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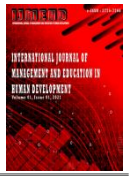

Planning and Management Model of Green Open Space with The Concept of Healing Garden with Local Plants in Bahteramas Public Hospital Southeast Sulawesi Province

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ABSTRACT

The Bahteramas General Hospital (RSU) area does not yet have a special green open space design to create environmental health and comfort for patients and visitors. The study will analyze the green open space model for the Bahteramas Hospital area by integrating aspects, landscape (landscape), ecology, aesthetics, economy, and social and culture which are packaged in the concept of healing garden. This research includes qualitative research. Data analysis was carried out descriptively with the help of 3D Studio Max software application. The Green Open Space (GOS) Model at Bahteramas Hospital with the concept of healing garden consists of six (6) spatial functions, namely; entrance / reception, transmission, social interaction, therapy, meditation, and expression and art. The green open space model with the healing garden is carried out by integrating landscape aspects, placing vegetation according to the composition of trees, shrubs, land cover shrubs and grasses. Ecologically, local plants facilitate user interaction (cultivation and care) as well as presenting the aesthetics of a blend of local plants with sufficient color variations, neither striking nor dark.

Keywords: *Green Open Space, Healing Garden, Management, Planning*

I. INTRODUCTION

The development activities of a city have an impact on changes in the natural landscape and regional layout which results in a decrease in the carrying capacity of the environment and environmental services (Silalahi and Harianja, 2014). As a result, city dwellers face environmental and social stress that have a negative impact on the physical and psychological impact of their residents (Carreiro, et al, 2008).

Green Open Space (GOS) is an important part of the city-forming structure and has the main function of supporting the city's ecology (Law Number 26 of 2007). In the Spatial Planning Law and and the Minister of Public Works Regulation (Permen-PU), the importance of green open space (GOS) in urban areas is provided, provided that the provision of RTH is at least 30% of the total area.

Green Open Space (GOS) plays a role in providing environmental services. Green Open Space can also improve the quality of the environment, improve the quality of life of individuals and communities, provide various environmental services to individuals and communities, produce a healthier and more comfortable environment for its citizens (Joga & Ismaun, 2011). The provision of green open space is part of mitigating global warming so that green open space is considered the right way to reduce CO emissions, which are the largest emissions in greenhouse gases (GHG) (Rawung, 2015).

Green Open Space is an open space, both public and private, whose surface is covered by vegetation, either directly or indirectly available to users (Farida, 2010). To overcome city environmental conditions that are high in exhaust gas (CO2) pollution, green space is needed because it can function to improve environmental quality and maintain the continuity of life that is relatively cheaper, safer, healthy and comfortable (Khoiroh & Damayanti, 2015).

Green open space as an open space, both public and private, whose surface is covered by vegetation, is either directly or indirectly available to users (Farida, 2010). RTH Urban Area is part of the open space of an urban area filled with plants and plants to support ecological, social, cultural, economic and aesthetic benefits (Regulation of the Minister of Public Works No. 5 of 2008).

Referring to the Regulation of the Minister of Public Works Number 05 of 2008, Green Open Space functions in three ways, namely: 1) maintaining the availability of land as water catchment areas, 2) creating urban planological aspects through a balance between the natural environment and the built environment which is useful for people's

lives, and 3) increasing the harmony of the urban environment as a means of environmental protection that is safe, comfortable, fresh, beautiful and clean (Minister of Public Works Regulation No. 5 of 2008).

Green Open Space has various functions; a) Edaphic function, namely as a place to live for animals and other microorganisms; b) Hydro-orological functions, soil and water sustainability; c) The climatological function is the creation of a micro climate; d) Protective function: protecting against wind, noise, and sun disturbances; e) Hygienic function, reducing pollutants both in air and in water; f) The educational function is that Green Open Space can be a source of public knowledge about the kinds and types of vegetation, its origin, scientific name, benefits and others; and g) aesthetic function, to contribute to beauty, through colors, shapes, combinations of textures, smells or sounds of the wildlife that inhabit it (Hasni, 2009; and Nawangsari & Mussadun, 2018).

The negative impact of not optimal green open space where the green open space of the city does not meet the quantity and quality requirements (unavailable green open space is reducing the comfort of the city: decreasing the capacity and carrying capacity of the area (increasing pollution, decreasing groundwater availability, increasing city temperature, etc.) city security, reducing the natural beauty of the city, reducing the level of public health physically and psychologically (Widyastri., Faisal & Soeriaatmadja, 2012).

