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# Redesign of Karapan Sapi Park as an urban green open space in Jakarta

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**Abstract:** Volker Park, an abandoned park located in North Jakarta which potentially develop as green open space in urban area. The green open areas of DKI Jakarta itself currently only 9.98% of the total area, which is planned to be extended into 30%. This expansion in accordance with UU No.26 of 2007 that Municipal government have to provide green open space to improve the quality of the environment and as a means of environmental protection. It is also creating harmony of the natural environment and the built environment that is useful for the benefit of society. The planning and design concept then needed to implement this vision. This paper brings the idea of urban harvesting and farming theme park to encourage the collaboration within the community. The area then divided into six stages, which are 1870 m<sup>2</sup> for the first phase, followed by 3094 m<sup>2</sup> in second phase, then 3094 m<sup>2</sup> in the third phase, the 2808 m<sup>2</sup> in the fourth phase, the 700 m<sup>2</sup> in the fifth phase and finally the sixth phase is 752 m<sup>2</sup>.

**Keywords:** environment, green open space, urban area

## 1. Introduction

### 1.1. Background

The main problems in the field of the population these days are population growth and urbanization. Urban population is predicted to reach 60% of the total world population by 2025, with growth reaching three times faster than the growth of villagers [1].

The city as a dynamic entity that develops continuously, demanding continue to build facilities and infrastructure to serve its citizens. Physical development is done by changing the natural landscape and spatial area which resulted in the decrease of environmental supporting capacity and environmental services [1, 3]. As a result, city residents faced environmental and social stress that negatively impact the physical and psychological of their citizens [4].

Along with the development of a city, population, and physical development continue to increase resulting in the availability of land that is currently less and less. Attention to the role of green open space that plays a role in sustainability and urban comfort increases with the increasing impact of urbanization [5].

The importance of the city's green open spaces, especially in the neighborhoods, has been proven in several studies. Urban green open space is an important component that affects the quality of human



life, both ecologically and socially-psychologically. However, the current proportion is diminishing as a result of the high population density due to the growing human population [6].

Therefore, this research is based on the results of research that examines the needs of green open spaces, especially in the capital city of DKI Jakarta and establishes a green open space system in accordance with the needs of the community, and can contribute to the system on a larger scale, with case studies of the region Karapan Sapi Park (Taman Volker) on RE Martadinata street, Tanjung Priok Sub-district, North Jakarta. The findings of the research are a description of the characteristics of the case study case as the green open space is misused and it becomes a negative impact on the surrounding environment. From these findings, a model of empowerment and a design framework that can be developed in the development, utilization, and maintenance of green open spaces by the local community in the form of redesigning design that can revive an unproductive area to be productive.

## 1.2. Green Open Space in Jakarta

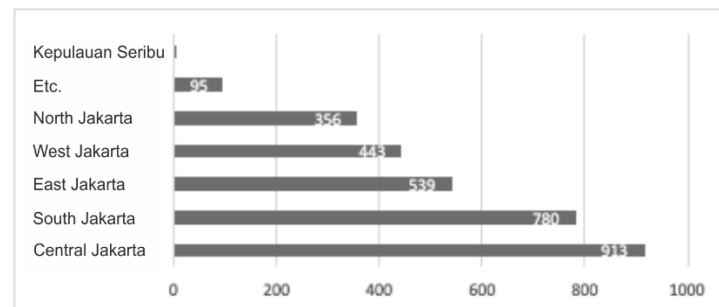
Green Open Space under the Instruction of the Minister of Home Affairs No. 14 of 1988 on the arrangement of green open spaces in urban areas is the spaces within the city or wider area, either in the form of area or in the form of elongated areas/paths where in its use is more basic without the building. Green Open Space itself is normatively expected to have multifunctional for city life, that is ecological function, socio-cultural and economic function.

UU No. 26 of 2007 on Spatial Planning mandates spatial planning of urban areas should contain a plan for the provision and utilization of the Green Open Space is a minimum of 30% of the city area. Green Open Space in the urban area consists of public and private where the proportion of green open space in the urban area is at least 30% consisting of 20% public green open space and 10% consists of private green open space [7].

