Smart Architecture as a Concept of Sustainable Development in the Improvement of the Slum Settlementarea in Bandung

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Abstract:-The construction of Cipularang toll access that connects Bandung to the capital city Jakarta has influenced the city's changes in various aspects. Bandung is expected to become a tourist destination, but it is not provided with planning and control tools to anticipate the development of the area that can accommodate many activities and users. As a result, the city of Bandung is undergoing decreases in its physical, environmental and social quality. Problems of physical deterioration can be clearly seen with the declining green open areas that serve as a support to the green environment, the decrease in the supporting capacity of the lands along with the changes of the green land into building areas.Cikapundung as a major river passing through the city of Bandung is another area inundated with a variety of problems. Piles of garbage, liquid and solid waste, sedimentation and erosion have reduced the optimal function of Cikapundung as a big river should. One area that is located in the watershed area of Cikapundung is *KawasanPelesiran*. The region is situated at the back of the trading center Cihampelas that is located between Cihampelas street and Tamansari Street, which has gradually changed from the city's green area into a densely populated residential area; even the riparianthat serve as the green area have become highly congested slums. Its strategic location and lack of planning and control tools to anticipate the development of the region has caused this region to experience decreases in physical, environmental and social qualities. Problems on garbage, flood and surface water pollution, especially on the river Cikapundung caused by solid and liquid waste from households, have caused environmental endangerment that includes the life of aquatic flora and fauna and the declining health of the population. In addition, the inhabitants have the habit of disposing their garbage into the river, causing a clogged drain, bad odor, and even floods in the rainy season. The existence of Cikapundung River that runs across the area should have become good potentials for the environment but, instead, has become the problem that has given Tamansari-Cihampelas an impression as a slum.

Keywords:-Environment, Development, Social quality, Residential, Slums Area.

I. INTRODUCTION

Urban life is an area that receives the biggest impacts and the most influences due to the development of the globalization, the impacts of the flow of exchange and mutual conditions that affect various dimensions in the economic, social, political, cultural, and technological aspects. Various issues of urban life ranging from environmental damage, clashes of cultures in the community, decrease in living spaces, capitalism, and consumerism are problems faced by the majority of big cities in developing countries. The developments have led to the rapid growth and increases of the population in large cities as a result of the migration of the people from the rural areas.

The increase in the population number in urban areas subsequently leads to the rapid increase in the needs for town housing, especially among low income earners. The phenomenon of one hundred million urban population and that half of Indonesia's population have become urban residents is an important condition to be used as a basis for the development of cities in the future, for instance in Jakarta (supported by its surrounding cities such as Bogor, Depok, Tangerang, and Bekasi), Bandung, Surabaya, Medan and other cities as centers of national economic activities and their many other functions, including as centers of government. This development does not go along with the availability of the housing in the developing countries, which is growing very slowly, hence the housing shortage in urban areas has become higher and higher. It is characterized by the growth of illegal shacks and shantytowns with high population density and use of illegal spaces. In addition to the needs for housing, adequate urban infrastructures, including water supply, energy, telecommunications, public transportation, and other infrastructure availability are other essential factors. Firman and Soegijoko (2005) say that other critical factors as a result of urban development are environmental issues: water pollution, soil, air, traffic congestion, etc., as well as social issues (such as poverty, slums, crime, conflicts between residents and others).

Basically, as a requirement to keep and maintain their life, human beings including people with low income and people with no steady incomeneed houses as a shelter from all threats. It can be seen from the figure that depicts the equation of comparison between the economic condition of a person's basic needs and his or her priority scale of basic needs and housing needs as stated by Turner (1972), which refers to the theory of Maslow's (as indicated in Figure 1)
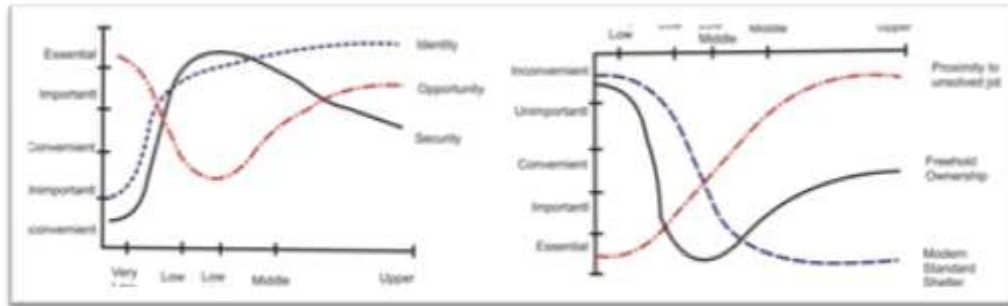

