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The transformative characteristics of public spaces in unplanned settlements

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Abstract

This research aims to explore the transformative specifications of public space in unplanned settlements. The neglected state of some urban specification, particularly urban spaces is one of the current problems in cities undergoing rapid urbanization. Public spaces in unplanned settlements manifest the resultant of the socio-economic condition in a specific context. The research employed the qualitative method and techniques such as unobtrusive observation, photography, mapping, and graphical analysis to collect, analyze, and interpret the data. The findings reveal a dynamic system of reproduction of the public spaces based on the mass-space proportions and private-public relationships with temporary, portable, and assembled components with low quality in the area. In this regard, the transformative character of the public spaces could categorize in four types including de-form, less-form, soft-form, and anti-form spaces. The result of the research reveals that although there is a process of changing the private spaces to semi-private, paths and open spaces are more vulnerable under the pressure of users to privatize the spaces. The results of this research could help the policymakers and designers for real insight into the public spaces in unplanned settlements.

Keywords
Mass-space proportions, Public-private relations, Public space, Unplanned settlement.

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1. Introduction

Rwanda locates in East Africa, where encompasses a total area of 26 338 square km, with the population of approximately 10.5 million, and a density of 340 inhabitants per square km, which a proportion of the population in Kigali lives in poor condition in inner-urban areas (MININFRA, 2015). In recent years, Rwanda is characterized by rapid urbanization (UNDP, 2008; MININFRA, 2015) similar to other countries in Africa (UNDESA, 2014). In fact, inhabitants in slum areas are more than 70 percent of the total population in some countries (UN-Habitat , 2003a) and informality is the increasing trend in most cities in the world (Gilbert, 2004).

Studies highlight the informality as part of the rapid development in African cities. For example, the study theorized that the urbanization in African cities takes the place in the absence of the industrialization (Bryceson, 2014) and African cities tend to follow their own pattern of growth (Buckley & Kallergis, 2014). Therefore, the rapid urbanization results in some problems such as poor infrastructures, environmental pollution, insufficient transport system, informality, lost spaces, and even may damage the identity of the city (Dringelis, Ramanauskas, Povilaitienė, & Mačiukėnaitė, 2015).

In addition, studies identify informal settlements with different perspectives such as contextual adaptation (Rapoport, 1969), people as infrastructure (Simone A. , 2004; Simone A. , 2010), a result of the informal economy (Roy, 2005), adaptation to the condition (Pieterse E. , 2010), the meaning of the public realm (Sebina & Koma, 2015), and as a contemporary component of cities (Avni & Yiftachel, 2014). Despite UN-Habitat defines informal settlements such as slums as a manifestation of the physical, spatial urban poverty and intra-city inequality (UN-Habitat, 2014), neither all parts of slum areas include low quality of life, nor all slum dwellers are always poor (Roy, 2005). Notwithstanding, to call the slum areas either as an unplanned, informal or unofficial settlement (Huchzermeyer, 2011), the current condition of these areas can indicate vibrancy, activities, and social interaction in the context with many deficiencies, challenges, and misunderstanding. Therefore, it seems the comprehension of the public space in the context of unplanned settlements would formulate a new perspective.

The studies also mentioned that informality is so wide including informal of job, market, and economy such as semi-formal, quasi-formal, or informal, which is rooted in the formality (Roy, 2005; AlSayyad, 2004). In detail, formal political, economic, and financial processes and procedures include deficiencies, which create opportunities to set up an informal business, job, services, or production. For example, part-time, home-based, street-base, and ruin-area-base of jobs, products or services are part of informality to serve both informal and formal part of the society (Simone A. , 2004). For this reason, Oldfield argues that the substance, process, and procedure of the economic and political powers configure both formal and informal areas (Oldfield, 2014). Seemingly, the public space attributes take the place in both physical and nonphysical specifications that Roy calls in terms of the mapping of unmapped spaces (Roy, 2004), which refers to documenting of the area that never mapped in detail. Therefore, the concept of the public spaces in slum areas is related to informal (Simone A. , 2003; Roy, 2005) specifications such as small size, recycle and cheap materials, and integrated components, in contrast to formal spaces presenting large size of space, artificial and decorative materials, and clarity in the urban functions and land use (Moughtin, 2003).

Some of the studies also theorized that neoliberal and postmodern approaches influence the insufficient urban development. For example, Sideris and Banerjee mention that the priorities of the development in some cities orient toward the rich and developed parts in terms of a postmodern development approach (Sideris & Banerjee, 2007). In detail, the modern style of planning was comprehensive, inclusive, and integrated as the total design (Lang, 2005) based on the welfare state. However, the planning and design are segmented, separated, and individualized based on private investment,

banking finance, and international consortium in a neoliberal government with a postmodern approach (Sideris & Banerjee, 2007). This process creates a gap for marginalized users to get access to public services to establish unofficial relationships to cover this gap (Simone A. , 2003). In this regard, the necessity of life directs users to innovate different ways to encounter the deficiencies in the built environment in an uncertain condition, particularly political decisions, social movement, and urban economy (Simone A. , 2014), and public activities in the public realm (Habermas, 1991).

