

ANALYSIS OF MORPHOLOGY & HOUSING LAYOUT IN CIBADUYUT HANDICRAFT CENTER IN CONTEXT TOWARD INTEGRATION WITH THE NEW SYSTEM OF TOD IN THE FUTURE Study Case: Cibaduyut Human Settlement as an area for Crafting Shoes in Bandung City

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Abstract - The city development is should give a positive contribution to social development, in the ideal situation. However, this situation is not always similar to the expectation as well as theory. Several factors are as the push factor to the movement, and the movement can be contradictive to negative conditions: (1). The high-level land invasion by the private sector to the community on location. (2). The lack of development as well as a training program in location, by the government and others. (3). The condition of high pressure of import handicraft from another country including shoes and other handicrafts from leather. Similar things happen in Cibaduyut as housing settlements based on leather industry-activity. An important thing that should be highlighted in this analysis based on the strength and the opportunity of application concept of "system approach to architecture", which is completed with many supporting theories. Comprehensive analysis of physical condition social as well as regulation is as the key factor to find the best model as the design solution of redevelopment sustainable settlement as well as sustainable landscape development in research location. Hopefully, the model will relevant with the planning of High-Speed railway (HSRT) Bandung-Jakarta which will be finished in 2021.

Keywords: Housing Layout, Housing Morphology, Transit-Oriented Development (TOD), System Approach to Architecture, Sustainable Tourism Settlement.

1. Background

Cibaduyut settlement area in the Bandung city has been known since 1920 as the home industry of shoe craftsmen, also a place to markets and sells shoes. The term Cibaduyut itself is taken from the word "*baduyut*" which means one type of fruiting plant which was grown in a location in the past. In the old days, this area was still cool, the leather craftsman community grew up among the farming and fisheries community, still with the atmosphere of a traditional village. After Indonesia's independence day, in the 1950s the number of craftsmen's business units was 250 business units, which later developed into several 3000 craftsmen and the Cibaduyut settlement area which originally produced shoes and marketed and sold them on-site, developed into one of the Shoe Market Tourism (Wisata Sepatu) area. This development can be seen from the number of tourists who came to Bandung in November 2013, both local and foreign tourists reaching 4.9 million people (Kurniawan: 2014).

In Indonesia, leather shoes seemed to be the trademark of the Cibaduyut area in Bandung, West Java, other than shoes from Sukaregang, Garut. Since the early 1900s, in Cibaduyut there was a large leather shoe factory containing dozens of workers. But in the end, the factory was closed, the trained workers made various models of leather shoes independently through individual home industries or groups. They also started making home-based businesses that produce leather shoes by orders. However, in its development due to housing and commercial construction, and also due

to changes in livelihoods, the number of craftsmen decreased to several 850 people according to data in 2011 (Data from Kelurahan Cibaduyut: 2011).

Cibaduyut area is has a tourism area which not only for individuals but also for groups such as using buses from outside the city. Cibaduyut area is in the sub-region city (SWK) Tegalega, with the theme of developing is *Mediapolis*, which in principle integrates mass media communication, production of the creative industry, and also for exhibition with recreation. Seeing such massive entrepreneurial potential, the government also made the Cibaduyut region one of the tourist destinations in Bandung. No longer limited to leather shoes, various accessories from the same material began to be produced. Even in 1989, Cibaduyut won the title of the longest shoe sales market in the world. Specific studies are needed to understand the physical and social side of Cibaduyut. According to the record, the production capacity of shoes in particular from Cibaduyut per year reached 3.114.022 pairs, with an investment value of Rp. 19 billion and absorbing 3.008 workers. With the development of technology and similar industries in several regions, both in the cities of West Java and outside of West Java.



Figure 1. Left: The Research location of the Cibaduyut area can be reached from Soekarno-Hatta Street and has a distance of about 300 m from Leuwi Panjang Bus Station. Right: The sculpture of Shoe as the landmark of the gate of the Cibaduyut District Area.



Figure 2. On the left: The condition of environment degradation and density of traffic jams in around Cibaduyut District. On the right: The plan of M-Square apartment and commercial area (CBD) which has been growing in Cibaduyut District, besides the other real estate development. From this picture can be seen that there is a challenge toward the existence of a local settlement, the challenge toward the existence of open space, and the challenge toward the art of this district as a recreational area. But there is will be developed MRT Station and LRT Station, on the other hand, this is can be an opportunity for the development of the Cibaduyut District on long term planning, if this is thinking on the context of a sustainable city and sustainable development.