Figure1 Between priority of needs for living and housing and Income
Source: Turner, 1972:167

Figure 1. Comparison on Priority scale of basicneeds, income, and housing needs
Source: Modification the theory of Maslow's (Turner, 1972;)

The diagram on Figure 1 above clearly showed how one determined his or her priority upon housing; a person with very low-income tends to put his or her priority on the location of the house, which has to be as nearest as possible to his or her workplace. The status of the house and land ownership is the second priority, while the shape and quality of the house serve as the last priority. For low income earners, the most important thing for them is the availability of "home" for shelter and rest as a means of survival. Thus, it can be concluded that for low income earners, the distance between the location of the house and their workplace is the first priority. Clear land and house ownership is the second priority, while the shape and quality of the buildings still occupy the lowest priority.

Lippsmeier, G (1997) states that within the scope of development in tropical areas, urban planning is essentially of the same status as it is in industrial countries; it starts with a national planning for the entire regions down to site planning. City planning can positively influence the development of an area, and it also has a duty to fix and repair past mistakes and uncontrolled urban growth. In the process of urban planning, a planner must consider several factors such as climate, population growth, urbanization, tradition, local economy, and infrastructures. What distinguishes the urban planning in developing countries from that in Europe is that political influences of powerful politicians are very important; in the process of urban planning in developing countries, the concept of prestige of the ruling politicians is also influential. Usually, a planner has to make pragmatic decisions of the situation and the local environmental conditions. The difference is that the planning in industrial countriescarefully takes into consideration any levels of planning based on planners' respective disciplines. Thus, one of the factors that can reduce the success of the urban planning is the strong influence of politicians and the condition of the society that have led to uncontrolled and unplanned development of the city and that growinto slums.

On the other hand, the complexity of the society's lives has led to radical changes in the structure of the cities in the developing countries. City development does not go along with adequate economic growth that supports the ideal development and growth of the city. The paradigm of the developments such as this has been widely discussed by several experts, one of which is Friedman, J., (1966) who divides the world into dynamic city centers and static waterfront areas. Cities are no longer viewed as a static system engineering, which are easily controlled according to the planner's imagination. Instead, the growth and development of the big cities in developing countries are affected by humans as the actors, both as individuals and as a group of community. Migration to large cities in developing countries are due to the attraction they offers, promising a better life than in the villages and resulting in the irregular and unplanned development of the city. Most of the people who come to the city work in informal sectors, mostly actual labor intensives not necessarily providing a decent living they need. Also, the low education factor in the majority of the community in the developing cities will affect the development of the city,whichcauses social problems and forms poor settlements, having inadequate and very limited facilities; and not infrequently people use illegal lands/squatters. Urban economic outlook is one of the reasons for the movement of the majority of the population to the cities.

Entering the third millennium, outdoor work is still traditionally retained, both by the public in the metropolitan cities and those in densely populated areas (slums). Space (house) is used merely as a shelter, a place to rest. Obviously, in treating space, there are differences between the metropolitan communities and those

who live in densely populated areas. Those who live in metropolitan cities, with all their glitz and glamour, only need to just press buttons to make ends meet, while the people in densely populated areas live in their limited spaces. This phenomenon is always seen in major cities, especially in the third world with city centers as the main attraction, which is associated with the circulation of the city's economy;this has brought the impactin the form of massive flow of migrants that crowdthe city centers.

The above problems are usually not matched with the availability of decent housing by the city government, hence the poor find their own solutions in providing themselves with residence. Likewise, Bandung is experiencing similar situation as other big cities in Indonesia. Bandung with a population of 3,542,823 has an increase of population that has reached approximately 67% over the past ten years (BPS Bandung, 2011). This growth rate has resulted in unsystematic physical development. In terms of density, the City of Bandung has a high density with 30,000 people/km^2 (BPS Bandung, 2011). Dense settlements along river Cikapundung starting from the north end (Dago Bengkok) to the end of the city limit in the south (Toll Road Padaleunyi) also face the problems mentioned above.

