

The Conceptual Design of Recycled Micro-Library in RW 9 Kelurahan Merjosari - Malang

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Keywords:

common space,
green,
micro-library,
participatory,
recycled

ABSTRACT

The conceptual design of the recycled micro-library in RW 9 Kelurahan Merjosari is a part of ongoing partnership with the residents of RW 9 Kelurahan Merjosari. Library's existence is expected to be a common space for residents, especially children, to interact and learn collectively. The design method used on this research is the design process method starting from the assimilation stage, general study, development, and communication. This micro-library design applies a recycled design principle for the selection of its materials and main structure, and it is in line with sustainable landscape concept in macro context. Additionally, the design acts as a public generator by providing participatory space for its users by applying a green wall that can be assembled and developed as needed. The main green wall is made through a re-use of plastic bottles with green plants insertion. Light steel, hollow and recycled teak pallets are used for the main structure, panels, and furniture.

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INTRODUCTION

Residential neighborhood in RW 9 Kelurahan Merjosari has a lot of potentials on its public space development. With highly active residents in various cultural and social activities, yet it has a limited space and facilities to make it happen and evolve further. Therefore, the urgently need to develop more usable and good public space is evident especially with many vacant open space in several spots that located in the middle of settlement, riverbanks, green space, also median streets. One of many ideas to build this vacant space is the design of micro-library. Library itself has a purpose of fulfilling people awareness regarding information and knowledge through reading habit, thus the built of library should be able to reach out all regions and groups (Rahma, et.al 2015). The existence of a library in the middle of settlement is needed due to lowest literacy rate of Indonesian including youth (Surangga, 2017; Yunus, 2018). Based on the social cultural indicator 2012-2018 issued by Central Bureau of Statistics (BPS) reading habit for resident more than ten years old is lower than watching television (BPS, 2018).

Currently, the building of micro-library is starting to be a new trend in many places in Indonesia. It offers a good design and new look for classical library that could be compact and flexible within a

limited space. The trend was started in Bandung, Indonesia after the local government decided to build 100 micro-library in Bandung partnering SHAU (Architecture Studio) (Bürklein, 2017). The motivation behind this initiation is to level up Indonesian literacy index even in remote areas across Indonesia. As we know that lot of cities in Indonesia suffered a land scarcity that makes us to be more creative and innovative to utilize it (Zhu, 2015).

The presence of a reading area in the form of micro-library in RW 9 Kelurahan Merjosari is intended as a means of gathering for residents, especially children and adolescents, besides that this space is expected to be able to increase reading interest and people's knowledge in the future. On the other hand, the presence of a micro-library with a recycling concept also aims to provide awareness of good and sustainable waste processing so that it can impact the community as a whole, especially in managing waste into useful recycled products.

METHODS

The research used is a qualitative descriptive approach that was aiming to elaborate the relationship between variables and research substances. The analysis is done by collecting literature data from wide references and previous study on similar topics, then it is followed by a design process method based on RIBA Design Process Work Map (2005). This method allows designer to deliver better and depth design solutions by following set of design processes from start to end (Lawson, 2005). The design process consisted of four phases as shown below:

First Phase: Assimilation

The Assimilation phase is an accumulation containing general and specific information related to the problem at hand. This research seeks primary information and data in RW9 Kelurahan Merjosari. The location is precisely within the scope of Joyogrand Residential boundaries.

Second Phase: General Studies

General studies are an investigation of the character of the problem, and also possible solutions that can later be applied to product design ideas. The main used studies here came from the series of micro-housing designed by SHAU to dig in some micro-library characters to be further developed again. Also, the study related to recycling material is employed to fulfill green design principles to the design.

Third Phase: Development

It is the development of ideas or the process of modifying tentative solutions that have previously been obtained in general studies. The study was conducted through the use of Computer Aided Design (CAD) by using Sketch-Up program to see possible alternative design for the micro-library.

Phase Four: Communication

It is the process of communicating solution ideas to parties outside the design team to get feedback. This research is a part of on-going partnership with residents in RW 9 Kelurahan Merjosari that previously produced a study related to the use of green space as public park and the Joyogrand's traditional playground.

RESULT AND DISCUSSION

Library's site locatean is located in the Taman Merah Kampung Pelangi designed area in the Joyogrand RW 9 Settlement, Kelurahan Merjosari, Malang City. The existing site is one of the public open space facilities owned by the housing complex, but so far it has not been utilized and managed properly. The location is adjacent to UNIGA Housing on the west side, residents' houses on the east side, the river on the south side and residents on the north side. The site's location is also close to the Al-Ikhlas Mosque and the Multipurpose Building on the north side. The following is an overview of the existing site conditions.