In the future, Cibaduyut as The Shoe Market Tourism area has a better prospect due to the growth of High-Speed Railway Transportation (HSRT) Jakarta – Bandung which will be pass across

this location until Gedebage TOD Station. On the other side, Cibaduyut area development also has the good prospect in the context of the development of South Bandung and Bandung Regency in the South, for example, the development of the Ciwidey Region, the relationship of the city's development system in the south such as Gede Bage Area, Industrial Zone in West Bandung, and so on. Especially functions that support tourism such as Ciwidey, Cimol Clothing Trading Center in Gede Bage, and also in Cibaduyut itself which have scattered spots need to find out how the circulation system and the social relations system both the community system and institutions in this neighborhood (Permana, Susanti, Indra, Dewi, & Wijaya, 2019). Especially with the completion of the construction of the Soroja toll road which is intensively operated in mid-2018, this is a good potential for the development power of Bandung towards the south and west. Also, it is necessary to see the physical and social conditions of settlements in the region.

2. Research Methods and Goals

This research is using qualitative method, by using data from the field and literature study. There are several potentials in research location as bellow (from SWOT analysis of the first-year research 2017): (1). Potential of small industry in the large numbers of handyman, (2) Recreation Potential, (3). Potential development of new transportation LRT, (4). Potential of historical legend on the Cibaduyut area and (5). Potential development in the economy of the community. An important thing that should be highlighted in this analysis based on the strength and the opportunity of application concept of "system approach to architecture" (Handler : (1970). All of the data from field survey, depth interview, and FDG are using to find the conclusion about layout and morphology of this area, therefore, can do a simulation of prospect modeling about Cibaduyut in the future.

In brief, meanwhile, the aim of the study of this research is as the descriptions below :

1. Finding the result analysis of the physical condition of shoe craftsmen's settlement in Cibaduyut Area, Bandung
2. Finding the social conditions of the shoe craftsmen community in Cibaduyut Region in a shifting condition due to the invasion of urban development
3. Formulate a model of the landscape and settlement design in the Cibaduyut area of Bandung that supports the sustainability of residential shoe craftsmen in the neighborhood which relevant to the city development in the future.

3. Theoretical Framework

Development of Mass Transportation Infrastructure in Tourism Area: Subject, Concept, System, and Target of Cibaduyut Craftment's Housing Settlement. According to Prof. Puti Farida Marzuki (2015), quality in construction is more difficult to define compared to manufacturing industries. Construction products are usually non-repetitive units but are a unique work product with specific characteristics. Refer to the construction trilogy which covers the scope, budget, and project schedule. These are the three main things that interact in producing quality built facilities. Management to achieve quality construction so far has been done through a systems approach and process approach. The effort to produce quality built facilities through the entire construction project process relies on the strength of the relationship between customers and suppliers. To find a good result on a construction project is need many gradually step and every step is needed frequently evaluation, mainly on infrastructure construction which has a big scope as well as budget on the process of development (Watson and Bentley, 2007).

There are three main parties or subjects involved in construction projects: (1). Owner, (2). Designer, and (3). Construction contractor. Each part has a role that must be implemented in various stages of the project life cycle. Meanwhile, the project itself consists of three components : (1). Scope, (2). Budget, and (3). Schedule. The life cycle of a construction project starts with the need for a new facility. Awareness of this need must be followed by planning on a broad scale. Elements on the scale include conceptual analysis, technical and economic feasibility studies, and environmental impact analysis.

Customers in a construction project require confidence that the supplier can meet the quality, cost, and delivery requirements. Conversely, to produce a quality construction project, suppliers need to have the capability to identify the expectations of their customers and other stakeholders, meet customers' needs and expectations in the products and services produced, supply products and services that meet the requirements of customers and expected benefits, and operate in such a way that it can meet the needs of all stakeholders. For this reason, it is important to conduct research collaborations to obtain optimal results regarding the results of an infrastructure project.

Initially, the concept of Transit Oriented Development (TOD) as one of the construction projects, emerged as a reaction to the phenomenon of urban sprawl which was followed by high population dependence on the use of roads and private vehicles in America (Curtis 2009; Waterson, 1997). TOD is a concept that promises vitality and development around transit points or transportation nodes by creating a pedestrian-friendly environment, mixed land use, and good connectivity with transit points. Therefore, the TOD concept is part of the Smart Growth City concept that carries mixed land use and compact cities (system of activities) around the transit point of mass public transport (network system) to influence its travel behavior (movement system).

Meanwhile, the approach to architecture that is also used in this research study related to the development of TOD is 'system approach to architecture' approach, is a theory of Benjamin A Handler (1970). This system model is based on the framework of the relationship between humans and their physical environment, where the approach to this architecture requires a clear design of the architectural system, to direct the architect to the right target. The *systems approach to architecture* has stages that have a clear and related role in forming a system. With the system starting from input to output, feedback control can be done at each stage, analyzing problems, development prospects, economic development analysis of settlements and regions so that researchers and/or architects can decide on results or products that are more thorough, in a basic form, a system that if described as the diagram below.

