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Yulia Nurliani Lukito

Department of Architecture, Faculty of Engineering, Universitas Indonesia, yulianurliani@yahoo.com

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The urban forest project as an extension of landscape immersion in the Ragunan Zoo, Jakarta

Yulia Nurliani Lukito^{a*}

^a*Department of Architecture, Faculty of Engineering, Universitas Indonesia*

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Abstract

This article examines necessary elements to be considered in designing urban forest at the Ragunan Zoo, Jakarta, as part of increasing the role of the zoo to educate people on animals and their habitats. The purpose of the community project conducted by the Architectural Team from the Universitas Indonesia is to assist the management of the Ragunan Zoo to develop part of the zoo area as an urban forest. The Zoo has already an intention to incorporate the urban forest not only as recreation space but as part of a larger development of the zoo that focuses more on the welfare of the animals and creating a memorable experience for visitors. The idea of landscape immersion, an approach in zoo design that incorporates the needs of both visitors and animals so that the zoo can be a place for education, conservation, and recreation, prioritizes the welfare of animals and natural conditions instead of focusing only at aspects related to human comforts. The development of the urban forest is intended to be a successful example of designing landscape and natural environment for the zoo. Accordingly, urban forest can support community activities and the need for green and open spaces for Jakarta. In doing so, this article outlines the importance of urban forest and addresses the benefit of good design for the zoo and providing green space for the city. Finally, this piece provides case study examples describing the context in designers use their knowledge and ability to help the management to collaborate with university and community in the development of the zoo, especially with the focus on urban forest as an extension of landscape immersion. In conclusion, through community engagement, not only the management can have design proposal but also students of Universitas Indonesia can take part in the design process of the urban project and connect with communities in the city.

Keywords: Urban forest; zoo design; Ragunan Zoo; landscape immersion; community engagement

1. Introduction

Ragunan Zoo is located in South Jakarta and becomes the second largest zoo in the world with an area of 147 hectares and more than 2.000 specimen and 50.000 trees. First established in 1864 as a private zoo in Cikini area, the Ragunan Zoo was moved to Pasar Minggu in 1966 and since then was managed by the Jakarta government. The Zoo has relatively cheap entrance rate for visitors and the facilities offered to its visitors are various ranging from animal collections, parks, cafeteria, bicycle lane, information center, and animal attractions. Up to now, the Zoo becomes one of favorite places to visit

* Correspondence Author: yulianurliani@yahoo.com

during holidays for people living in Jakarta and nearby areas and is famous for its green space.

Zoo has many functions such as conservation, education, research and recreation. In relation to conservation of endangered species, a zoo provides shelter for animals that in the wild are increasingly threatened due to illegal hunting activities and destruction of their habitats. Humans need to be responsible for protecting animals from animal extinction through a zoo. Various animal and plant species are needed for sources of knowledge and research for the next generation. In relation to education, a zoo is a medium for humans to recognize various types of animals that are not affordable in terms of distance so that a zoo also functions as educational tools about animals and the diversity of life. The introduction of these animals is needed to foster a sense of empathy for animals as other living beings. In the context of education and conservation, research is the reason a zoo can be a good source and a place of education and conservation. A zoo is also a place to do a research on wildlife using the captive facilities for studies not possible in nature. In relation to recreation, a zoo provides a place for recreation because usually it serves as green space and consists of some recreational areas.

Green spaces in the city play an important role for communities because they provide recreation spaces and breathing rooms, particularly for crowded area like Jakarta where the majority of houses are rented houses or apartments. Respectively, community activities have a strong tie to local green spaces and the zoo management wants to incorporate local interests of having good community activities into newly designed parks, as well as providing green and open area for Jakarta. The idea of designing the urban forest then needs to consider the spatial and the biological construct of the urban forest to support the function of urban forest as a novel ecosystem, as a provider of ecosystem services, and as a spatially and culturally rich landscape.

The zoo is one of the facilities that has a concern to entertain and educate people because its primary function is to facilitate access to see animals from around the world. The purpose of the zoo itself has been oriented towards the conditions of the collected animals, including the environments. As an effort to connect people to environment and respect nature, there are many efforts to re-creating “natural” spaces and cultural phenomena in the zoo. As part of improving service to visitors and long term

development, the management of the Ragunan Zoo wants to develop an area of almost two hectares as an urban forest. The development of the urban forest in Ragunan Zoo inevitably gives benefits for the city in providing green spaces.

