IEREK PRESS
Academic Research Community

http://www.press.ierek.com

ESSD

CrossMark

ISSN (Print: 2357-0849, online: 2357-0857)

International Journal on:

Environmental Science and Sustainable Development

DOI: 10.21625/essd.v4i1.489

Green Building with Nature Concept on Lakeside Resort Design

Wasilah Wasilah[1], Andi Hildayanti[1], Hamzah Hamzah[1]

[1]*Architectural Engineering, Faculty of Science and Technology Alauddin Islamic State University, Indonesia*

Abstract

The natural condition of Matano lake is heavily scenic includes the land, water, air, energy, and reasonably required to preserve. Exploration in the resort design with green building and design with nature concept is one of preservation effort to maximize the natural potency of the area based on the aspect of environment, socio-economics, and sociocultural. The method in the design process involve a green building and design with nature principles implementation in the site plan, structural design, natural energy to maintain the building thermal and natural lighting, and reuse rainwater management to optimize the resort function, green materials and prevent the residual material. The result explained the lakeside resort based on green building and design with nature principles increase the aesthetic potential view and environmental sustainability of Matano lake.

Keywords

Resort; green building; design with nature; structure; material building; lakeside

1. Introduction

Most of green building concept is to create a better life and meet the next generation needs. The aim concern on the environmental protection, health, and social. The environmental destruction phenomena have been existing in all aspect of life and cause a natural disaster (Hildayanti, Shirly & Suriana, 2012). Some societies are intense expressing a restoration and the balance of nature. One of the program is green building concept that includes a building development, house, apartment, office, and so forth.

The green building concept tries to practice efficiency in four factors: efficiency in structure design, energy, water, and material (Frick and Suskiyanto, 2007). The purpose of design structure efficiency is to minimize the impact of development, from the execution to the building occupation. If the step is not efficient, then the development will produce a negative effect to the environment. The negative effect might occur in massive material usage or wasteful. Additionally, efficiency in energy includes the steps to save the energy. The energy is including a daily needs energy, such as air and sunlight that come into the building or energy for operational aspect. For example, a building with wooden material tend to produce a lower disposal energy than the stone, concrete, or steel material. Energy efficiency also relates on the number of electrical consumption of the building to support the optimization the function of the building (Frick and Mulyani, 2016).

Besides that, water efficiency relates on the life principles that strongly depend on the water. In fact, the human cannot live without a water, meanwhile the supply of the clean water is become a polemic. Therefore, the green building concept also concern to water consumption efficiency. The efficiency includes how to get the water and

green water management. For example, the rainwater reservoir tank, absorption wells, and soon could practice in order to collect the water. Furthermore, material efficiency related on the building structure material. The material has a correlation with the efficiency of structure design. Application of green building concept should practice as the necessities of material precisely (Safrilia, 2013). Please be advised that excessive material usage will boost the development budget, more impact to the environment, high energy consumption during the construction process, and etc.

Consequently, the principle in green building concept emphizes the design principle which concern on the environmental condition and the concept is closely related with design with nature. The principle is building without environmental destruction. The building design has a great expectation where the design should provide a solution on the development problem as the human needs but does not create a problem to the environtental (Prihambudi, 2010). One of the typical solution to apply this objective is to practice the sustainability principle that concern with the aspect of social, economy, environment, and local wisdom as the design identity itself.

In many ways, green building principle has a huge benefit for the human life and enviromental sustainability. Some of advantages in the green building are (1) as a saving, from co t development saving, electrical, water, and saving the energy (Frick and Suskiyanto, 2007). The impact explicitly on the financial and. simple and small monthly expense. The practice of green building concept definitely involves an extra cost in early development, but the concept will economical for a long-term operational cost. Some studies have proved an economical green building concept practice with; (2) an increasing productivity and quality of life of the occupant with green building concept. In fact, the concept definitely influences the productivity improvement. For example, there is a study in 31 green buildings in Seattle city. The result explains the worker absences reduce up to 40%. The Cushman & Wakefield study conclude that the sick leave decline to 30% in the employee and increasing of profit because an improvement of employee performance. The increasing also occur in the quality of life. The green building may minimize a stress, an increasing of a life style, more health, and a good social condition.

