

Study of Sustainable Landscape Criteria in Order to Green Open Space Planning for Settlements in RW 9 Kelurahan Merjosari – Malang

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ABSTRACT

The green space in urban areas is the problem of its own for the speedy development. However, in our neighbourhood housing complex of RW 9 Kelurahan Merjosari has housing facilities of empty land that could be used as active and productive space. The purpose of the study is to find recommendation which relates to the development of sustainable green space benefiting the citizens. The methodology used is a qualitative method based on a literature study of sustainable landscape criteria; (environment, economic, social and culture, architectural, and institutional). The results show that the environmental criteria, the physical qualities need to be increased. The economy can be increased by production activities such as productive plant cultivation and thematic space tourism development. The architectural planning for the gardens and environmental landmark can give space and attractive place experience. It also involves all social housing in our neighbourhood RW.9 Kelurahan Merjosari.

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INTRODUCTION

Residential neighbourhood Joyogrand RW 9 Kelurahan Merjosari has the potential to public facilities lowland empty enough. Some of the empty land was used as green space and the open communal space for residents to socialize. Some people used the land to plant herbal plants and vegetables. Food innovation products of carbohydrate substitute from yellow pumpkin grown by residents was once got second best award from the government of Malang in the Menu Creation Competition of food sustainability agenda, and got the top 10 of Thematic Village 2016 in the concept of park neighborhood in RW 09 Kelurahan Merjosari. The citizens in RW 9 are also active in social cultural activities such as cultural art parade conducted by singosongo art group. In addition, also has the PKK (local woman association), the environment enthusiast, the residents who are experts in the fields of agriculture, communication and economic society, so it is important to be part of the settlement of the environment quality and oriented on sustainable landscape.

The context of this continuous landscape aimed at identifying and mapping the physical condition / non-physical environment settlement of RW 9 Kelurahan Merjosari public facilities and to create conditions in the form of an open space well-ordered and sustainable research needs to be done to assess all the criteria for sustainable landscape. The result of the study can be used as the data for developing plans a master plan for landscape environment settlement, especially in the use of vacant land in accordance with the social and cultural condition of the local residents. This study is expected to be able to know potential and weakness of the people of social and physical environment settlement related to the criteria for sustainable landscape architecture. Therefore, the settlement RW 9 Kelurahan Merjosari has the character of physical and non-physical difference with other areas.

Sustainable landscape

Based on etymology, landscape derived from an ancient German; the land and scapjan (form), a system thorough land that is part of the surface of the earth. Therein is the relation between components (biotic living things), abiotik physical (earth), and influence human life (artifact), with all their natural and artificial appearances visually (Simonds, 2006). Based on sustainability analysis and study of history, sustainable landscape expressed as one of the base of the process, fundamental sustainability as an exclamatory to minimize the impact to the natural environment. The first process is merely to the aspect of environmental sustainability. Therefore, the sustainable paradigm appears based on the concerns about the resources and the decrease of man environmental quality. The second phase, environmental issues had a setback so economy can be interpreted as the concept of sustainability. Although it environment issues keep its position as the sustainability, regardless the importance of another dimension, cultural social and economy and even institutional dimensions (Dinep & Schwab, 2010)

Sustainable landscape is the comprehensive process that integrates 4 dimensions process by means of most ecological by the sustainability of nature and man. To reach sustainable landscape ecologically, the landscape structures have to support ecology, social and economic process necessary while maintaining institutional requirements to provide better biodiversity for the present and future generations (Opdam et al., 2006).

According to the development of a sustainable landscape (Çiftçioğlu and Sözen, 2017), having five pillars of sustainable landscapes, the ecological (green space, the quality of water and air of flora and fauna), economic (tourism and agricultural products), social and cultural (education, health, natural experience, local wisdom, participation, and cultural identity), esthetic (visual experience and quality), and politic (policies and implementation capacity), of which those five pillar potential indicators applied in the north west frontier sustainable landscape in Nort Cyprus. The planning aspect of sustainable landscape that needs to be considered (Uniatty, 2011). Environmental aspects, of land use, economic and employment sustainable, people participation, energy conservation, environmental development, aesthetic development, regulations, and comfortable living environment.