In Kendari City, the green open space development policy has been mandated in the vision of Kendari City development, namely "realizing Kendari City in a Park; peaceful, safe and comfortable ", it's just that the availability of green open space when it is not proportional to the number of people who contribute to gas (carbon).

One area that can be designated as an open green space is the area of the Bahteramas General Hospital. With an area of about 17 ha, only about 5 have been built. This area does not yet have a special green open space design to create a healthy environment and comfort for patients and visitors (healing garden). This is because high mobilization and activities around the hospital contribute to CO2, while visitors need adequate oxygen intake for a comfortable and healthy environment.

Observing these problems, the research will analyze making plans and management models of green open space for the Bahteramas General Hospital area by integrating aspects, landscape (landscape), ecological, aesthetic, economic, and social and cultural aspects. A management approach (planning and organizing) green open space is important to achieve the goal of managing a healthy hospital with the availability of green open space to absorb carbon. The green open space management planning model is applied in the form of a site plan, planting plan and green open space plan for the Bahteramas General Hospital area which is packaged in a healing garden concept.

II. LITERATURE REVIEW

Green Open Space (RTH) as an open space both public and private whose surface is covered by vegetation, either directly or indirectly available to users (Farida, 2010). To overcome city environmental conditions that are high in exhaust gas (CO2) pollution, green space is needed because it can function to improve environmental quality and maintain the continuity of life which is relatively cheaper, safer, healthy and comfortable (Khoiroh & Damayanti. 2015). Green Open Space as an open space both public and private whose surface is covered by vegetation, either directly or indirectly available to users (Farida, 2010). Green Open Space Urban areas are part of the open spaces of an urban area filled with plants and plants to support ecological, social, cultural, economic and aesthetic benefits (Minister of Public Works Regulation No. 5 of 2008).

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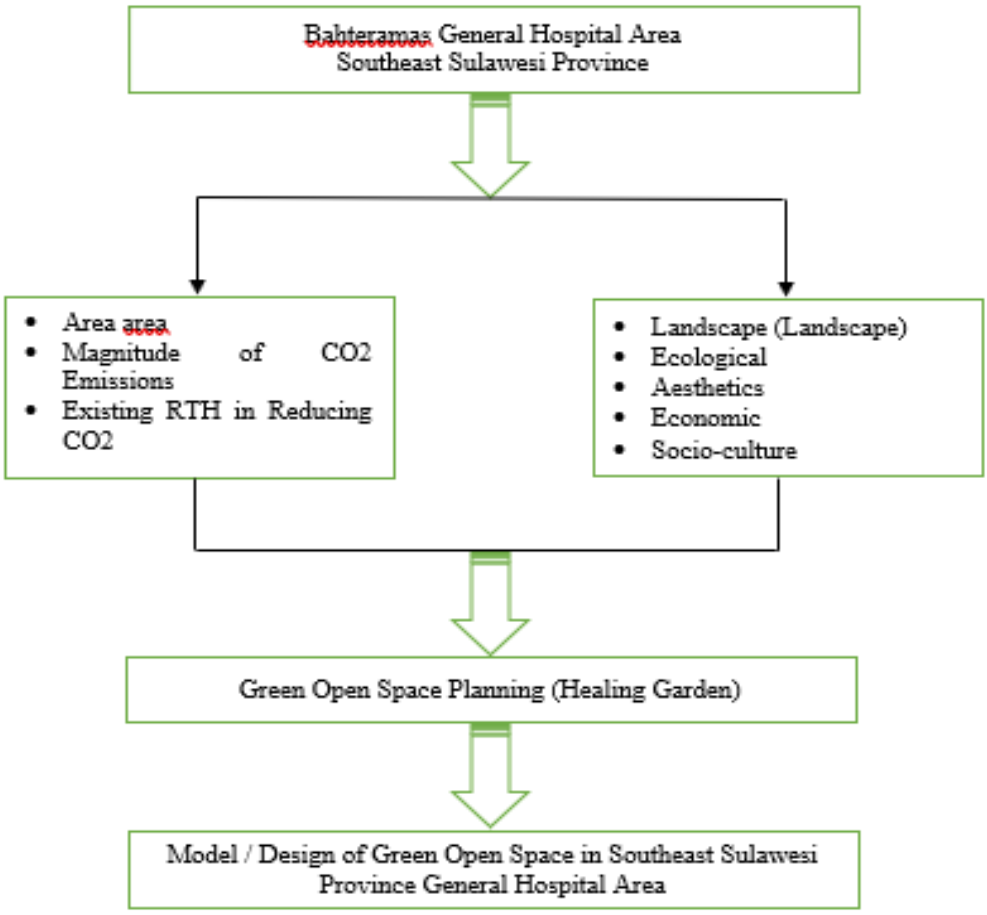