Based on the study of the green building concept and a huge benefit of design with nature for human life and environment sustainability, this paper designs a lakeside resort area that high potential for the development of lakeside tourism function. The lake is Matano lake that located in Sorowako city, East Luwu regency, about 600 km southwest of Makassar city, South Sulawesi. Matano lake has 16,408 km^2 wide and high potential for a new tourism destination in some part of the lakeside (East Luwu Culture and Tourism Office, 2016). Currently, some lakesides area become a location of a recreation, such as Ide beach, Kupu-Kupu beach, and Salosa beach. Matano lake presents an exotic panorama, cool water, beautiful lakeside landscape with many big trees with a lot of leaves that create pleasant atmosphere (Minisitry of Environmental of Indonesia, 2014). However, some aspects have a poor tourism accommodation. According to East Luwu Tourism Office data 2015-2016, tourism facility is inadequate and poor supporting facility (South Sulawesi Culture and Tourism Office, 2016). Therefore, the formulation of resort area design performs to fulfill a demand of resort area development as tourism area. The resort would be facilitated and become a destination for local people, domestic, and international tourist. The development·should be provided a local income and an effort to create an innovative and efficient green building design.

2. Research method

This study conducted a content analysis approach to realize the result of the design with green concept application. The design methods of this study are:

a) Literature study: data collection on green building, efficiency of structure design, efficiency in energy, water, material, and a requirement and the standard of the room for facility area in lakeside resort.

b) Design location observation: collecting the information on the series of tourist activity in lakeside recreation area, characteristic of the tourist, and Matano lake environment as the siteplan to support the resort design.

c) Analysis in the design approach: identifying the green building principle, including:

- Structure design efficiency, such as element of the construction and building structure.
- Energy efficiency, used the natural potential such as the air and sunlight that come into the building and the aspect of operational energy.
- Water efficiency, how to get the water and green management. Rainwater reservoir tank, absorption wells, and etc., are a method to collect the water.
- Material efficiency, implementation of building material for the development of architecture elements, such as wall, roof, and floor. Material usage practice as the necessities of material precisely.

d) The concept design; applying theroom configuration with the green building principle and design with nature, integrated with the social and environmental aspect the siteplan. The principle of green building and design with nature is to emphasize the harmony and balance between physical design and high quality of the landscape.

e) The result of the design: in form of resort area design in Matano lake area with the implementation of green building concept and design with nature to present an efficient, expressive, and innovative.

3. Result and discussion

3.1. Design Transformation

The design considers on the protection of lakeside to minimize the water and air pollution. An unoccupied building could have another benefit by modifying the function of the building into commercial function. The transformation of building function consistent with the local government policy as the effort to increase the quality of lakeside environmental.

However, there are some obstacles during the development of the area. The obstacle factors are erosion or abrasion, sedimentation, and high cost on the siteplan development because the development involve specific technology and construction. Therefore, the formulation of land use concept determines the function of the area as the resort with some supporting facilities to optimize the resort function. The concept will provide an access for the public, providing some green, economical, accommodative facilities for long-term period in order to attract the visitor.

According to the activity that facilitated by Matano Lakeside Resort, there are three resort activities: category, primary, secondary, and tertiary function.

a. Primary function. The function is the primary requirement for the resort, such as:

1) Occupation

The occupation is the primary function in the design as the place for relaxation, to stay, and enjoying the Matano lake environment from the resort. The resort facility should facilitate the visitor activity to create a comfort atmosphere.

2) Entertainment and recreation

Based on the design theme, the resort certainly presents an entertainment and become a recreative area located in the Matano lakeside. This function is the primary attraction of the resort. The attraction will realize in form of mini waterboom/water park, outbound arena, swimming pool, and some others supporting facilities.

b. Secondary function. The realization of this function is to support or operating the primary function, such as:

1) Administration

The administration related to the all resort management, such as: manager room, staff room (administration) and etc.

2) Commercial service

Commercial facility is the facility that support the quality of the resort, such as cafe, ATM, minimarket or convenience store and souvenir shop.

3) Promotion

The promotion category will facility are the hotel announcement to the tourists and organize the event to attract the visitor to come the resort.

4) Sport

The sport facility is to support the requirement inside the resort. The facilities are swimming pool, jogging track, and outbound area.

c. Tertiary function. The function is to support the primary and secondary function, which are:

1) Service

A service will support all resort activity, include maintenance /repair and building maintenance.

2) Service function

The function will present a service to the resort guest. All quest needs will provide by service function. The service function facilitated with main kitchen, engineering, praying room, and parking area.

The resort facilities above conclude that the room requirement define by the building function to be facilitated the room inside the building. The next part will describe the site plan of lakeside resort area of the Matano lake and some recreation facilities inside the resort area (see figure 1).

