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Utilization of residual space on Ciliwung riverbank

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Abstract. The need for space within the city is increasing. The city itself has residual spaces that are considered non-functional. Supported by factors such as the need for space and an attachment to the space itself, residual space has the possibility to be appropriated (taken over) by the city dwellers. One of residual spaces within the city is an unused riverfront. The city of Jakarta is bypassed by the Ciliwung River. In the Dutch colonial era, there was an increase of immigrants consisting of laborers and hired workers who needed shelter, resulting in slums or river-side settlements, as the river are the only source of clean water for villages that do not have adequate facilities. The Ciliwung River was then used as a sewer, which prompted the government to erect fences on the banks of the Ciliwung River, creating residual spaces on the banks of the Ciliwung River. Although the river is viewed as residual space for other city dwellers, a section of Ciliwung is appropriated by a number of villagers in the Cikini area. By observing the appropriation activity as an alteration resulting in the transformation of a residual space, it will show the potential of the residual space itself and the emergence of functionality in the residual space

Keywords: Space appropriation, residual space, riverfront, Cikini

1. Introduction

One of the problems faced by city residents is limited space. The city itself has residual spaces that are perceived as nonfunctional spaces. These residual spaces have the possibility to be appropriated or taken over by a handful of people who have a need for space, either for gathering or other needs. Feldman and Stall (2004) stated that appropriation of space is the creation, choice, ownership, modification, repair, maintenance or as simple as the act of using a space which aims to make the space one's own, carried out by individuals and groups. Rapoport (1985) argue that appropriation is influenced by several elements, one of which is the availability of space for appropriation. The perpetrators of appropriation will then attempt to transform the available space, creating new functions that better suits their needs. Forms of appropriation within a space can be seen as a reflection of urgent needs of the people who are implementing the appropriation. Appropriation can happens in any type of space, but the extent of the appropriation depends on the users' legal control of a space. Therefore, an appropriation can only fully takes place in a legally owned space or a space with a lack of strict control over it.

Trancik (1986) stated that a residual space means a space that does not correspond to its surroundings and does not have a defined use for its users. These spaces are often neglected or left unattended, so it is relatively easy for city dwellers to assume control over these spaces. One form of residual space in a city is a riverfront that is abandoned due to being isolated from the city planning system or deliberately closed due to a detrimental use of the river and its perceived threats to human health. The city of Jakarta is passed by the Ciliwung River. In the Dutch colonial era there was an increase in immigrants consisting of laborers and unskilled workers who needed a place to live, creating slums on the riverbank



as the river is the only source of clean water for the villages that do not have adequate facilities. The Ciliwung River is then used as a garbage disposal and sewer, which encourages the government to build fences along the Ciliwung River, thus creating a residual space on the banks of the Ciliwung River. Although it is seen as a residual space for other city dwellers, there is a part of the Ciliwung River that was appropriated by a number of villagers in the Cikini area. The appropriation of this residual space shows the potential of space that other city dwellers did not realize beforehand. The aim of this research is to observe the transformation happening in a residual space, and to understand the effect of informal space appropriation in this particular space (Ciliwung Riverbank). The questions presented in this research are:

1. What is/are the forms of appropriation happening in Ciliwung Riverbank?
2. What is the role of space appropriation in the transformation of riverbank as a residual space?
3. How does space appropriation affect human activities on Ciliwung Riverbank?

The scope of this research is the appropriation that occurs on riverfront/riverbank as a residual space and how space appropriation affect this space. The residual space is seen as an environment that has physical components and characteristics that can be perceived by humans. The residual space that are focused on in this research is the residual space on the riverbank, particularly Ciliwung Riverbank along Cikini, Central Jakarta.

2. Appropriation in residual space

To fully understand the meaning of space appropriation, we first need to understand the meaning of space, and why it differs from place. Space is a dimension created by a combination of several human receptor (sense). The eyes receive input visually, while the sense of touch, combined with movement, helping a human to observe an object. Humans' awareness of an object will lead to an awareness of distance between objects, which can be called space. Humans perceive space with visual perception, touch, and movement. Humans' existence creates the orientation and structure of a space. Space provides a background for humans' lives and activities. Space has a meaning when humans pass through or occupies that space. [14] Place in the Oxford Dictionary is defined as a position, point or area in a space. Place has physical components that can be analyzed and is an active point used by humans in space. [14] We can conclude that a space can only become a place when it is given meaning by the humans using it.

2.1 Space Appropriation

De Haan [3] states there is several kind of appropriation by individuals depending on the powers they held over a certain space. Different kinds of appropriation can occur individually or at the same time. There are 5 types of appropriations that might occur in a space, but the one that is visible on Ciliwung riverbank is material appropriation. The other 4 types of appropriation are social, cultural, political and moral appropriation, which are the appropriation by social seclusion, cultural significance, and carried out by political forces against a space, usually carried out by the government in the arrangement and distribution of zoning in a city respectively.

Material appropriation of a space is the arrangement or production of spatial objects in that particular space. Material appropriation includes the placement of material objects in a space constraint, and is the most visible spatial transformation. Material appropriation are reciprocal in nature, meaning that the spatial arrangement created with a specific purpose by the humans then influence the activity of the human occupying it. Material in this context is considered as an object that facilitates human activities and/or interactions.

Material appropriation of a space begins with spatial resentment, where individuals or group harbor a dislike of the nature of a space, or when a physical environment is considered not functioning properly. Humans tend to do material appropriation with the aim of producing a physical arrangement that bears a purpose, by determining where an object should be placed, what function do these objects had, how they are used, when and by whom they are used. This order reflects the social rules and spatial needs of the individual or group carrying out the appropriation. [3]

Rapoport [1] states that there are 3 elements driving/contributing the space appropriation, which are the occupancy of space, defense of space, and attachment to place. Occupancy in the KBBI is defined as occupation (*pendudukan*), use or placement. Space appropriation is determined by the ability of an

individual or group to assign their occupancy to the place. Rapoport [1] states that there are 4 typologies of space occupancy that are expressed in physical setting, having differences in territorial signs, maintenance, control, and boundary of a space, as well as how often the space itself is used. This occupancy is classified into two areas, namely the public and private areas.