One of the principles of sustainable landscape can be found on the concept of healing garden in city parks which aimed to improve the public health. The dimensions principle of sustainable landscape used to analyze the concept is as follows, social dimensions (an aesthetic value, lighting efficiency, social and spiritual satisfaction), environmental dimensions (healthy land, damaged land rehabilitation, flexible material, being careful on water use, keep wildlife , reduce the use of the artificial surface, consider the local climate condition), economic dimension (economic ability , aware of the cost of energy), institutional dimensions (involving all parties, sustainability treatment) (Hesham, 2013).

Approach landscape sustainability used as the concept of the development of sustainable city environment, namely the sustainability of ecological (development runs in harmony with the proceedings ecological biodiversity/ the diversity living things conservation and protection natural resources), the sustainability of economy (development efficient and competitive economically). Construction also take into account the needs of the generation that will come and the sustainability of social (development increase control individual on the lives of their respective. The results of development distributed equally and the sustainability of culture (development in harmony with the concept of culture everyone involved in it) (Benson, John and Roe, 2000).

Sustainable landscapes will meet all the needs of the local in harmony (for example to ensure water supplies for households, agricultural land business entities and wildlife; biodiversity for

pollinating plants; local food security and income). The food security objectives targeted, and individual households through improving food availability, independently to improve nutrition so people will be healthy and productive (Suharyanto, 2011). Sustainability city are suggested to minimize consumption of space and resources, to optimize the urban to facilitate the urbanization, to protect ecosystems and human health, to ensure equal access to a source of power and services and to maintain cultural and social diversity and integrity. Urban interpretation sustainability is generally consistent with six elements of the sustainable landscape, namely environment, economy, equality, aesthetic, experience, and ethics (Messeidy, 2017).

The following part of key indicators that illustrate the sustainable landscapes on the development of a region, namely to increase the physical qualities landscape through conservation and new infrastructure procurement, economic dimension through the increase in the number of visitors, generating revenue the development of entrepreneurial, investment and competitiveness, tourism social and cultural dimension through the development of relationships and network collaboration, the local potential development, local policy and planning (Simsek, 2017). The process to realize sustainable landscapes need to illustration approach the landscape with their five major attributes, namely geographical area and place an area for targeting the implementation of sustainability), social collaboration (in social collaboration between residents), commitment to and understanding of sustainability (commitment shared together to realize the aspect of the sustainability), ecological knowledge production (knowledge of ecological environment), and sharing (shared knowledge and experience) (Axelsson et al, 2011).

Criteria of sustainable landscape

Based on the results of research before relating to sustainable, landscape found several criteria to discuss sustainable landscape. Of the overall reference found that the main criterion used sustainable landscape is the aspect of environmental, the economic aspect, and social culture aspects. Then added several aspects such as an architectural aesthetic, institutional and also the previous experiences and knowledge. The following table criteria for sustainable landscape will be examined in settlement RW 9 Kelurahan Merjosari as a basis for planning and managing the vacant land as public open space for residents of RW 9 Kelurahan Merjosari.

Table 1. Criteria of sustainable landscape

Criteria of Sustainable Landscape	Dinep & Schwab, 2010	Opdam et al., 2006	Çiftçiöğlü and Sözen, 2017	Uniarty, 2011	Hesham, 2013	Benson, John and Roe, 2000	Suharyanto, 2011	Messeidy, 2017	Simsek, 2017	Axelsson et al, 2011
Environmental/ ecological	√	√	√	√	√	√	√	√	√	√
Green Room			√							
Maintain water and air quality			√				√	√		
Maintain flora and fauna			√		√		√	√		
Utilization of productive land				√			√			
Environmental comfort				√						
Healthy land / rehabilitation of damaged land					√					
Local material					√					
Care about water use					√					
Reducing the use of hard surfaces					√					
Take into account local climatic conditions					√					
Preservation / Conservation and protection of natural resources				√		√		√	√	
Increasing the physical quality of the environment									√	
Determination of land use functions										√
Sharing ecological knowledge										√
Economic	√	√	√	√	√	√	√	√	√	√
Agricultural product			√							
Tourism development and increasing the number of visitors			√						√	
Economic capability					√					