Figure 1. The site plan and the facility of Matano lakeside resort area

The site plan is 60,000 m^2 or 6 hectares. Total of the lands space is 11,569.31 m^2 or 19.28 % of the site plan. 48430.69 m^2 is non-built-up area and most area is a reforestation area with big tree and shrub vegetation. The allocation of built-up area and non-built-up area proportion usage is one of the implementations of design with nature concept with the application of balance between resort physical design and reforestation composition in Matano lakeside land.

3.2. Structure Design

All wooden material must dry, old, straight, and without a crack, and the humidity degree is less than 15% as the requirement stated in PKKL 1970-NI.5. The selection of wooden material because a wood construction is an

accessible material. The material is the material that mastering by the local engineer because the characteristic of wood are easy to cut and flexible (measurable, easy to cut, elastic, and etc.). The truss construction for the roof will resist the wind pressure horizontally and proved by the application in the traditional house. In fact, the construction is standing for a hundred years, depend on the preparation of the wood material (see figure 2).

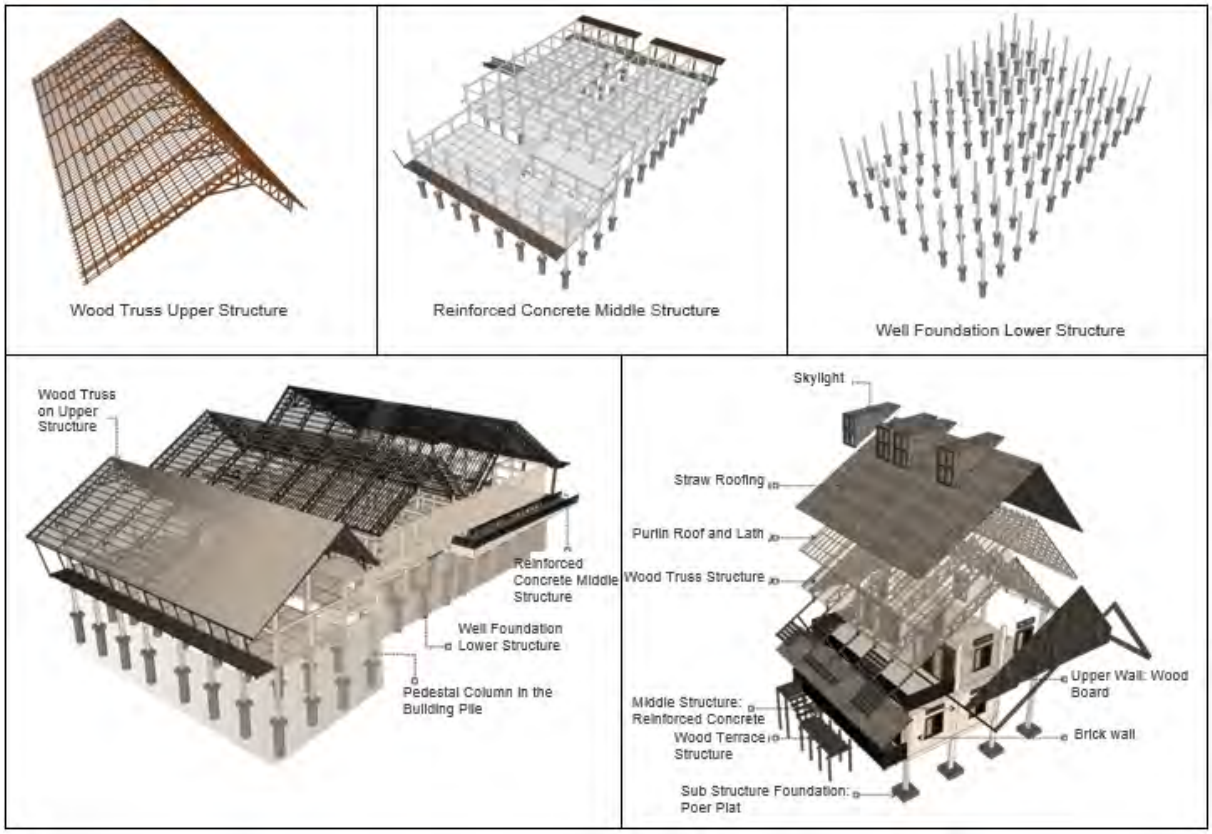

Figure 2. The building structure a re roof. middle, and sub structure.

The sub structure of building practice the caisson pile to adapt the land contour, and pedestal column applied in the building pile. The middle structure of house building is reinforced concentrate and the upper structure is a wood truss. Some buildings have foot plate sub structure, a common structure found in the high building with soft land condition. The foundation characteristic is economical and the land pit is few that make the project time saving.