The proportion of 30% is a minimum measure to ensure the balance of the ecosystem of the city, both the balance of the hydrological system and the balance of microclimates, as well as other ecological systems that can increase the availability of clean air that is needed by the community, as well as to increase the aesthetic value of the city. The broad target of 30% of the city area can be achieved gradually through the typical urban land allocation (Ministry of Public Works Regulation No. 5 Year 2008 on Guidelines for the Provision and Utilization of Green Open Space in Urban Areas).

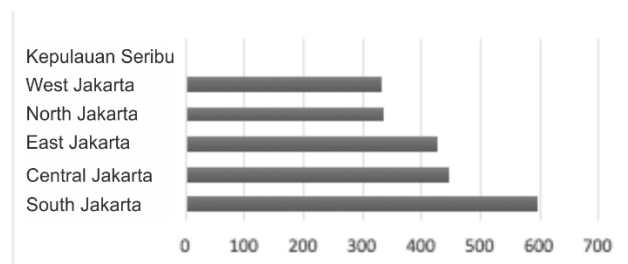
Development of an increasingly developed city in Indonesia, especially in DKI Jakarta has an impact on the wide change of land use including the extent of green open space. The existence of green open spaces in big cities including DKI Jakarta has become a demand of modern life that wants a more fresh and natural atmosphere and the aesthetic demands of the city. DKI Jakarta as the capital city of Indonesia has a total land area of 661.52 km<sup>2</sup>. However, the proportion of green open spaces of DKI Jakarta currently does not meet spatial policy standards (based on Law No.26 Year 2007 on Spatial Planning), which is 30% of the total urban area. DKI Jakarta Provincial Government keeps trying to make Jakarta temperature cooler. One of them is by building more green parks and open spaces, amid the limited land in Jakarta. But the number of parks currently considered not enough to sustain the needs of green space in the capital.

Based on data from Jakarta Parks and Cemetery Agency, the number of Green Open Space in Jakarta reached 3,131. This green open space in the form of city parks, environmental parks, interactive parks and also the path of the green road. Although the number has been widely spread throughout the DKI Jakarta, the area of green open space in Jakarta only amounted to 9.98% of the total area. This figure is still far from 30% that should be owned by DKI Jakarta. During this time the development of green open space constrained land acquisition and too many problems in the process of land acquisition and land purchase.



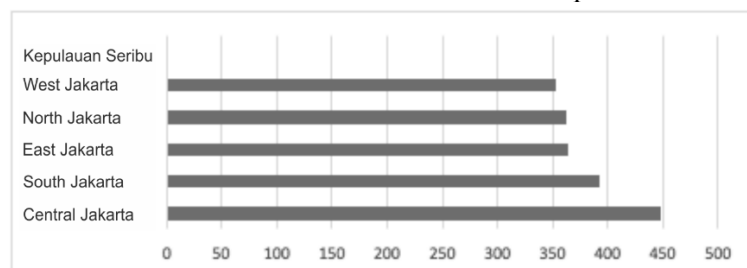
**Figure 1.** Number of Green Open Space by Region in Jakarta 2017

Based on Figure 1 Central Jakarta became the region with the largest green open space, as many as 913 green open spaces. Although the number has been widely spread throughout the DKI Jakarta, the area of green open space in Jakarta only amounted to 9.98% of the total area. Followed by 780 parks, East Jakarta as many as 539 parks, West Jakarta as many as 443 parks, North Jakarta as many as 356 parks, others as many as 95 parks, and Kepulauan Seribu only 5 parks. This figure is still far from 30% that should be owned by DKI Jakarta because so far green open space development is constrained land acquisition and too many problems in the process of land acquisition and land purchase.



**Figure 2.** Number of Park City by region in DKI Jakarta 2017

Based on data from Jakarta Central Bureau of Statistics (BPS) until 2013, the number of urban parks spread in the capital amounted to 2,166. Table 2. Explains that South Jakarta is the region with the urbanest parks, which is 597 parks, followed by Central Jakarta and East Jakarta as many as 446 and 426 parks. The areas of North Jakarta and West Jakarta have urban parks of 336 and 331.