It means that the users face a range of changing in the political, social, and economical condition, which influences daily life without active participation. This uncertain condition forms the living areas with temporary materials although those forms become gradually part of the urban components, which is called as the "grey spaces" (Avni & Yiftachel, 2014). In a detailed study, Simon advocates the structure of placemaking in terms of the composition of "places, people, actions, and things" in the slum areas (Simone A. , 2004, p. 409). The physical and mom physical aspects of the public spaces are categorized in terms of the mass-space proportions and public-private relationships in the architectural and urban design respectively (Madanipour, 1996; Moughtin, Cuesta, Sarris, & Signoretta, 1999; Lang, 2005). In fact, the term mass refers to the architectural elements that occupy spaces particularly constructed elements and spaces include open areas, which the public-private relationships take the place in the mass-space proportions.

2. Argument on the character of public space in unplanned settlements

There are wide ranges of studies on the public space that carried out through different approaches. For example, public spaces were defined as the result of urban configuration to demonstrate the reality of urban life (Carmona, Heath, Oc, & Tiesdell, 2003). Madanipour also described varieties of public space in the paradoxical specification based on the experiences in the world. He stated urban design approaches for public space design including the scale or level, productive or procedural, one or multidisciplinary activity, visual or monumental, spatial or cultural, public or private, and objective-rational or subjective-expressive process (Madanipour, 1996), or something mixed from those aspects. Furthermore, other studies emphasized the importance of function, location, and size (Woolley, 2003), either familiarity, legibility, distinctiveness, accessibility, comfort, safety as qualities in urban spaces (Burton & Mitchell, 2006), or physical forms such as streets and squares (Moughtin, 2003).

By contrast, Oliver criticized that some definitions on the architectural productions are less clear and he advocated the cultural aspects, materials, and form of productions by people could explain the essence of spaces (Oliver, 2006). His interpretation refers to those constructed forms in daily life as a spontaneous public space than an architectural production by government. In addition, the study of Robinson reveals a new understanding of cities in the global south, which poverty and informality are an integral part of urban development (Robinson, 2014). In this kind of society, public space is produced by either social or political power (Schmid, 2008) that informal space refers to social aspects; however, formal spaces represent political factors.

Simone reveals a mixed system of formality and informality in the working, ethnical relation, and neighboring in Jakarta (Simone A. , 2015). The informality also refers to "shadow groups" who try to survive in a defective system of the urban job markets by their own innovation (Simone A. , 2010). In this process, the residents change the physical form of urban areas by temporary or permanent intervention to modify the area based on their needs in daily life (Simone & Fauzan, 2013). Hence, this self-managing (Simone A. , 2003) of spaces creates a systematic network of relation and cooperation for the shaping of the urban form out of the architectural standards of the western countries (Jones, 2009). In other words, people change the urban form through their own interventions to transform the city into a personalized form.

In addition, Simone theorized that although redevelopment process represents the accumulation of financial and political powers to make the city legible for the specific group, the ruined spaces have acted as a possible potential to run other activities for marginalized people (Simone A. , 2004). In this regard, AlSayyad and Roy argued that the physical productions of informal spaces have been the inseparable part of informal markets, jobs, and economy (AlSayyad, 2004; Roy, 2005). Consequently, the informal economy is also produced by physical forms of construction as informality (Bayat, 2004). Miraftab criticized that the models of development of the global north do not work in Cape Town due to deficient urban institutions under the neoliberal urban policies (Miraftab, 2007). Thus, users construct their own individual, family, and neighbor interpersonal relationships to tackle problems in the lack of efficient urban institutions (Simone A. , 2008).

In detail, Khan and Pieterse (2004) concluded that increasing process of urban slum areas may demonstrate the problematic decision-making process in the surrounding of big cities in Asia, Africa, and Latin America. They discovered that the main reason is derived from the poor process of democratization, institutionalization, and constitutionalization under the shadow of the metaphor, ritual, and rhetoric of urban policies. Additionally, they summarized that the destitute people attempt to settle in the urban peripheries to take advantage of being a citizen in the whole cities regarding those unclear policies in the in developing countries.

For this reason, Sticzay and Koch criticized urban design projects without diversity based on some models from developed countries (Sticzay & Koch, 2015). In fact, those public spaces projects were unrelated to the context (Pieterse E. , 2013). Therefore, the concept of public space becomes an artificial prototype in the absent of the cultural values than part of the context in informal areas. More importantly, inhabitants of slum areas are also involved in both formal economic system and informal activities in open spaces (Bayat, 2004). Therefore, street, valley, and open space play a significant role in providing opportunities for informal activities in the shadow of formality (AlSayyad, 2004).

Nevertheless, the study revealed that policymakers advocated the idea of irregular, chaotic, and physically dysfunctional forms in unplanned settlements to provide the legitimacy for governmental interventions to relocate officially (Pieterse e. , 2008) the marginalized and deinstitutionalized groups (Bayat, 2004). This approach has also affected theoretical studies by replacing the slum terminology with other words such as unplanned area and unofficial settlements (Huchzermeyer, 2011). However, it is of great importance to take into consideration African cities, city-ness, and poor settlements in the context and people perceptions (Pieterse E. , 2010) to recognize inhabitants as the main actors of community development (Pieterse E. , 2013).