Appropriation in public areas are divided into three categories, one of them being occupancy by community. This appropriation is often controlled by a group whose members must pass a screening process to be considered as members. These groups can be created by populating a place together (neighborhood groups), having the same belief (churches, etc.) or by having the same status and being in the same situation (student at a university, co-workers, etc.). Seamon (1979) in De Haan [3] argues that appropriation is associated with an emotional attachment to a place, which can be seen in high intensity use of a space. Neighborhood appropriation or appropriation in a housing environment can be seen as an attempt to widen the sentiment of ownership of the home environment into the public sphere. Signs of community occupancy are usually symbolic or material, which aims to exclude people who is not a part of the group. The appropriation on Ciliwung riverbank qualifies as occupancy of space in public areas, and can be seen as occupancy by community.

The second contributing factor of space appropriation is defense of space. Rapoport [1] states a space will protected if the space has defined and easily controlled physical limitations, but not all spaces with these characteristics will evoke defensive feelings. Some spaces will not be protected if the user found the place to be unpleasant or uncomfortable to be in. The form of protection of a space can be seen in the creation of physical boundaries, prominent signs, increased supervision of space, and strict rules of use. (Rapoport, 1980)

Cresswell (1996) in De Haan [3] argues that "the *order is inscribed through and in space & place*", implying that space appropriation also depends on the power possessed by the perpetrator who is appropriating the space. De Haan [3] states that the appropriation of a public space is an act of domination or resistance; Resistance is the action of users against the law (rules that have been set by the government) and are seen as a violation of the law while domination is the effort of the party with the power to maintain 'purification' of a place and eliminate behavior that is deemed inappropriate. Users who violate the rules will experience confrontation with the authorities. Gotham (2003) in De Haan [3] argues that appropriation or 'rewriting space' is a way for people who do not have the power to engage in the transformation of a space.

The last contributing factors of space appropriation is attachment to place. Rapoport [1] states that attachment to a space is a possessive feeling, possessed by a space user towards a territory caused by the association of that space to his/her self-identity. In understanding the attachment to a place, it is necessary to understand what attachment is in human beings. Bowlby [15] states that one of the fundamental characteristics of humans is the importance of emotional relationships:

"Attachment theory pays attention to the tendency to create an intimate emotional connection with certain individuals as a basic component of human nature, which existed since (early) in the womb and continues into old age."

Bowlby [15] states that this theory is related to the behavior of emotional attachments, namely all forms of an individual's behavior in achieving and maintaining closeness with individuals who are considered able to survive in the world. Attachment bond is a sense of comfort, love and security that is created by the closeness and availability of certain individuals. This relationship is not limited to other human beings, but the surrounding environment as well. Humans will create associations between different aspects of his/her life, including the environment, with various roles and identities of themselves. This identity and role determines behavior when they interacts in a social environment. Humans will associate their roles and identities with the environment where they are currently in (*Place-person merger*) [16]

Attachment to a place might develops from continuously interacting with a particular environment (prolonged interaction). Continuous interaction with a particular environment will cause a sense of place to emerge, if followed by a high level of satisfaction with the place, has the potential to develop to an attachment to the place. An example of attachment to a place due to continuous interaction is a child who often plays in the school playground during recess. The playground is associated as a part of

her school environment, where she spends a lot of time in her daily life, so that there is an attachment between the child and the playground.

Attachment to the place is not only influenced by identity and continuous interaction, but also influenced by the human satisfaction about the quality of the environment where he/she is located. Sense of place helps humans perceive place satisfaction. High satisfaction will encourage humans to create attachment to places, while low satisfaction is associated with low attachment or no attachment at all. [16] Attachment influences space appropriation in two ways; The occupant will appropriate a space if the occupant has a strong sense of identification with the space (sense of place) and/or a strong sense of identification usually arises as a result of appropriation activities, and the space that is appropriated reflects the sense of personal/community worth so that it is likely to be protected if the space is damaged or intended to be taken over.

When humans can identify a space, they will personalize it with objects that indicate their own personalities as a sign of occupancy. In territories owned by the community, territorial signs are made to make outsiders feel alien and reluctant in the space. Attachment does not always mean ownership of a space. A sense of attachment often arises after legal ownership of a place, but does not always appear along with the ownership (e.g. ownership of a new house where the occupant has not yet feel at home in). On the other hand, lack of ownership will inhibit some forms of appropriation, but humans tend to appropriate spaces they do not legally have. [1]

2.2 High density as a potential trigger

Other than the three factors stated above, there is another potential drive to space appropriation, namely high density condition. An individual must manage and control his environment to a certain extent to fulfill his/her goals or desires. The more people occupying an environment, the less control an individual has in that environment. In an essay titled *Crowding Stress and Human Behavior*, Epstein stated little to no control over an environment due to the high number of individuals in one environment will encourage an individual to change the condition by altering the environment or by looking for another environment, where the individual is able to assume more control towards the environment. [11]

The condition in which an individual feels the need for space beyond available space is called crowding [12] Crowding has a different meaning than density. Density is a physical area that is available for individuals, while crowding is a feeling that humans feel when they don't have enough space. Evans [11] states that a high density (number of individuals per unit of space) does not always lead to crowding. For example if an individual is in a small room and surrounded by family and close friends, then he does not feel as if he was crowded. Whereas, if he is placed very close to a stranger, an individual might feel crowding.

Loo (1973) in Evans [11] states that high density can be achieved in two ways, namely increasing the number of people in a room or changing the spatial arrangement in the room with a fixed number of people. He stated that this difference divides the type of crowding into two, namely *social crowding* and *spatial crowding*. Spatial crowding implies a lack of space to be occupied and used by humans within it. The inability to alter space conditions causes a feeling of lack of control that someone has for the space. This desire to have controlled space will encourage people to appropriate other spaces that has more potential to be controlled. This phenomenon can be seen in both Raden Saleh and Kenari village, the two villages on both sides of Ciliwung River.

2.3. Residual space

Tonnellat (2008) in Shaw and Hudson [17] states that although the residual space has many terms (voids, dead zones, interstitial space), these terms indicate a similar type of space, usually a space empty and devoid of any meaning because the government does not assign any function to the space. These spaces are the opposite of normal spaces in the city, due to their lack of formal functions. Shaw and Hudson [17] stated that there are 3 types of residual space that are often found in cities, namely abandoned buildings, leftover space (spaces between buildings) and spaces of infrastructure, such as underpass of a bridge or an unused riverfront.