**Figure 3.** Area of city park by area in DKI Jakarta 2017

Based on Central Bureau of Statistics (BPS) data of DKI Jakarta Province until 2013, the urban park area in all Capital City area is only 1,912.1 Ha. Table 3. Explains that Central Jakarta is the region with the largest city park, which is 446.4 Ha, followed by South and East Jakarta area of 391.6 and 362 Ha. The area of North Jakarta and West Jakarta has a city park area of 361.3 and 350.7 Ha.

### 1.3. Karapan Sapi Park (Taman Volker)

Karapan Sapi Park (Taman Volker) is a park that is categorized as an environmental park located on RE Martadinata street, Tanjung Priok Sub-district, North Jakarta. The condition of Karapan Sapi Park (Taman Volker) as a missed green open space is actually a negative impact on the surrounding environment, especially for Tanjung Priok Sub-district residents. The balance of functional and aesthetic aspects is important in every green open space, taking into consideration the proportion of functional aspect and ideal aesthetic aspect in describing its development, it is expected that Karapan Sapi Park (Taman Volker) can become a landscape of harmony as the identity of Tanjung Priok Sub-district of North Jakarta from redesign process and increasing green open space productivity in the capital city of DKI Jakarta.

## 2. Methods

This research is done by field survey method, then the data is analyzed descriptively. The type of data used is primary data and secondary data.

### 2.1. Tools and materials

Tools and materials used in this study are as follows:

Meter measure, Compass, Wood stakes, Ruler, Pen / pencil, Camera, Handphone, Printer, Paper, and Ink.

### 2.2. Field survey

Activities undertaken during the field survey are as follows:

1. Contour, topographic, and boundary data retrieval
2. Weather test and citizen activity
3. Documentations

### 2.3. Preparation of reports

Preparation of reports in the form of papers and image panels using Autodesk AutoCad 2016, Sketchup Pro 2016, Adobe Photoshop CC 2017, Adobe Illustrator CC 2017, and Microsoft Excel 2016.

### 2.4. Details of the design stage as follows

#### 2.4.1. Preliminary stage

- Initial survey
- Initial consultation

#### 2.4.2. Survey stage and site analysis

- Survey of existing site conditions
- Topography
- Contour
- Site Limit
- Circulation and Achievement
- Water Resources
- Site Drainage System
- Power Source
- Site Rating
- Potential Assessment
- Looking for Potential View
- Consultation of Survey Results

### 2.4.3. Conceptual Planning Stage

- Site Planning Concepts
- Concept Consultation

### 2.4.4. Redesign stage

- Programming
- Schematic Design
- Design consultation

## 3. Result and Discussion

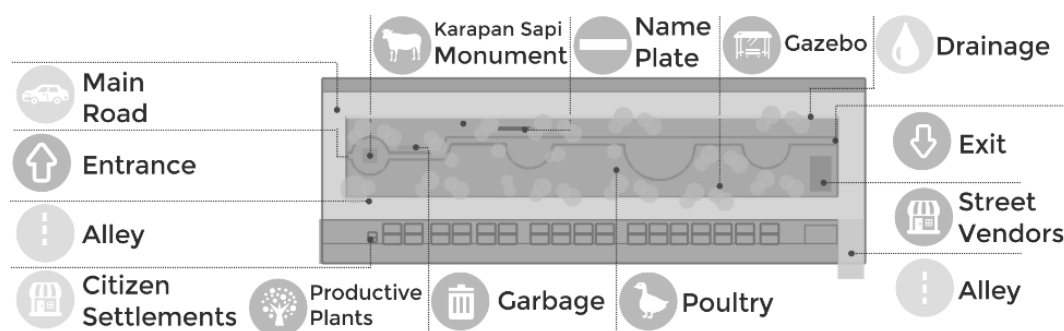
### 3.1. Existing Condition of Karapan Sapi Park



**Figure 4.** Case study sites

(Source: Personal Documentation, 2017)

Established since 1997 on the ownership of PT KAI, Karapan Sapi Park (Taman Volker) was originally created with the aim of creating a public area that can be an absorption area and a place for people to engage in social activities and interactions. In Figure 1. The 1870m<sup>2</sup> park is located in Tanjung Priok sub-district close to the residential area. Name Karapan Sapi is made because of the majority of residents Kec. Tanjungpriok who lived in the surrounding area is a native of Madura. There are also monuments shaped Karapan Sapi at the entrance of this park.