Energy cost savings					√					
Efficiency						√				
The needs of future generations						√				
Entrepreneurship / investment / employment			√				√		√	
Social-Cultural	√	√	√	√	√	√	√	√	√	√
Education			√							
Health / Community healthy and productive			√							
Natural experience			√					√		
Identity of local wisdom / local culture			√			√		√		
Participation and cooperation			√	√						√
Social and spiritual satisfaction					√					
The results of development are enjoyed equally / equitably						√		√		
Relationship and collaboration / partner development							√		√	
Esthetic/ Architectural			√	√	√			√	√	
Experience space and place			√							
Aesthetic value and visual quality			√		√				√	
Environmental aesthetic development				√						
Institutional/ politic			√	√	√					√
Policy / regulation			√	√						
Implementation capability			√							
The involvement and commitment of all parties					√					√
Continuous care					√					

Source: Author's analysis results (2020)

Based on the previous discussions relating to sustainable landscape, there were some criteria to discuss about sustainable landscape. The major sustainable landscape criteria were environment/ecology, economic, and social culture. Some criteria were added such as aesthetic relating with the quality of visual the environment and institutional criteria is that related to the involvement of stakeholders or stakeholders who were related to. Therefore, it can be concluded that there are 5 primary criteria namely environmental criteria, economic, socio-cultural, architectural/aesthetic, and institutional.

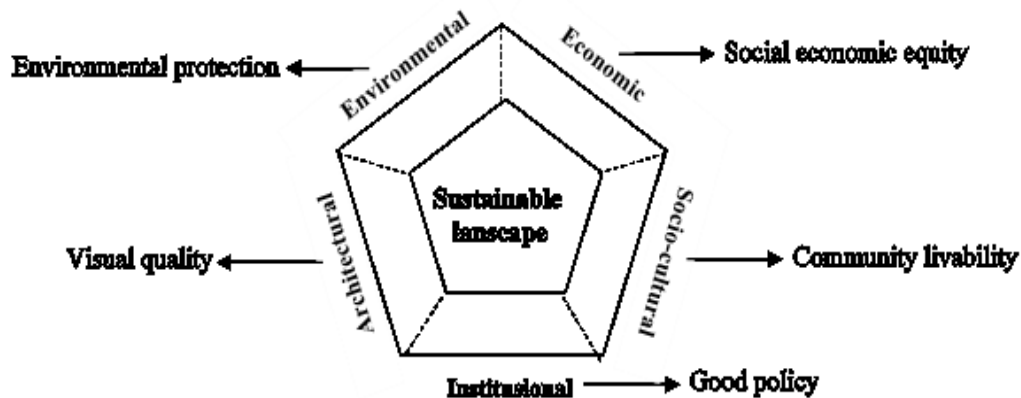


Figure 1. Criteria of sustainable landscape (source: analysis results, 2020)

Landscape architecture

Landscape architecture having 4 principle of the study and the first is, the landscape as construction three-dimensional outlining, visual manifestation of open space, surface sails and volume and to do in terms of structural organization (for example, balance, tension, rhythm, the proportion, scale) and principles of the arrangement (for example, axis, symmetry, hierarchy, datum transformation). Second, landscape as history: express character of location not just geographically but also, historical character, social, and aesthetics. Third, landscape as a continuum scale: this principle as regards landscape relational structure linking the scale and spatial, entity, ecological

functional and social. Fourth, landscape as the process: landscape considered as a system holistic and dynamic, (Nijhuis, 2013).

The role of landscape architecture in urban areas is arranging the open space in accord with its visual environment, form and to create a human character inside the design. While the role of landscape architect in helping to solve society oldest problems on the urban shall be based on social and cultural landscape that is understanding and transforming the culture of the people in the utilization of open space into the needs of open space, predicts that the need of the future, without eliminate the old character. The ecology environment aspect namely providing an alternative input related to the rearranging of open space, fundamental climate understanding, and protect ecosystem biodiversity in the environment. Engineering aspects of landscapes (landscape engineering) that is lighting, the mechanical, electrical, aquascape (water landscape), hardscape, softscape (of plants / vegetation) (Hakim, 2012).