3. Methods

In writing this paper, we used qualitative research methods, such as individual interviews with residents and observations (field surveys). Before beginning the observation, we have conducted a literature study on space appropriation, residual space and riverbank as residual space. We also analyzed the link between the residual space and space appropriation activities, and conducted a case study based on the theory discussed in the literature review. We have conducted a 4 weeks observation of Ciliwung Riverbank in the Cikini area (mapping and categorizing the activities on the riverbank) which is adjacent to the Raden Saleh and Kenari villages where the space appropriation is happening.

4. Results

4.1 The emergence of residual space on Ciliwung riverbanks

Ciliwung riverbanks has not always been a residual space. During the Dutch colonial period until the 1980s, the banks of the Ciliwung River were still used for urban activities. The Ciliwung River is one of the largest rivers of 13 rivers in Jakarta. The spring comes from the mountain area of Gede/Pangrango which is located 1500 m above the sea. During the Dutch colonial period, Ciliwung was called Kali Besar, located along the southern city of Batavia and flowing from east to west. Kali Besar is used for transportation lines, city defense, and water supply lines for the Nieuwpoort fort built by J.P. Coen. The city of Batavia is a fortified city which originally consisted only of the area that is now Jakarta Kota. Batavia residents live in separate clusters by religion and status. [6]



Figure 1. City residents, bathing and washing clothes in the river

(Source: <http://jakarta.108jakarta.com/2012/06/kali-dan-kanal-di-jakarta>,

http://luk.staff.ugm.ac.id/itd/Batavia/COLLECTIE_TROPENMUSEUM_De_Molenvliet_in_Batavia_TMnr_10015160.jpg)

In the 1930s, the river had not been polluted, so the river could be used for city residents to bathe and wash clothes in. The river was also used for transportation using canoes. [9] Activities on rivers and riverbanks are common during this time. The Ciliwung riverbank is also inhabited by natives who works as laborers for the Dutch colonizers, forming small villages on the banks of the river to facilitate the need of clean water as well as to be near the Dutch colonizers' settlements in Cikini where they worked at the time. After the Dutch occupation ended in 1945, the city of Jakarta began to develop out of the grid city-structure inherited from the Dutch government. This was due to the increase of urbanization in Jakarta which peaked in 1980, resulting in a drastic increase in Jakarta's population, and consequently increasing household and humans' wastes within the city with nowhere for it to go other than the river. The Ciliwung River became a part of Jakarta's drainage system and its' previous functions began to decline after it was used for garbage disposal by villages' residents on the banks of the river.

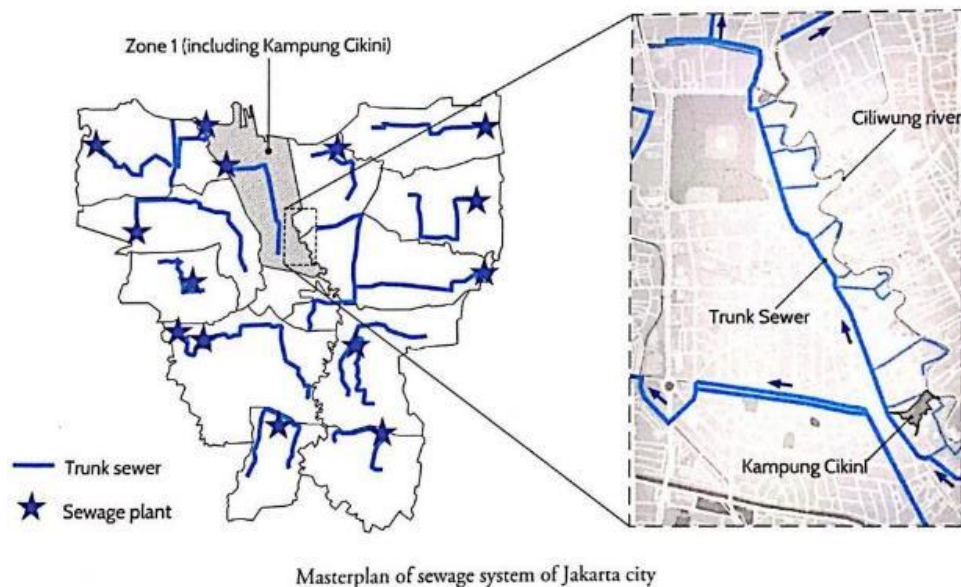


Figure 2. Masterplan of DKI Jakarta's sewer system
(Source: Booklet Sensible high density 2014-2016)



Figure 3. (a) Ciliwung before normalization (b) Ciliwung in May 2018
(Source: https://statik.tempo.co/data/2015/08/27/id_431512/431512_620.jpg)
Ciliwung 2018 (Personal photos)

The government began cleaning up the Ciliwung River after a major flood that hit Jakarta in 2013, killing 14 people. [18] The government also began building river bank retaining walls to widen the Ciliwung River to avoid future flooding and fencing the river to separate the villages and roads from the river. Retaining wall is a relatively thin, concrete vertical wall that serves to retain soil from both sides of the river and widen the river so that the river flows more smoothly. It also increases the depth of the Ciliwung River to prevent flooding. These new component on the banks of the river are a part of the infrastructure created by the local government, therefore falling under their authority/jurisdiction. The closure of this river area causes an emergence of a space on the riverbank that cannot be directly accessed by city dwellers. The Ciliwung riverbank is cut off from the pedestrian area in the city, thus meeting the criteria of a residual space in the city. While these retaining walls was not intended to have a function beyond widening the river, the villages' residents sees a functionality beyond its intended use.