It is our aim as architects and designers working at Universitas Indonesia (UI) to contribute to the design of the urban forest in the Ragunan Zoo so that the forest can continuously serve as a provider of ecosystem services, rich landscape, inspiration and as education of nature. As part of the Universitas Indonesia Community Engagement Programs, the project of designing urban forest for the Ragunan Zoo involves UI students with the broad goal of both learning and having a positive impact in understanding environment. In general, community engagement means a collaboration between institutions of higher education and their larger communities for the mutually beneficial exchange of knowledge and resources in a context of partnership and reciprocity. Therefore, applying design knowledge to zoo design and giving service to the management of the Ragunan Zoo means contributing to the development of larger communities.

The objective of this paper is to examine necessary elements to be considered in designing urban forest at the Ragunan Zoo. Jakarta, as part of increasing the role of the zoo to educate people on animals and their habitats. Through design research and collaboration with designers, the zoo management and visitors, the UI team aims to create a good urban forest that has a potential to support community's activities. A well-designed green space in the city has a potential to emancipate anyone within the city that in turn lead to community empowerment.

Zoos play a big role in conservation, education, and recreation by presenting animals as the center of attention and visitors' good experience as the most valuable thing. Previous development of zoo has shown some changes from animal prison to naturalistic environment (Milstein, 2009). The use of space and the improvement of nature into the zoo in which humans and animals has asymmetrical connection needs to be reviewed so that the presence of one subject does not interfere and harm other subject.

The development of the zoo can be categorized into several types of the zoo (Ludlum, 2008):

1. Zoo as a Prison

The state of the zoo is the form of small cages and humans only enjoy animals as objects. Animals are placed according to the taxonomy and the term used is still in the form of "house", such as "a bird house" or "a cat house."

2. Zoo as Art Galleries

Because the flow of Romanticism was still developing during the early nineteenth century, the zoo also underwent an adaptation in the form of the emergence of the concept of "barless" which is actually a cage that has a barrier in the form of a ditch. This adaptation is due to a changing meaning of the zoo environment into "landscape in paintings" with humans, animals and their environment become objects. Carl Hagenback was the originator of this Romantic landscape concept, following the idea of famous painters of his time (Baratay & Hardouin-Fugier, 2002).

3. Zoo as Conservation and Education Facilities

In the mid-20th century until now, the concept of immersion landscape was born. This concept was born when a group of people from Woodland Park Zoo took the initial idea of the "barless" cage but with more attention to humans and animals presented.

The increasing public awareness and appreciation of the wildlife conservation causes a new approach in zoo design that turn a zoo into a conservational and educational space rather than as an attraction (Conan, 2000). One approach to zoos is landscape immersion or immersion of a habitat or nature that comes from outside into the context of a zoo. As part of the development of the zoo is the issue of animal welfare that recently becomes a benchmark for a good zoo. As an example is zoo that can function as animal breeding center is considered a good zoo.

Landscape immersion is an approach proposed in zoo design as a solution to the functions and systems that take place in several zoos to give a better focus on animal welfare (Coe, 1997). Visitors, animals, environment and all interactions that occur in the zoo are aspects that are needed for the zoo to run well. Therefore, a good zoo means not only balancing the role of the zoo as a good place for education, conservation, and

recreation but also prioritizing the welfare of animals and nature beside providing aspects related to human comforts.

The idea of domination and subordination between human and animal becomes an issue that is developed to change the mindset of visitors to animals, so that visitors do not see the presence of animals as objects, but as part of ecosystem and subjects with values that can be learned (Roe, et al, 2014). Lately, the idea of landscape immersion that indicates how human dominance can be presented without giving disturbance to either visitors and animals, visitors can have memorable space experiences and animals are not disturbed by all visitors' activities. In a theoretical study that discusses landscape immersion, there are several important principles and points in their application, namely visual fields, pathways, crowd, position, and altitude.

Landscape immersion is a term coined to describe exhibits in which visitors share the same landscape, but not the same area with the animals (Coe, 1985). It is a design concept of virtually 'immersing' the visitor in the same natural habitat as the animals, as the best idea for zoo design today. Landscape immersion can be one of the solutions that arise for environmental problems in zoos. This solution not only focuses on the animal environment, but also how the relationship between visitors, animals and the environment. The term landscape in landscape immersion an extension of a landscape while immersion means a representation of an affective or engaged experience (Douglas, 2000). This representation is in the form of the interaction of the subject with the context which provides memorable experience because of the originality of the animal habitat. The limitation of the barrier between visitors and animals creates a sense of real experiences of animal habitat. Therefore, landscape immersion is needed to present various aspects that exist in nature into the zoo and coupled with aspects of human view that are integrated in an architectural way. Senses and understanding are the main aspects to create an experience that suits the purpose of landscape immersion.