Based on the above problems, the following can be formulated: (1.) What elements of space can be utilized as the embodiment of the concept of Smart-architecture? (2) What are the forms of the Smart-architecture concept that occurin a densely populated neighborhood in Bandung?

II. METHODOLOGY

2.1 Methodology
The approach used in this study was descriptive survey method that was intended to map the current phenomena of the use of public open spaces, while the methodological framework of this study refers to the opinion of Krier, R. (1997) that architecture is a cultural phenomenon and not a mere physical reality; spatial architecture consists of static and dynamic spaces (typological aspect, scale, relationships, and identity). The main strength of this method lies in the results obtained through recording of activities and direct observation, such as disclosed by Carr, et al. (1992) that the best way to understand public space is by directly going to the place and making time to see how the space is used, and recording what one feels about it. The time design used is through the use of single-time design (cross-sectional study) that provides snapshots in the period of 2012.
Data collection tools used consisted of observation guidelines, interview guidelines, and documentation. Observation was used to map the spatial layout and the use of space based on space-time actors. Interviews, observation, and documentation were used to reconstruct the spatial layout of the area of research. Interviews were also used to collect primary data on the role of public open spaces in supporting community's activities as the actors of the space use. In order to clarify the process of observation, cameras and camcorders were used as the instrument to visually record the condition of the scope of the study.

2.2 Location of Research and Data Source
The data source of this research is the residents of the river plate of Cikapundung of Bandung city. The focus of this study was RW05/RT 01-05 of *kelurahan*Cipaganti*, Coblong sub-district,* Bandung. Cikapundungriverplate is an area located in the river valley, and it is the biggest river passing the city of Bandung. Administratively Cikapundungriver runs across the city of Bandung from the northern part in Maribaya as the upstream region to the south on Purbaleunyi toll road as the city border. The length of Cikapundung River from its tip in the north (Dago Bengkok) to the city border in the south (*Padaleunyi* Toll Road) is approximately 15.61 Km. Cikapundung has a very important function and role in the city's development, as the river serves as the main source of water for the City of Bandung. In the draft of the Spatial Plan of Bandung for 2011-2030, the river region of Cikapundung has been established as one of the City's Strategic Areas (KSK) that has strategic values in the interest of Environmental Supporting Capacity function. The strategic area of Cikapundungriveris an area that crosses 3 (three) Sub-regional of the city (SWK), i.e. SWK Cibeunying, Karees and Tegalega as well as administrative cross region of *kelurahan* and sub-districts.Bandung city is located at coordinates 107° East Longitude and 6°55' South Latitude. The area of Bandung is 16,767 hectares wide, at an altitude of ± 768 m above the mean of the sea level, with the northern area generally higher than that in the south. The altitude of the north is ± 1050 msl, while of the south is ± 675 msl. Bandung city is surrounded by mountains, and therefore it has a characteristics of Bandung Basin. The city is geographically situated in the middle of the province of West Java and, being the capital of the province, it has strategic values to the surrounding areas. Major rivers such as Cikapundung and Citarum and their tributaries run across Bandung; they generally flow to the south and meet at the CitarumRiver, and with such conditions, southern Bandung area is highly vulnerable to flooding.
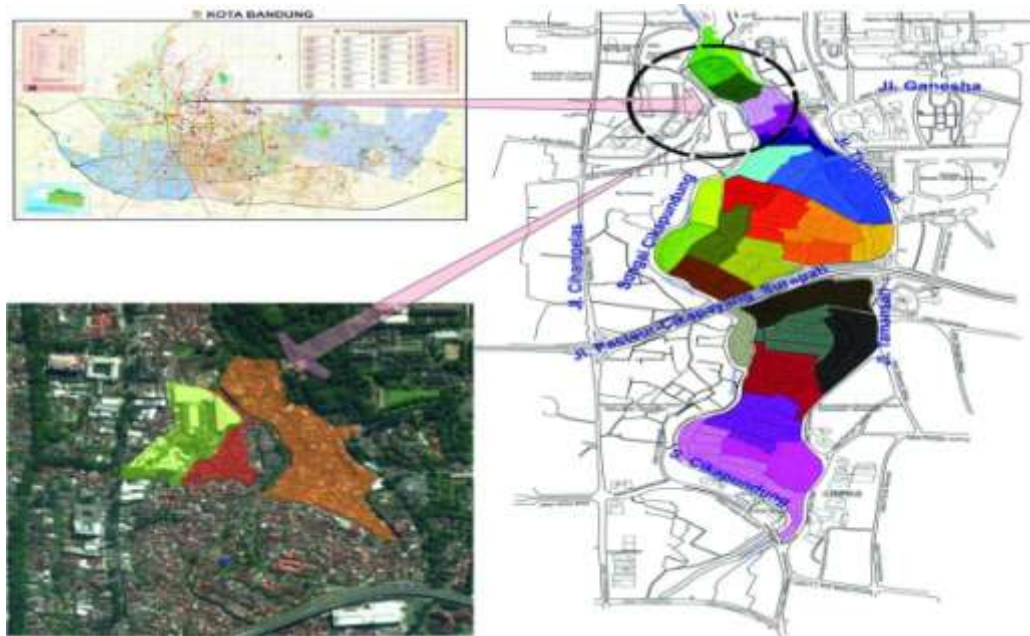
Figure 2. Location of research (A. *Key plan*ofBandung city; B. Site Plan of Location of Research; and
C. Aerial of Location of research)
Source: Modification of digital map, *Google map*and*RTRW*(Spatial Plans) of BandungCity