Benjamin A. Handler's theory then actually needs to be linked to the condition of facilities in the Cibaduyut craftsmen's settlement because changes in transportation facilities and infrastructure will change the need for details of public facilities and infrastructure.

The model referred to in this research is the planning process by using a systematic approach to architecture from Benyamin A Handler (1970). This model is based on the framework of the relationship between humans and their physical environment, where the approach to architecture requires a clear design of the architectural system, to direct the architect to its proper target. The systems approach to architecture has stages that have a clear role and related to form a system.

With this system, from input to output, feedback control can be done at every stage, and the architect can work more thoroughly, in basic form, the system is described as follows:

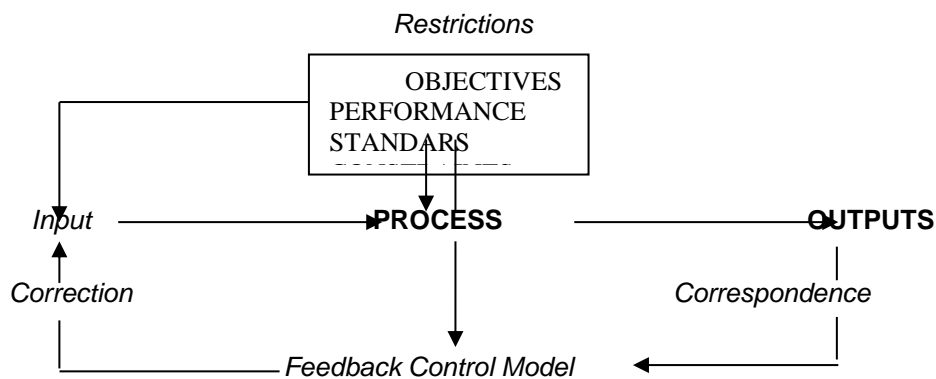


Figure 3. The Basic Form of *Systems approach to architecture*
Source: Benjamin A Handler

Basic System Work :

- Restrictions* : Limitations
- Objectives* : GOALS resulting from a particular system formed from an ACTIVITY
- Performance Standards*: MEASURABLE LIMITS, it is necessary to be able to give the extent to which the results of a system can achieve its prescribed OBJECTIVES and also provide the requirements for the system components
- Constraints* : RESTRICTING FUNCTIONS AND THE ROLE of the system components in the process of forming a RESULT
- Feedback Control Model*
- Model* : CHECKING an output to the input, whether APPROPRIATE or NOT

The thinking framework of this system trying to assemble the criteria ranging from human to technical criteria, so that the position and the role of the building towards the goal of the human and

also clearly the role and position of the planner. The system approach to architecture has 4 (four) subsystem, that is: (1). Sub planning system, (2). Subsystem development, (3). Sub management system and (4). Sub bionomic process system.

The greater the dependence on housing procurement decisions for the Central Government, the greater the discrepancy between the results of housing procurement and the needs and abilities of the community (Turner 1976). Based on the above facts, Turner suggested that people be more involved in the procurement of their housing, especially in decision making. This does not mean that they have to physically carry out their construction, but the important thing is they have the right to make decisions and determine the type of house, how to finance and how to manage the implementation of their housing construction. With the house procurement system, alternative ways of solving problems and alternative types of homes are produced more (Turner: 1976). One of its ways is to strengthen and develop research and development including research studies like this to help the government have more comprehensive, creative, and detailed solutions.

Meanwhile, according to Ettinger (1960), the criteria for housing should meet good standards in terms of various aspects including the following :

1. In terms of health and safety, it can protect its occupant from rain, humidity, and noise, have enough ventilation, sunlight can enter the house, and be equipped with enough water, electricity, and sanitation infrastructure.
2. Having enough room for various activities in the house with high privacy.
3. Having enough access to neighbors, health facilities, education, recreation, religion, shopping, and so forth.