**Figure 5.** Existing Conditions of Karapan Sapi Park

(Source: Personal Documentation, 2017)



This park has been misused far from the real green open space function, which is a place of sale of used goods and storage of heavy equipment. From heavy machine wreckage to poultry cages scattered at several points makes the area a slum such as iron, tin, wood, even anchor ships, ship propellers and ship turbines. Some of the illegal parks along the park are also impressed, some of which are also used as illegal parking lots for trucks or expedition vehicles that will unload at the port of Tanjung Priok. It



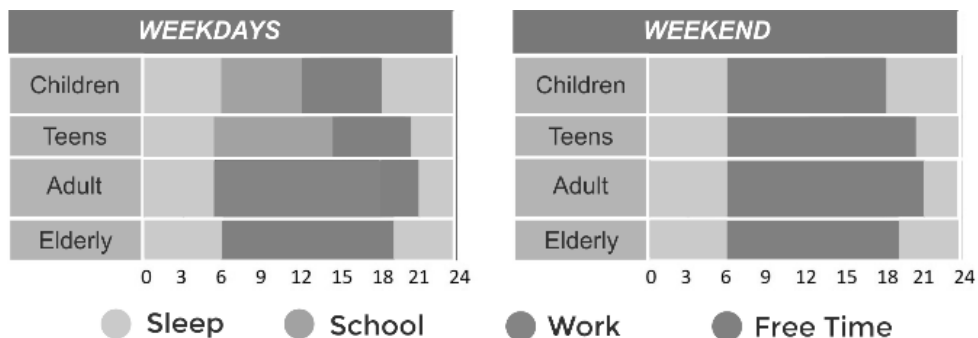
adds to the chaos of the park which seems to have never been touched by the Municipality government.

**Figure 6.** Existing Conditions of Karapan Sapi Park  
(Source: Personal Documentation, 2017)

### 3.2. Residents of Tanjung Priok

Based on the results of field surveys and interviews with one of the community leaders, the majority of citizens based on the age in Tanjung Priok around Karapan Sapi Park (Taman Volker) is 45% of parents, 40% of youth, and 15% of children. As for the community profession of traders by 70%, factory workers 25%, and civil servants of 5%.

The majority of people who use the park are children. Despite the very worrying condition of the existing, children who are residents of the Tanjung Priok desperately needs a Green Open Space around their residence. Based on the results of interviews with several children in the field, children usually do activities such as playing and relaxing around the park.



**Figure 7.** Residents of Tanjung Priok Activities  
(Source: Personal Documentation, 2017)

Based on fig. 4 the layers of residents around the park are children, adolescents, adults, and the elderly. In the spare time (yellow in the figure) all walks of life can use the Karapan Sapi Park (Taman Volker) as a public green open space during weekdays and weekend.

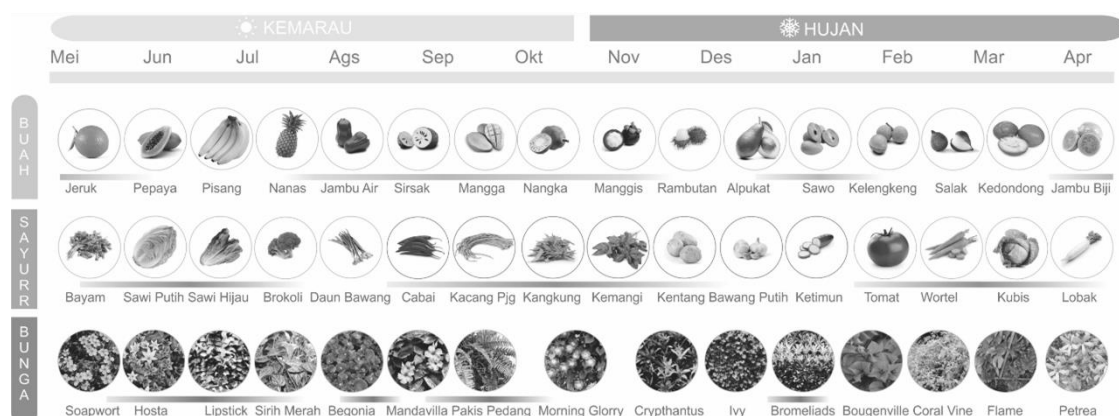
### 3.3. Redesign Karapan Sapi park (Taman Volker)

