

The Relationship Patterns of Itenas Open Spaces as the Keystones for Regenerative Design

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ABSTRACT : Public open spaces designs determine the patterns of natural balance. In order to preserve its sustainability, regenerative design should be applied. As the main step of its application, an investigation of relationship patterns or keystones of the designs needs to be conducted. Using a qualitative approach, this study aims to investigate those patterns in public open spaces in Itenas compared to six other campuses in Bandung and Jakarta. The research method of analysis is descriptive.. It is concluded that the relationship patterns found in the public open spaces of the campus generally are: (1). Connectivity is formed from vehicle circulation patterns and accessibility; (2). Criteria for outdoor space that are generally desirable. While the findings specifically are (1). The relationship patterns found in Itenas relate to the response of activities, locations, times and categories of the public spaces; (2). Stimuli in the form of other activity-creating aspects; (3). In the communal and commercial facilities categories, users mix, interact; (4). There is a place of illegal stimuli causing the circulation function changes into a facility. The findings support the theories and serve as important information implementing the regenerative design in Itenas.

Keywords : Relationship Patterns (Keystone), Public Open Space, Campus, Itenas, Regenerative Design

INTRODUCTION

Sustainable site regulates the criteria in architectural design for the outdoor space of the building which is better known as landscapes. Landscapes, referred to Federick Steiner (Dinep. C, 2010), are not only media's outside the building which are interactive and interconnected, but also designs considering the complexity of the ecological system as well as culture. The relations between landscapes, designs and sustainability define the roles of architectural professions. Through their designs, architects will revamp the already-organized ecological system to make functions for individual and community needs. To create sustainable cities, life has to be brought back into the city, not only to a privileged few, but to all social groups. Employment, housing, education, culture and leisure facilities should be available to all (Sassi, 2006).

A public space, on the other hand, is a design with the function of providing a pleasant experience to the visitors in enjoying the view of the site itself as well as the activities in it. The usage of public spaces that allow people to meet on ostensibly neutral ground in planned and unplanned ways, to interact with others within the context of the whole community (Caroline Holland, Andrew Clark, 2007). Activities in the public space is believed to create interactions between the environment and the community (Bhatia, 2015). Another definition of a public space is a communal space giving people an opportunity to meet each other provided the catalysts are there (Lang, 1987). The catalysts are brought by each individual together in a discussion or other activity requiring an interaction between them. They are apparently the stimuli of the design of the space itself, i.e. how it can attract the visitors, invite and provide comfort to them to do basic activities in it such as walking, standing, sitting, strolling, chatting with friends, listening to the nature or music, and experssing themselves in their own way (Gehl, 2010).

The stimuli quality of a public open space design is able to convey denotative or conotative meaning that will affect the activities in it. Therefore, the space will be active and sustained longer than passive spaces. The existence of passive space that is not responded properly will consequently disrupt the sustainability of the design itself. In this area, sustainability is an important issue of the current global problem, and thus a plan needs to put the sustainability aspect first place. However, some plans might not be sustainable so they need to be renewed. As an object that has been designed can not renew automatically, regeneration (regenerative) is considered the best solution for its sustainability issue. Regenerative Design is an approach that aims to create a new set of relationships that reinforce the state of health of human and natural ecosystems, utilising appropriate construction and

technology (Naboni, E & Havinga, 2019). Regenerative design itself is defined as a relationship between objects and how to make them developed and make them renewed. In 2010-2017 regenerative design, there are two basic aspects of renewability: (1) Determining the patterns of relationship between the design and nature. It is believed that a thorough relationship is complex as it involves the ecology and technique. The determined patterns of relationship will help us define the whole ecosystem being formed. Understanding the relationship patterns is crucial as the basic consideration before involving any technology to tackle any issues found for the purpose of regenerative design. Nonetheless, technology can be learned yet it will be useless without the relationship pattern awareness of the site. (2) The end-process of a design should be a process of experience based on the basis of how life goes in that site, expecting the sustainable conditions.