3. Methodology

The methodology of research was grounded on qualitative methods (Groat & Wang, 2002; Miller, Dingwall, & Morphy, 2004; Neuman, 2006). The method was applied to analyze behavioral patterns and activities of users (Goulding, 1999) and graphical analysis based on reality, observability, and testability (Katoppo & Sudradjat, 2015).

The applied techniques consisted of the unobtrusive observation (Bonnes & Bonaiuto, 2002) and site analysis (Groat & Wang, 2002; Moughtin, Cuesta, Sarris, & Signoretta, 1999), photography (Georgoula, Stamnas, Patias, Georgiadis, & Fragkoulidou, 2013; Sebina & Koma, 2015; Tafahomi & Nadi, 2016), and sketching and mapping (Laseau, 2001; Groat & Wang, 2002; Deming & Swaffield, 2011; Regis, 2003; Sperlregen, 2003; Tafahomi & Nadi, 2020). These techniques provided a set of data based on systematic and consistent contextual elements and behavioral activities to recognize elements and activities in the public space (Carmona, Heath, Oc, & Tiesdell, 2003). The data for the analysis included the mass-space proportions and public-private relationships similar to places, people, actions, and things (Simone A. , 2004); hence, the data were interpreted in the analytical redrawing process (Mugerauer, 1995; Groat & Wang, 2002; Regis, 2003; Sperlregen, 2003).

The data collection took the place on dry seasons between February to March and June to August 2017 and 2018 with a weekly plan in the early stages of the research, and then monthly, seasonal, and occasionally based on the checking the process development. Despite the fact that photography was not a normal activity in the area, some photographs were shot to exemplify the data grounded on the ethical requirements. The visiting arranged with some of the students, visitors, and other experts in mornings and afternoons.

Two sets of the data were collected for the analysis including physical and non-physical elements in terms of space and activity. The space referred to the architectural elements for analysis including both temporary and permanent components such as buildings, setbacks, frontages, and courtyards. The activity included the public-private relationships based on the behavioral patterns of the inhabitant in the spaces in the daily life. The final stage was when all available data were analyzed, diagrammed, interpreted, and reinterpreted through overlay technique (Laseau, 2001; Moughtin, Cuesta, Sarris, & Signoretta, 1999). The graphical technique was recommended through sketches, schematic drawing, and diagram (Laseau, 2001) to illustrate the data through the analytical matrix tables to represent all data based on analysis, illustration, and interpretation (Charmaz, 2006; Mugerauer, 1995; Mugerauer, 2014; Roy, 2014).

The research faced some limitations and constraints. First, the research, observation, and photography were carried out based on the dry seasons particularly June, July, August, and weekly visiting including weekdays and weekends in daytime activities. Therefore, this study may have missed the possible effects of the raining seasons, nighttime and nightlife activities in the area. Second, the research focused on the observation of behavioral patterns, temporary and permanent elements. However, the range of the changes was dramatic based on seasons and possessions. For example, it was observed that football field, courtyard, shop, and open space converted into maize farms, gardens, storages, and house respectively. Third, in-depth-interview with users could have released much more priorities, trends, interests, and challenges, which users faced. Finally, the research also did not incorporate the ethnographic inquiries relating to the origin of the inhabitants to discover any possible effects of specific pattern, technology, or space arrangement, which residents may apply those as an adaptation process in the area.

4. The cast of the study

Kigali as the capital of Rwanda situated right in the heart of Rwanda, and has a total population of 1.2 million (OZ, 2007), with the rising level of immigration from rural areas to the city, which means more than 45 percent of the current population of Kigali are immigrants. Biryogo is one of component parts of Nyarugenge district in the city, which includes Agatara area as an unplanned settlement. The connected road between Agatara and Rwamapra was constructed between hillsides and wetland as a public space (Figure 1).

Agatara area includes "5821 population, 27.62 hectares, 1292 household, with 211 density person per hectares", Rwampara area "6198 population, 26.24 hectares, 1585 household, with 236 density person per hectares" (MINIFRA, 2016, p. 8). The report reveals, "80 percent of the populations are under 40 age, with a deteriorating condition (largely of mud and wood with iron sheet roofs)" (MINIFRA, 2016, p. 9). The report highlights "both formal and informal business activities thrive in the area with traders dealing in new and second-hand clothes, groceries, spare parts for vehicles, motor-bikes, electronic etc. Other sources of income include transport business e.g. motor-bike taxi and sale of food-stuff" (MINIFRA, 2016, p. 11). Although the report mention less about the social background of the population, the rapid urbanization process in the city (OZ, 2007) implies that they are majority immigrant from village parts. The central road (shown in Figure 1) represents public activities, which from the hillside to wetland, the dwelling houses and buildings become temporary and unplanned. The road called the Agatara road in documents (MINIFRA, 2016; Rapid Planning, 2017).