Research variables of this research from the research problems and theory review which have been reviewed above areas the table following:

Table 1. Details of Research Variables

Research Variable	Item of Research Variable
Site Plan (<i>Design Landscape</i>)	<ul style="list-style-type: none"> - Regulation - Climate - Building - Circulation - Vegetation - Landscape furniture
<i>System Approach to Architecture Theory</i>	<ul style="list-style-type: none"> - Objective - Criteria - Constrains
Neighborhood Settlements (<i>Housing Settlement</i>)	<ul style="list-style-type: none"> - Nature - Social environment - Network - Shade (housing/shell) - Culture
Sustainable Tourism Environment	<ul style="list-style-type: none"> - Human Resources - Natural resources
Sustainable City	<ul style="list-style-type: none"> - Physical (Human Resources and Natural Resources) - Non-physical - Time

Source: Analysis and Formulation of Research Team (2017-2018)

4. Analysis

Housing layout and housing morphology of cibaduyut settlement area the potential and propose model for the future in context of the change of infrastructure. In this research process before analyzing and modeling the urban kampong settlement environment as continuity from the last landscape model, it is necessary to analyze the application of the theme concept which is about the "*system approach to architecture*" or the infrastructure development plan. Currently, the Jakarta MRT is 99 percent complete, but the LRT and other facilities and infrastructure of mass rapid transportation in Bandung city still have challenges, this needs to be traced to its root causes to achieve the objectives in this study. PT *Kereta Cepat* Indonesia China (KCIC) said the Jakarta-Bandung Rapid Train construction project cost increased to USD 6,071 billion (IDR 81.95 trillion) from the previous amount of USD 5.9 billion (IDR 80.83 trillion). The addition is due to the inclusion

of insurance costs and the *debt service reserve accounting* (DSRA) component. Managing Director of PT KCIC Dwi Windarto said the amount of the need for the construction of high-speed trains amounting to USD 6.071 billion has long been determined including insurance costs and DSRA.

It is very interesting to observe the success of the realization of the Jakarta MRT that has been initiated for a long time and is now almost complete and usable. PT Mass Rapid Transit Jakarta (PT MRT Jakarta) was established on June 17, 2008, in the form of a limited liability company (Perseroan Terbatas) with a majority of shares owned by the Provincial Government of DKI Jakarta (ownership structure: DKI Jakarta Provincial Government 99.98%, PD Pasar Jaya 0.02%). PT MRT Jakarta has the scope of activities including the operation and construction of MRT infrastructure and facilities, operation and maintenance (O & M) MRT infrastructure and facilities, as well as the development and management of property/business in the station and the surrounding area, as well as the Depo and the region surrounding it.

The results of landscape models (1st-year research) still need gradually evaluation because the progress of the TOD (Transit Oriented Development) development plan requires changes and improvements to the settlement model as the main achievement of this 2nd-year research. The High-Speed Railway target in Jakarta - Bandung (HSR) was completed also suffered a setback which is targeted to be completed in 2019, but later it was targeted to be completed in 2021. The proposed basic concept of settlement planning to complete the concept of landscape planning is essentially divided into 3 outlines of the conceptual framework, they are: (1). Physical Concepts, (2). Non-Physical Concepts and (3). Regulation concept. This is because socially and culturally this environment has gone through a very significant change from the original condition of the first Cibaduyut shoes/ leather craftsmen environment, both in terms of population, increasing educational character, and income differentiation.

Based on Agus Purnomo (2014) research on the *Australian Journal of Basic and Applied Science*, which has the title “ *Cluster Analysis of Supply Chain Performance Small Industry Shoe Cibaduyut Indonesia*”, can be known that there is 3 part of the cluster in Cibaduyut District. The high cluster can have income Rp. 200 million in a month, meanwhile low cluster is about Rp. 7 million in a month. His result of research about the categorization of the cluster in Cibaduyut is can be seen as follow :

Tabel 2. *The cluster of Company in Cibaduyut*

Cluster	Total of Company	No Respondent	Name of Company
1 <i>High Cluster</i>	9 (30%)	10, 14, 3, 16, 24, 18, 5, 30, 1	Pormil, Tiara House, Diana, Oval, Mitako, Mega Cibaduyut, Trio, D Class, Aneka
2 Medium Cluster	10 (33 %)	2, 28, 6, 25, 26, 29, 15, 9, 12, 20	Basama, Basoga, Dian Sari Pratama, Royal, Repalts, Gontina, Ocssa, Parunten, Ega Shoes, Ogan Jaya, Chaira House
3 Cluster Tipe Bawah Low Cluster	11 (37,5%)	4, 11, 7, 22, 8, 21, 17, 28, 13, 27, 19	Silvi Shoes, Gian Ghie, Aldymore Shoes, CBU, Ellyza, Almond, Asra, Picanto, Annisa Jaya, Inntany, Kiyoko

Source: Purnomo (2014)

Meanwhile, the morphology of housing layout belong to craftsmen in location is has several characters, there are as the illustration on the pictures below :