Connection creation and enrichment are the two most important issues that we must address in order to move beyond landscape immersion (Clayton et al. 2009). The complexity of stepping beyond landscape immersion may be in the format of creating "novelty" to visitors. Therefore, developing the urban forest can be understood as 'a more natural part of the zoo' that vegetation and other natural elements attracts for instance birds and squirrel to stay or use the forest as part of their migration cycle. We need to make experiences for the visitor and animal – as both share experience – in

slightly different and new situations (Olive & Jansen, 2017). Since it is rather difficult to start the idea of landscape immersion to the whole zoo, the urban forest project can be a way of giving both connection and enrichment experience for visitors.

In addressing the issues of connection creation and incorporation of enrichment into design, the most critical step is to develop stronger relationships between architectural designers and zoo management. Therefore, the urban forest project will help designers to not only understand the needs of the zoo management, but also to help create bonds between designers, the management and the animals whose homes they are creating. Zoos in Indonesia are mostly still human oriented. However, some parts of the zoo may have implemented landscape immersion that pay more attention to the long-term impact of animal welfare. The Schmutzer Primate Center in Ragunan Zoo is one of the example where animals do not seem to be stressful and visitors can understand and feel the habitat of the animals. This kind of situation give visitors a unique space and experience.

In “novelty-based” design, zoos and designers need to work together to develop new methods of enrichment and test them before integrating them into design. The urban forest is part of a larger novelty-based design and the plan should be carefully announced for the entire zoo community to share. Enrichment must be seen as a philosophical aspect of design, incorporated into the planning process so that visitors will become more engaged in the idea of the zoo as educational tools. The idea of “novelty-based” design process is created by experience for instance visitors can experience various things in their visit, especially by having visitors close to the animals (connection-centered) but at the same time enriched by animals’ behavior. This experience, which will be most likely novel upon each visit, makes these exhibits memorable to visitors and begins to create a connection and an educational process.

2. Methods

Designing the urban forest located in the zoo means designing parks and public spaces and at the same time putting the zoo at the center of the concept. The process of developing the urban forest goes through several stages. First, a literature study is conducted which will be used as references, such as on green spaces and zoo design. The compilation of studies is forwarded to the zoo management for review and to obtain

input for the creation of concept design. One of the processes is through a focus group discussion involving the management, designers, UI students, and some experts in landscape design and urban policy.

Second, a field survey is conducted to map the vegetation, contour, sunlight and possibility of development. The survey also involves looking at the natural features of the urban forest and their measurements as well as the activities of visitors in the zoo and their expectations from the urban forest. The data gathered is then analyzed so that the good natural features of the urban forest can be optimized and a memorable experience can be fulfilled through a comprehensive design.

Third, both quantitative and qualitative approaches are used in analyzing the information gathered through visits to the zoo, and creating an initial concept. The quantitative approach is used mainly to gather valuable information on vegetation, natural features, traffic patterns, and user preferences. The qualitative approach is related to the interpretation of user preferences and memorable experience. At the design stage, design alternatives are proposed in relation to the experience of visitors with the urban forest, and these are presented to the zoo management. This is a crucial stage of the process as suggestions and opinions from visitors and the management will influence the design development.

The community members expected to get involved in the design process include urban-forest visitors who jog in the morning, regular zoo visitors, and students. The design that the team will deliver is not final but instead a concept design, which is important in leading the team to the final stage of designing to be conducted next year. The collaboration between the zoo management, the university, designers, and students is expected to result into creation of a zoo design that has incorporated the various perspectives of community members. In the case of this urban forest project, this will mean the zoo management is not the only one who is responsible for the zoo-design development but also community members.

3. Result and Discussion

The field survey phase is carried out to collect data such as vegetation, sunlight, contour, and other features in the urban forest as shown in Figure 1. In addition, the team also survey how visitors spend their time and their expectation while in the zoo.

Although there are no animals in the urban forest, except free small animals that are attracted by the forest, it is necessary to create unique experience for the visitors and connect the experience with the greater idea of the zoo as a place for community education and immersing zoo habitat. Therefore, the team then do analysis of the site to find the site potentials crucial for the design of the urban forest.