Green Open space

Green open space is still one of the main problems found in cities. Law No.26 concerning Spatial Planning Article 17 Paragraph 5 of 2007 mandates that 30% of the city area is in the form of green open space, 20% is public green open space and 10% is private green open space. Local governments carry out various programs to realize the mandate of this law. For example, the Malang City Government and the private sector have implemented a park and urban forest revitalization program, the output of which is a thematic park. The results of the revitalization of the park have an impact, namely a reduction in the area of green open space due to the addition of public facilities in the park area, and a positive impact in terms of the visual image of the area (Wikantiyoso, & Tutuko, 2019).

Arrangement of plants on vacant land has ecological, architectural, socio-cultural and economic functions (Sulistyanto, 2014), namely; Ecological function: green open space can contribute to improving the quality of the environment, ground water, preventing flooding, and reducing air pollution; Socio-Cultural function: green open space can play a role in creating space for social interaction, recreational facilities and regional landmarks; Architectural function: green open space is expected to increase the beauty and comfort value of the area; Economic function: green open space is expected to play a role in developing urban green tourism facilities, thereby attracting tourists to visit an area.

Green open space according to Permen PU No. 5 of 2008, is an area of land extending or in groups, open in nature, where plants grow naturally or are intentionally planted. One type of green open space found in urban areas is a residential and residential area park. This park is a park with a smaller classification and is intended for limited recreational needs for communities around residential settlements. Serves as the lungs of the city, noise cancellation, visual aesthetic, interaction area, recreation, playground, and creates a comfortable environment (Permendagri No.1 of 2007 concerning Planning of Green Open Spaces in Urban Areas).

METHODS

The method used in this research is qualitative method. This research is a study of the criteria for a sustainable landscape found in the Joyogrand housing environment, in order to organize green open spaces in the neighborhood of RW 9 Kelurahan Merjosari. The first step is to conduct a literature review of the criteria for sustainable landscapes that will be used as the discussion variable. Based on the literature review, 5 criteria for sustainable landscapes were found, namely environmental, economic, socio-cultural, aesthetic/ architectural, and institutional criteria. The second step is to identify/ field observations related to the five criteria, to look for potentials and weaknesses in each criterion. The third step is to analyze the data from field observations based on 5 criteria for sustainable landscapes. The fourth step, concludes the results of the analysis and provides recommendations for sustainable landscape criteria towards the direction of planning and developing green open spaces as residential neighborhood parks in Joyogrand RW 9, Kelurahan Merjosari .

RESULT AND DISCUSSION

Kelurahan Merjosari is one of the areas in Lowokwaru District, Malang City, which is located in the western part of Malang City with a distance of ± 5 km from the city center of Malang. Geographically it is located at the coordinates 1120 06 ' - 1120 07' East Longitude and 70 06 ' - 80

02' South Latitude. The location of the research is precisely within the scope of the Joyogrand Housing boundaries which are administratively included in the neighborhood of RW 9, Kelurahan Merjosari. The choice of the scope of the Joyogrand Housing area which is in the administrative area of RW 9 as the location of the object of research was motivated by various things, namely; a). is the center of activity (social, cultural, educational and religious) in RW 9, b) most of the RTs located in the neighborhood of RW 9 Perumahan Joyogrand, c) environmental conditions that have many public facilities in the form of green open spaces that can be developed towards sustainable landscape), d) area RW 9 Perumahan Joyogrand is one form of thematic village which is named as Kampung Pelangi, e). residents of RW 9 Perumahan Joyogrand are active in art activities, competitions, and economic activities such as the Sunday market). The residents have diverse educational backgrounds, so that later they can be empowered for the development of a residential environment that applies the principles of sustainable landscapes.

Environmental criteria

The object of research has several open spaces scattered over several points, where the location of the open space can represent the existence of RT (Rukun Warga). The open space includes open space in the middle of a settlement, open space on the riverbank, open space in the form of a roadside and open space in the form of a road island/ traffic island. Each has a different shape and size and topography, but the existence of this open space has not been utilized optimally according to its designation, so that the condition seems neglected and unproductive. The following are the potential for public facilities for green open space in RW 9 Joyogrand Housing, Kelurahan Merjosari.