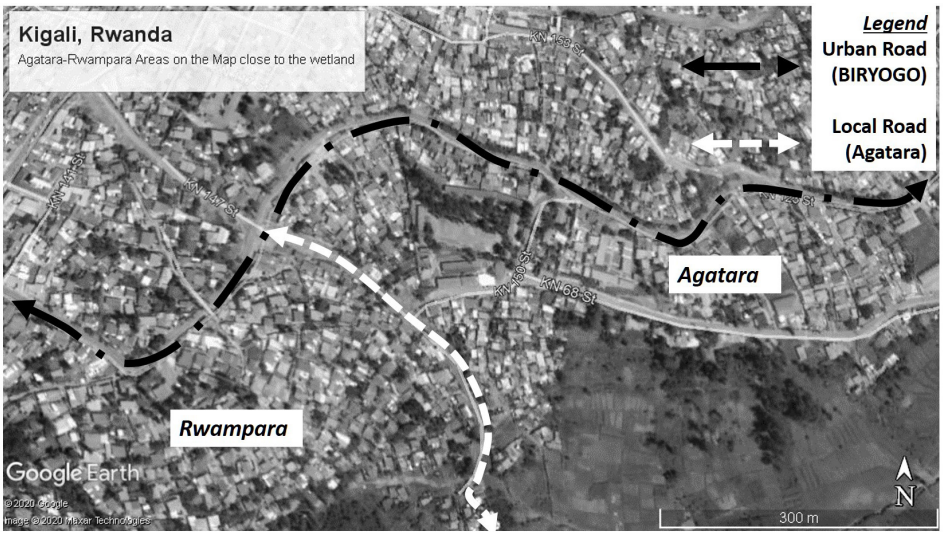


Figure 1. *The main path as the public space in Agatara.*

4.1 Results

Data analysis consisted of the mass-space proportions as the morphology and the behavioral patterns in terms of public-private relationship in the area. Tables of type of space and activity demonstrated important data in the area (Tables 1 and 3). The column of graphical illustration presented the spatial relations of space and activity. All data were converted into a diagrammatic sketch to represent the relations based on the analytical diagram. Hence, those diagrammatic sketches illustrated the position of each space and activity attributes in the context. The logic of the diagrams was constructed based on the location, position, and form of the mass-space in the area.

In detail, according to the survey, all buildings were included one floor on the ground without any architectural or design characteristic and generally as a housing production. Buildings were changed into other small activities such as a retailing shop, repairing shop, and restaurant or bar, or farm-storage house. Therefore, the main character of the area was a self-planned neighborhood with limited functions or varieties in both form and space.

The table of space was classified into six categorical attributes including path, frontage, adjacent, possession outward, setback, and courtyard based on the existing form of mass-space proportions (Table 1). Additionally, data of the activity part was classified into three main parts including accessibility, services, and recreational activities based on the behavioral patterns to present public-private relationships (Table 3). All typology of space and activity were included an exemplified image to represent the concept. All images were converted into the graphical analysis to interpret the relation between mass-space and private-public by diagrammatic sketches. In addition, to highlight and distinguish the specification of data in the unplanned settlement and other areas in the city, a comparative table designed to explain the differentiation (Tables 2 and 4).

4.2. Research findings

Findings are organized in interpretative parts including tables and figures. First, the results of the graphical analysis are converted into the interpretive-illustrative diagram to conceptualize the relationship between different typologies of both space and activity. In detail, the analytical framework is grounded on the public-private relationships for activity and the mass-space proportions for space in the area. In this structure, it is attempted to conceptualize the position of both space and activity items in the frame of private-public and mass-space to illustrate the common trends. The conceptualized frame is supported by a descriptive column to clarify the interpretation of the trends in detail in the area.

Table 1. *Type of the space.*

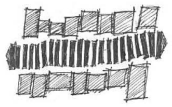
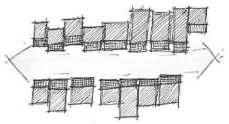
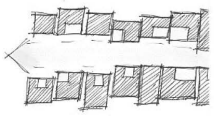
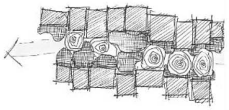
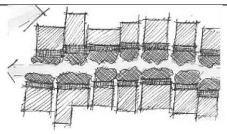
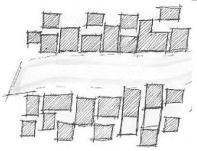
Type of Space	Characteristic of Space	Example	Graphical Analysis
Paths	Public, open, temporary occupying, Accessibility		
Frontages	Semi-private Tends to extend the private are into public areas		
Setbacks	Semi-private		
Possession Outwards	Semi-private, semi-public		
Adjacent	Develop the private space into public area		
Courtyards	Semi-private, semi-public		

Table 2. *Comparison of type of the space in the unplanned settlements and city areas.*