Fig. 1 Field survey to indicate site's potentials

Source: Author's documentation

From the site's potentials, the team get some important points for the initial design such as creating vegetation zones based on the height of the plants, the flow of visitors, using light intensity to create memorable experience and providing necessary facilities for visitors. Those important points from the site become highlight features that can support the design development, so that the visitor experience inside the urban forest is not flat and becomes more valuable and memorable. Highlights obtained from the results of the analysis produce areas in the urban forest with various brightness, heights and vegetation arrangement. In addition, the highlights features are used in creating a broader program of the zoo related to comprehensive education and recreation in the zoo.



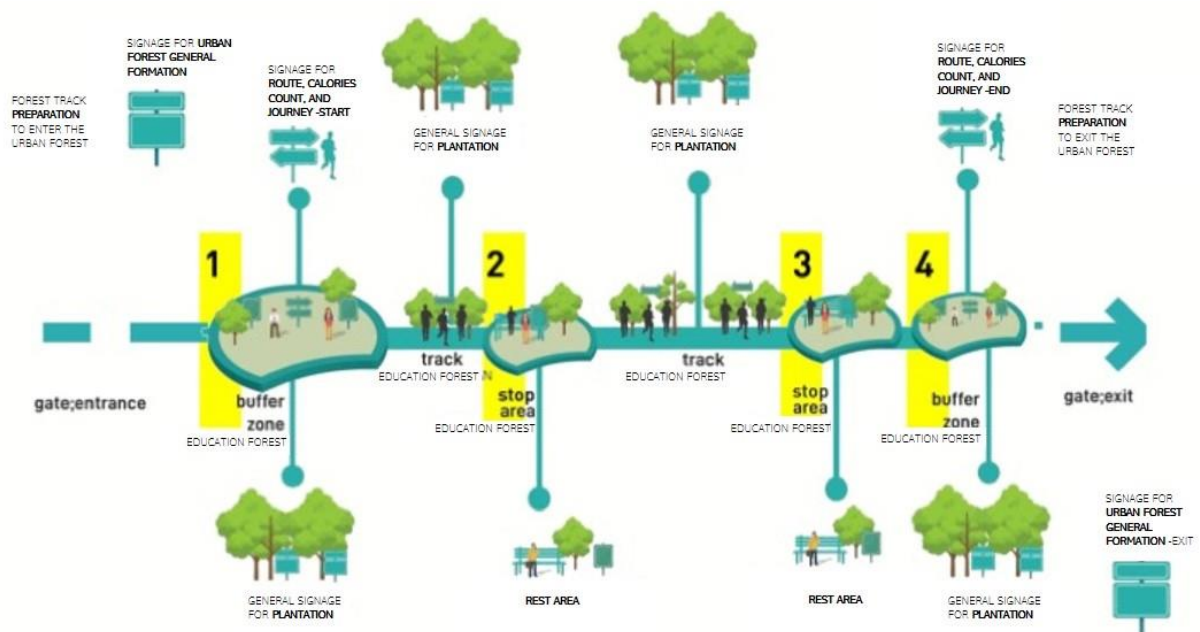
Fig. 2 Results of field survey

Source: Author's documentation

From the analysis, it is necessary to put vegetation into primary account since the vegetation are important resources and can be used as a foundation for the design. The team proposes to create vegetation zones based on the height of the plants, light intensities, the flow of visitors and facilities needed by modeling the tropical forest. All of those aspects are used in the proposed design so that the visitor's experience inside the urban forest becomes an important part of the whole experience in the zoo or as part of landscape immersion. The visual and highlights obtained from the site analysis

(see Fig. 2) suggest how to organize paths following the density of vegetation, various light intensities and contours to support the experience of being in nature as well as the educational and recreational purposes.

The next design stage is carried out by presenting several options by considering existing vegetation, visitors experience and budget. The basic design suggestions include the improvement of the existing track and the vegetation settings, gates, and the making of information boards. As part of this design stage is the design of entrance area and some stop stations where visitors can have different atmosphere and experience. In the later stages of development, the team proposed a creation of bird observation and the expansion of the urban forest to the nearby area with a lake.



GENERAL PROGRAM

Fig. 3 The Urban Forest design concept

Source: Author's documentation

With different programs at the proposed stations, the urban forest can have different themes and various educational purposes. For example, at the entrance area, visitors are offered a beautiful and dense forest as the background. Hopefully, this place will give photogenic corners for visitors who want to take photos so that visitors start a wonderful journey entering the rainforest. There are basically four stop stations

connected with a trace where the zoo management may incorporate education on human body and ecology.