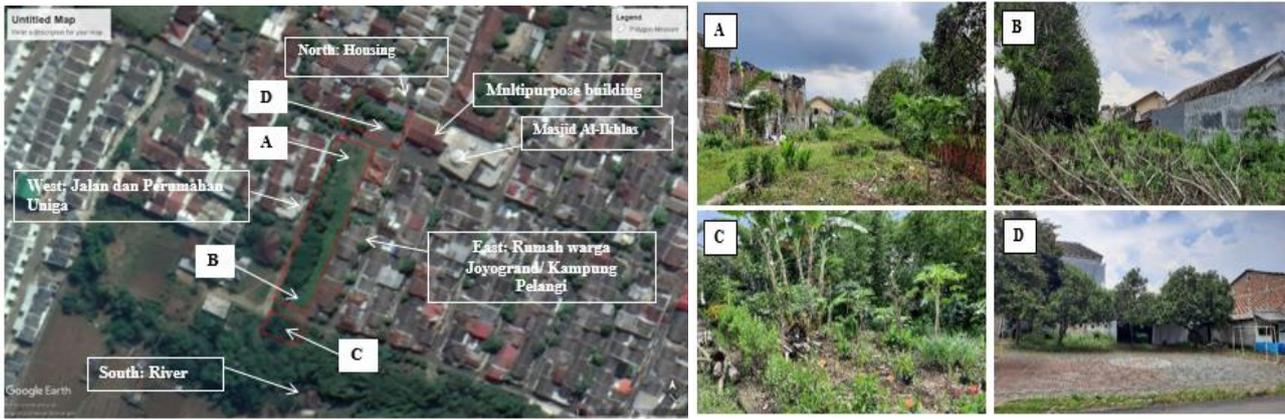


Figure 1. Site Location

Figure 1.A is the north side of the land in the center which is projected as the main entrance area of the park, and Figure 1.B is the site condition in the south. The contours of the site are relatively flat and empty without vegetation in the middle of the land. It needs processing on the east side of the border which is directly adjacent to the walls of the residents' houses to make it look more attractive. Figure 1.C is an area of land on the south side is expected to be a productive cultivation zone, where some residents plant medicinal plants or cooking spices, as well as fruits such as bananas and papayas. Figure D on the north side will be used as as a children's play ground area and a sports arena. This area can then be used as a parking area for vehicles, by moving the play area to the central land area. The land area is quite large, so it is necessary to divide land zoning according to the needs and activities of residents.

Based on the zoning of the Taman Merah Kampung Pelangi designed area facilities, site zoning is divided into 6 main zoning, namely, economic zoning, supporting zoning, general zoning, educational zoning, sports zoning, and cultivation zoning. The proposed library located in zone four with educational zoning that includes library, kindergarten, and playground facilities. The library area has ± 120 sqm space, thus it should be built in a micro-size library. Based on SHAU's micro-library projects Warak Kayu, Hanging Garden, Selasar, Helicoid, Taman Lansia, Taman Bima, and Fibonacci the size of micro-library ranging from 80 sqm to 200 sqm (SHAU, 2020).