The decision to place Cikapundung Strategic Area in Bandung *RTRW*(Spatial Plans) 2011-2031, which is
an area with cross administrative areaof*Kelurahan*sandsub-districts, and three (3) city sub-regions (SWK), i.e.
SWK Cibeunying, Karees and Tegalega. Therefore, from the location point of view, Cikapundung area is very
strategic, hence the development of this region is very rapid. These developments in the Strategic Area of
Cikapundung have brought about the impacts on the development of the whole city in which the influence of the
economic sector is very strong, affecting other sectors (social, cultural, and even political). One of the impacts
of this development is the growing slum areas along the watershed of Cikapundungriver.

III. RESULTS AND DISCUSSION
3.1 Literature Review on Architecture, Ecology, and Basic Concept of Sustainable Architecture
The term ecology was first introduced by a German biologist named Ernst Haeckel in 1866. Djajoz
(19772) in his book Introduction to Ecology explains that Ecology is derived from Greek *oikos*, which means
house and *logos* meaning science. Ecology literally means the science of houses, in which a
construction(houses) as a settlement is an activity of building human living environment since their first
settlement in the place with a variety of environmental components that support its presence. This action is a
manifestation of our ancestors' experiences in real life due to their direct contacts with all forms of natural
phenomena that ultimately result in the ability to survive.
In Rachmad, W.B. (2000) it is explained that the discussion on ecology basically involves conditions
necessary for living beings to survive along with other creatures; on the other hand, it is also related to the
interactions between the living things and their physical environment. The main concept of ecology is the
ecosystem, a system formed by a reciprocal relationship and the interdependence between the living things and
their environment. The order and balance of the ecosystem are realized through a dynamic balance, which
makes it possible for changes or shifts in the balance to happen. According to Cooper (2009) in his book
Designing Sustainable Cities in a human environment, out of the five factors of integration between people and
their environment, there are two (2) factors that are closely related to architecture, namely (1) technological
culture, and (2) Use of natural resources. Thus, an architecture (building) is seen not only from the aesthetic
aspect but, more importantly, from the idea of architecture (buildings), an idea of how the architecture/building
can maintain and care for the depleting natural resources (among others, related to the diminishing raw materials
for making building structures).
Ken Yeang (1995) in his book Designing with Nature: The Ecological Basis for Architectural Design
states that according to the ecological concept every development process will result in any changes in the
environment (towards good changes or the opposite). As a result of the construction as part of the work of
architecture/building, the existing ecological systems will get the impacts in the form of, among others, (a) the
buildings will occupy some spaces of the ecosystem in the physical forms that cause changes in the composition
of energy and building materials; (b) use of man-made environment will spur continual environment

development; (c) constructions that use natural resources in large quantities will have an impact on the economy, and (d) the development will result in a large number of outcomes, including wasted energy and pollution during the building operations that tend to damage the environment and its natural resources. Then, Ken Yeang (1995) suggests that an architect as an environmental planner needs to consider the meaning of the artificial environments from the viewpoint of an ecologist, i.e.: (a) an artificial environment (in this case the architecture/building) has living and non-living life components (b) a design must consider the compliance with the minimum standards of living and conditions of needs of the wearers; (c) Architecture/building as an artificial environment is considered part of the flow of energy and matter in the life cycle, (d) a planned integrated system planned with the earth ecosystem; (e) there should be identification on the effects that will occur in the life cycle of the planned system, and (f) from the external aspects of a planned system, there should be consideration on the unity of the biosphere ecosystems and the natural resources.