To realize these programs, the implementation of the design is carried out by utilizing the existing vegetation and contours, the height of the tree, the distribution of the canopy, the height of the contour, the scenery, and the existing facilities. Not only the aspect of the scenery is put into account but also the aspect of the velocity of the groove (silent or walking), shadows, education, and recreation. Our team divides the urban forest into several zones with reference to the character of several types of tropical rainforests, namely light, medium and dense forests. Figure 4 shows the implementation of the design that will be applied based on the three different zones with existing vegetation found in the urban forest.

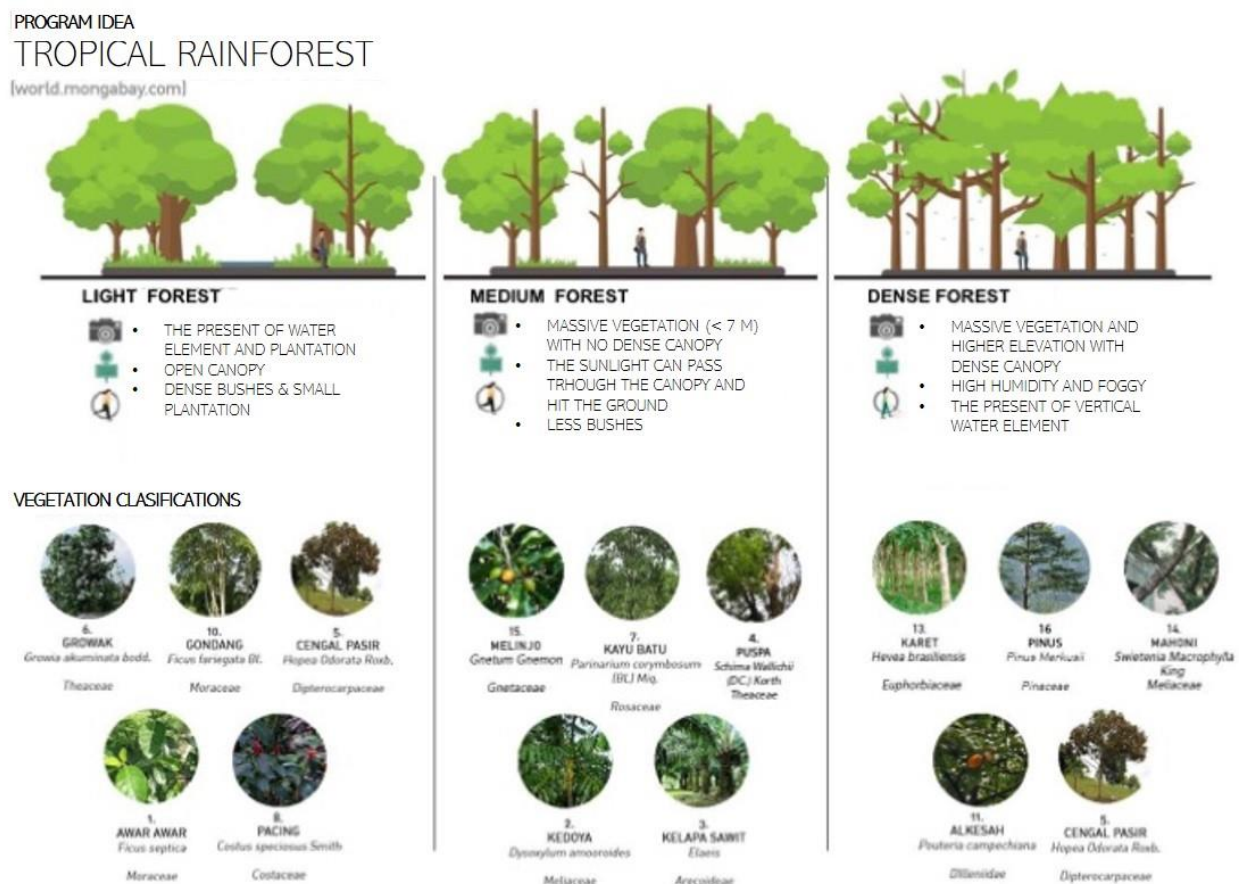


Fig. 4 Zoning Based on 3 Types Character of Tropical Rainforest

Source: Author's documentation

A light forest is used as a buffer area, a medium forest as an active area, and a dense forest as a quiet area. These areas are facilitated with different guidance and education

information, as mapped in Figure 5. With different zones and programs, the team divides the urban forest into some stations according to different vegetation arrangements and supporting features. The entrance and the open space in front of it are open spaces that function as buffer areas. These spaces provide visitors with information of what to expect during the visit. There will be an educational theme for each station such as on human and natural environment supported by landscape features in order to create different experience and educational focus.