4.2. Urban villages on the banks of Ciliwung River



Figure 4. (a) Two villages framing Ciliwung river (b) Area of residents appropriating the riverbank
(Source: Google Maps, edited)

The east side of Ciliwung River is bordered by a road, next to Kenari village (RW 08), while on the west side it is directly adjacent to Raden Saleh village (RW 01, 03 and 08). Residents of Raden Saleh and Kenari village who had lived in the riverside area before it was being repaired by the government uses the river as a garbage disposal. These villages are located near Cikini village, where settlements in the village meet a standard size of 30-50 square meters, but the majority of homes are occupied by families exceeding the capacity of the house itself, with a density of 1000 people per hectare. [13]



Figure 5. (a) A road on Raden Saleh village (b) A road on Kampung Kenari village
(Source: Personal photos)

As seen in figure 5. (a) and (b), the streets in the village are used by residents as a storage space. High density housing condition encourage residents to use the front of their house to store things that cannot be stored in the house, such as motorbikes and food carts. This phenomenon can be seen as *spatial crowding* by objects. The women often owned control of activities and arrangements in the house, and are involved in daily activities in the house. Meanwhile, the men and boys usually went for activities outside the home, either working or playing. Their only use of the house is to sleep, eat and clean themselves. There are not enough space to relax and gossip with neighbors or to play inside the house, the two activities that are still considered very important to the close-knit traditional villagers.

According to the theory of the effect of human crowding stated by Epstein, the lack of control of an environment will encourage humans to look for other environments that can be controlled in accordance with the human' wishes. In this case, the lack of space to control pushes them out of the house into a more readily available space, such as the outside their houses where the women usually gossips while sitting on makeshift wooden benches, while some of the men appropriates the residual space on Ciliwung riverbank for a place to gather.

4.3 Appropriation of residual space by the villages' residents



Figure 6. (a) Residents' houses on the riverbank (b) The riverbank is closed off
(Source: <https://bit.ly/2tgZpyC>; Personal photos)

Before the government fenced off the river, villages' residents built their houses along the riverbanks (as can be seen in figure 6. (a)) The development of retaining walls causes the residents' houses to be pushed a few meters back on the banks of the Ciliwung River. The decreasing amount of controllable space forces the residents of Raden Saleh and Kenari villages into seeing the river's residual space as an unchallenged open space.

While the government already fenced off the river, villages' residents who lives near and frequently interact within this area perceive gaps on these fences as an access to the riverbank. The same thing happened on Kenari village, where low concrete barriers did not obstruct the view of the residents to the riverbank. These gaps creates both visual and physical access. Meanwhile, the majority of city dwellers who passes this area by moving vehicles do not see any access to the riverbank because it is obscured by concrete barriers and stalls that are set up on the side of the highway. Therefore, nothing affects their opinion of the river and its banks as a residual space. By walking on foot, moving field of view becomes slower so that villages' residents can perceive the surrounding environment more clearly. Although most of the riverbank are closed off by fences, there is some section of fence missing near the entrance to the Raden Saleh village and along Kenari village, so that it was perceived as an access to the riverbank.



Figure 7. (a) Open visual access towards the river (b) Visual access is blocked of by stalls
(Source: Personal photos, edited)

Space appropriation happening on Ciliwung Riverbank is a takeover of space occupancy from the government of DKI Jakarta, who has the legal right to control the use of the river, including its use by city residents. However, the government of DKI Jakarta does not provide any supervision towards the river. Lenient occupancy of space and almost nonexistent protection of the river (other than the fences) are some of the factors that drives the space appropriation. The government's lax control of Ciliwung riverbank resulting in the river being perceived as an abandoned and unprotected space in the city.

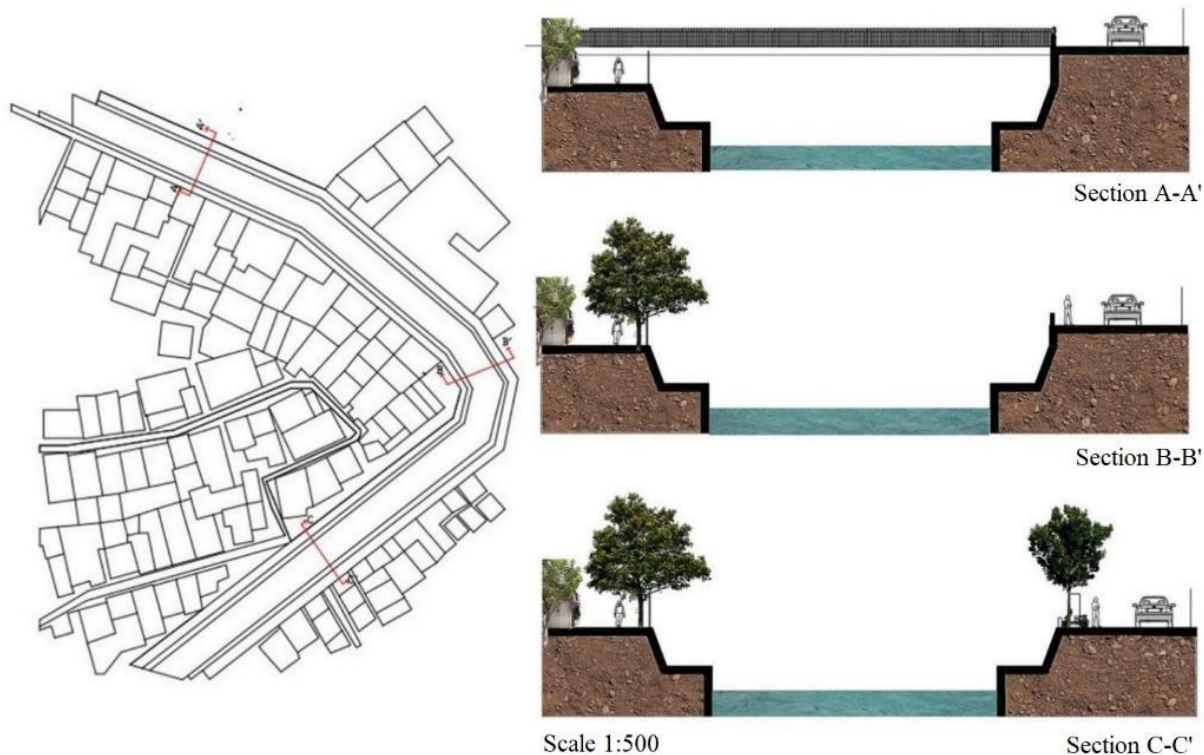


Figure 8. Ciliwung river section in 3 different areas
(Source: Personal illustration)

Another factor that drives the appropriation is the feeling of attachment to a space. The Ciliwung Riverbank is within 5-8 meters of Raden Saleh and Kenari villages. Raden Saleh residents whose houses are not directly facing the river also have to pass through the road near the river because it is one of the main roads in and out of the village. Activities such as parking their motorbikes & selling food in stalls are carried out on the main road adjacent to the river. Residents began to associate the river, and by extension the riverbank, as a part of their home territory. This close proximity then evokes a feeling of familiarity which then creates an attachment to the area.