3.3. Energy

The light and the air are the most important elements to provide the illumination into the building interior and sufficient natural ventilation. The elements also present amenities to the user for their activity. The rooms with ventilation and natural illuminance will have sufficient humidity and keep the environment condition. Moreover, sufficient ventilation and natural illuminance will save the electrical energy, because the building will not completely depend on the artificial light and mechanical ventilation. The strategy of natural energy consumption inside the Matano lakeside resort area (see figure 3).

Energy consumption inside the building will maximize by the implementation of building orientation that positioned between the sun path and the wind (Sahabuddin, 2019). The most advantageous building positioning is to the west from the eastward. The opening head to the South and East to avoid direct sunlight. The building will have enough wind opening, the ventilation positioning is horizontal and vertical, and the larger room positioning will direct to the wind direction. The building considers on the window orientation to the sun with natural material that absorb the heat. The material includes wooden material for the interior, fence and vertical garden, pitched roof formation (simple plane) to reduce the temperature under the roof. The design provides a terrace for the

building/house as a transition area between outdoor (yard) and indoor (building) that create a micro atmosphere either inside the building or around the building. The design enhances green vegetation, secondary skin concept on the faced to reduce the heat of the sunlight, providing an open space inside the building, and located the pond around the building area. Moreover, there are implementation of building form configuration, cross ventilation, and skylight to reflect sunlight from the top.

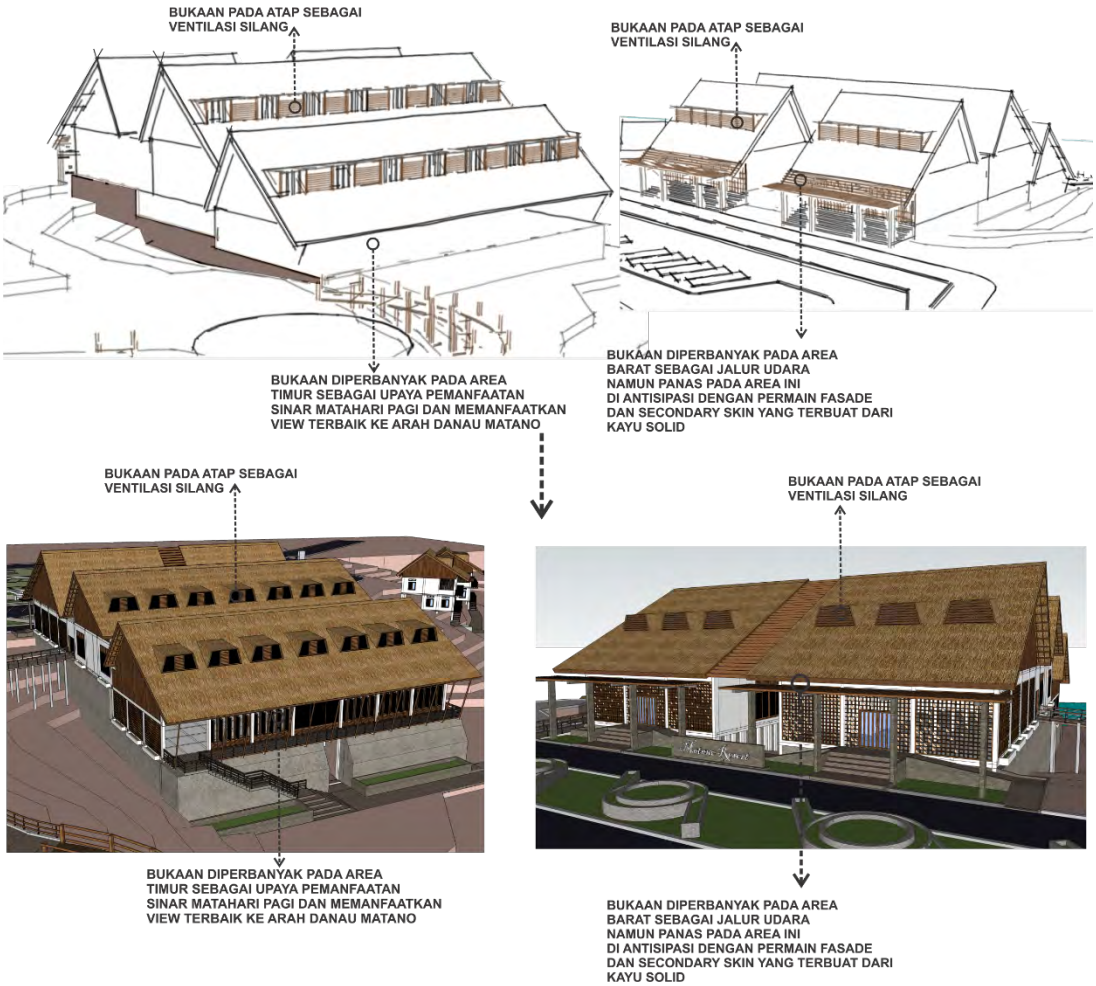

Figure 3. The utilization strategy on natural energy for building illumination and ventilation