No	Title	Specification in the slum areas	Specification in the city
1	Paths are	penetrated with linear or antenna shape for access to the fabric	part of the urban network to circulate inhabitant movement
		mixed on all activities	clear based on the classification and hierarchy
		mixed people and vehicles	The relationship between of the vehicles and pedestrian are clear.
		The road is the main public activity.	The road is tools for access to public activities.
2	Frontages are	sheltering for comfort	Decorative with beautifications
		additional parts to the inside	extension of the inside to outside
		Full of varieties based on the desires and ideas	Similar based on the laws and urban policies
		For sitting and storing	For sitting and presenting
		semi-private and semi-public	Private and semi-private
3	Setbacks are	For more public activities	For more private activities
		Just cutting of the mass	Decorative
		Formless	Based on the urban policies
4	Possession Outward are	Occupying by users in public areas	Forbidden or limited
		Flexible, temporary, and varied	Strictly controlled
		Multi-proposed areas	Not exist
		Depended on the time and events	A calendar base activities
		Manged by interpersonal relationships	Based on the community or state permission
5	Adjacent Areas are	Determined by the occupying of the land	part of the public road, walk side, or frontage
		Developing by elements in the site such as tables, desks, or carriages	Filled by the greenery or urban furniture
		Used for the small businesses	For public services
		Developed by the function of buildings	Distinguished by differentiation form buildings
6	Courtyards are	Varieties of forms, sizes, and shapes	Based on the building codes
		Intersection between buildings, plots, and walls	In the plot for the building
		Uncompleted form and flexible	Solid form of design
		For public activities	Private and semi-private activities

Table 3. *Type of the activity.*

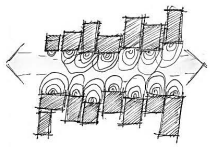
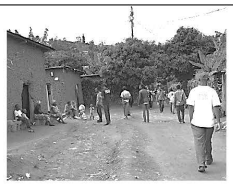
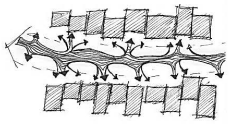
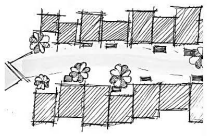
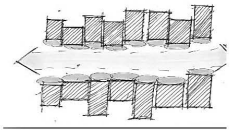
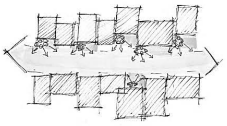
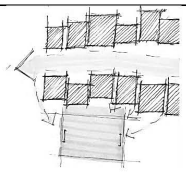
Type of Activity	Characteristic of Activity	Example	Graphical Analysis
Accessibility	Passing		
	Access		
Service Stations	Public, tend to Privatize spaces		
Recreational Activities	Sitting, Watching		
	Gaming Grouping,		
	Football in the lost spaces, social activities		

Table 4. *Comparison of type of the activity in the unplanned settlements and city areas.*

No	Title	Specification in the slum areas	Specification in the city
1	Passing activities are	Connection of the area to outside	Part of the urban network structure
		Based on the pedestrian, bicycle, and motorbike	Based on vehicles
		Necessity activity in the main road	Optional activity with varieties in other roads
2	Access activities are	the ability of accessibility houses, restaurants, shops, farms, and the logistics to transport the goods and equipment	the ability of accessibility houses, public services, commercial, and transport
		Flexible form of access pattern to the plots	Fixed form of accessibility
		Changeable form access based on the behavioural pattern	Fixed form of accessibility
3	Service Stations are	Flexible forms, patterns, and locations	Fixed based on the landuse plan
		Based on the daily need in the streets	With varieties of need in the buildings
		Limited in small scales of activities such as airtime umbrella, motorbike station, and money transfer desks.	Varieties of sizes and scales based on the functions and activities
4	Recreational Activities are	Including passive activities such as stopping, sitting, and watching in the road	Including passive activities in the designed public spaces such as parks, open spaces, and public spaces
		Including active recreational such as chatting, listing to the radio in the road	Including active recreation those took place in the clubs, restaurants, and coffee shops
		Including social gaming such as football, traditional gaming and playing in the ruined areas and farms	Including those activities took place in the clubs, gyms, open spaces, or playgrounds

Table 5. *Findings on the space components.*

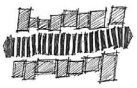
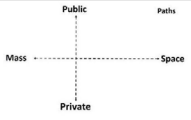
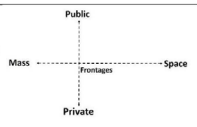
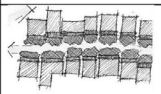
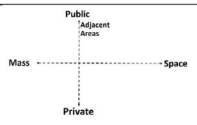
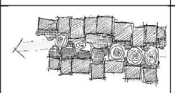
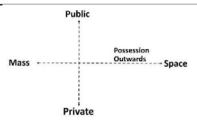
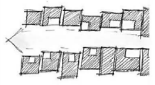
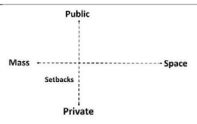
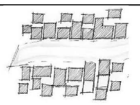
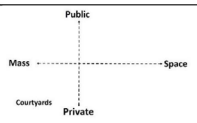
Type of Space	Graphical Analysis	Interpretative Diagram	Description
Paths			Paths take place in the public parts as most commonplace for activities also occur in open parts of the land. The forward-backward of the mass deformed the paths based on the public-private interests in the space to shape a de-form space.
Frontages			Frontages depended on the Mass and extended the concept of the building to the open part of the spaces. So, frontages created personal less-form spaces in continue with the mass, which they are neither space nor mass.
Adjacent Area			Adjacent areas are after frontages, where those spaces were inseparable from the mass and functions that owners used to continue the activities with flexible from of soft-form spaces with some temporary or permanent materials.
Possession Outwards			Possession of spaces was started from the mass parts and continued to the public space part. The size and scale of getting possession were depended on the conventional relations as activities. Therefore, these spaces resisted to be formed. Indeed, they have been an anti-form than a formed space.
Setbacks			Setbacks invited spaces into the mass with private or semi-private functions such as restaurants, shops, or small business as a de-form space. Therefore, this changing of the building deformed private space and activity to adapt with a new function of public activities. The function of the setback normally followed homogeneously with the function of the buildings in private space.
Courtyards			Courtyards were spaces that more private. They may be separated by walls or surrounded by mass. They controlled by ownership or groups of ownership. Those semi-private activities take the position in the courtyard spaces such as storage, restaurant, or small business. Therefore, these spaces have been under forming, re-forming and de-forming to adapt with the need.