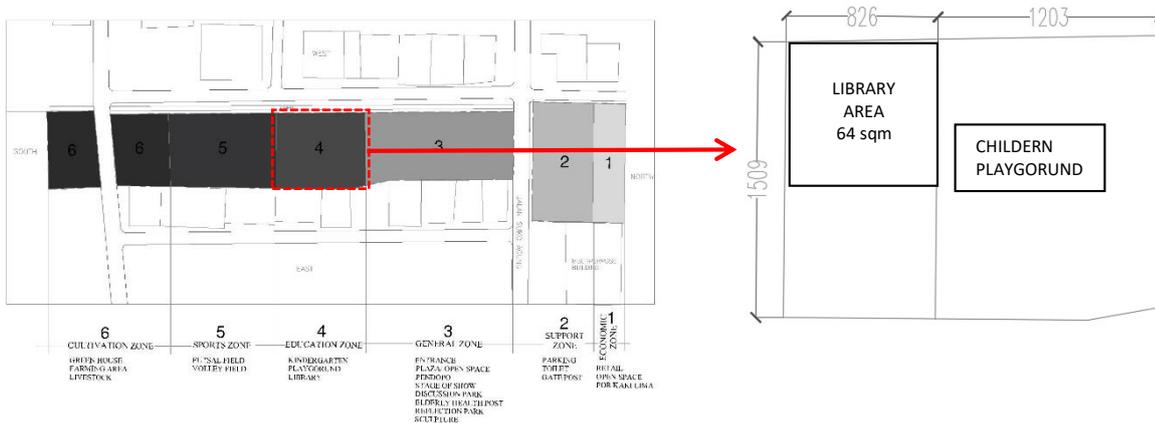


Figure 2. Zoning Concept and Site Details

.The micro-library area is a small part of the design of the Taman Merah Kampung Pelangi which applies the concept of sustainable landscaping (Hamka, et.al, 2020). Thus, this micro-library will be deepening into more micro scale towards the design concept. Dedicated site for this micro library is ± 120 sqm, by proposing ± 64 sqm for main building, it is still allowing left over space as an outdoor reading area and it is connected with bigger children playground area on the right side.

Table 1. Indicator of Sustainable Landscape

Criteria of Sustainable Landscape	Indicator
Environmental	Availability of green open spaces, maintaining water and air quality, flora and fauna, productive land use, determining land use functions, using environmentally friendly materials, saving energy
Economic	Agricultural and livestock cultivation, tourism development, entrepreneurship / investment / employment
Social-culture	Education, health, scientific experience, cultural identity / local wisdom, spaces for social interaction, group or individual collaboration
Architectural	Provides a space and place experience of an attractive visual quality and a comfortable environment
Institutional	Policy, participation and commitment of all parties

Based on the identification of users or groups of residents, the micro-library facilities will be used by the storytelling and reading groups from PAUD Bunga Cempaka and SD Negeri 5 Merjosari as well as residents in the RW 9 environment. Therefore, as a place to gather, it should be useful to be a library as its main function, and give a value to the neighborhoods in wider area. During our third and fourth way of designing which are development and communication phases, the library should be able to act as a generator (Katoppo, et. al , 2014) that contributes and inspires everyone. Green design aspect appeared as the final theme that could be embedded to the design result, in particular how the design could accommodate the spirit of reducing, reuse, and recycle. There are three hierarchical levels of recycling according to its benefits, namely Re-use, which is the highest level in recycling, works by reusing items that have been used before but still have a remaining life; Recycle, re-using material with a specific treatment beforehand; and latest Energy recover by burning it to obtain potential energy that is still present through combustion process (Berge, 2010). The main purpose of recycling is to extend the useful life of an object or material. The longer use of building materials or possibility to be reused, the less likely the building materials will cause rubbish and debris to pollution and damage our environment. Based on the sustainable landscape criteria, the micro-library design compile some of design criteria as shown below:

Table 2. Indicator of Sustainable Landscape in Micro-Library Design

Facility	Design Criteria	Sustainable Landscape Criteria				
		Environment	Economy	Social-cultural	Architectural	Institutional
Micro-Library	Serves as a space to level up children's literacy and knowledge, it has a mission to be a generator of green habit			✓		✓
	In the form of a semi-closed library (integrated with the early childhood education area) to store a collection of reading books and open in the form of a reading garden and fairy tale performances				✓	
	Room / place quality: Shady under the tree (addition of trees), with an attractive design for children and public. Materials: combine with recycled materials and use natural colors. Plus the use of economic value plants that are easy to care for and dismantle.	✓	✓		✓	

Regarding to the recycling agenda, the micro design library in RW9 Kelurahan Merjosari accommodates building materials principals'ecology starting from reuse, recycle, to energy efficiency. However, the design also accommodates the guideline from Greenship assessment of new building criteria version 1.2 for the energy efficiency aspect (GBCI, 2013). Even, the building is less than 2500 sqm, the two categories out of six is still relevant as a complimentary when we design a building with a green theme. Thus, energy efficiency will be added further based on criteria of

Energy Efficiency and Conservation (EEC) and Material Resources and Cycle (MRC) taken from GBCI guideline.