3.4. Water

Water efficiency more emphasize on the reuse of rainwater utilization for operational resort. Reservoir system provides a reservation for the rainwater. Reservoir tanks is dark painting to obstruct the growth of algae, enclose, the ventilation is like a filter, and easy to clean (if use for a clean water system). The water Reservoir tank material is from concrete and clay. The reservoir container material is from Fiberglass Reinforced Plastics (FRP) which available in various form and dimension. The reservoir tank or storage is the most important component for rainwater system and usually is the most expensive system. Reservoir water tank located as close as possible to the rainwater splash area and the dimension calculation is based on the requirement, rainfall frequency, wide surface, budget, and aesthetic (see figure 4). The tank position to the rainfall area and filter in accordance with the water current and important to maximize the water collection. Therefore, some strategic location selected for reservoir tank and along with the characteristic of the location as describe in figure below.

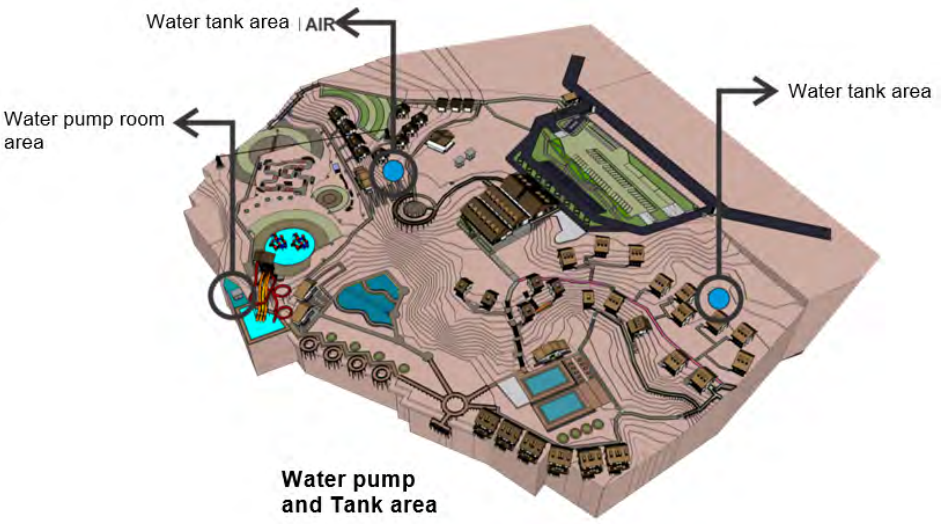

Figure 4. Location of water tank positioning

According to the allocation of various room requirement to optimize the resort function, two water tanks should be able provided up to 150,000 liters with consumer standard needs is 10-15 Liters/person/day. The water tank characteristic is communal or center. The water will distribute through the pipe with water pump support.

3.5. Materials

According to design approach that emphasize the green building concept and design with nature, the material selection priority on the green material. The green material is not only for environmental sustainability, but more efficient and energy saving based on the long-term estimation cost aspect. Green material selection includes the aspect of technology and application. According to the aspect of technology, material selection avoids the toxic contain material and the production is compatible with the nature. Wooden material application is appropriate with the quantity and availability of material in the nature. As long as the site plan area has abundance wood resources then wood utilization still appropriate for the construction process. Moreover, in the utilization aspect, green material selection like is transparent glass material will generate more reflection of the natural sunlight. Wooden is in accordance with the requirement and avoiding produce a residual material.