Based on the 6 (six) above considerations, the complexity that occurs in the association between architecture and ecological environment based on the development process starting from input, built, and output, will form a closed balance. As described by Tam Kwok Wai, et al, (1994) in the diagram below.
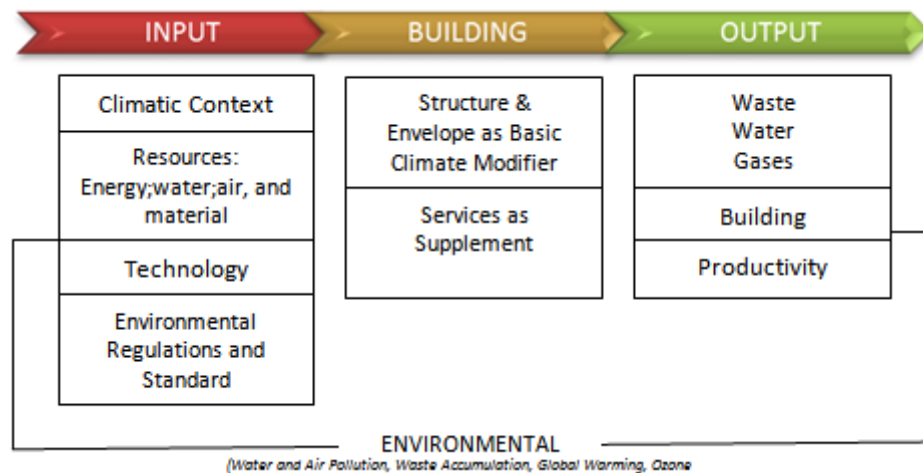

Figure3. Complexity of relations between buildings and their environment
Source: modified from Tam Kwok Wai, at. al..,1994; Rachmad, W.B., 2000

Figure 3 above shows a building can be considered as a unit that can affect and is affected by the environment. Balance is required to maintain a sustainable relationship, hence the architecture/building and its environment has mutual relations,andinstead, improve the quality of each by forming a symbiotic relationship. Tam Kwok Wai, et. Al. (1994) calls this relationship as "sustainable symbiotic systemic phenomenon".

The word sustainable is derived from the verb 'to sustain', a transition verb. In The Oxford English Dictionary 2nd edition as cited by Rachmad W.B. (2000:8) there are many meanings of the word *sustain*, among others: (1) to keep in being; to cause to continue in a certain state; to keep or maintain at the proper level or standard; to preserve the status of, (2) to keep going; keep up (an action or process), to keep up without Intermission (with mixture of sense), and (3) to endure without failing or giving away; to bear up against; to withstand. Based on these meanings, the word sustainable has a meaning as ongoing activities/processes that run continuously. This definition is in line with the opinion of Jack A. Kremers (1996) that says that to sustain means a continual basis, so that the word sustainable can be interpreted as "continual".

The word architecture comes from the Greek word *arche* and *tektoon*, which mean the chief of a master carpenter or handyman/builder, in the sense not just mere skills (as a product/noun) but also as a contribution to knowledge (as a science/verb). Spiro Kostof (1977) describes the notion of architecture as knowledge that has two meanings of quality, i.e. as a science that can be learned and the ability to create, an expertise of builders. (See also Rachmad, WB, 2000; YudiPermana, 2009). From the above meaning there are 2 (two) different senses, namely: (1) architecture as an art or science of building (as a verb that indicates a process), and (2) architecture as a noun that is the result of creative works (in terms of The building itself). Thus, architecture can be understood as a science to conduct the process of designing, patterning, compiling technological elements into a form of a building (as a verb/as a process), and architecture as a knowledge (technology) that belongs to human civilization hence human beings able to adapt and utilize their environment in order to fulfill their needs in the form of the buildings as a manifestation of their creations (as a noun).