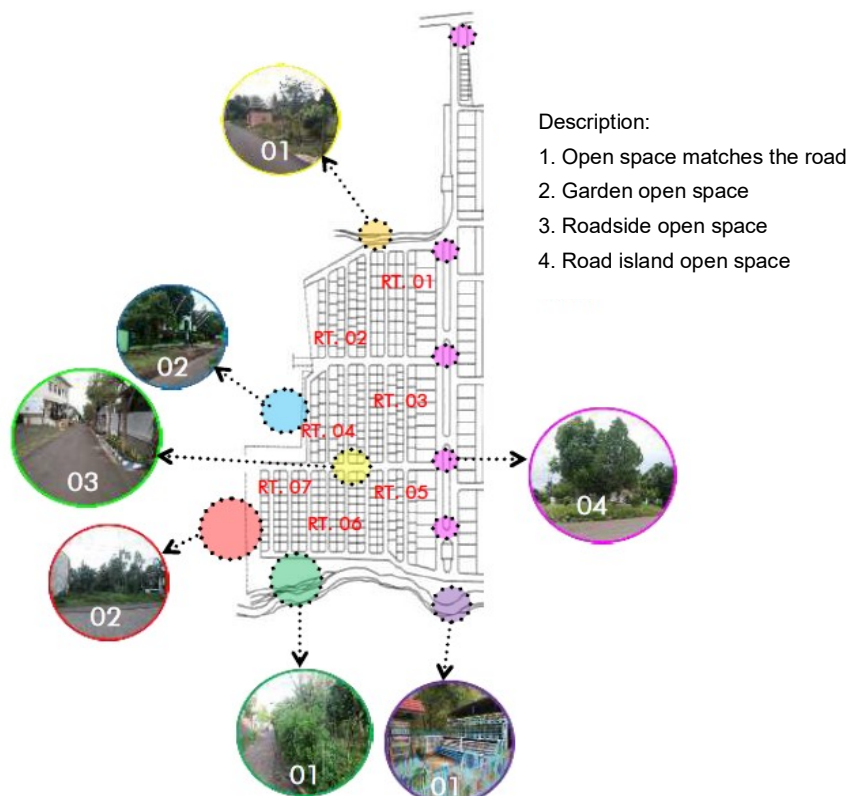


Figure 2. Green open space distribution map (source: survey results, 2020)

The map of the distribution of green open space found in RW9 Joyogrand Housing as showed in Figure 2 has a large enough land potential to be used as green open space/ productive land, as well as communal space for residents by applying sustainable landscape principles which in the future can be developed towards tourism of the Rainbow Village/ Kampung Pelangi. The condition of water quality is still fully using PDAM, there is no independent water management. Greening through tree planting is one of the ways that has been taken so that the environmental ecosystem

runs in balance. Some of the vacant land has been used by residents for farming, but these activities are not sustainable, so it needs a land management that involves various parties.



Figure 3. The condition of the open space (source: survey results, 2020)

In general, the environmental criteria for landscape architecture have not been applied. Thus, it is necessary to further organize and utilize green open space that takes into account ecological knowledge, determination of land functions, improving the physical quality of the environment, protecting natural resources, reducing the use of hard surfaces, using local materials, utilizing productive land, reusing used materials and handling household waste into compost products so as not to pollute the environment.

Economic criteria

The main economic activities of residents of RW 9 Joyogrand Housing, Kelurahan Merjosari are very diverse. In terms of economic criteria, none of them meet the criteria for sustainable landscapes, but it can be considered that the main land use becomes productive land. The results can be used jointly by residents as a form of community independence and food security. In addition, the land products can also be processed into food commodities which are managed through a community business unit or a type of cooperative. The second is through tourism development, this has been initiated by the residents through the thematic village program in the form of the Kampung Pelangi, but the development of the thematic village has not been running optimally. The development of productive land is used as a way to increase the economic capacity of residents and also to maintain environmental quality through the diversity of plant species on the land. Biodiversity in land can improve soil fertility and water quality and maintain wild fauna habitat. Tourism is one of the goals that residents want through Kampung Pelangi village tourism. The results of the commodity of productive land products can be used as souvenirs in tourism activities for people who will later visit Kampung Pelangi. Sustainable tourism initiatives such as ecotourism, agro-culture, household tourism / settlement that provide education and tourism benefits for residents are the things to develop in the area. The amount of income and types of work generated from tourism activities can be used as indicators of economic benefits obtained from the tourism sector at both the general public and household levels.