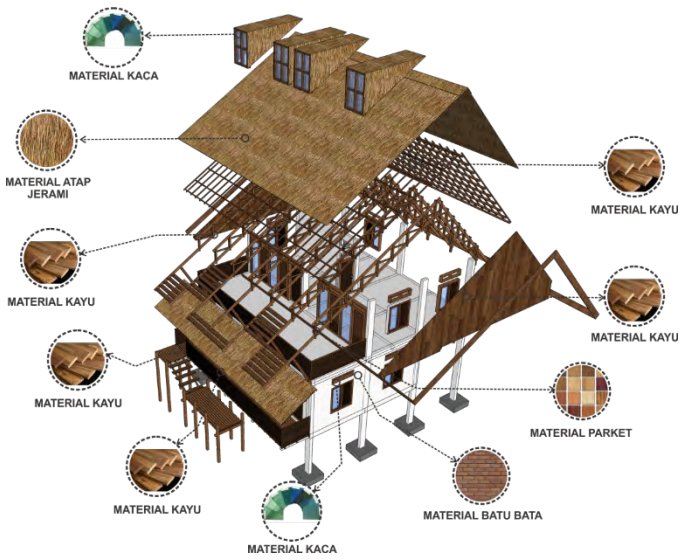

Figure 5. Building material

Most of the material in building resort is used natural material, such as wood, stone, and straw. Moreover, the glass material implemented on the building window. The purlin roof and lath, terrace, and the upper wall is wooden material and the main wall is brick wall.

4. Conclusions

Green building with nature concept is one of the effort for sustainability development. The formulation process considers on the harmony of the nature and physical and non-physical design component to avoiding a natural destruction because of the development in the lakeside resort area. The government has make an exclusive regulation for waterfront area as critical consideration in the development of coastal area. Benefit in the application of green building with nature concept in the Matano lakeside area is a preservation in East Luwu local architecture. Principally, the concept practices a natural synergy that create a local wisdom with green building concept.

Implementation of green building with nature concept component includes the composition of built-up and non built-up area where the area function are the reforestation and playground area. The building material, secondary skin is the obstacle from a direct sunlight into the building. The utilization of rainwater is to support resort activity around the Matano lakeside area. The function of recreation activity with natural interaction concept present the visitor to enjoy the vegetation landscape view and Matano lake with playground, swimming pool, and field area facilities. As a result, green building with nature concept principles are structure design efficiency, energy, water and material efficiency. These efficiencies have been applied in the design of Matano lake lakeside resort.

5. Acknowledgments

Authors would like to show our gratitude to the Architectural Engineering laboratory staff, Faculty of Science and Technology Alauddin Islamic State University, for sharing their pearls of wisdom with us during the course of this research.

6. References

1. Dinas Kebudayaan dan Kepariwisataan Provinsi Sulawesi Selatan [South Sulawesi Culture and Tourism Office]. (2016). Analisa Data Kunjungan Wisatawan (Nusantara dan Mancanegara) [Data Analysis in Tourist Visit (Local and International)] 2015-2016.

2. Dinas Kebudayaan dan Pariwisata Luwu Timur [East Luwu Culture and Tourism Office]. (2016). Mengenali Potensi Budaya dan Pariwisata Luwu Timur [Introduction on Culture and Tourism East Luwu Potency].

3. Frick, H., and Mulyani TH. (2016). Arsitektur Ekologi (Seri Arsitektur ekologis 2) [Eco-Architecture (2nd Series of Eco-Architecture)], Yogyakarta: Kanisius.

4. Frick, H., and Suskiyanto, FX Bambang. (2007). Dasar – Dasar Eko- Arsitektur (Seri Arsitektur ekologis 1) [Architecture Fundamental (1st Eeco-Architecture Series)], Yogyakarta: Kanisius.

5. Hildayanti, A., Shirly W., & Suriana L.T.. (2012). Review Procedures For Building Housing And Settlement With The Concept Of Green River Flowing River Pampang Area Makassar City.

6. Kementrian Lingkungan Hidup Republik Indonesia [Minisitry of Environmental of Indonesia]. (2014). Gerakan Penyelamatan Danau Matano (Germadan or A movement to Save The Mantano Lake) Matano.

7. Neufert, E. (2000). Data Arsitek Jilid 1 [Architect Data 1st Volume]. Jakarta: Erlangga.

8. Neufert, E. (2002). Data Arsitek Jilid 2 [Architect Data 2st Volume]. Jakarta: Erlangga.

9. Prihambudi, A. (2010). Resort Dikawasan Wisata Kota Batu Dengan Tema Green Architecture [Resort in Kota Batu tourism Area with Green Architecture Theme], Undergraduate Thesis in FTS ITN Malang. Available in *(https://www.scribd.com/doc/214634640/Skripsi-ARID-PRIHAMBUDI-Resort-Di-Batu-Dengan-Tema-Green Architecture),* accessed on 3 March 2017, 20.17.