on the understanding of sustainable and architecture, the notion of sustainable architecture has the meaning of human knowledge that is used to sustainable adapt and make use of their environment in order to fulfill their needs for buildings as a place to live. In Rachmad, W.B., (2000) it is explained that the concept of sustainable architecture as a whole is a concept to describe an idealism which is an approach of designs that is

environmentally consciouswhose implementation is deliberately and responsibly made by planners in particular and other parties involved in the building process in general; it is intended to prevent environmental damage. The main objective of the sustainable development architecture is the construction process by considering good natural resource management to achieve sustainable good environmental conditions and resources in the future. There are 10 basic principles that should be made the basic consideration in the designs of sustainable architecture, namely: (1) use of building materials is intended to empower local resources, (2) effective use of natural materials rather than synthetic material; (3) Observing/engaging users of the buildings in the design process, (4) Designing buildings that support the principles of energy efficiency, (5) Minimizing the design that may have damaging effects to the tread and environment, (6) Designing buildings with respect to the local environment, such as local climatic conditions, (7) Performing holistic approach, which brings together all the demands of design and their ecological aspects in harmony and support; (8) prioritizing the conservation and reuse of buildings, infrastructure and building materials; (9) Minimizing the use of and dependence on current energy systems (such as electricity) and replacing it with other sources (such as solar power, wind power, etc.), and (10) Designing buildings should be with high flexibility, and therefore it can be used for various activities (meaning during the length of time of use, the buildings can be adapted to different functions). (Read Cliff Moughtin, 1997; Rachmad W.B, 2000).

Of the ten principles, with the limited ability of the design to apply these principles, use of these principles are not absolute in every architectural design; according to their characteristics, architectural design is not mathematical but holistic instead (in the sense that the design process is not linear/static according to their sequences but iterative). In the process of designing a work of design (architecture), the designer is required to implement these principles in accordance with the factors that influence it. The reason is that it is influenced by how the designer (architect) elaborates on the human factors (as a user) and the environment as the foundation of the work. The human factor cannot be separated from the socio-cultural conditions, lifestyle, economic status, while the environmental factors cannot be separated from the conditions which include the location (in the city or outside the city), climate, availability of materials and existing regulations. Taking into account both of these factors it is expected that there will be architecture (buildings) that is friendly to the environment, in the sense that the architecture (buildings) can materialize the environmental balance in supporting the sustainability of the existing ecosystem.

3.2 Literature Review on Concept of Ecology

Architecture is an integrated process of theory and practices because basically architectural theory cannot be separated from its practices (the real world), both the physical environment and the world as a human being's intellectual life environment. The concept of the environment is not just a person's mind (not only within the head/ subjective environment); this subjective environment can be transformed into an objective environment (such as the physical environment/built environment). Marcella (2004) suggests that architecture is a physical space for human activities, which allows the movement of people from one space to another, which creates pressure between spaces in the building and the outdoor space. In a broad sense architecture is the result of the perception and imagination of human beings in which architecture is a crystallization of a way of life, hence architecture is not merely a technique and aesthetics of the building (as a form of *fisk*). Instead, architecture is a materialization of life, in which architecture is described through the specification of the elements of the structure, materials, sizes of surfaces and corners.
This opinion is in line with that quoted by Marcella (2004) which gives the sense that architecture is not just a static object; architecture also studies things that are not visible as part of the concrete and symbolic reality. Based on that argument, it can be seen that there are differences between the idea as a concept of thought and its reality. Therefore, the architectural design process always includes the aspect of fulfilling the needs and it should be balanced by the success of meeting those needs. Thus, to create an architectural design based on ecological architecture, holistic consideration of all the factors involved in applying the principles of sustainable design is required.

3.3 Research Results

Bandung is nearly 16.767hectares wide. When first designed by Thomas Karsten, the city was only intended for only 750,000 residents with an area of approximately 2,000 hectares or about 375 people per ha; it was originally designed as a Garden City with its urban characteristics. In its development today, Bandung has expanded nearly eight times of its initial area, with the population reaching 2.5 million. With these conditions, of course, the need/demand for housing is considerably high, while the capacity is very limited. As a result, people use illegal areas for housing and accommodating their daily activity, making the environment dirty and congested.