Figure 1. Research Conceptual Framework

III. RESEARCH METHODS

The research was conducted at the Bahteramas General Hospital (RSU), Southeast Sulawesi Province in 2020. This research includes qualitative research. The sample area in this study was carried out by census, namely taking the entire sample of the Bahteramas Hospital in Southeast Sulawesi Province which is designated as a green open space with an area of about 170,000 m2 or 17 ha. Sampling of managers (staff, nurses and doctors) and visitors to the Bahteramas Hospital was carried out by purposive sampling technique or purposive sampling or with special consideration. The model plan, site plan, planting plan and surface plan of the hospital's green open space were analyzed descriptively with the help of the 3D Studio Max software application.

IV. FINDINGS AND DISCUSSION

4.1 Spatial Plan for Green Open Space Development at Bahteramas Hospital with the Healing Garden Concept

The approach used in forming spaces on the site is an analogy to the shape of the human organ. Based on the basic concept and design objectives, the site is planned to be six spaces with a general percentage of space. The results of the mapping are grouped into five main rooms to form a block plan (Figure 2). These rooms are reception rooms, transition rooms, social interaction rooms, therapy rooms, and meditation rooms as presented in Table 1.

Figure 2. Spatial Use Plan (Master Plan) at Bahteramas General Hospital, Southeast Sulawesi Province

These rooms are reception rooms, transition rooms, social interaction rooms, therapy rooms, and meditation rooms as presented in Table 1.

Table 1. Division of Space in Bahteramas Hospital according to function (Research Results Processed 2020)

No.	Space	Sub Space	Function
1.	Entrance area Reception	-	The area or room the first time a visitor enters the hospital area to the next room function
2.	Acceptance	-	The room the first time a visitor enters accommodates access to the next room (transition)
3.	Transmission	-	Visitors determine the space needed to support their health
4.	Social interaction	a. Rest area b. Private and family c. Meetings and meetings	A space designed to accommodate meetings between all visitors and interact so as to create a comfortable and family atmosphere
5.	Therapy	a. Horticultural plants b. Rehabilitation plants	Open space with plantation and horticultural plant facilities equipped with outbound for active and passive activities
6.	Meditation	a. Rest area b. Recitation and contemplation	A space that accommodates visitors to rest from work fatigue, and is elegant
7.	Expression and art	a. Art painting b. Fine arts (voice expression with gestures)	A space that accommodates visitors (especially patients) to be able to express their talents and abilities through art.

4.2 Green Planning in Green Open Space at Bahteramas Hospital

The modeling plan (model plan) for green open space at Bahteramas Hospital is analyzed to determine the local vegetation that is in accordance with the green open space model of the Bahteramas Hospital according to the existing landscape, ecological, aesthetic and socio-cultural values (local plants). This is done because each type of plant has different functions and benefits, so that the function of vegetation should be adjusted to the function of the area (Purnomohadi, 2006). The green layout designed is vegetation with functions that will be applied to these spaces (role factors). The vegetation to be applied at the Bahteramas General Hospital will provide aesthetic, therapeutic and socio-cultural aspects as well as several other functions intended to be easily recognizable vegetation (local plants) so that it is easy to care for.