10. Safrilia, A. (2013). Perancangan Resort Dengan Penerapan Prinsip Ekologi Di Pulau Menjangan Kecil Karimunjawa [Resort Design in Application of Ecology Principle in Menjangan Kecil Karimunjawa Island], *Article in FT Brawijaya University Malang. Available in (http://arsitektur.ub.ac.id/wp-content/uploads/2013/10/JURNAL-ILMIAH12.pdf)*, accessed on 20 April 2017, 21.10.

11. Sahabuddin, W. (2019). The Design of Space Based on Architectural Geometry. International Journal of Engineering & Technology (9) pg. 571-576, Science Publishing Corporation

7. Appendix A

A.1. Specification of Room Requirement and Dimension in the Matano lakeside resort design

In this appendix we present the collecting data used for Specification of Room Requirement and Dimension in the Matano lakeside resort design.

Table 1. Requirement and Room Dimension

Room	Quantity	Capacity	Standard (m^2)	Area (m^2)	Source
Management					
General Manager Room	1	5	4.4	22 m^2	Tss
Assistant General Manager Room	1	4	3.1	12.4 m^2	Tss
Manager Room	1	4	2	8 m^2	Da
Management Staff Room	1	4	2.3	9.2 m^2	Hpd
Financial Manager Room	1	3	3	9 m^2	Da
Financial Staff Room	1	8	2.3	18.4 m^2	Da
Marketing Manager Room	1	3	2.3	6.9 m^2	Tss
Marketing Staff Room	1	3	2.3	6.9 m^2	Hpd
Meeting Room	1	9	2	18 m^2	Hpd
Pantry and Locker	1	7	1.2	8.4 m^2	Ap
Toilet	1	5	2.25	33.75 m^2	Da
Subtotal	3			144.55 m^2	
20% for Circulation				28.91 m^2	
Total				173.46 m^2	

Room	Quantity	Capacity	Standard (m^2)	Area (m^2)	Source
Hunian Resort					
Type A Resort occupation					
Guest Room	1		9	9 m^2	Ap

Continued on next page

Table 2 continued

Family Room	1		9	9 m^2	Ap
Master Bedroom	1		12	12 m^2	Ap
Pantry	1		5	5 m^2	Ap
Wash Stand	1	1	0.64	0.64 m^2	Stui
Bathroom	1	1	2.25	2.25 m^2	Da
Subtotal	20			757.8 m^2	
20% for circulation				151.56 m^2	
Total				909.36 m^2	
Type B Resort Occupation					
Guest Room	1		9	9 m^2	Ap
Family Room	1		15	15 m^2	Ap
Master Bedroom	1		16	16 m^2	Ap
Children Bedroom	1		9	9 m^2	Ap
Pantry	1		5	5 m^2	Ap
Wash Stand	1	1	0.64	0.64 m^2	Stui
Bathroom	1	1	2.25	2.25 m^2	Da
Subtotal	11			625.79 m^2	
20% for Circulation				125.158 m^2	
Total				750.948 m^2	
Type C Resort Occupation					
Guest Room	1		15	15 m^2	Ap
Private Room	1		15	15 m^2	Ap
Family Room	1		12	12 m^2	Ap
Master Bedroom	1		25	25 m^2	Ap
Children Bedroom	1		20	20 m^2	Ap
Pantry	1		9	9 m^2	Ap
Wash Stand	1	1	0.64	0.64 m^2	Stui
Bathroom	1	1	2.25	2.25 m^2	Da
Subtotal	6			327.84 m^2	
20% for Circulation				65.568 m^2	
Total				330.09 m^2	
				1990.398 m^2	

Room	Quantity	Capacity	Standard (m^2)	Area (m^2)	Source
Entrance					
Lobby	1	40	0.9	36 m^2	Bpds
Receptionist	1	2	0.9	1.8 m^2	Bpds
Locker	1	3	0.882	2.646 m^2	Nad
Book Keeper	1	1	0.02	0.02 m^2	Hpd
Wash Stand	4	1	0.64	2.56 m^2	Stui
Bathroom	1	1	2.25	2.25 m^2	Nad
Subtotal				45.276 m^2	
20% for Circulation				9.0552 m^2	
Total				54.3312 m^2	