At this dense environment, accessibility is through streets/alleys as the primary infrastructure in social interaction. Streets/alleys serve not only as a transportation lines out, but also as a place of interaction,

communication between people, and even for business. In the case of residential areas at *Pelesiran* and *Taman Hewan* in Bandung, the focus of discussion is on the diversity of the social space produced by the actors (citizens and other actors/traders and guests). The definition of social space in this case is the context of the environment both spatially and socio-culturally as the background that encourages the formation of space in supporting the quality of the environment and utilizing this as a supporter of social space in the daily life. This space includes: streets/alleys, open space, fields. Analysis of social space is focused into 3 (three) objects, namely: alley/street environment, open space, and rivers. In details the analysis of the use of space as one application of echo-architecture concepts are as follow:

A.   Alleys/Streets
Streets/alleys are paths in villages that connect all residential areas of the river plate of Cikapundung, with varying dimensions of road width (± 80-100cm). This relatively narrow alleys make pedestrians and bicycles have to walk or run slowly and carefully. The materials used to cover the alley is mashed concrete and combination of paving blocks. The ground has high enough contour, and therefore, in some places, rams as access for bicycles, motorcycles or merchandise carts are made. At certain points, the condition of the steep contour has caused the ram shapeandthe steps far from the standard (height = ±25-30cm). Thus, the ram and trap functions are central in connecting one space to another, the height of the steps is no longer of a standard size because the main focus is how to reach the alley/street above.

Streets/alleys serve as a circulation place/space of accessibility for pedestrians, vehicles (two-wheeled/motorcycles and bicycles), sellers using carts, *gendong* (carrying), and *pikul*(carrying using balances on sellers' shoulders)in support of day-to-day activities.

Streets/alleys are one form of public open space that is very important in a city area. Streets/alleys are a space that serves not only as a means of tracking the movement of a society but also as a place of social interaction. Streets are one of the places where all classes of people feel entitled to access. Streets also play an important role in everyday life. The existence of streets/alleys as the path is needed by those who use it either by walking, cycling, riding tricycles, motorcycles, and others. Streets/alleys, generally serving as the infrastructure in densely populated areas, are accesses for each other to connect and the main attraction of other actors, namely the sellers of food, drink, and other merchandise, as a place for business. Interactions that occur bring life to the streets/alleys, which makes them a meaningful place. The streets become alive due to people's various activities such as to sit around, talk, perform economic activities, a place to eat/drink, and many other daily activities. The streets have become the city's living room, a communal space accessible to all people without exception. The walls on the right and left side of the streets are used by the residents to grow plants that are beneficial to them, such as medicinal plants/TOGA and for domestic/cooking purposes (such as leek, celery, greenery, etc.). In addition, through the use of this vertical space, the environment can be preserved as green space.

Activities that occur in the use of streets/alleys as a space for interaction are, among other: a place to trade/sell for street peddlers (by carrying, cart), children's playground, bike/motorcycle parking space, taxi base, residents/elderly interactions, drying clothes. The diversity of users of these streets/alleys is usually in accordance with the time cycle of their use. In the morning, many people use them to do their activities (parents' going to work, children's going to school), for sellers to trade (selling porridge, vegetables), for parking motorcycles/*ojek* rider to wait for clients, for people to wash their motorcycles, clothes, and dishes (household appliances). During the night and daylight, children use the streets as a place to play, meatball sellers as the place for selling, household appliances traders, parking motorcycles/ojek riders to wait for clients, washing motorcycle. At certain corners, people use the wall on the left and right side of the alleys (especially in front of the house) for storing their garbage in plastic bags, and each day they are collected under the coordination of the head of RT and to be disposed at the dumping areas.

The T junction areas of the alleys/ corners are used by meatball sellers and soup sellers (either using carts or carrying the merchandise) to stop and wait for buyers; the buyers are usually housewives, students, children. They can also be used as a place for gossiping and making chit chat. When doing the shopping, women usually use the alleys/streets as a place to gather and make chit chat/gossiping, while the children use the alleys as a place to play. As for the teenagers, they usually use them to hangout (at the entrance of the alleys, at the fences, while chatting).