Table 2. Concept of green green space at RSUD Bahteramas (Research Results Processed 2020)

No	Space	Functions of Plants	Specific Functions
1	Entrance and Reception Areas	Aesthetics and direction	Identity formers; a. Interesting flower color b. Shrubs and vines
2	Transmission	Aesthetics and boundary plants	Aesthetics; a. Low flowering tree b. Shrubs and vines
3	Social interaction	Aesthetics and shade	Atmosphere freshener a. Tall tree b. Shrubs and or flowering vines
4.	Therapy	Aroma therapy	Plants smell fresh and are bright in color
		Horticulture	Agricultural crops and fruits
5.	Meditation	Aesthetics, aromatherapy and shade	Provides a quiet, calm and soothing effect
6.	Expression and art	Aesthetics and shade	Bright, inspiring, fresh and comfortable effect

The vegetation plan used is partly the existing vegetation on the site, the other part is an addition to aesthetic plants, and therapeutic plants, both horticultural therapy and physical rehabilitation. Some of the plants selected are plants with functions that adapt to existing spatial conditions (Table 3). According to the Ideal Assessment Coefficient (KPI) analysis (Hakim and Utomo, 2008) obtained several types of plants with aesthetic characteristics, according to the landscape and local plants, obtained several types of vegetation to be used in the construction of green open space with the concept of a hospital garden (healing garden) as presented in Table 3.

Table 3. Types of green open space at the Bahteramas Hospital (Research Results Processed 2020)

No	Scientific name	Local Name	Unit
1.	*Adenium*, sp	Kamboja	Pot
2.	*Aschynanthus lobbiana*	Bunga lipstick	Pot
3.	*Arachis pintoi*	Kacang-kacangan	m^2
4.	*Arundinaria pumila*	Bamboo	Plb
5.	*Axonapus*, spp	Rumputan	m^2
6.	*Bauhinia purpurea*	Daun kupu-kupu	Tree
7.	*Bromelia* sp	Bromelia	Plb
8.	*Calliandra*, sp	Kaliandra	Plb
9.	*Canna*, sp	Bunga tasbih	m^2
10.	*Capsicum anmum*	Cabai hias	m^2
11.	*Celosia*, sp	Jengger ayam	m^2
12.	*Cadiaeum*, sp	Puring	Plb
13.	*Certostachis renda*	Palem merah	Tree
14.	*Delonix regia* Raf.	Flamboyant	Tree
15	*Denrobium*, sp	Anggrek bulan	Pot
16.	*Dracaena*, sp	Drasena	Plb
17.	*Ficus benjamina*	Beringin	Tree
18.	*Heliconia*, sp	Pisang hias	Tree
19.	*Layandula angustifolia*	Lavender	m^2
20.	*Mascarena lagenicaulis*	Palem botol	Tree
21.	*Michelia champaka* L.	Cempaka	Tree
22.	*Massaenda*, sp	Nusa indah	Tree
23.	*Pandanus odorus*	Pandan wangi	m^2
24.	*Phyllostachys sulphrurea*	Bambu kuning	Tree
25.	*Pinus mercusii*	Pinus	Tree
26.	*Ptychospermae macarthurri*	Palem hijau	Tree

27.	*Roystonea regia*	Palem raja	Tree
28.	*Samanea saman*	Ki hujan	Tree
29.	*Swietenia mahogany*	Mahoni	Tree
30.	*Thuja orientalis*	Cemara kipas	Pot
31.	*Vitex coffasus*	Biti	Tree
32.	*Aquilaria beccariana*	Gaharu	Tree
33.	*Sansivera*	Lidah mertua	Tree

Some shade plants such as Swietenia mahogani, Michelia champaca L., and Pinus merkusii are dominant plants in rehabilitation rooms, especially in outbound locations, while in chemotherapy and reflexology locations many aesthetic plants are used, including *Heliconia sp, Bromelia sp, Dracaena sp*. Several guide plants, such as *Pinus merkusii*, and *Roystonea* regia are well placed at several locations bordering the road (circulation) of vehicles to confirm the direction of the intended location. The social interaction space uses aesthetic plants that can give a comfortable impression, including *Canna sp, Celosia sp, Capsicum anmum, Cadiaeum, sp*, and *Certostachis lace*. Apart from aesthetic plants, other types of plants that are dominant in this space are barrier plants. Some of the types used include *Roystonea regia*, and *Ptychospermae macarturii*.