Socio-cultural criteria

Area RW.09 Kelurahan Merjosari is administratively divided into 10 (ten) RT. RT. 01 to RT. 09 are in 1 (one) area while RT. 10 are outside the area. RW. 09 Kelurahan Merjosari especially RT. 01 - 09 which is in 1 area, has a total of 448 households and a population of 1156 people. RT. 01

consists of 39 families with a population of 126 people, RT. 02 consists of 51 families with a population of 135 people, RT. 03 consists of 69 families with a population of 233 people, RT. 04 consists of 57 families with a population of 191 people, RT. 05. consists of 51 families with a population of 182 people, RT. 06. consists of 51 families with a population of 184 people, RT. 07. consists of 51 families with a population of 171 people, RT. 08. consists of 41 families with a population of 175 people, RT. 09. Consisting of 19 families with a population of 116 people. For more details, see the following table:

Table 2. Population composition of residents of RW 9 Kelurahan Merjosari

Criteria	Number of people
Based on gender	
Female	781
Male	735
Based on age	
>60	86
41-60	421
25-40	306
20-24	264
16-19	122
13-15	75
7-12	123
5-6	50
0-4	69

Source: Survey results (2020)

Demographic data on the population of residents show that the ratio of numbers based on sex shows a balanced number. The development of a sustainable residential landscape area will have to pay attention to and provide a place for activities based on the age of the residents in the form of activities such as a playground for children, a place for developing talent for youth, communal space for adults, parents and the elderly. RW. 09 Kelurahan Merjosari is a new settlement, so that all residents are immigrants, both from outside the city, outside the region or from outside the island who are socially, economically and culturally very heterogeneous. Residents of RW 09 Kelurahan Merjosari 95% are Muslims while the rest are other religions, namely Christian, Catholic and Hindu. RW. 09 Kelurahan Merjosari is one of the RWs in Merjosari Village, Lowokwaru District, Malang City, whose residents come from various regions with various socio-cultural backgrounds. In the development of the RW 9 community is able to actualize oneself in social communication which is manifested in socio-cultural activities carried out by the community by mutual agreement. The socio-cultural activities cover various types according to talents and interests and are carried out by various age levels. Starting from an early age to the elderly, these socio-cultural activities are as follows:

Table 3. Socio-cultural activities of the residents of RW 9, Merjosari Village

Activities	Organizer / group
early childhood education	POS PAUD Cempaka
Empowerment of family welfare by women	Kelompok PKK RW 9
Sunday recitation routine	Taman Pendidikan Al-Quran Masjid Al-Ikhlas
Religious activities once a month	Waqiah Indonesia
Sports and arts	Karang Taruna "Singosongo"
integrated healthcare center, the elderly	RW 9
Healthy gymnastics	Lansia community (Karangwreda)
Clean and care for the environment	Kader lingkungan

Source: Survey results (2020)

Social and cultural activities are manifested in general and spiritual education activities, community empowerment, sports and health in the form of providing integrated healthcare center and healthy gymnastics for the elderly. However, these activities still do not have sufficient space to carry out activities. So far, they have taken turns when they conduct activities in the multipurpose building. So it is necessary to use one of the vacant land as a garden with the function of communal space to accommodate these activities. Socio-cultural activities are a way of life that is built by a group of people or communities that are passed down from one generation to another which shows participation, natural experiences, local identity and self-satisfaction and togetherness. It is

necessary to group the existing socio-cultural resources in the community, for example handicrafts / arts and traditional knowledge as citizens' identities, as has been implemented by the Singosongo group through sports and arts activities. This socio-cultural activity will later be able to support tourism programs which will result in an increase in the economy of local resident.