B.   Open Fields
Open space in an urban housing areas with high population density has a limited area, hence very often fields with limited size or even courts with a width of ± 80cm-150cm are found. Yet, this open space has a very big role in the people's lives in this slum area. Open ground/fields are intended to accommodate public activities (for temporary use together, alternately, or others, freely and easily). This space has symbolic, religious, cultural and strong political meanings. This space has a static character, acting as local termination of one space to another. This space usually serves as a place for commercial and cultural activities (civic activity). Open space

(physically) often used as a third space of the construction of the area/third space usually do not have a particular shape, more often organically. Basically it is the users that shape and interpret it through a variety of activities they do. In the densely populated areas the open spaces are usually located at the intersection of the alleys with a width of ±80-150 cm or a court of limited size; this space has a very diverse functions, such as circulation areas, children's play area, a place to sell, a place to dry clothes, for socializing areas and can even be used as an area for celebrations at certain times.

Activities that occur in the use of the open space for interaction are, among other: a place to sell for sellers (both by carrying or using cart), children's playground, interactions between citizens /elderly (for doing sports, performing spiritual activities, celebration, religious events). The diversity of users in using this open space is usually in accordance with the activities of the residents: (a place to do sports, children's play room, spiritual activities, celebrations, religious festivals). In addition, this open space is used jointly by the community in growing medicinal plants (TOGA) and productive crops that can yield in produce to fulfill the needs of Tamansari or to supplement their income.

C. River

Residents as users utilize the river and canal as sewerage, for dumping light trash/garbage, sewage for disposing residual detergent after washing clothes. The use of the river with unorganized system of disposal apparently causes blockage in sewage, and therefore the water flow does not run smoothly and even the quality of the water is black colored and smells. In the area of RW05/RT05, to be specific, use of gutters has started to be more orderly; people do not dispose of their garbage carelessly. There now exists a shared septic tank management for the citizens through a shared channel along the sewer line to the shared septic.

Activities that occur in the use of the river as a space for interaction are, among others: a place to dispose trash, sewage for waste water from lavatories, fish cages, and water sports. The diversity of users of this river consists of local residents (children, adults/elderly) and newcomers. Besides that, the fences between the alleys/streets and sewer lines are frequently used for drying clothes. At certain spots, along the ditch, there are many stalls, security guard posts, and others erected. To support their economy some people also make fish cages not only for their own consumption but also for sale. The river is used not only as city drainage but also, in the life of the densely-populated community, as a support for their daily activities. With very limited land, children also use the river/canal as a place to play.

Geographically the space of RW05/RT01-05 of *Kelurahan*Cipaganti of Coblong Sub-district has formed a living space. Settlements formed almost entirely cover the whole existing land, hence there are hardly any visible open space not being utilized. Occupancy is composed closely adjacent to each other; thus, the border between one residential and another is difficult to identify. Use of space is quite diverse, ranging from just a room to sleep up to business space (shop, home industry, and space for rent. This result in the formation of a mixed pattern (not all spaces are formed as the results of the same space needs). Spaces form spontaneously (for instance for hanging out in the alleys, shopping for vegetables, children's playground, etc.); other activities arealsoperformed at the same space.

For the people who live in this region, which is included in the slums area, the convenience to interact with each other occurspontaneously outside their residences (usually utilizing the streets/alleys, corners of the alleys; even they use the upper part of the ditch/gutter to build a place for gathering/ security guard posts). From the results of the observation, it can be seen that people mostly gatherat shady alleys (they have more flexible space) with stalls surrounding them.

IV. CONCLUSION

Based on the above data and discussion, the following conclusion can be drawn: that the general characteristics of the space formed in the densely populated residential area in the city of Bandung is that the space is formed as a unity of the interlinked space-time-actors, as a coherent wholeness that has flexible spatial and temporal boundaries. Basically, space as a spatial element that serves to accommodate the dynamic nature of ongoing activities is physically/materially fixed. It is the supporting elements that contribute to change the layout/structure/composition so that the space has a variety of forms and different arrangement. Time is dynamic, in the sense that the role of time is apparently to rule, control, and even determine when an event should or better be held (daily, weekly, monthly, yearly) in the everyday life of the people building the rhythm of the city life. Actor is another aspect that plays a key role in defining space as a place, and also a decisive element in the formation of an event. Like space and time, actors are also dynamic, in the sense that they as individuals have a high level of mobility in a space, as well as in groups, and can move about in accordance with the particular circumstances. Thus, actors (as individuals or groups) can change their role according to the context.

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