Redesign is an activity of planning and redesigning a physical change without changing its function either through expansion or location transfer (Jalal, 2010). Karapan Sapi Park (Volker Park) is located between R.E. Martadinata street with residents of Tanjungpriok Sub-district. This means that the park's position as an environmental park for the surrounding community should be a buffer system that separates the highway from the settlement. The planned area is generally a lowland with a very low slope (ramps). The type of soil in the area is alluvial gleik and belongs to clay loam texture category. This area is located at a lower altitude than the highway and parallel to the residential area. This makes the area often affected by flooding when heavy rain falls because the existing drainage system in the area can't accommodate enough water and eventually overflowed into the area even up to the settlement. The climate inside the area is very hot at around 39 ° C at midday, which is good for plant growth as a process of photosynthesis, but there is a need for shade for the users of the area.

Karapan Sapi Park (Taman Volker) is part of Jakarta Green Open Space. In RUTRK Jakarta stated that Karapan Sapi Park (Taman Volker) is included in the environmental park area which prioritized its development as part of North Jakarta City. The Jakarta City Government already has the RPTRA (Child-Friendly Public Open Space) program and has run more than 100 parks spread across Jakarta area. To achieve that objective, the researcher made some special design concept for Kencana Sapi Park (Taman Volker) by considering a design to be able to restore the portrait of real green open space and able to revive the area around the park into a productive area.

Karapan Sapi Park (Taman Volker) is planned as an active park. Tread developed with Urban Harvesting and Farming theme. Many changes to the grading, the surface of the tread is made higher than the surface of the highway and residents settlements. The concept of Urban Harvesting and Farming is used as a way to answer the problems of the people in Tanjung Priok Sub-district. On the social aspect, people need a place for self-expression, interaction space, and as a container of citizen activity. In the cultural aspect, the majority of Tanjung Priok Sub-district enjoys planting and raising. This is evidenced in the existing state of the area that is planted with many productive plants and there is some domestic poultry. In the economic aspect, the majority of citizens are middle-lowers, citizens need areas that can provide benefits as well as turning capital for them.

Urban Farming Activity is done in the area around the tread area of fruit, vegetables, and flowers with the division of schedules and alternatives based on the results of studies and analysis according to the season in Indonesia on each month.



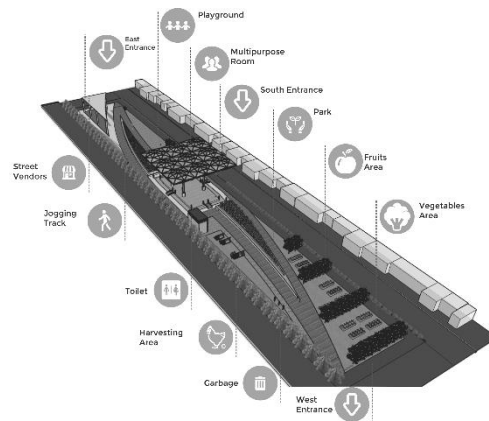
**Figure 8.** Schedule Analysis of Urban Farming in Indonesia

(Source: Personal Documentation, 2017)

Based on the fig.5 urban farming activities carried out in accordance with the schedule of growing plants every month. The table is the result of the seasonal analysis in Indonesia, it is expected that the



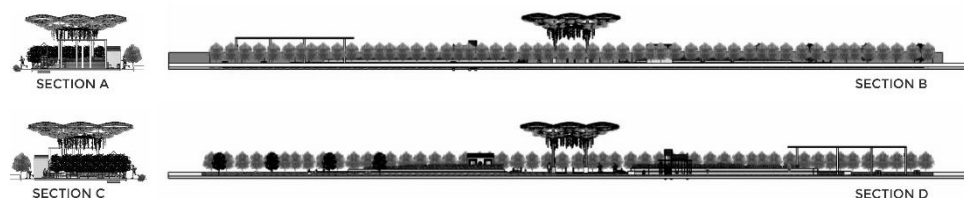
residents of Tanjungpriok Sub-district have land to grow fruit, vegetables, and flowers in the park area that can make a magnet for residents come to the park every day.