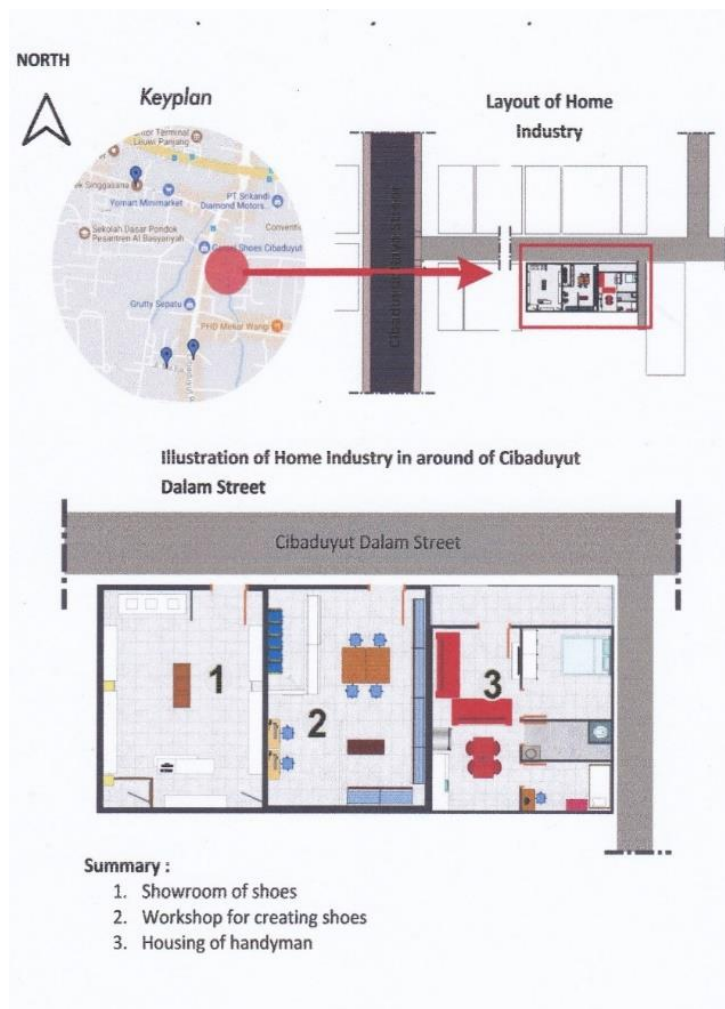


Figure 4. The condition of housing in Kelurahan Cibaduyut, near Linda Shop. The condition of housing in Kelurahan Cibaduyut, near Linda Outlet is looking better and also has the better technology of making shoes, there are so many shoes for teenager or shoes from fish skin. They are more creative and also have a better link of community in making as well as selling shoes, direct oriented, or online oriented.