Table 6. *Findings on the activity components.*

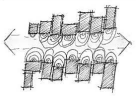
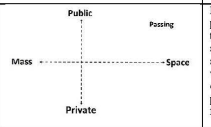
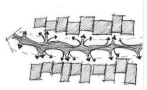
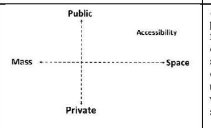
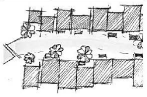
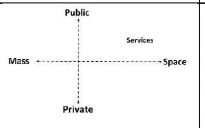
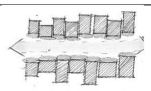
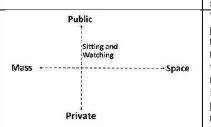
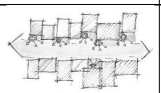
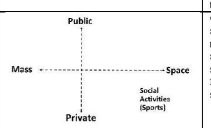
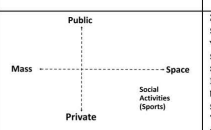
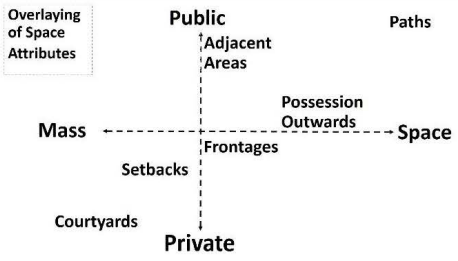
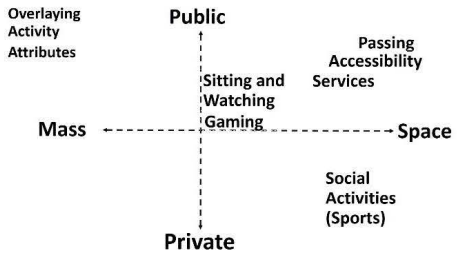
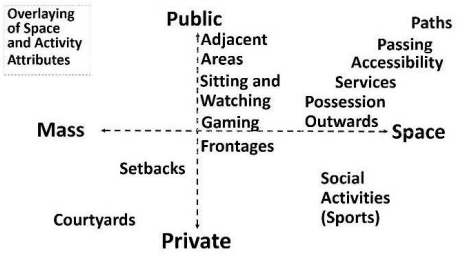
Type of Activity	Graphical Analysis	Interpretative Diagram	Description
Passing			Passing just happens in the most public part of the paths. The passing activity take the position through other activities those take place in the adjacent area of the buildings such as vendors, services, and possession outwards, therefore, the passing pattern is deformed based on the multi-factors.
Accessibility			Accessibility was more permeable than passing due to penetration into frontage, adjacent and possession outward of spaces. Therefore, the accessibility contained a flexible form of spaces based on the vibrancy of users. The accessibility characterized with less-form specification in the areas.
Portable selling Services in spaces			Portable selling services such as airtimes selling, motor taxi stations, hackers, and salesperson included tendency to possess the spaces in the public part. Therefore, these activities followed trend to privatize open spaces but flexible by the time and location. Therefore, this occupying of spaces changed the location in the space to create some soft-form of forms in the area.
Sitting and Watching			The sitting and watching took place in public spaces or with a visual corridor to the public space. It is also located in the adjacent and frontage of mass with varieties of pattern, time, and user to make a less-form pattern of activities in the area. If this activity took the position in the setback or courtyards, it normally was divided from public with temporal screens.
Gaming			Gaming as part of recreational activities took place in close of the mass parts to create privacy for the activity. Therefore, frontage, adjacent, setback, and courtyard could be used for gaming to form more soft-form of spaces in the area.
Social Activities (Sports)			Social activities, ceremonies, and sports took place in the open spaces with a large-scale size in the surrounding area of the living, working and passing. Those activities were flexible based on the users, events, and times to resist to be formed in specific shape, size, or pattern of activities. Therefore, those social activities revealed an anti-form of spaces in the area.

