowest GPSI amongst others. It had three high valued variables those of temporal diversity of use (0.63), variety of use (0.64) and diversity of users (0.79); and the rest were valued in low and very low. Perhaps it was an effect on existence of two junctions that made this segment becomes the busier and full of motorized vehicle activities.

Fig. 8. Physical condition of segment C2

This segment had rather similar characteristic of land use diversity but in the higher level of activities. This segment comprised from commercial and service facilities that served domestic user and wider range of local communities. It made traffic of this segment as the busier one with wider road. There was neither any pedestrian way nor outdoor space designated intentionally for public activities. Most potential open spaces were observed to be utilized as parking for motorized vehicles or intermodal spots.

3. Multiple linear regression (MLR) analysis

MLR was utilized to find mathematic pattern of correlation among variables. To develop the more comprehensive understanding of this correlation, this analysis was conducted in several levels.

The first level of MLR analysis used GPSI as dependent variable (Y1.1) and build environment components those of Simpson's diversity index of land use (LU), availability of pedestrian facility (APF), potential public outdoor spaces (PPOS) and vehicular activity (VCR) as independent variables. Result of this analysis as follows.

$$Y1.1 = 3,073 – 0,356VCR$$

Second level used GPSI as dependent variable (Y1.2) and variables of GPSI those of intensity of user (IU), intensity of social use (ISU), people's duration of stay (PDS), temporal diversity of use (TDU), variety of use (VU) and Diversity of users (DU) as independent variables. Result of this analysis as follows.

$$Y1.2 = 1,319 + 3,574ISU + 1,440PDS$$

Third level comprised two MLR analyses those of ISU (Y2) and PDS (Y3) as dependent variable and build environment component as independent variables. Result of these analysis as follow.

$$Y2 = 0,473 – 0,075VCR$$
$$Y3 = 0,467 – 0,027PPOS$$

4. Discussions

The first level of MLR analysis explains general finding about how GPSI correlates with certain kind of build environment component. Starting point of this analysis is theoretical assumption that physical condition of build environment plays important role in encouraging people to do some outdoor activities (Van Schaick: 2011, p.2). From the resulted equation we find that generally GPSI (Y1.1) only had correlation with motorized vehicle activity

(VCR) in negative direction. It is really making sense that motorized vehicle activity gives negative impacts of outdoor public spaces i.e. fear of accident and wide range pollutions those of noise, dust, CO and other hazardous gases. This finding is also relevant with research conducted by Sauter and Huettenmoser (2008) about the effect of traffic on social relations of a neighborhood.

The second level of MLR analysis finds that only two variables had correlation of GPSI (Y1.2) value those of intensity of social use (ISU) and people's duration of stay (PDS). Both of these variables had positive direction with ISU as the highest one. From this analysis we find that ISU and PDS have high role in inclination and declination of GPSI. This second level of analysis is important to find which build environment component has correlation to GPSI in more specific way i.e. in variable level that be analyzed in the next level analysis.

The third level of MLR analysis gives explanations that both ISU (Y2) and PDS (Y3) had exactly different predictor. ISU (Y2) was more influenced by VCR i.e. the same finding in the first level analysis. People tend to be gathered and interacted each other in conducive situation and through this research it is found that vehicle activity has negative impact on outdoor social environment. PDS (Y3) was more influenced by PPOS. It was rather peculiar that availability of outdoor public space gives paradoxically effect on duration of outdoor activities. However, it can be explained that most of the available outdoor public spaces are not managed in proper manner. They were mostly used as illegal parking lot and street vendor's that in fact discourage pedestrian activities. So in other words, there was still no enough space for pedestrian. In terminology on political economy, this kind of outdoor privatization has critical problems and debates upon relations between people or persons with environment and how those people or persons should manage their power upon public sphere (Brodin, 2006). Declination of accessibility for people in appropriating public space then could make public space lost its publicity function and in turn this condition could lead to disruption of stability of society (Ijla, 2012).

It is important to give proper attention on build environment components that effect public space quality i.e. measured with GPSI method. Social activity and social inclusion as final result of good managed public space need conducive environment that constituted not only by availability of outdoor space but also control of motorized vehicle activity. As Francis Tibbalds argued in his work (2001: 33), in supporting more pedestrian activities, control upon traffic is needed in the means of not totally excluded but more about lowering its intensity to be more calmed, so the outdoor public spaces cannot be ruined to be daily disaster suffered by urban neighborhood.

5. Conclusions

Conclusions can be drawn from this research as follows:
- Good public space index (GPSI) can be useful in measuring quality of public space metaphorically in means of appropriation of spaces for outdoor activities.
- Motorized vehicle activity has negatively dominant influence in maintaining conducive environment for outdoor activity i.e. measured with GPSI.
- Availability of outdoor public space can otherwise become a negative influence on GPSI if it is not managed properly to support pedestrian activities.

Recommendations can be stated from this research as follows:
- It needs to develop specific method to measure variable of GPSI in the more precise way i.e. elaborating social science method and valuation of build environment quality.
- GPSI has not been elaborated with qualitative components those of aesthetic and sense of place. It can be raised a need to develop the more comprehensive method in measuring quality of public space with intensity of outdoor activities and qualitative components as its starting point.

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