Plants or vegetation selected in the horticultural therapy room were selected according to the local microclimate, *including Solanum lycopersicum (tomato), Capsium annum (chili), Amaranthus (spinach), Musa paradica (banana), Mangifera indica (Mangga),* and *Carica papaya (papaya).* The meditation room requires a quiet and calm atmosphere. The selected plants were aesthetic plants that could support the atmosphere, so plants were chosen such as *Pinus merkusiim (Pinus), Ficus benjamina (banyan) Cyrstotachis Renda (red palm), Pandanus odorus (Pandan wangi).*The expression space and art are used to express the artistic talent of the user for the convenience of the user in finding inspiration, so shade plants are needed such as *Samanea saman (ki Hujan), Bauhinia purpurea, so that it gives a shady impression in the room.* The meditation room is a passive space needed by users who want peace, both their heart and mind. Therefore, several types of plants selected include *Pinus merkusiim (Pinus), Ficus benjamina (banyan) Cyrstotachis lace (red palm), Pandanus odorus (Pandan wangi).* Expression and art spaces are used to express the artistic talents of the users so that the comfort of the users in finding inspiration needs to be prioritized, especially shade. The need for shade plants such as *Samanea saman (ki Hujan), Bauhinia purpurea,* so that it gives a shady impression in the room.

4.3 Site Plan, Surface Plan and Planting Plan

The concept of healing garden and the type of surface used (Site Plan and surface plan) of the Bahteramas Hospital are shown in Table 4, Figure 3 and Figure 4.

Table 4. Designation of RTH at Bahteramas Hospital according to area and function (Research Results Processed 2020)

No	Space	Function	Area Plan	
			(m^2)	ha
1.	Entrance/ Reception area	Main road, footpath and parking area	10.130	1,013
2.	Transmission	Paving blocks and corridors	8.720	0,872
3.	Social interaction	Sitting, Meeting or gathering, and Gathering	7.590	0,759
4.	Rehabilitation	Outbound Games, Reflexology and Chemotherapy	6.320	0,632
5.	Therapy (Horticultural Plants)	Parent House, Fish pond, Fruit picking, Vegetable planting and fishing	6.980	0,698
6.	Meditation	Worship Activities, Sitting (rest)	7.530	0,753
7.	Expression and Art	Dancing, painting or singing and playing music	3.730	0,373
Total/Amount			51.000	5,100

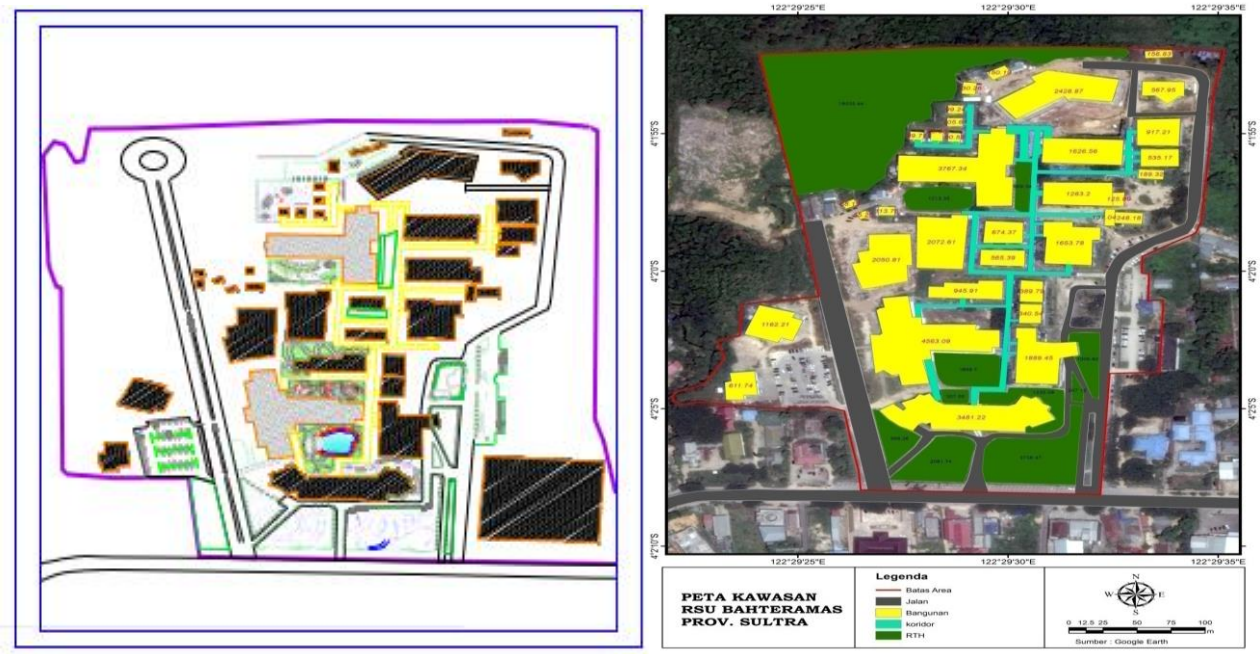

Figure 3. Site Plan (Left) and Surface Plan (Right) green open space At Bahteramas Hospital,