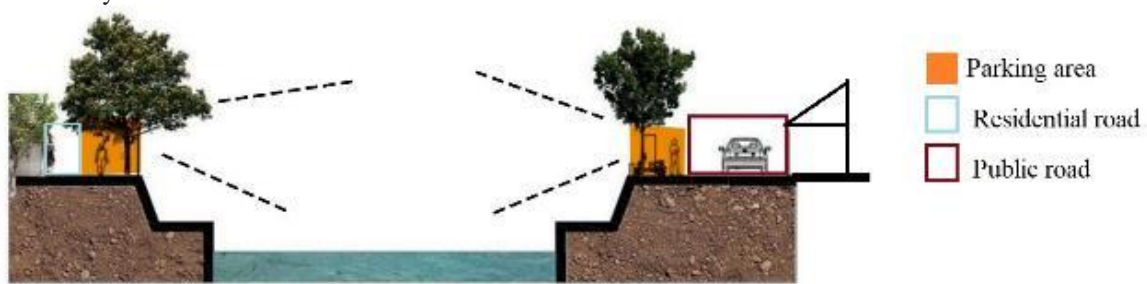


Figure 9. The riverbank is located near residents' houses
(Source: Personal illustration)

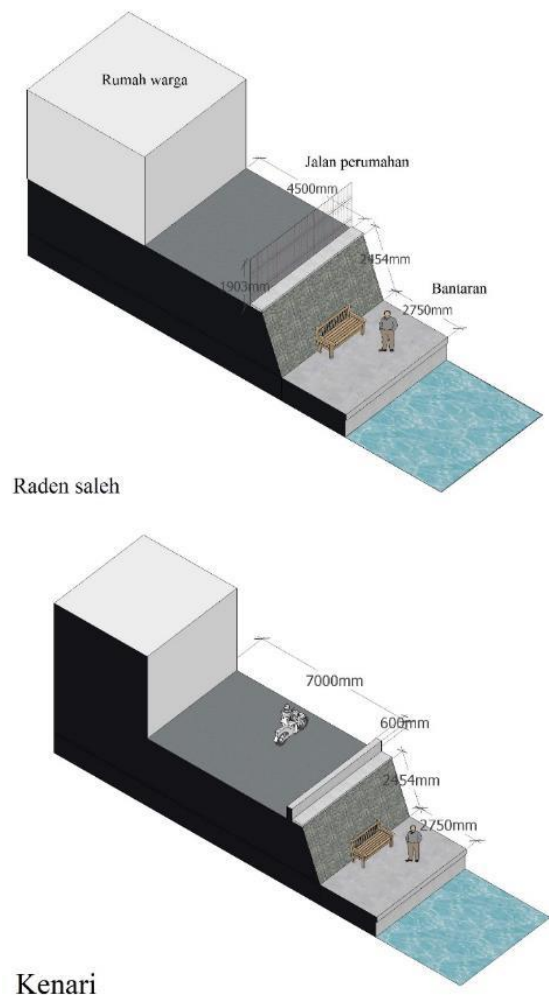


Figure 10. (a) Raden saleh village road dimension (b) Kenari village road dimension
(Source: Personal illustration)

The factors stated above further encourages the residents of Raden Saleh and Kenari village to do an informal takeover. The purpose of the takeover is to transform the physical composition of the environment in order to create a desired condition which is a comfortable open space. The residents used makeshift wooden stairs as a mean to access the riverbank. Materials such as wood and bamboos are obtained the leftover of nearest building construction or other sources and are used to make stairs, huts, and benches. There are several forms of appropriation carried out by the residents. The most common form is material appropriation, which is supported by the surface affordance of the riverbank. The forms of material appropriation includes urban farming, makeshift huts for activities such as relaxing and gathering, and bird houses on the riverbank. As it can be seen on figure 11, there are several access points to the riverbank, almost all of it using makeshift wooden stairs.



Figure 11. Mapping of stairs on the riverbank
(Source: Personal photos, edited; Personal illustration)

The riverbank itself has an elongated shape along the river, so the spatial arrangement done by the residents are in a linear fashion (arranged in a straight or almost straight line) so that the bank can function as continuous space (no blockage caused by objects) and to make the most use of available space. Large objects such as bird houses are placed above or near the wall of the banks so as not to fall into the river. This layout aim to provide visual access to the river as a vista for the villagers while relaxing. Chairs are placed facing each other to maximize interaction and to not block access along the riverbank.