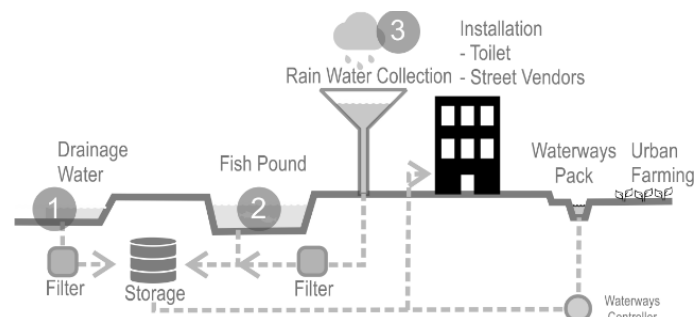
**Figure 9. Planning Concept**  
(Source: Personal Documentation, 2017)

This concept is then developed and continued at the design stage because it is regarded as the most capable concept to showcase the distinctive features of Karapan Sapi Park (Taman Volker). Based on fig.6 Redesign of Karapan Sapi Park (Taman Volker) is done by adding some facilities in the park that is playground (playground of children), multipurpose room, garden, urban farming area (fruit area, vegetable, and flower) urban harvesting, toilets, jogging tracks, and street vendors to sell.

Entrance in the region consists of 3 access to access to the west, east, and south. It is chosen to make it easier for users to enter the park area, as well as avoid public transportation or stop vehicles in the north (front of the park) which can cause congestion in the direction of RE. Martadinata street. The zone on the site consists of 3 play zones, interaction zones, and production zones each representing several park facilities. Production zones are located in the east because urban farms need more light during the day



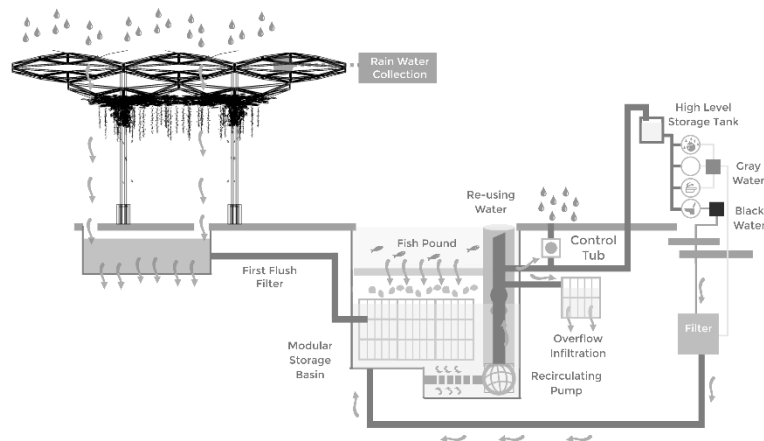
**Figure 10. Section of Plan**  
(Source: Personal Documentation, 2017)