The green open space *Planting Plan* at Bahteramas Hospital are:

a) Entrance Area (Main Page)

The entrance area is a space as the main entrance to the Bahteramas Hospital. As the main entrance, the main impression that must be raised is the nuances of exotic comfort so as to give each visitor a sense of comfort from the first entry. The main road is combined with a garden along the pathway with shade trees such as *Swietenia mahogani*, *Michelia champaca L.*, and *Pinus merkusii* to become dominant plants and is combined with aesthetic plants including *Heliconia sp, Bromelia sp, Dracaena sp*.

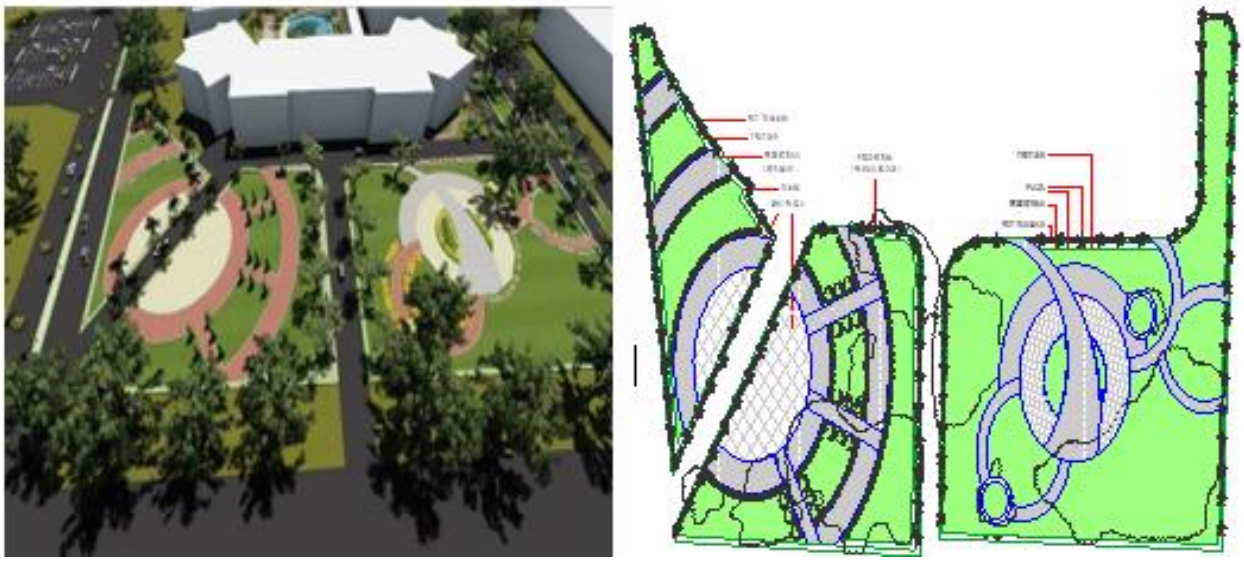

Figure 4. Illustration of green open space Model for Vehicle Entry and Parking Areas at Bahteramas Hospital

b) Transmission

The transmission room is a connecting space between other rooms. The connecting facilities between the rooms are corridors and paths in the form of paving blocks. The transmission room is also a space for social interaction because it is a means of going back and forth between visitors between spaces between visitors, patients, doctors and other paramedics. This space uses aesthetic plants that can give a comfortable impression, including *Canna sp, Celosia sp, Capsicum anmum, Cadiaeum, sp,* and *Certostachis lace.* Apart from aesthetic plants, other dominant plant species in this space are barrier plants, including *Roystonea regia*, and *Ptychospermae macarturii*.