Institut Teknologi Nasional (Itenas) Bandung is a campus with approximately 7000 student body and the culturally diversified civitas academica. It is located in a strategic place in the heart of Bandung city and has a large area of campus, making it attractive to its students and prospective students. Its sufficient area of land as well as horizontally built buildings give it sufficient space for some large open space designs. The public open spaces in this campus can be divided into three criteria: open space as a communal, commercial and departmental facilities that are formed as the results of the patterns of mass order. Previous research has investigated spatial designs viewed from the sustainable design perspective. The results of the study identified the existence of passive spaces, unsystematic ecological connectivity, unaccommodated activities in the open spaces and unplanned & spontaneous open spaces.

The problems found in the previous research become the basis of this advanced research thinking, i.e. to find patterns of relationships in the public open spaces, particularly those in the campus, as the process of regenerative design for the purpose of sustainable design.

METHODS

The main research object of this study was the non-parking public open spaces of the National Institute of Technology (Itenas). Used as comparisons to the main object, three equivalent campuses located in Bandung City and Jakarta City were observed.

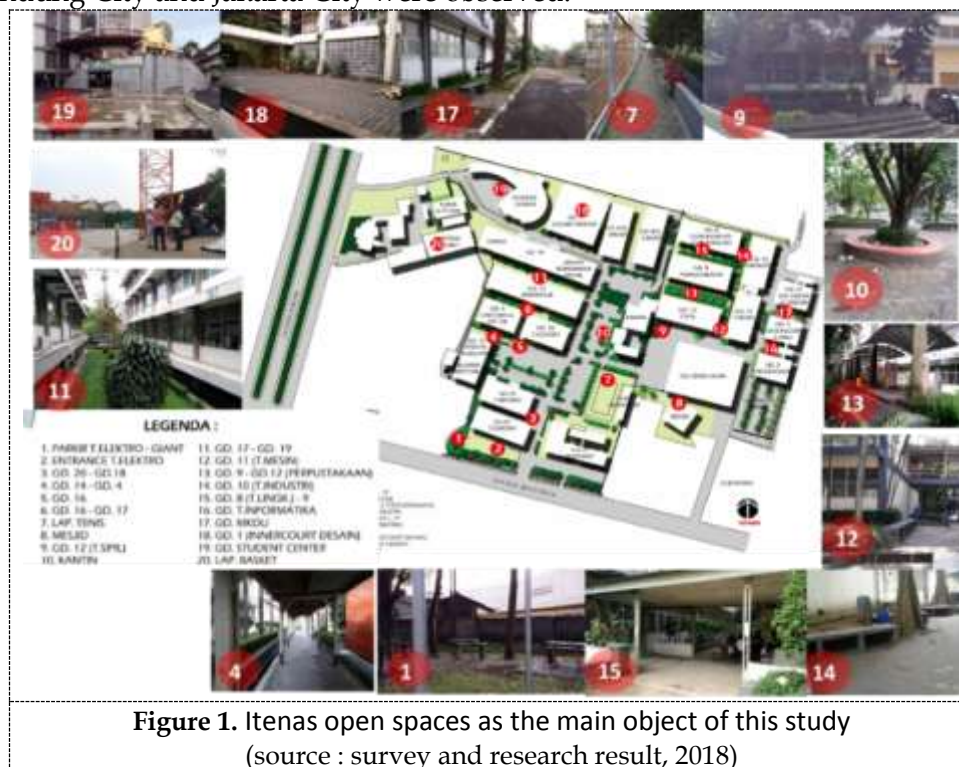


Figure 1. Itenas open spaces as the main object of this study
(source : survey and research result, 2018)

The research approach in this study was qualitative with some data collection methods applied for the triangulation. The methods were observation, documentation and interviews. The data from the three sources were later analyzed to better understand the results. The survey team was divided into two based on activities in the sample city. Research parameters measured were in the form of sustainable site: (1) connectivity; (2) usage; and (3) purposes. The descriptive method of analysis was

applied to illustrate how the patterns of relationship occur in public spaces in general and in Itenas specifically according to the regenerative design considerations.