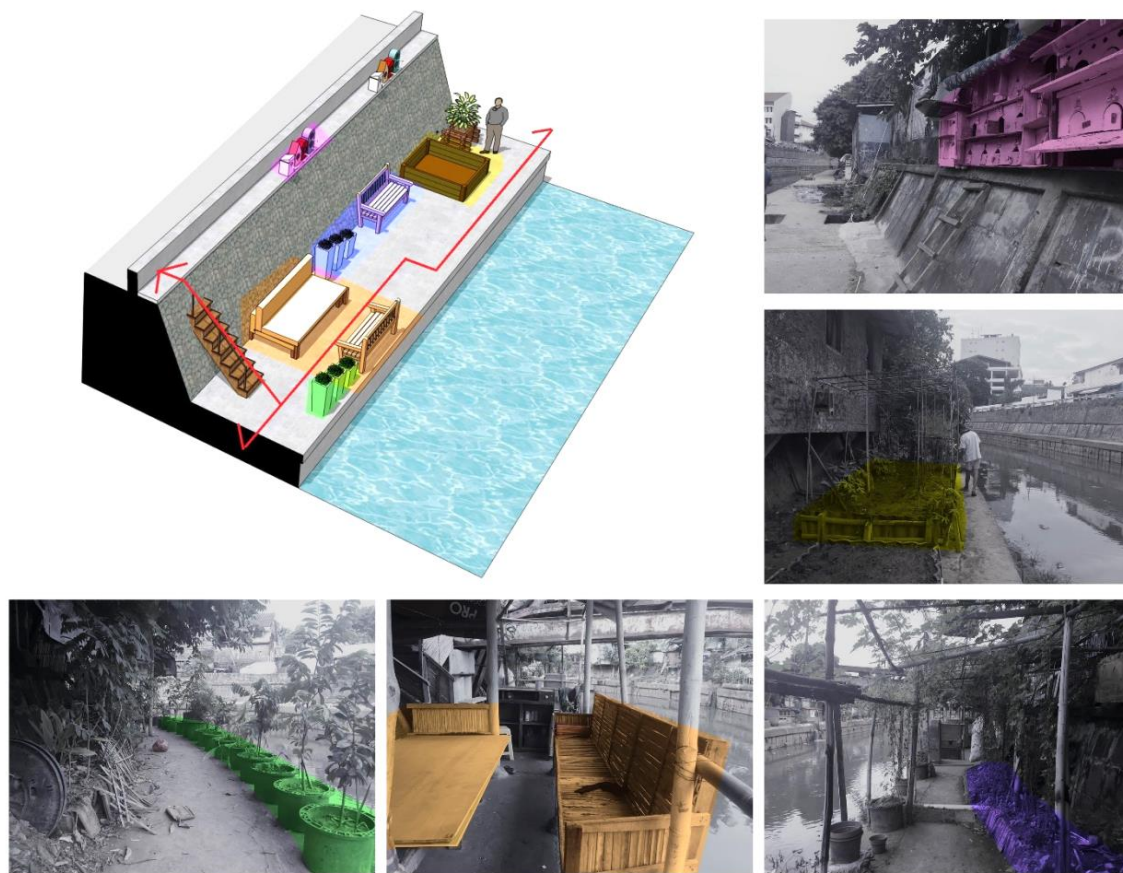


Figure 12. Linear space arrangement made by the residents
(Source: Personal photos, edited; Personal illustration)

Space appropriation began when both villages' residents started to place bird cages on the riverbank in 2015. Roads in both village are so narrow, residents found it difficult to find a hobby that doesn't require a lot of space. Keeping birds as pets is a both a pleasure and a source of pride for residents, in that keeping pets is a sign of financial stability. Most birds can be maintained in a smaller space. However, large number of birds require a bigger birdhouse, so they cannot be placed near the residents' house. Larger sized-birds such as chickens also need more space. Thus began the space appropriation by the placement of birdhouses on the riverbank.



Figure 13. Mapping of birdhouses on the riverbank
(Source: Personal photos, edited; Personal illustration)

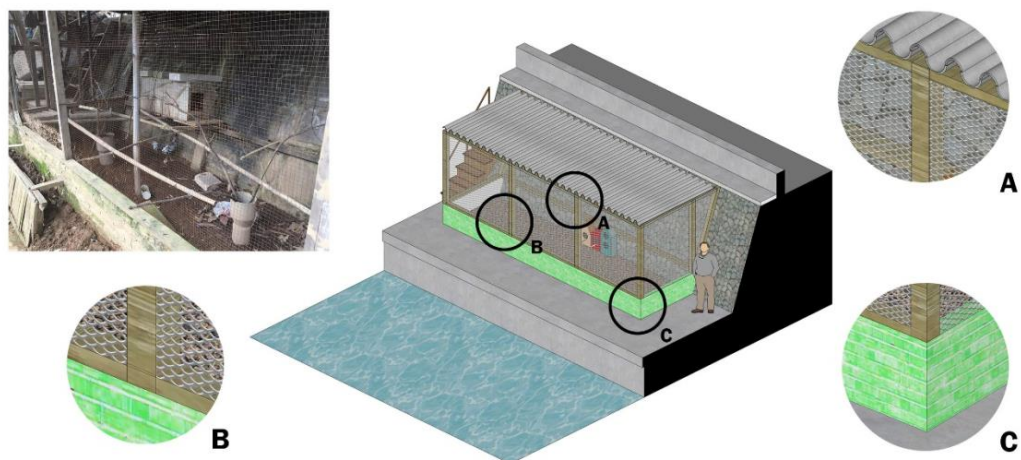


Figure 14. One of the makeshift birdcage made by the residents
(Source: Personal photos; Personal illustration)

The residents created the birdhouses from scratch, by using any leftover materials from nearby building construction. As can be seen in figure 14, the birdcage was created by a low brick fence (around 50 cm), which then painted over (C). The cage's partition was created out of wooden frame and wire sheeting (B), covered by a piece of zinc roof (A). After noticing a large amount of birdhouses on the riverbank, the government banned the residents from keeping live creatures on the banks. However, there are still many people who put birdhouses on the bank. Built of material that conducts heat (concrete), the riverbank's high temperature was so uncomfortable that the residents began planting activities around the end of 2015 as an effort to change the riverbank's condition to be more comfortable.



Figure 15. (a) Mapping of planting activity (b) Plants on the riverbank
(Source: Personal photos; Personal illustration)

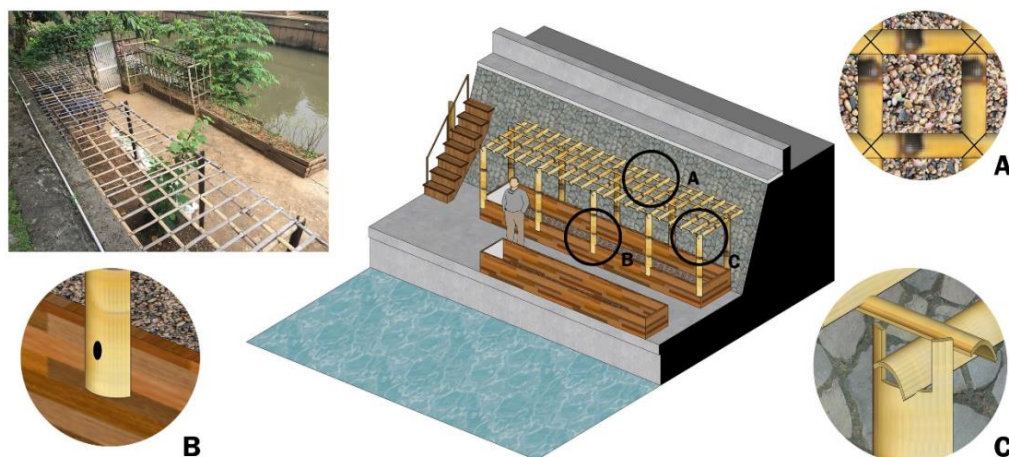


Figure 16. One of the makeshift planting media made by the residents
(Source: Personal photos; Personal illustration)