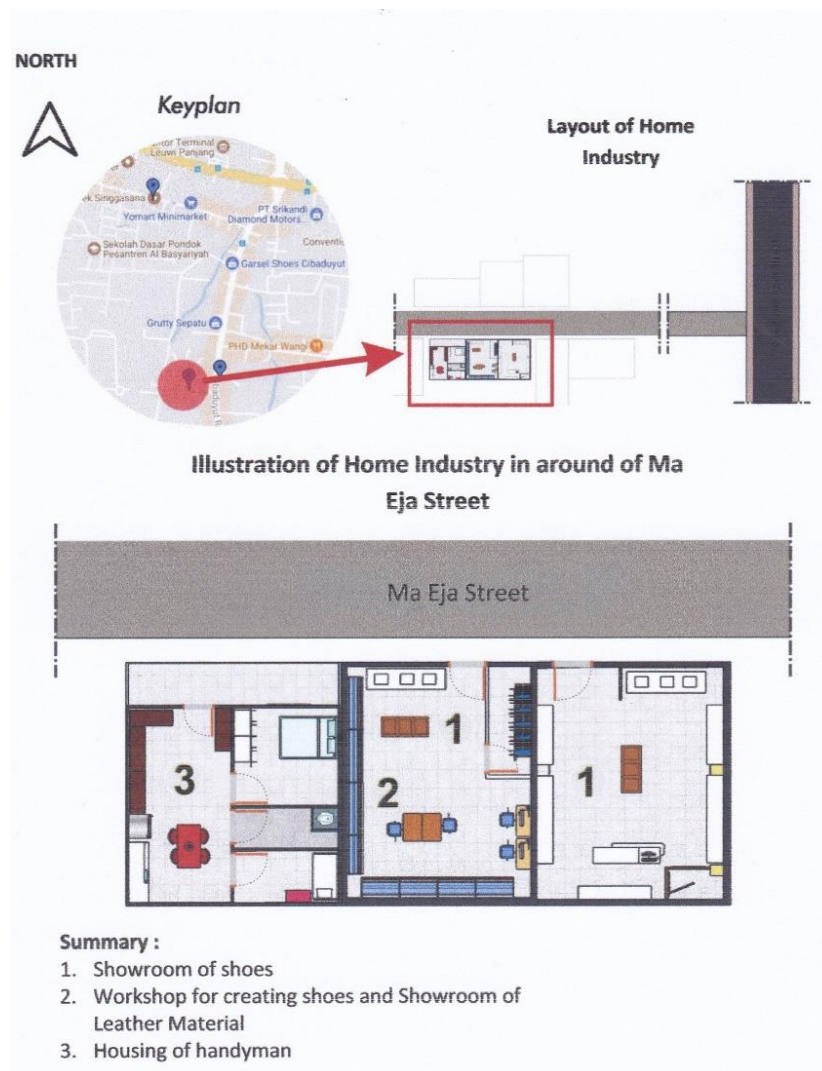


Figure 5. Condition of Craftmen’s housing in around of Ma Eja Street, in Kelurahan Cibaduyut. The condition of Craftmen’s housing in around of Ma Eja Street, in Kelurahan Cibaduyut is look more steady. The craftsmen's housing settlement is spreading along Ma Eja Street and around. The character is nearly the same with housing layout in around of Linda Shop, they creating shoes as their routine home industry.

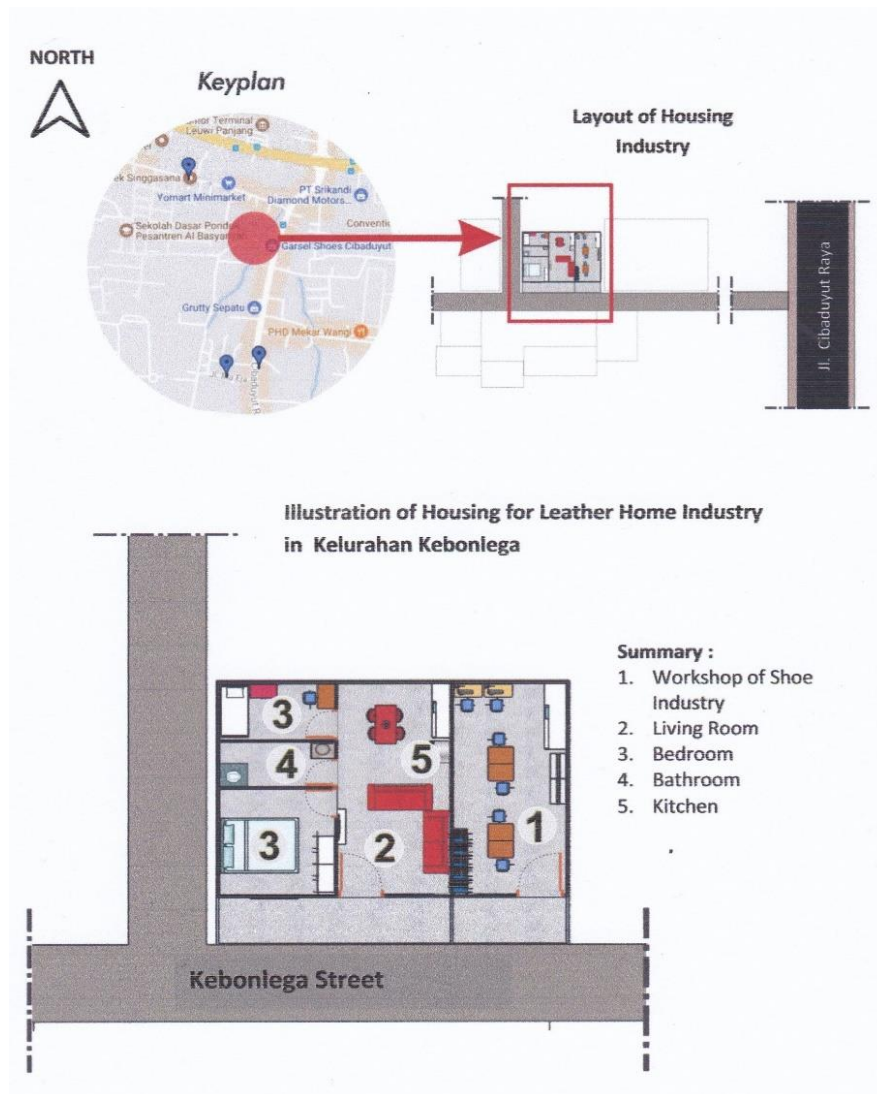


Figure 6. Layout and condition of Craftment's housing in Kelurahan Kebonlega, Cibaduyut. The condition of housing here looks like slum housing, developing sprawl with limited technology in making shoes. It's different from the housing condition in Kelurahan Cibaduyut which has better quality and looks more healthy. Several spots of housing area need special treatment for example by applying empowerment strategy or programming training to increase their ability and therefore develop housing quality in the future.