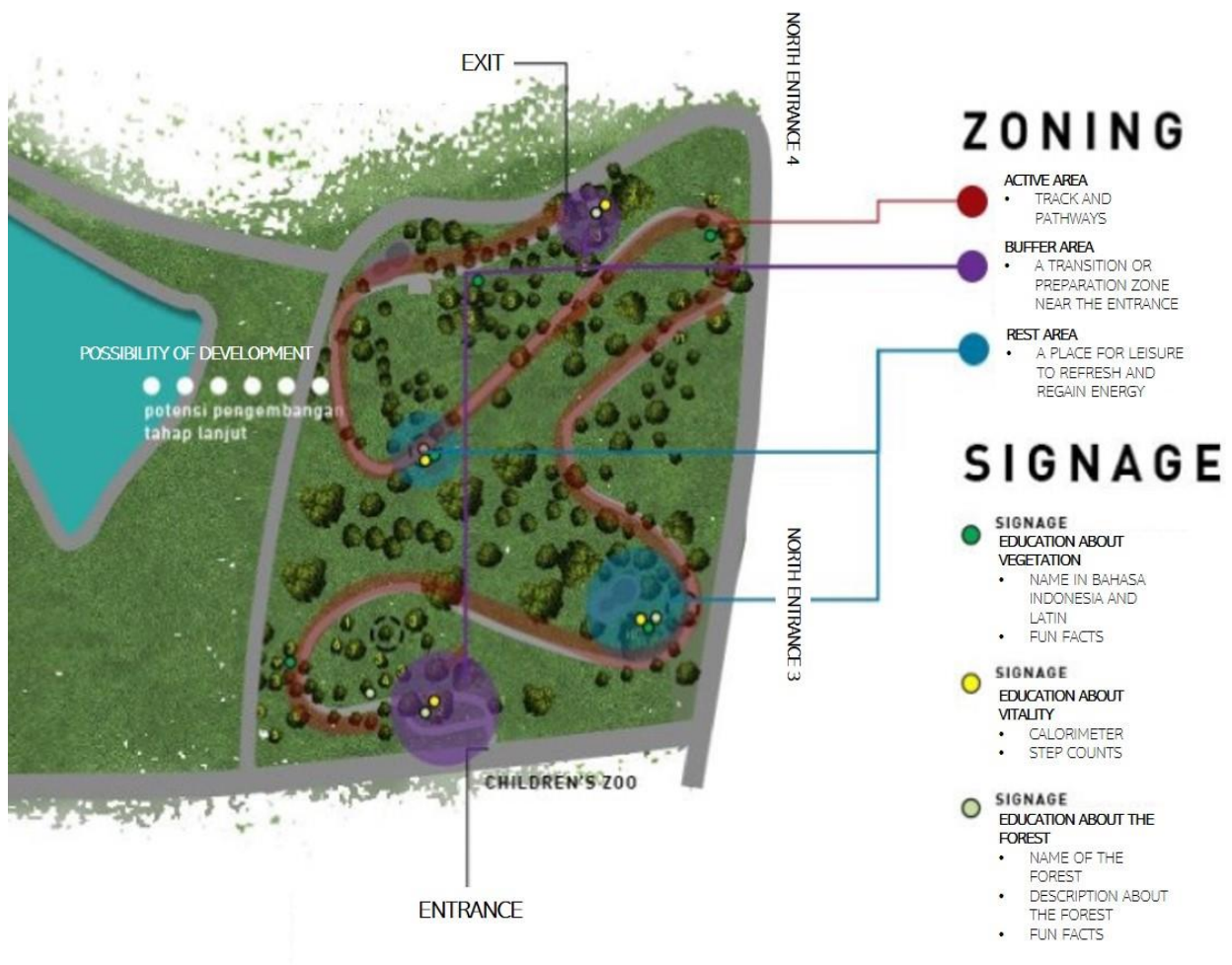


Fig. 5 Zoning in the Urban Forest

Source: Author's documentation

In relation to visitor experience, the design ideas for each station in the urban forest are localized into:

4.1. Buffer area

The buffer area utilizes areas with high light intensity located near the entrance. This area functions as a gathering space, the first education area, information and supervision areas. As part of the plan, some large trees are needed to create focal points and invite visitors outside the gate to come. The arrangement plan for these features is illustrated in Figure 6.