Using wood and bamboo, residents create a media resembling a shelter for creeping plants to grow (such as grapes, vines), so that it could function as a shelter from the sun as they grow horizontally. As can be seen in figure 15, the residents used pieces of wood to make a wooden crate, which are used to store the soil. Then they nailed the bamboo to the sides of the crates so it stays upright (B). They also cut the middle of the bamboo stalk to make the joints (C), before tying it with plastic or wire rope (A). They also use plastic and ceramic pots for planting activities. The types of plants usually vary, ranging from herbs such as turmeric and fruits such as tomatoes and cucumber, as well as the creeping plants.



Figure 17. 4 types of planting medias

(Source: Personal photos, edited; Personal illustration)

To accommodate their tendency to gather outside the house, residents utilized wooden chairs and structures made of wood and tarpaulin as outdoor furniture that can be used to gather outside the home. This utilization also occurs on the banks of the river, where the water flow makes the temperature of the river lower than the area above it, so that the riverbank becomes an ideal area for gathering and relaxing.



Figure 18. (a) Mapping of traditional huts (b) 2 types of huts

(Source: Personal photos, edited; Personal illustration)

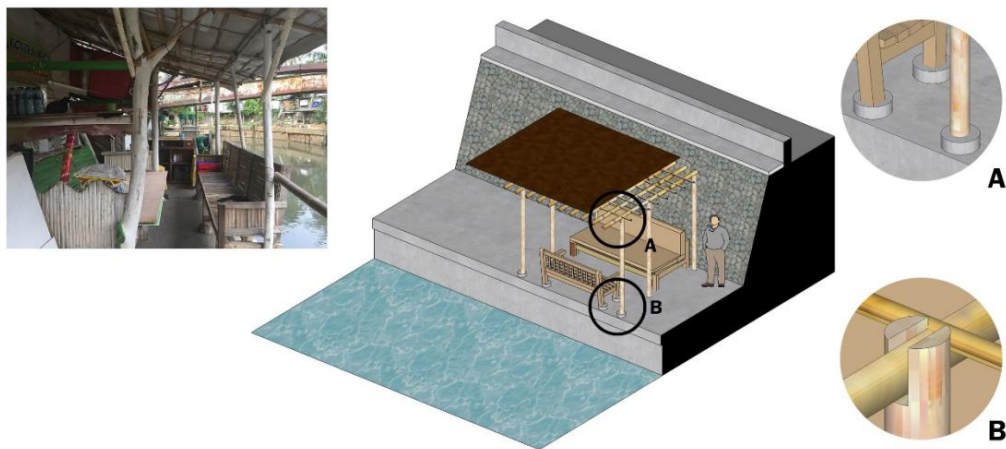


Figure 19. One of the makeshift huts made by the residents
(Source: Personal photos; Personal illustration)

As can be seen in figure 18, the residents used the same structure as the planting media (B), but they used a sheet of tarpaulin (*Terpal*) to make the hut's roof. They also used concrete to make sure the chairs does not tip over into the river (A). The use of sustainable materials such as wood and bamboos are mostly for the convenience of the residents, yet they also do not affect the river environment in a negative way. Impermanent structures such as huts made out of woods are easily removable, able to provide a space for the residents in the present and yet not permanently affect the riverbank in the future. However, some of the structure such as the birdcage and the chairs does use permanent materials (bricks and concrete) and should be discouraged in the future due to its potential damage to the riverbank itself. Space appropriation in the form of placement of these furniture transforms the government occupancy of the riverbank to a community occupancy. Informally, both villages' residents assumed ownership over the riverbank they are appropriating. This ownership can be seen from both use the space and efforts of regular maintenance by residents of the Kenari and Raden Saleh villages.

4.4 The condition after the space appropriation

Space appropriation changes the spatial composition on the riverbank according to the wishes and needs of the residents, affecting the sense of place that residents have before and after the appropriation. Space appropriation affects one of the main factors in forming a sense of place, which is physical environment, by adding objects as a new element on the river bank that used to be a residual space. According to a statement made by Stedman [16], by identifying a space humans can establish an understanding (cognition) of the space. With this understanding, humans can establish the level of their satisfaction of a space. By appropriating a space, the residents transformed the spatial arrangement of the riverbank. This makes it easier for residents to identify the riverbank as their own space, as they are involved in the creation of the space itself (deciding the placement of objects and the types of objects placed).



Figure 20. (a) Residents gathering in one of the huts (b) a teenage resident is taking care of the plants
(Source: Personal photos)

This feeling of identification can be seen in the emergence of various activities on the riverbank. The men and children of both villages use the riverbank as a place to gather and chat, while the women are not usually seen in this area as they have a gathering space of their own in front their houses. The emergence of new elements such as stairs, huts, chairs et cetera provide a media for sitting, chatting, watching TV, and taking a rest from planting activities and keeping the birds. These new elements helps changing a space that were previously inaccessible and functionless (negative space) so that it turns into a space that can be accessed and has activity in it (positive space).



Figure 21. The boys of Raden Saleh village are taking care of the birds
(Source: Personal photos)

One of the functions that emerged after space appropriation is the use of the riverbank as a space for urban farming. The POKTAN program or Farmers Group in Raden Saleh Village is a group of urban farmers that uses the riverbank for additional income. In addition to farming, there are catfishes farmers as well. These activities are supported by the headman of Cikini, Ati Mediana [10] Agus is one of the residents of Raden Saleh that are using the riverbank as a small farming land, in the area directly adjacent to his house. The crops were then sold or distributed to residents in the Cikini area. As it can be seen in figure 21.(a), Agus's farming area are thriving with plants and vegetables, while in 21.(b) A handling member from the government rests near the vicinity of Agus's farming area.