Architectural criteria

Architectural criteria relate to aesthetic visualization that can influence the observer's perception of the experience of the space and place he has visited. This visual quality depends on economic, socio-cultural factors, and knowledge of the perception and condition of the landscape. The experience of a space and a place is the pleasure of individuals or groups about the characteristics of a place or landscape. Therefore, it is necessary to improve the visual and aesthetic quality of the existing residential neighborhood of RW 9 Joyogrand Housing and create a garden design that has character and is able to provide an interesting space and place experience for visitors. Aesthetic experiences can also be provided through increasing individual knowledge and awareness about the structure and function of the landscape, local wisdom knowledge, heritage sites, sacred sites and cultural centers that can help us measure the level of 'sense of place' of an area.

Things that need to be considered by residents of the research object are improving the visual quality of the existing environment by improving existing environmental facilities and making architectural markers such as the main gate to the object and gates at the main access to the housing. Designing garden landscapes from existing vacant land facilities by applying thematic designs that have stories that match the concept of Kampung Pelangi, so that the garden landscape design can provide valuable experience and knowledge for residents and visitors.

Institutional criteria

RW. 09 Kelurahan Merjosari has several community social institutions under the auspices of the Government, such as RW., RT., PKK., Dasawisma, PAUD Cempaka, Kader Lingkungan, Singosongo Youth Organization (Karangtaruna), Elderly Group (Karangwreda), as well as those formed based on community agreement, including are Jamaah Tahlil, Recitation of Mothers, Waqiah Indonesia, Youth Mosque, Al-Quran Education Park, Badminton group, Fairy Tale Group, Reading Group, Ethnic Music Group etc. These institutions or groups can support each other in compiling the program together by involving the active participation of the whole community. Starting from the making of a master plan for the development of tourism in residential areas and the design of the landscape of utilizing empty land facilities into productive land, plans for development and environmental management, plans for increasing economic activities starting from preparation, production, marketing, plans for socio-cultural and educational activities, as well as fundraising to government institutions and the private sector for the realization of a residential area RW 9 Joyogrand Housing that is sustainable in terms of sustainable landscape criteria.

The following are things that can be done to create a sustainable green open space, namely: determining the type of activity container based on the group of community activities, the potential and needs of the community as well as the needs of the area in general, optimizing the role and capacity of the community and assistance in implementing activities, division of tasks and management authority, maintaining the percentage of green open space and optimizing its benefits as an active green open space, maximizing local potential as the preservation of local wisdom, and planning a green open space design that applies the principles, criteria of architecture and sustainable landscapes together with planners and assistants and involves citizen participation.

CONCLUSION

In general, residents of RW 9 Joyogrand Housing, Kelurahan Merjosari have a Kampung Pelangi thematic village program in order to create a village tourism in Malang City, one of which is by utilizing the existing vacant land facilities in the housing to become an active and productive green open space. It was found that there are open spaces along the road/ border road, garden open spaces, roadside open spaces, and road island/ traffic island open spaces. However, the proposed design concept only touches the socio-cultural and architectural criteria, has not considered the sustainability aspect. Here are some things that need to be done to create green open spaces that apply sustainable landscape criteria in planning green open spaces in the neighborhood of RW 09 Joyogrand Housing, Kelurahan Merjosari, namely, improving environmental quality through planting

a variety of vegetation (ecosystem function plants and productive functions / plant cultivation can produce to realize independence and security food) by utilizing existing vacant land, utilizing productive plant products and developing open space parks with tourism functions as a way to improve the residents' economy, recording the socio-cultural activities that exist within the community both in the form of physical and knowledge prepared a place for activities that are more adequate and can serve as a tourist attraction, planning marker spots, parks, and landscape features to provide an experience of space and place that is attractive to visitors and residents, and take advantage of n community organizations and groups that exist within the community to jointly plan and develop the potential for green open space. In addition, it can also take advantage of the potential of individual residents who have expertise including as planners or architects, agricultural experts, visual communication experts, or potential students in the RW 9. The involvement of all parties is the key to realizing environmental sustainability, economic, socio-cultural, architectural and institutional in the neighborhood of RW 9 Perumahan Joyogrand, Kelurahan Merjosari.

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