**Figure 11. Water storage process**  
(Source: Personal Documentation, 2017)

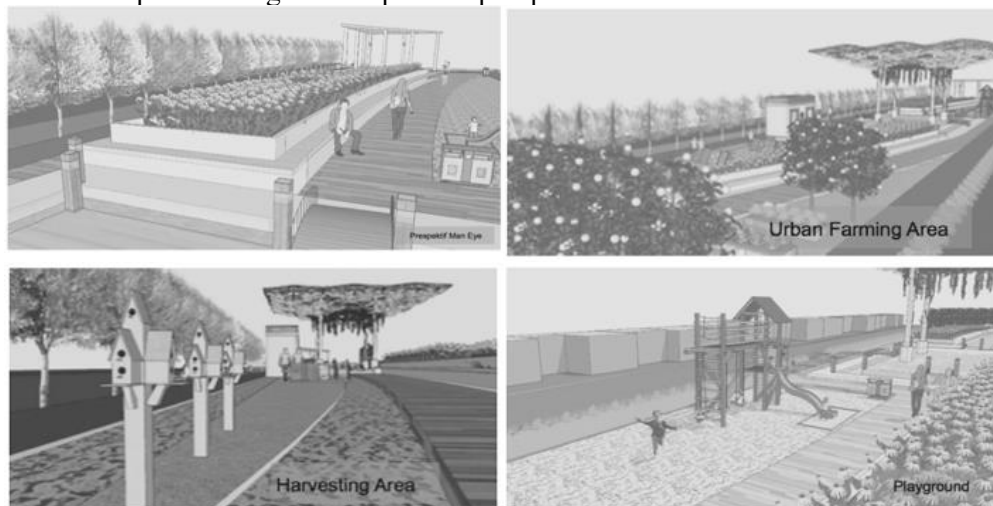
To answer the problem of water that often overflows from RE. Martadinata street and drainage around the area carried out a water storage process that is accommodated into a storage or storage tub. This water storage process is divided into 3 water sources which will be water that will be re-used (secondary use water) for the benefit of the park for example to irrigate urban farming and garden water source.

Based on Figure 11 the source of water is water from drainage, fish ponds stored around the park, and rain water collection that is stored on the roof of the multipurpose room in the park area.



**Figure 12.** Water storage process  
(Source: Personal Documentation, 2017)

Based on Figure 12 explained how the rain water collection process is accommodated and channeled back to the needs of Karapan Sapi Park (Taman Volker). The rain water collection process is obtained from rainwater which is then accommodated into a modular storage basin through a process of clarification assisted by a control tub as a regulator of the water circulation. Water that is in storage then distributed to some point through the help of the pump.



**Figure 13.** Redesign Karapan Sapi Park situation  
(Source: Personal Documentation, 2017)

Planning and designing green open spaces based on community needs allows for a more productive and environmentally conscious community [8]. Based on Figure 14 Planning and facility design on redesigning Karapan Sapi Park (Taman Volker) enables the sub-district of Tanjungpriok to become an active and productive area through the presence of existing environmental parks in their area of residence.

### 3.4. Green Open Space Vision for Tanjung Priok Sub-district



**Figure 14.** Green Open Space Vision for Tanjung Priok Sub-district  
(Source: Personal Documentation, 2017)

After creating a design framework with Karapan Sapi Park (Taman Volker) case study, the author tried to make a vision for the future. This idea aims to develop, utilize, and maintain green open spaces in the area of DKI Jakarta. The first phase is its own Volker park of 1870 m<sup>2</sup>. Followed by a second phase of 3094 m<sup>2</sup>, the third phase of 4698 m<sup>2</sup>, the fourth phase of 2808 m<sup>2</sup>, the fifth phase of 700 m<sup>2</sup>, and the sixth phase of 752 m<sup>2</sup>. Based on the calculation of this open space planning, it is expected to develop the green open space in DKI Jakarta to affect the quality of human life, both ecologically and socially-psychologically.

### 4. Conclusion

- 1) Green Open Space is an important component of people's quality of life, the presence of green open space can revive society into a productive society.
- 2) The existence of green open space in the city of DKI Jakarta that is less than standard requires the government must move actively to fix open green spaces and revitalize the existing ones.
- 3) Redesign of Karapan Sapi Park (Taman Volker) is done by adding various elements to the site, that is how to apply urban harvesting and urban farming can be the hallmark of the park in accordance with the needs and potentials of Tanjung Priok Sub-district.
- 4) With an area of 1870 m<sup>2</sup> of Karapan Sapi Park (Taman Volker) can be used as a place to express themselves to the people around Tanjung Priok Sub-district with playground facilities, multipurpose room, garden, urban farming area (fruit area, vegetables, and flowers), urban harvesting areas, toilets, jogging tracks, and street vendors to sell.

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