Room	Quantity	Capacity	Standard (m^2)	Area (m^2)	Source
Service					
Cashier	1	4	2.75 m^2	11 m^2	Nad
Restaurant	1	150	2.5 m^2	375 m^2	Nad
Cafe	1	30	2.5 m^2	75 m^2	Nad
Staff Room	1	20	2.25 m^2	45 m^2	Nad
Kitchen	1	10	4 m^2	40 m^2	Nad
Kitchen and Washing room	2	4	0.2 m^2	1.6 m^2	Tss
Food Storage	32	1	0.1 m^2	3.2 m^2	Hpd
Drinking Storage	2	1	0.18 m^2	0.36 m^2	Nad
Freezer Storage	1		7.5 m^2	7.5 m^2	Ap
Serving Room	1	32	0.32 m^2	10.24 m^2	Nad
Laundry	1		16 m^2	16 m^2	Tss
Cleaning Room	1		25 m^2	25 m^2	Ap
Office Boy Room	1		18 m^2	18 m^2	Ap
Staff Resort Room	1		30 m^2	30 m^2	Ap
Parking Staff Room	1		8 m^2	8m^2	Ap
Gardening Room	1		8 m^2	8 m^2	Ap
Gardening Storage Room	1		4 m^2	4 m^2	Ap
Locker	1	10	0.882 m^2	8.82 m^2	Nad
Parking Gate	3	1	1 m^2	3 m^2	Nad
Toilet	1	1	2.25 m^2	2.25 m^2	Nad
Wash Stand	1	1	0.64 m^2	0.64 m^2	Stui
Subtotal				675.93 m^2	
20% for Circulation				135.186	
Total				811.116	

Room	Quantity	Capacity	Standard (m^2)	Area (m^2)	Source
M.E.P Staff Room					
Electrical Room	1	3	1.5	4.5 m^2	Ap
Engineering Room	1	3	0.8	2.4 m^2	Ap
Genset Room	1		25	25 m^2	Ap
Toilet	2	1	2.25	4.5 m^2	Da
Subtotal				36.4 m^2	
20% for Circulation				7.28 m^2	
Total				43.68 m^2	

Room	Quantity	Capacity	Standard (m^2)	Area (m^2)	Source
Entertainment and Recreation					
Children Swimming Pool	2		200	400 m^2	Ap
Adult Swimming Pool	2		500	1000 m^2	Ap
Water Park	1		400	400 m^2	Nad

Continued on next page

Table 6 continued

Outboud Area	1		5000	5000 m^2	Ap
Visitor Locker	1	100	0.882	88.2 m^2	Ap
Dressing Room	10	1	1.25	12.5 m^2	Nad
Toilet	10	1	2.25	22.5 m^2	Nad
Rinse Room	10	1	2.25	22.5 m^2	Nad
Subtotal				6945.7 m^2	
20% for Circulation				1389.14 m^2	
Total				8334.84 m^2	

Room	Quantity	Capacity	Standard (m^2)	Area (m^2)	Source
Management, Staff and Costumer					
Musallah	1	40	1.008	40.32 m^2	Da
Toilet	4	1	2.25	9 m^2	Da
Storage	1	1	25	25 m^2	Ap
Subtotal				74.32 m^2	
20% for Circulation				14.864 m^2	
Total				89.184 m^2	

Room	Quantity	Capacity	Standard (m^2)	Area (m^2)	Source
Security Guard					
Head of Security	1	2	5	10 m^2	Ap
Security Staff Room	1	4	5	20 m^2	Ap
Security Post	4	2	2	16 m^2	Ap
Locker	1	6	2	12 m^2	Ap
Toilet	1	1	2.25	2.25 m^2	Da
Subtotal				60.25 m^2	
20% for Circulation				12.05 m^2	
Total				72.3 m^2	

Room		Quantity	Capacity	Standard (m^2)	Area (m^2)	Source
Parking Area						
Parking Area	Car	29		5.5 X 2.4	348 m^2	Da
	Motorcycle	72		2.2	158.4 m^2	Da
	Bus	3		12	86.4 m^2	Da
	Speedboat	6		7.25	33.3 m^2	Da
Subtotal					592.8 m^2	m^2
50 % for Circulation					296.4 m^2	m^2
Total					889.2 m^2	m^2

Room	Area (m^2)
Total of Building Area	

Continued on next page

Table 10 continued

Management	173.46 m^2
Resort Occupation	1990.398 m^2
Entrance	54.3312 m^2
Service	811.116 m^2
M.E Staff	43.68 m^2
Entertainment and Recreation	8334.84 m^2
Management, Staff, and Consumer	89.184 m^2
Security Guard	72.3 m^2
Parking Area	889.2 m^2
Total	
Remarks	
D.A	Data Arsitek [Architecture Data] (Neufert, 2000; Neufert, 2002)
T.S.S	*Time Saver Standar For Building Types*
A.P	Asumsi Pribadi [Personal Opinion]