Table 7. *Overlaying of attributes of the space and activity.*

Items	Overlaying of the Attributes	Description
Items of Space		According to the overlaying diagram, major parts of the space's attributes take position in the space-public part of the diagram. They are open, flexible, and common. However, owner of the land controls frontage, so the level of private effects and interventions in the frontages were higher. Setback and courtyards were either part of the plot or surrounded by, and so the level of the mass and private activities were higher than public-open. In the public-mass was not any public building in the area.
Items of Activity		Gaming, sitting, and watching were most relevant activities with the buildings and mass part in the area. Other activities took the position in the public-space. Sports activity other gathering also took the position in the private areas such as frames or gardens but a layers back of the main path. Despite the restaurants and some small business took the position in the mass-private area, those were not in the public-open spaces activities, so did not affect directly on the public space activities.
Overlay space and activity		Based on the analysis, major part of the activities took the position in the public-space part of the diagram. Space and activity in the space-public and mass-private were supportive or advantage-taker from activities in the public-space part. In addition, those activities in the public-space part were more causal and daily-life activities, free or less payment base, than in private-mass or private-spaces.

Diagrams in Tables 5 and 6 illustrate the passing and accessibility activities found in the open spaces and paths. It supports that the quality of the activities is depended on the quality of the open spaces such as size, continuity, and connectivity. In addition, the quality of physical and non-physical components in the space such as the shelter, frontage, setback, or possession outward influence the activities of users in the public spaces such as passing, accessibility, and behavioral sitting. In detail, Tables 5 and 6 also demonstrate four spatial attributes including de-form, less-form, soft-form, and anti-form of space and activity, which are inextricably intertwined to create those attributes.

The de-form spaces include at least a basic form but faced with deforming processes due to some changes gradually in the structure, size, and pattern grounded on the intervention of users. It means that the de-form spaces represent those derived forms of the mass-space proportions grounded on the need, claim, or general tendency of users as behavioral patterns. For example, the passing and accessibility activities are changed frequently based on users' interventions such as changing the setbacks and courtyards to restaurants and storages to adopt new semi-private activities.

Table 8. *Arrangement of forms.*

Indicator	Space	Activity
De-form	Paths Setbacks Courtyards	Passing
Less-form	Frontages	Accessibility Gaming Sitting and Watching
Soft-form	Adjacent Areas	Portable selling, Services Stations
Anti-form	Possession Outwards	Recreational Activities

The less-form spaces represent

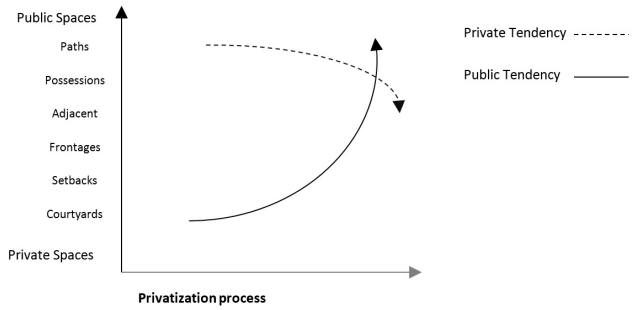


Figure 2. *The general trends in public and private relationships.*

those extended forms of the constructions in the frontage, sides, or adjacent areas of buildings, which are attached to private spaces as an uncompleted form of space and activity. The less-form spaces reveal that the constructed form is not a completed form in the area, rather than, they are completed by flexible size, dynamic interaction, and incremental elements gradually such as expending the shelters and verandas, extending frontages and terraces, facilitating of accessibility, or sitting areas as a favorite haunt.

The soft-form spaces take the place next to the private parts, which requires fewer materials or fixed elements in the space. Those activities form a flexible, mobile, and intermittent space. For example, portable selling service stations with a handcart, daily and weekly market of vegetable and fruit by vendors with baskets, and on-street sellers with or without boxes and tables create varieties of spaces with soft-form of spaces; however, with clear side effects of the behavioral patterns and sense of place.

Finally, the anti-form spaces resist being formed by hardscape materials in the open spaces. These spaces form based on the behavioral patterns to maximize the efficiency of the public realm in open spaces such as gaming, recreational activities, and occasional ceremonies such as a wedding.

Table 7 reveals the components of the tables of space and activity to represent conceptual relationships of each item. The table demonstrates a concentration of both space and activity components in the public-space segment, which reveals the trends of inhabitants for public activities. In addition, Table 8 represents both Tables 5 and 6 with a new structure to illustrate the relationships based on space and activity specifications.

In a summary, Figure 2 conceptualizes the interaction between public and private based on the space items in the unplanned settlement. In fact, although some of the items integrate with semi-private activities such as frontage, courtyard, and adjacent areas, this tendency is limited to building as mass part of the structure. However, the privatization of the public spaces is common trends in the area. This diagram just conceptualizes the general tendency in terms of the finding of the research; however, the clarification of the accurate relationship between each variable will require further research.

4.3. Discussion

Results of the study identified that paths encompassed the public spaces in the unplanned area for passing, accessibility, and social behavioral patterns in terms of the public realm (Tables 5 and 6). The results of the research approved public spaces in unplanned areas in terms of street-based (Moughtin, 2003) as the social location (Schmid, 2008) with the procedural, public, and cultural specifications (Madanipour, 1996; Moughtin, 2003; Woolley, 2003). It was also similar to the findings of Simone based on the modification process of open spaces to transform the spaces for neighbors on a local scale (Simone A. , 2008). Results of the research showed the mass-space proportions and the public-private relationships were flexible, temporary, and transformative in the unplanned settlement.