Table 3. Ecology of Building Materials Applications

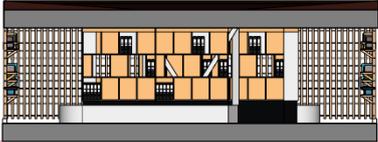
NO	Propose Design	Reference	Aspect	Information
1			Re-Use	<p>The design acts as public generator by providing participatory space for its users through the application of a green wall that can be assembled and developed as needed. The main green wall is made through a re-use of plastic waste with the green plants insertion.</p>
2			Recycle	<p>Recycled teak pallets as wall panel and facade, bookshelves also movable chair outside indoor area. It is categorized as recycle because it needs some treatments to make it ready to be used. The material is easily founded nearby, and it could be applied without difficulty.</p>
3			Energy Efficiency & MRC	<p>Light steel is a new material that is increasingly in demand, this material can be made with various expanses, when it is designed properly, it could be stronger and safer than wooden, this material is more durable, does not eat fire, the material properties are light and easy to assemble, moreover it could be reuse again as long as it is still in good condition. Also, the use of unfinished concrete creates a natural vibe while at the same time lowering additional finishing cost.</p>



Figure 3. Micro-Library Design

CONCLUSION

The conceptual design of micro library in RW 9 Kelurahan Merjosari is an effort to deliver a good design of reading area on limited space. Micro library design is starting to become an alternative in many places in Indonesia to provide shared reading areas on limited land, and minimum funds, maintain maximum architectural and functional quality. The design process work map can help designers to present excellent and contextual character of micro library design ideas. In the micro library design at RW 9 Kelurahan Merjosari, green characters and thematic are presented in the design to obtain the generator effect that could contribute to environmental enhancement in this area. By applying the principles of reuse, recycling and energy efficiency, the micro library design in RW 9 Kelurahan Merjosari is expected to become a generator for environmental and behavior improvement, especially reading habits for children. The concept of reuse is applied by using used bottles with plants insertion. These used bottles can later be filled through resident's active participation, so that everyone can contribute to greening this micro library. As a filler, the application of this used bottle can be removed and dismantled easily. The recycle concept is represented by reprocessing used teak pallets into wall panels, bookshelves and movable chairs. The energy efficient concept is presented by selecting structural materials like light steel, hollow steel and unfinished concrete floor. The choice of this material is intended to facilitate the application, mobilization and speed of construction. This material is also expected to be able to present a modern impression at a reasonable price, and it could be in harmony with the surrounding building context.

REFERENCES

- Berge, B. (2010). *The Ecology of Building Materials, 2nd Edition*. London: Taylor&Francis.
- BPS. (2018). *Indikator Sosial Budaya*. Retrieved December 21, 2020, from <https://www.bps.go.id/indikator/27/103/1/indikator-sosial-budaya.html>:
- Bürklein, C. (2017). *Bima, the micro-library by SHAU in Indonesia*. Retrieved from <https://www.floorature.com/blog/bima-micro-library-shau-indonesia-13036/>
- GBCI. (2013). *GreenShip For New Building Ver 1.2*. Jakarta: Green Building Council Indonesia.
- Hamka; Winarni, Sri; Widarthara, Adhi;. (2020). Study of Sustainable Landscape Criteria in Order to Green Open Space Planning for Settlements in RW9 Kelurahan Merjosari-Malang. *ESE International Journal*, 13-22. Retrieved from <http://journal.greenvisioneers.or.id/index.php/ESE/article/view/86/52>
- Jieming Zhu, H. A. (2015). Formal land rights versus informal land rights: Governance for sustainable urbanization in the Jakarta metropolitan region, Indonesia,. *Land Use Policy*, 43, 63-73. doi:<https://doi.org/10.1016/j.landusepol.2014.10.016>.
- Katoppo, M., Oppusungu, R., Valencia, P., & Triyadi, S. (2014). DESIGN AS GENERATOR (DAG): AN ARCHITECTURAL APPROACH FOR EMPOWERING COMMUNITY. *DIMENSI*, 85-94. doi:<https://doi.org/10.9744/dimensi.41.2.85-94>
- Lawson, B. (2005). *How Designers Think*. Oxford: Architectural Press.
- Rahma, N. M., Pratiwi, N. R., & V.A, N. L. (2015). STRATEGI PENINGKATAN MINAT BACA ANAK (Studi pada Ruang Baca Anak Perpustakaan Umum dan Arsip Daerah Kota Malang). *Jurnal Administrasi Publik (JAP)*, 763-769.
- SHAU. (2020). *Project Micro-Library*. Retrieved from <http://www.shau.nl/en/project>
- Suragangga, I. M. (2017). MENDIDIK LEWAT LITERASI UNTUK PENDIDIKAN BERKUALITAS. *Jurnal Penjaminan Mutu*, 154-163.
- Yunus, A. (2018). *Pembelajaran Literasi Strategi Meningkatkan Kemampuan Literasi Matematika, Sains, Membaca dan Menulis*. Jakarta: Bumi Aksara.