RESULTS AND DISCUSSION

The patterns of relationship that occur in the campus open spaces are generally affected by the aspects of events, activities and time. The results of the analysis can define the relationship patterns in Itenas and comparative campuses. The trend of relationship patterns that occur are sorted as follows.

Connectivity

In terms of the site connectivity to the system and the function of the area, the public open spaces of Itenas in general can be considered well connected. This sub-system is formed from the vertex of the open space and is directly connected through the circulation in the form of connecting lines such as the pedestrians' sidewalks, roads, and lobbies. However, this connectivity needs more comfort in several connecting lines by adding roofs to pedestrians' sidewalks and shelters. It is found that the function connectivity reached 85% for active functioning space. The rest 15% is identified to be the passive public open spaces, which are the results of the unformed stimuli from the design and the response of the visitors.

In contrast to the site connectivity to the system and the function of the area, the site connectivity to ecology is found less intact. The system is found unestablished and thus the public open space Itenas cannot be considered environmentally friendly yet. However, the respondents in some active gathering points claim that the establishment of microclimate has provided a sense of comfort for them. Additionally, the connection of the site to the visitors' activities are also considered good, especially in the public space categories of communal and commercial facilities that have particular stimuli.

The same tendency of connectivity of the objects to the system and functions is also found in the other objects observed in this study. The public open spaces in the study objects both in Jakarta and the city of Bandung demonstrate to have good connection to the system and functions of the area. This active connection system is most likely formed by the vehicle and pedestrian circulation lines. In fact, function connectivity gives impacts to the space activities. However, the data from the field observations show a contrast finding. It shows that there is a different tendency in the function of connectivity of the main object of this study and the comparative campuses. The possible cause of this discrepancy is the different sunlight intensity of Bandung and Jakarta. It is not surprising that the outdoor temperature in Jakarta is relatively high causing the students reluctant to do outdoor activities.

Another finding of this study related to the connectivity of the spaces to ecology reveals that this connectivity has not been formed completely. The public open spaces of the objects in this study both in Bandung and Jakarta are not considered totally friendly to the natural environment. The last finding related to connectivity is the connectivity of the objects to the visitors' activities which is considered to be formed well, particularly in the public space categories of communal and commercial facilities. This finding is interpreted as the results of the attraction of the objects, e.g. food and particular functions such as praying.

Usage

In line with the theory, a design is impactful to certain situations that lead the communities, their activities, and minds to a pleasant and environmentally friendly situation (Nuryanto, 2007). In other words, situations are formed by the design as well as response of the visitors determining the space to become active or passive. The results of the data analysis gathered from the observations show that most active and passive nodes are defined depending on time. The active spaces are scattered in almost every vertex in the objects of the study with various categories such as front yard of buildings, corridors or facilities. The respondents interviewed in this study claimed that they visited the open spaces in the campus area of Itenas and the comparative campuses because they are shaded, comfortable, convenient as they are close to their study rooms. Additionally, these spaces also provide seating areas and green environment. These criteria should be general requirements for public space designs in education environment.

The interpretation of the observation data analysis finds that the active node points occur as a response to other particular activities in the area. These responses invite visitors to gather in the area. The existence of the passive areas proves that the location, function and shape of an open space design indeed provide stimuli to the activities occurring in the active space. The absence of the stimuli results in the absence of response from people, minds and activities, so the setting of the site is not perfectly formed (Purwanto, 2007). In addition to that, the high heat intensity of the sun in the city of Jakarta cause the open public spaces as undesirable places to go, except those with shades and/or other stimuli such as food stalls or events.