5. Conclusion.

Concept Applications of System Approach to Architecture Model for Sustainability of Craftsmen’s Settlement in Tourism Area of Leather Industrial Center Cibaduyut, Bandung. From two-step of this research and development, it suggested innovative new concept or idea that fit with the changes in physical condition, social condition, local culture and also fit with new problems that exist in the location related to the context of the development of the new way of infrastructure. It is found from the analysis from the data of this research. The final concept strategy plan of in question is as described in the table below:

Table 3. Housing Settlement Concept Plan in the Cibaduyut Craftsmen's Settlement Environment, Bandung

Concept Strategy	Description of the details of the concept plan that are a priority to be applied in Cibaduyut Settlement Environment, Bandung
PHYSICAL CONCEPT	<ul style="list-style-type: none"> - Restoration of housing facilities and infrastructure according to the results of the SWOT analysis in the neighborhood of the urban village of Cibaduyut shoe craftsmen in Bandung, especially for repairs to spots that were seen lost of meaning due to heavy competition and urban development. - Improvement of environmental conditions reforestation and mural design. - Improved integration between landscapes and housing in urban villages - Improved planning of relations between MRT infrastructure systems between cities and cities with formal and informal housing environments (urban villages).
NON PHYSICAL CONCEPT	<ul style="list-style-type: none"> - Improvement of environmental institutions in Cibaduyut settlements for the physical improvement of the environment and strengthening of social capital can be done by communicating with the local government and communicating with the local community or simultaneously in forums for discussion and cooperation. - Strengthening the integration of multi-stakeholders for the analysis of environmental improvements in the short and long term environment, both with government, private, community, and elements in higher education institutions, both researchers and devices and elements of student affairs. - Strengthening the concept of community participation to improve the living environment of the craftsmen so that they have the power of existence amid the rapid development of the city. - Preparation of plans and applications for integration of community services in line with the research process by looking for possible funding with institutions, village funds, or if there is assistance from private parts so that the restoration of the urban village environment has a faster and better implementation form. This can be realized by FGDs with community parts to conduct a SWOT analysis and strategy for the application of opportunities and strengthening environmental potential in a more real and sustainable manner.
REGULATION CONCEPT	<ul style="list-style-type: none"> - Propose an integrative regulation for strategic points of urban development that are affected by the inter-city and city MRT planning pathways. - Strengthening the regulations to the smallest government parts on understanding the needs of the settlement system power in the conditions of urban development challenges.

Source: Results of the Researcher's Analysis (2018)

Based on the description of the conceptual framework above, it is essentially necessary to have creativity in the target framework to improve the urban kampong settlement environment which has challenges on “the sustainability” which is indicated by the decrease in the trend of the number of craftsmen and a decrease in the physical quality of this environment. It may be that the government has many obstacles to entering a basic system such as people in large urban settlements that are increasingly individualistic, or the problems of building their MRT plans that often appear to be backward and meet challenges. The Jakarta MRT itself has proven to be built and almost finished despite encountering many challenges.

In essence, strategies are needed that have the power to solve problems. The settlement environment with the character of the society as a craftsman has social power in terms of social, arts, and culture. This is something that cannot only be approached with a *top-down* approach but needs to be done a lot with a *bottom-up* approach. The researcher is should always collaborate with the government as well as the community to keep this settlement in the future, analyzing the problems and create as well as communicate the ideas of the development of this case study. To respond to this condition, there were several suggestions about the development of the Cibaduyut Area as the concept and illustration model which were described as follows.

The core of the proposed Settlement Concept Concepts includes: (1). Mural on the school wall, (2). Murals and reforestation in the craftsmen’s villages, (3). FGD for repairs facilities and infrastructure, (4). Proposed construction of integrative commercial concept with informal sectors with the possibility of *land sharing development* concept of mixed-used on Jl Soekarno-Hatta and Mekarwangi Street, (5). Community empowerment with the proposed improvement of infrastructure facilities and (6). Improvement of industrial capacity by training for the community.