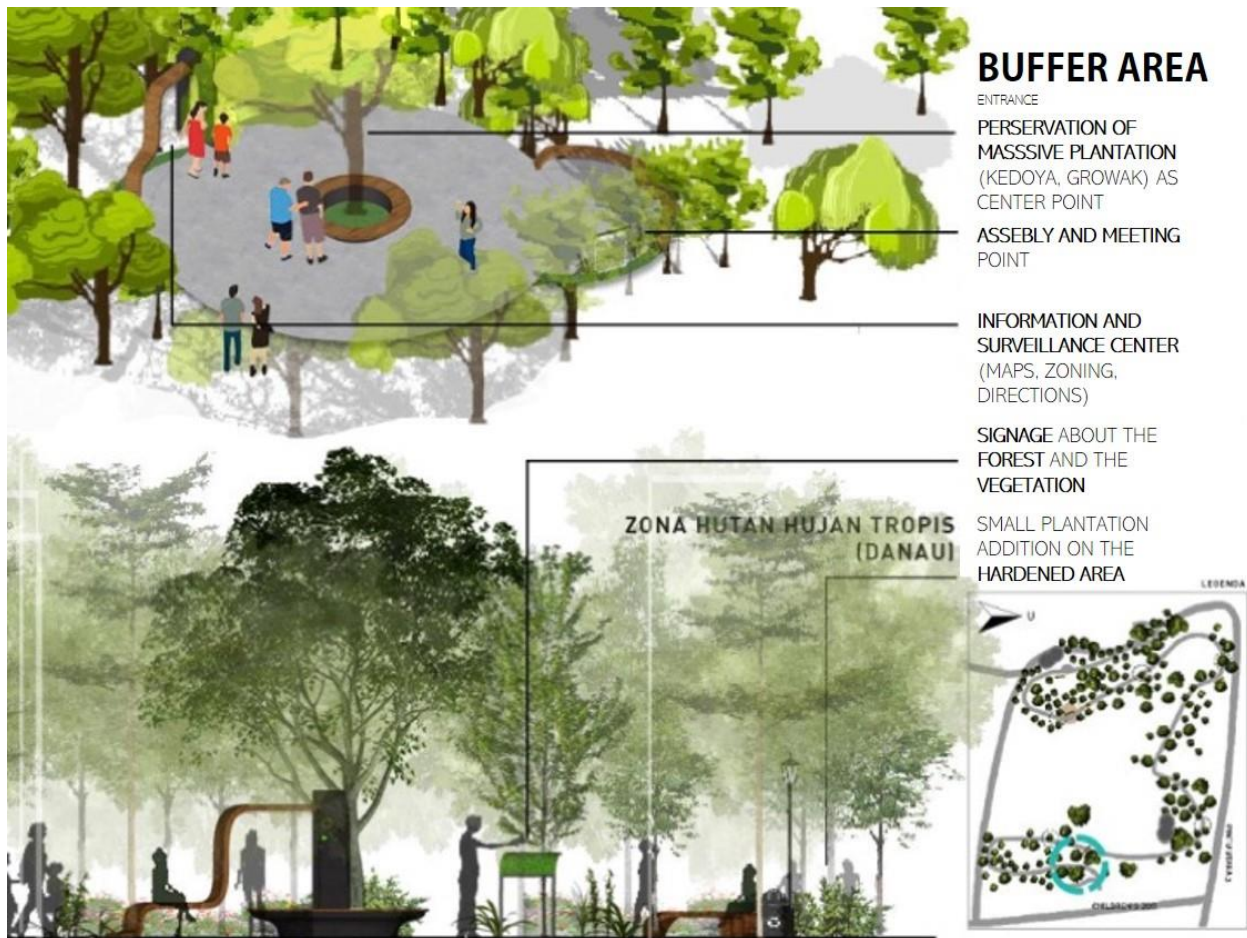


Fig. 6 Concept development of the buffer area

Source: Author's documentation

4.2. Rest Area

There are four stations located in the middle of the urban forest and each station works as a rest area that utilizes trees and existing pool facilities as refreshing areas. These areas facilitate the need for education with the use of vegetation, natural elements such as water and soil, as well as giving extraordinary experience of being in the tropical forest such as through big trees and sprinklers that create mist and splash. The

structure of the trees for these features is illustrated in Figure 7 and the placement of pond gives visual enhancement and tactical experience of some natural elements at the same time.