Figure 22. (a) Agus's planting area on the riverbank (b) Infrastructure-handling member from the government is resting near Agus's home
(Source: Personal photos)

Judging from the mapping of activities, the residents of Raden Saleh is more active in conducting the appropriation compared to the Kenari village. This might due to the existence of a highway that divides the Kenari village area and the banks of the river, so that the riverbank cannot be continuously monitored and is rather difficult to access when the highway is crowded by traffic. This caused the most of Kenari residents to see the riverbank as part of the public space. While the residents of Raden Saleh has a closed residential street evoking a greater sense of ownership, because the riverbank is seen as an extension of their home area (semi-private).

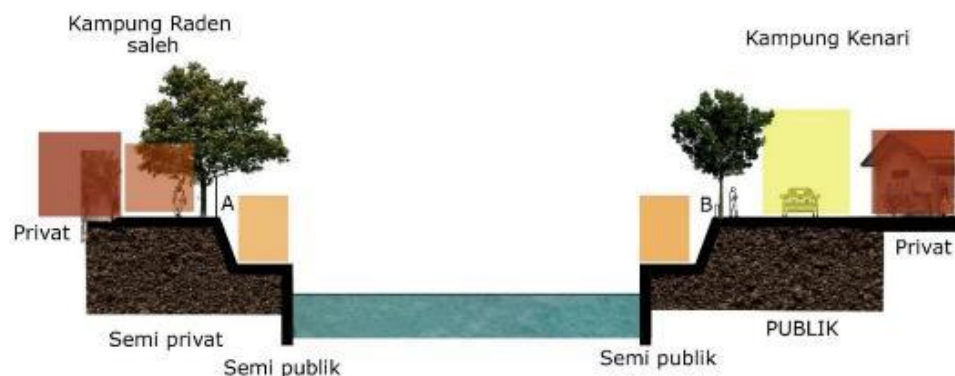


Figure 23. Public and private area in Raden Saleh and Kenari
(Source: Personal illustration)

The riverbank that was perceived as a residual space is now a familiar space for the residents who appropriate the space because the arrangement of the space is made by the people themselves, thus creating a new meaning from the residual space to a functional open space for them to gather. This will then increase the attachment to the place, which can be seen from the frequency of activities in space and the maintenance carried out on the riverbank, such as sweeping scattered leaves, watering plants et cetera. Residents tend to carry these activities in groups and/or splitting into smaller groups (depending on their circle of friends), so the activities tends to focus on random points on the riverbank and are not evenly distributed.

The appropriation happening in this residual space aims to change the nature of the space itself, creating a new meaning of the space which fulfills the characteristics/functions desired by the appropriators. The appropriation of Ciliwung riverbank adds new physical elements (seating, plant pots) as functioning objects into the residual space. The riverbank itself is a surface that has been changed by this new additions to the space. In changing the composition of the space, this appropriation creates new activities on the riverbank such as playing, relaxing and urban farming. The riverbank appropriation changes the negative nature of the space (having no function, access is blocked off) into a positive space, seen from the activities on the riverbank.

By carrying out space appropriation on the riverbank, the residents adds new physical elements that helps them accomplish their desires, which is a functional open space. Spatial arrangement carried out by residents causes the emergence of legibility or an understanding of space. Activities in the riverbank and frequent interaction with space drives the creation of a sense of place which is happening to residents of the Raden Saleh and Kenari villages. Sense of place, if followed by high satisfaction of space will then lead to a new meaning of the riverbank for the residents of Raden Saleh and Kenari village, as their own open space and gathering place. This can be seen as a placemaking process, which is the process of changing a space into a place by creating a sense of place and giving a clear meaning and functions to a previously meaningless space.

Most of Ciliwung riverbank in the city of Jakarta are usually side by side with public roads or highways. For city dwellers who pass these roads almost every day, the river is still considered a residual space, due to their perception that there is no physical access to the space (as seen from the field of view of city dwellers who passes these roads with moving vehicles). This is prove that the riverbanks in Jakarta may not be able to reach a city-level public space such as Clarke Quay in Singapore. However, through a small scale appropriation activities, the riverbank can be used to fulfill public space at the neighborhood level, especially for dense settlements along the Ciliwung River. The appropriation should encourage the use of materials and structures that is not permanent, so no damage will befall the river environment. The Ciliwung River passes through a lot of dense settlements in the city of Jakarta. With the collaboration between the local government and the RT/RW leaders in these settlements, there is a possibility of creating a riverside space that has a positive use and to keep control of appropriation activities so that it does not damage the river itself.

5. Conclusion

Through literature review and case study, it can be concluded that a city's residual space can undergo a transformation through space appropriation activities. One of the residual spaces in the city is a riverfront. Riverfront itself has several components in the form of riverbank and riverflow. The use of river in cities of developing countries is different compared to developed countries often uses river as a recreational open space (for example, Clarke Quay in Singapore). Third world developing countries uses river for sewer or garbage disposal, creating negative spaces in the city. This occurs in Ciliwung River in Jakarta, where the river undergoes a change in its functions, from transportation and water sources to a sewer for the city.

The prolonged interaction with the Ciliwung River causes residents who inhabits the area around the river to be able to perceive hidden access to the riverbank. The Ciliwung River is in local government occupancy, but it does not have strict protection so it is perceived as a space that has no occupancy. Residents who live near the river can identify the space as an area that is a part of their home territory. Driven by high density housing condition and the urgent need of space, residents appropriated the space on the riverbank.

The type of space appropriation occurring in the residual space on the banks of the Ciliwung River is material appropriation, by adding new physical elements such as chairs and so on to create the desired function and atmosphere of space. This appropriation creates a new function in the residual space that meets the needs of residents who are appropriating it. By conducting space appropriations, residents changed the components of the space on the riverbank according to their wish.

Space appropriation affects one factors of forming the sense of place, namely the physical environment, which then raises the residents understanding of the riverfront space. Sense of place then influences the level of satisfaction. A high level of satisfaction with this space leads to the maintenance and activities in the residual space which transforms the residual space into an active space. The Ciliwung riverfront is one of the many riverside spaces in DKI Jakarta that pass through the city, often passing high density settlements along the river. With the support of the local government in this appropriation activities, the transformation of Jakarta's riverbanks into healthier urban spaces can be realized.

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