The research also observed a synchronized paradoxical challenge between the tendency and resistance for privatizing of public spaces based on the economic interests, territories, and ownership. Despite the specifications referred to the unclear economic system (UNODC & UN-Habitat, 2011), integration of informal, semi-formal, and formal economic activity appeared in the area (Simone A. , 2008; Simone A. , 2003). In detail, the form and function of open spaces ware depended on the continuous process of

occupying, changing, and extending the mass-spaces proportions in the area. As the result, the spaces were not fixed in the form and function, however; in a process of transforming to generate adaptable forms based on the public-private relationships similar to the findings of Simone (Simone A. , 2015). In fact, ordinary people materialized those spaces with their own interventions as a self-managing (Simone A. , 2003) on a small scale, short time, and with a limited number of users to meet their need in the space particularly frontage, adjacent, and setback similar to studies of Miraftab and Simone (Miraftab, 2007; Simone A. , 2008).

Four specific attributes of space including the de-form, less-form, soft-form, and anti-form revealed that the spaces were transformed by interventions of users in the area (in Tables 5, 6, 7, and 8). This study revealed that the users transform the environment to their needs although this result challenged the study of Dringelis, which he focused the process for the creation of lost spaces and disappearing the identity in the location (Dringelis, Ramanauskas, Povilaitienė, & Mačiukėnaitė, 2015). In fact, the results indicated that the informality was part of transformation the mass-space proportions to improve livability in uncertain conditions in the area similar to precedents studies described in (Simone A. , 2004; Sticzay & Koch, 2015).

This study exposed that the public space was depended on the open parts of the paths in the area. However, both soft-form and less-form spaces tended to transform the public spaces in favor of private activities. This trend observed in the small scales of the construction, assembly, and flexible forms of shelters in the spaces, similar to the observation of Simone in Jakarta (Simone & Fauzan, 2013). However, the anti-form areas resisted privatizing the public part based on private-public relationships. In fact, the behavioral patterns of the users reshaped the urban form through the public-private relationships within the context beyond all architectural standards those reflecting the critical point of view of Jones (Jones, 2009).

The results verified that users struggling to change their conditions by changing the spaces through some small interventions, with available materials, in the micro scales (Table 5 and 6), which was in the same alignment with the results of Pieterse (Pieterse E. , 2004; Pieterse E. , 2010; Pieterse E. , 2013). Therefore, the public space in the case study was a contextual concept like the idea of Rapaport (1969) and findings of Pieterse (Pieterse e. , 2008), in contrast to the definition of UN-Habitat (2003a) and the western model of urbanization. Nonetheless, the public spaces encountered the privatization for informal business and activities in the area. Thus, the protection of public spaces required collective wisdom in an institutionalized mechanism as Khan and Pieterse recommended (Khan & Pieterse, 2004).

Furthermore, this study revealed a current style of self-construction to redesign the area based on the physical and nonphysical facility, accessibility, and possibility in an uncertain circumstance (Parnell, Pieterse, & Watson, 2009) to respond to their own need (Pieterse E. , 2013). Apparently, the informality was an unfit label from the outside, particularly the formal system (UN-Habitat, 2012). In this regard, the idealized pattern of the development (Pieterse e. , 2008) was replaced with a realistic pattern in the socio-spatial context (Bayat, 2004).

5. Conclusion

The concept of public space faces a paradigm shifting in the unplanned area as a common discourse, which this concept is under development with further studies. In fact, it is expected to consider the public space as a regenerative phenomenon in unplanned areas through a dynamic system of re-assembling of spaces by users in the uncertain context.

Public spaces are an essential part of the common lifestyle in the informal context. In fact, those spaces namely includes de-form, less-form, soft-form, and anti-form spaces, represent transformative characteristics of public spaces. The form is not only resulted from physical and fixed elements but also includes temporary, portable, and assembles components. This creates flexibility,

mobility, and adaptability between the mass-space proportions and the public-private relationships.

The spaces such as path, setback, and frontage are considered the practical components with a temporary structure to provide some facilities and services for users. Consequently, these small public spaces support the chain of demand and supply for both users and activities. Therefore, in the absence of a large amount of investment, effective policies, and well-organized institutions, users adapt the public spaces to their need to create the minimum quality of the social life. These activities form multilayers of behavioral patterns including either passive social activity such as sitting, stopping, and watching or active social activity such as chatting, gaming, and drinking.

Nevertheless, public spaces encounter serious privatization, particularly in un-designed areas based on the lacks the basic benchmarks such as the sidewalk, street furniture, and trees. In addition, the public spaces in the unplanned areas require more support through facilities, urban services, and financing for the paving, sewage, and hygiene to support the daily life of the inhabitants. Therefore, it is of great significance that designers, politicians, and developers take into consideration a dynamic approach for intervention in the mass-space proportions and the private-public relationships in upgrading, designing, and redeveloping.

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