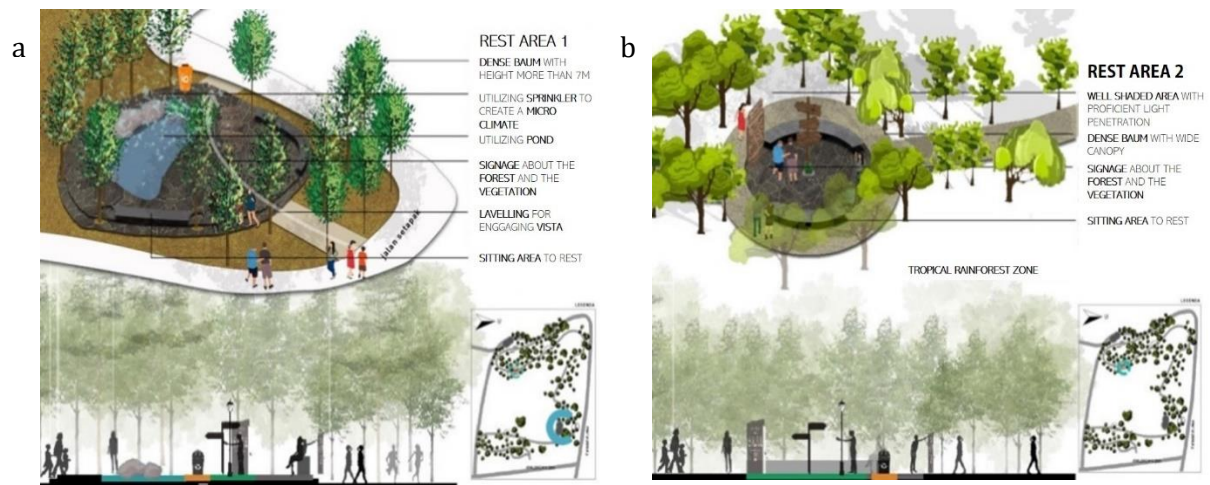


Fig. 7 (a) First Rest Area; (b) Second Rest Area

Source: Author's documentation

The management of the Ragunan Zoo wants to develop the Urban Forest as part of the role of the zoo in education, conservation, and recreation areas. Applying part of the idea of landscape immersion in the zoo where the focus is the good interaction among visitors, animals, and environment is part of program becomes a suitable idea especially since the idea aims to prioritize the welfare of animals and nature beside providing aspects related to human comforts. The urban forest in the Ragunan Zoo cannot be seen as separated from the whole zoo, therefore, although this area covers only a small part of the entire zoo the significant of its development create an opportunity to introduce animals habitats and providing green space for the city.

The collaboration process between the UI team and the zoo management starts with discussion on how to provide urban forest in the zoo with the same unique experience as in the zoo but with more focus on the forest and ecology. Besides continuous discussion, the UI team also does interview with visitors especially to know their expectation of the urban forest. The idea of urban forest tries to immerse visitors in the same natural habitat as animals and address the issues of green space in the city. As part of the community engagement, the urban forest has created an opportunity for architectural designers, UI students and zoo management to collaborate. At the end,

providing green space in the city may serve as recreation space and becomes an educational tools for larger communities.

5. Conclusion

To make zoo visitors have an interest in conservation and education, first they need good experience so that they have interest in animals and their habitats, as well as the connection between human and environment. This article examines important elements in designing urban forest for the Ragunan Zoo as part of the effort to increase the role of the zoo to educate people on animals and their habitats. The UI team initiates a focus group discussion that invite landscape and urban designers, architects, UI students and the management of the Ragunan Zoo. Through design research and collaboration with designers, the zoo management and visitors, the UI team takes part in the initial design of the urban forest to support visitors' activities because a well-designed green space in the city has a potential to include people in community empowerment.

The collaboration of designers and Universitas Indonesia in designing of the Ragunan Zoo is in some ways related to community engagement. The management of the zoo get benefit from the initial design while designers and students can take part of the project. Additionally, urban forest can support community activities and enhance the role of the zoo to educate people about animals and their habitats. In conclusion, through collaboration between designers, students and the management of the zoo, and students can experience the design process and connection between developing urban forest and communities in the city.

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