Figure 5. Illustration of green open space Model in the Transmission Room (Corridors and Paving Blocks) at Bahteramas Hospital

c) Social Interaction

This room is a room that has the main function as a meeting point for the activities of various parties in the hospital, including visitor activities (staying patients), visitors to Bahteramas Hospital, hospital staff (doctors, nurses, administrative staff) and patients (which allows for outbound mobilization. room). The use of conservation plants such as pine (*Pinus merkusii*), Palem raja (*Roystonea regia*), and ki hujan (*Samanea saman*) can be used to attract birds that can produce melodious chirp so that users can feel comfortable on the site. Sound stimulus is also generated from the splash of the fountain which creates a natural impression on the site.

Figure 6. Illustration of green open space for the Social Interaction Function in Bahteramas Hospital

d) Rehabilitation

There are several important goals in this space, including accommodating patients with physical limitations (fractures, paralysis, disabilities) to be able to train self-confidence to achieve healing through physical therapy (chemotherapy). This place can accommodate the needs of patients (psychiatric) to train themselves to be able to control emotions through outbound activities, with physical and psychological conditions.

Figure 7. Illustration of green open space for the rehabilitation function at the Bahteramas Hospital

e) Therapy (Plant Horticulture)

The design of this space design takes the theme of planting (planting) and harvesting (harvesting).

Figure 8. Illustration of green open space for Therapy (Horticultural Plants) at Bahteramas Hospital

f) Meditation

This room is specially designed to increase patient confidence to gain healing through spiritual power, and can be used by all park visitors, including doctors and hospital staff. The use of plants such as pine (*Pinus merkusii*), Palem raja (*Roystonea regia*), and ki hujan (*Samanea saman*) can be used as a catcher for birds that can produce melodious chirp so that users can feel comfortable on the site. The sound stimulus is also generated from the sprinkling of the fountain from the Taj Mahaal garden and can create a natural impression on the site.

Figure 9. Illustration of green open space for meditation (religion) at Bahteramas Hospital

g) Expression and Art

The main function of this space formation is to accommodate patients (psychiatric and drug addicts) in the ability to control emotions through art. Furthermore, patients are given the freedom to be able to develop their potential talents and skills that already existed before they entered the Bahteramas Hospital. Mild psychiatric patients (approaching recovery) are expected to train their ability to divert and control emotions by doing positive activities.

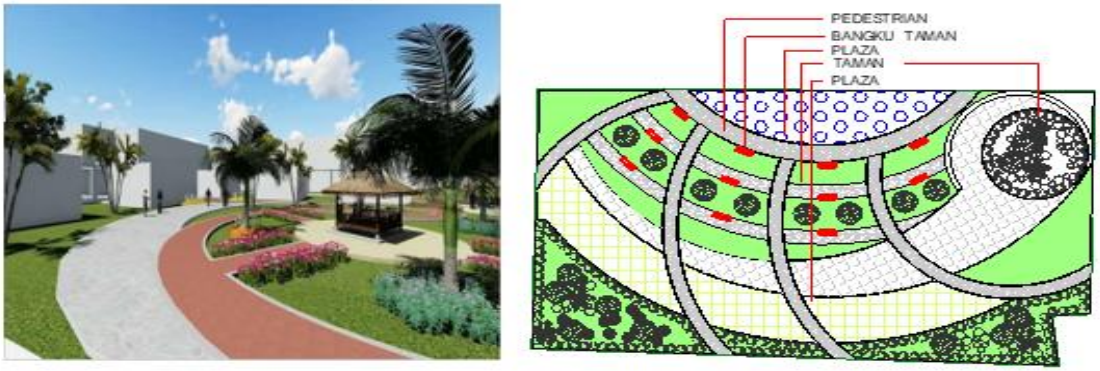

Figure 10. Illustration of green open space for art functions (dance and music) at Bahteramas Hospital

V. RECOMMENDATIONS & CONCLUSION

The Green Open Space Model at Bahteramas Hospital uses the healing garden concept approach which consists of six (6) spatial functions, namely; entrance/reception, transmission, social interaction, therapy, meditation, and expression and art. The green open space model with the healing garden model is carried out by integrating landscape aspects in each vegetation placement according to the composition of trees, shrubs, land cover shrubs and grasses. Ecological aspects and local plants can facilitate user interaction (cultivation and care) so that they can create a comfortable green open environment and in other aspects can provide economic activity (street vendors). The construction of green open space with the concept of healing garden also presents the aesthetic of a blend of local plants with sufficient color variations, neither striking nor dark.

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