Besides the findings above, the field observations conducted for this study also reveal that some active rooms used as places to interact are actually functioned as circulatory pathways. This finding is in line with the theory: participation, interactions and public activities have a visible eye attribute (Whyte, 1980) by events or availability: (1). self-Congestion, i.e. there is a tendency that people interact in crowded places; (2). sitting spaces or seating areas; (3). the comfort of light, wind, water and tree; and (4). the availability of food vendors as a source of amenities. Aspects (1), (2), (3) are evident in the observation results. In this case, active spaces occur without any elements/features of special landscape design, but due to some stimuli occurrences.

Another result from the observation data analysis is the criteria of the elements/features and design preferred by the students in public open spaces. In terms of the design elements, it appeared that students prefer dual - function separating walls. It is because in addition to their function as separators, these + 1 meters high walls turn out to serve as seat as well. In other cases, some students place an unused bench and/or lecture table in the area that they consider convenient as a hangout-interacting place.



Figure 2. Some preferred spots in open spaces of Itenas and comparative campuses
(source : survey and research result, 2018)

Based on the observation data and the figure above, the elements/features of a design and design criteria preferred by the visitors of Itenas are similar to those preferred by visitors in the comparative campuses. In each campus sample, many students gather in the building's periphery; the lobby floor is used as a place to sit and interact; the inner court area is also a convenient place to hang out. In conclusion, from the usage aspect of open public spaces, the criteria of preferred public open spaces in general are (1) The areas are cool (exposed to the shading areas), whether it is due to a vegetation shading, canopy/roof or other building; (2) There are places that can be used as seating tools; (3) Close to the students' place of study (departments or courses).

Purposes

In the context of the open space purposes, there is a connection between the open space activity-creating elements. In the elementary aspects of the activity-creating, there is a connection between activities, public space location and the activities occurring. The time-based activities identified in the open spaces of Itenas are:

- 1) based on non-periodic time when the activities are not limited by time, they are gathering/hanging out and chatting. The locations of these activities are scattered, but they occur mostly around the departmental buildings. This finding supports the theory of Hester Jr and Gehl J. claiming that social interaction is increasingly better if the community knows each other (homogeneity). In this case, the communities are the students from the same department.
- 2) based on periodic time in which the activities are limited by certain time depending on the stimuli at that time. They include (moslems) praying activities in the mosque, meal's time in the canteen and sport events. These special purposes occur as a response to the stimuli of activities which occur periodically. Other than the main purposes of the spaces, the students visit these places to sit and chat or in other words, to sit and to converse (hang out).

Relationship patterns in the campus public open spaces

The relationship patterns defined from the data analysis is searching for *the story about the place* based on three sustainable site parameters. The results of the analysis found both general and specific patterns of relationship. The generally - prevailing relationship patterns are identified from the overall observation of the campus samples. In other words, these patterns of relationship can occur in any campus, while the specific patterns of relationship apply specifically in the campus of Itenas.

The general patterns of relationship of the public open spaces are:

- 1) The connectivity is formed from the vehicle circulation patterns as well as accessibility.
- 2) The general favorite open space criteria are: (a) The area is cool (exposed to the shading area caused by a vegetation, a canopy/roof or building shading); (b) There are tools that can be used for seating; (c) It is close to the students' department or places of study.

The specific patterns of relationship of the public open spaces in Itenas are:

- 1) The patterns of relationship in Itenas are formed as response to the activities, location, time and category of the public spaces. Even though in every category of spaces most activities performed are sitting, chatting (hanging out), in this case there are other things that happen more specifically. The table below summarizes the specific patterns found in Itenas.