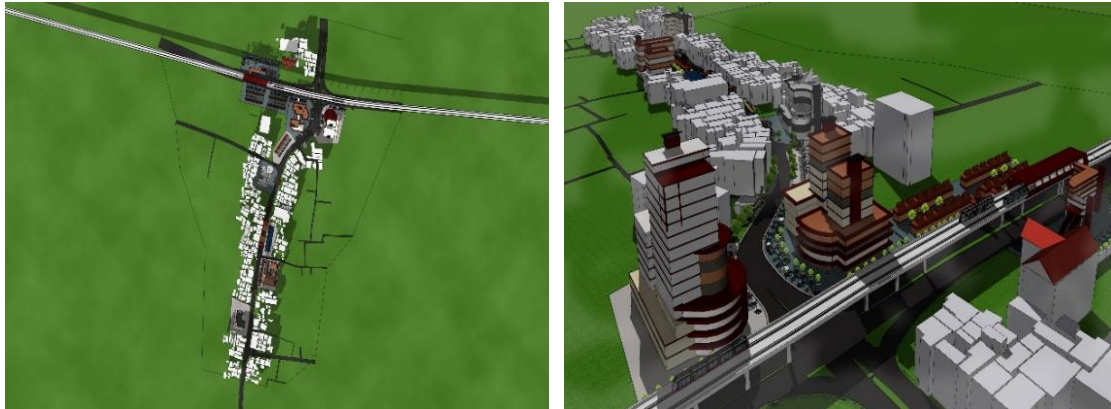


Figure 7. The proposed model of change for the Cibaduyut area where there is the TOD station will be developed here. Nowadays this location grows fast but being slum, arid, and not enough on good treatment. In the future the main concept of “system” which is developed is the purpose of collaboration between public and private partnerships on several potential locations, another primary concept is a reconstruction of historical concepts in location, for example, planting “*baduyut*” trees and reconstruction of local wisdom character in location.

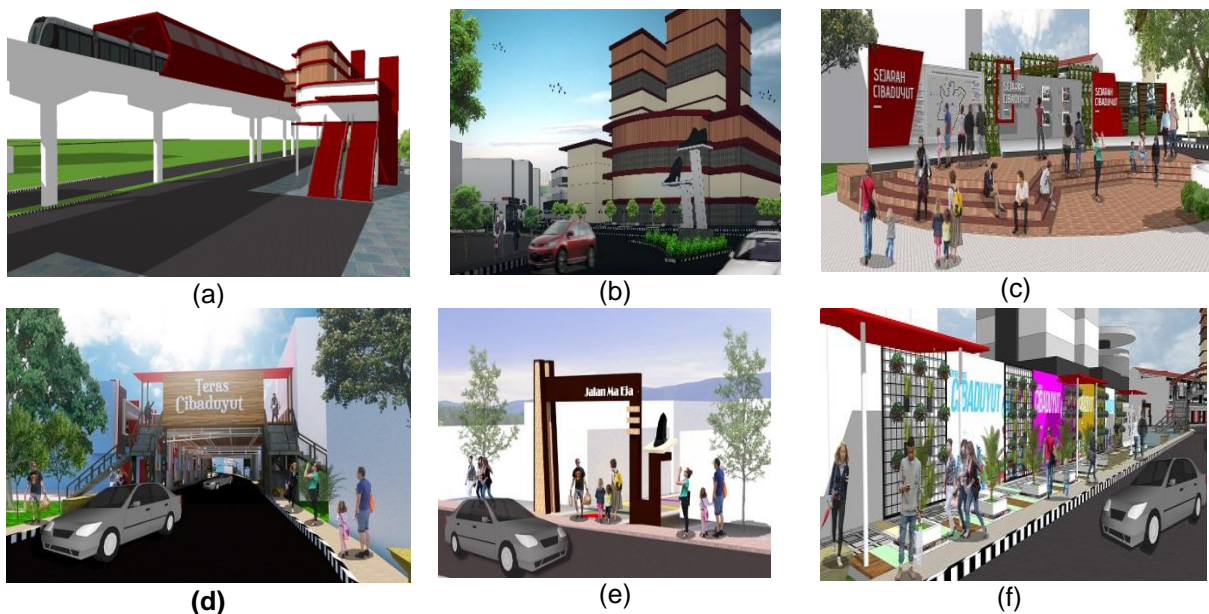


Figure 8. The condition of the growth of the city in Cibaduyut area is the prospect of development of Transit-Oriented Development (TOD), and many facilities which will be supporting the change of this function on location for example development of many CBD (Central Bussines District) which will be matched with the change of this location but on the other side the local character of Cibaduyut is also can be a main priority. There are several concepts as the proposal from the last analysis, as follows: (a). Model illustration of TOD in location, (b). Model illustration of CBD on the gate of Cibaduyut District, (c). The design of part of circulation can describe the historical concept in location and also has “*baduyut*” trees on new reconstruction, (d). The propose of skywalk for street vendors, (e). The gate of the local district in around of housing of handyman, and (f). Propose a mural in location.

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