Table 1 Public open space relationship patterns in Itenas

No	Activities as responds to the design	Location	Time	Type/Category of the public space
a.	Hanging out (incl. sitting and casual chatting) while waiting for the next class	The whole open spaces around department buildings	Non Periodic (continuous)	Private (Department building entrance and between departments space)
b.	Eating	Cafeteria open space	Periodic (depending on the individuals)	Commercial Facility
c.	Spectating	Basket open space	Periodic (depending on campus events)	Communal Sport Facility
d.	Religious activities	Mosque open space	Periodic (depending on praying times)	Communal Praying Facility

(source : survey and research result, 2018)

Campus spectating activity is referred to an activity of watching any sport events/matches, not the architectural elements/open space features.

- 2) Other activities as activity-creating stimuli

As discussed previously, there are some activity-creating stimuli in the form of other activities held in certain areas of the campus. They are:

- Fitness/exercise related activities held in the open-air gym. Not only activities related to inter-student matches, or extra-curricular sports, but there are activities included in the social aspect of the elderly gymnastics held periodically by the polyclinic of Itenas. Additionally, there is a place created for children to play balls on public holidays.
- Bazaar and music activities held in the parking area. The parking area is used as there is no public open space area that accommodates this activity yet.



Figure 3. Facet of public open space event in a parking lot
(source : survey and research result, 2018)

- 3) Communal open space and commercial facilities category prompt intermixed users' interaction. These places are visited by heterogeneous users. They might be students, faculty members, employees from different departments, or guests. As they occupy the same spot, they sometimes interact each other, prompting more interactions between the non-homogenous users.



Figure 4. Activity and users in the communal open space and commercial facilities are heterogeneous
(source : survey and research result, 2018)

- 4) The presence of food sellers as an unplanned source of facilities

In Itenas, there are some spots changing their function from as circulation pathways into commercial public open spaces due to the existence of a place that is actually considered as an illegal café. The designs of these spots actually do not support the illegal function. However, since the food sellers provide cheap and good food, the buying and eating activities occur in these areas. Some pictures taken in these illegal café found in Itenas are shown below (Figure 5).



Figure 5. Illegal stimuli causing the circulation pathway changing function into a facility
(source : survey and research result, 2018)

CONCLUSION

The public open space is an architectural design placed outside the building. It accommodates the nature and humans. A passive outdoor open space plan will have an unkind impact to the nature and humans as its users. To tackle this problem, the design should be improved. Improving the design does not mean destroying it and replacing it with a new one. In this case, regenerative design is the best solution as it renews the plan for the purpose of sustainability. In renewing it, the identification of the patterns of relationships or called Keystone is important to be acquired as it is a key step to regenerate the design so that the problem is resolved. This study is aimed to provide information of the Keystone of open public spaces in Itenas as compared to other campuses in Bandung and Jakarta. There are some findings of this study providing better pictures of relationship patterns occurring in the public open space of the campus in general and specific to Itenas. The relationship patterns in open spaces in campuses in general are: (1). Connectivity is formed from the vehicle circulation patterns and accessibility; (2). There are criteria for generally - preferred outdoor spaces: (a). The areas are cool as they are exposed to the shading area, whether it is due to a vegetation, a canopy/roof or building shading; (b). There are places or tools that can be occupied as seating areas; (c). Close to the students' department or places of study. While the relationship patterns in open space areas specifically occurring in Itenas are (1). The patterns of relationship occurring in Itenas highly depend on the occurrence of other activities, location, time and category of the public spaces. Although in every category of public spaces most activities performed are mainly sitting and chatting (hanging out), in this case there are specific activities occurring in them; (2). Other activity-creating aspects of temporal activities as stimuli such as sports, Bazaar, music performances and social events; (3). The communal open space and commercial facilities category trigger intermixed-users' interaction as the communities visiting these spaces are not homogeneous; (4). The existence of a place that is not functioned as a commercial open public space (Café). Without the design that supports the function, it becomes a place to gather, buy and eat food. The activities occurring in this illegal food selling spot are interpreted to be as the results of the students' basic needs, i.e. cheap and good price, not because of the design.

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