The landscape design of Karawang Islamic center based on Islamic garden

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Abstract. Karawang is the capital as well as the town center of Karawang Regency. As the capital and the town center, it requires public spaces with functional and aesthetic values that reflect and accommodate the town's social characteristics. As a city where most of the population is Muslim, it requires adequate space for worship and public space. The local government can develop the worship and public space from the existing Islamic Center in the township. Islamic Center Karawang is an Islamic Center that has long been built and is located in the township of Karawang. The Islamic Center Karawang consists of a collection of supporting buildings in various fields and the landscape itself. The landscape at the Islamic Center Karawang requires a good landscape design to accommodate visitors' needs and has a good aesthetic value. This study aims to identify the landscape's character at the Islamic Center Karawang, analyze the potential and constraints on the Islamic Center Karawang landscape, and design the landscape of the Islamic Center Karawang. The concept of Islamic garden is adopted from depicting the beauty of heaven in the Quran to a landscape character. The method used in this research is the method of field activities, which includes direct site surveys, interviews with stakeholders and visitors, and filling out questionnaires to visitors. This study's results are in concept diagrams, schematic designs, and Islamic Center Karawang designs. Concept diagrams include basic concepts, design concepts, and development concepts. The schematic design consists of a block plan and a phased scenario. The design output of the Islamic Center Karawang includes site plan, planting plan, section, detail, and design illustrations. The result is the design of a garden that can be enjoyed optimally by the five senses of humans. It can influence humans and definite sharia rules or boundaries regarding elements, characters, and activities in an Islamic garden.

Keywords: cultural landscape, landscape planning, tourism, weaving tradition

1. Introduction
Karawang is a city located in West Java Province, Indonesia. It has approximately 1,737.30 km\textsuperscript{2}, with 2,125,234 people and a density of 1,223 people per km\textsuperscript{2}. The population is getting increasing. Hence it makes the density of the population in Karawang is getting higher as well. The majority of the population is Muslim. As a city where most of the population is Muslim, it requires adequate space for worship and public space.

The Islamic Center Karawang is a place of worship and an important place that reflects Islamic development in the Karawang Regency and has various functions. The landscape at the Karawang Islamic Center. Karawang requires a good landscape design to accommodate the needs of visitors. The current Karawang Islamic Center landscape problems are untidy arrangement, hot climate, not optimal in accommodating visitors' needs, and the lack of landscape elements on the site.

This study aims to identify the landscape's character at the Karawang Islamic Center, analyze the potential and constraints on the Islamic Center Karawang landscape, and design
the Karawang Islamic Center landscape. This study's benefit is as an input of the Karawang Islamic Center landscape design and as a reference of Islamic center landscape design with garden-based Islamic landscape design.

2. Methods

2.1. Study site and period
This research was conducted in the Karawang Islamic Center, in the Karawang Regency, West Java (Figure 1), from October 2019 until March 2020.

![Research site](image1)

Figure 1 Research site
(a) Map of West Java, (b) Map of West Karawang Sub-District, (c) Map of Karangpawitan Village, (d) Karawang Islamic Center Complex

2.2. Research methods
The method used in this design research [1] are: 1. Site inventory (Table 1): (a) site observations; (b) interview; (c) study literature from book/journals of reference and articles; 2. Analysis: Analyzing the inventory data results is done through various methods, such as descriptive, qualitative, spatial, and tabulation methods; 3. Synthesis: The potential and amenities can be developed further in their utilization, while the solutions of the constraints and danger signals can be found; 4. Concept: (a) concept of space; (b) concept of circulation, (c) concept of facilities, and utilities; (d) concept of vegetation; 5. Design: (a) block plan; (b) site plan; (c) section drawing; (d) illustrations; (e) detailed drawings.
Table 1 Data used in the study

| No | Aspects and type of data            | Form of Data   | Data Source  | Obtain          |
|----|------------------------------------|----------------|--------------|-----------------|
| 1  | Physical and biophysical           |                |              |                 |
|    | a. Location and site boundary      | Map            | Primary      | Inventory       |
|    | b. Accessibility and circulation   | Map            | Primary      | Inventory       |
|    | c. Type of soil                    | Map/description| Secondary    | Study Literature|
|    | d. Hydrology                       | Map/description| Secondary    | Study Literature|
|    | e. Topography                      | Map/description| Secondary    | Study Literature|
|    | f. Climate                         | Map/description| Secondary    | Study Literature|
|    | g. Vegetation and animals          | Map/description| Primary      | Inventory       |
|    | h. Visual                          | Map/description| Primary      | Inventory       |
| 2  | Socio-cultural                     |                |              |                 |
|    | a. Social circumstances            | Tabular/description| Primary | Interview       |
|    | b. Users                           | Tabular/description| Primary | Interview/questionnaire |
|    | c. Activity and intensity          | Tabular/description| Primary | Interview/questionnaire |
| 3  | History                            |                |              |                 |
|    | a. Historical aspects              | Tabular/description| Secondary | Interview       |
| 4  | Institutional                      |                |              |                 |
|    | a. Institutional structure         | Tabular/description| Secondary | Interview       |

3. Result and discussion

3.1. Physical and biophysical aspect

3.1.1. Location and site boundary
The Islamic Center Karawang complex is located on General Ahmad Yani street No. 10, Karangpawitan Village, West Karawang District, Karawang Regency, West Java. It is located in a strategic location in Karawang City's heart and takes a vital role in disseminating Islam in Karawang Regency. Physically, the Islamic Center Karawang complex is bordered by Jenderal Ahmad Yani Street and RA Kartini Street. It is connected by Karangpawitan Field, Hotel Omega, and Karawang Public Health Center to the north. In the east, it is bordered by PT Jasa Raharja Karawang and commercial areas. In the south, it is bordered by community settlements, commercial areas, and Permata Ruby Hotel. In The west, it is bordered by commercial spaces and community settlements.

3.1.2. Accessibility and circulation
The Islamic Center Karawang Complex Access can be reached by using public transportation, private vehicle, or on foot. The Karawang Islamic Center complex is facing forward the main road with a provincial road status, Jenderal Ahmad Yani Street, Karangpawitan. The road consists of two lanes which plant bound as a road media. There is a pedestrian lane on the road's outer side with 6m width on each street. There are two accesses to the Karawang Islamic Center Complex, the main gate for vehicles and another gate for pedestrians.

3.1.3. Type of soil
The Karawang Islamic Center complex is located in West Karawang District, and the type of soil in the complex refers to the land data in West Karawang District. Karawang Regency has 3 types of soil, alluvial land is in the north, Mediterranean Land is in the east, and latosol
land is in the southern part of Karawang Regency. The type of soil in West Karawang District is an alluvial soil type [2]. Alluvial soil is formed from river sediment. Alluvial soil/sediment is formed from river mud that settles in the lowlands with fertile soil properties and is suitable for agricultural land. Alluvial soils are classified as young soils that are formed from fine sediment from river flow. Alluvial soil can be used as agricultural land because of its relatively high nutrient content. Alluvial soils also have a dense soil structure and are classified as clay or sandy loam [3].

3.1.4. Hydrology
Based on direct field observations, the hydrological system for water systems and drainage channels has no problems. The Runoff, which comes from rainwater, is channeled into a closed drainage channel in the form of a sizeable concrete-covered trench outside the Islamic Center of Karawang, then the flow will be directed to an irrigation channel called "Saluran Induk Tarum Utara Cabang Barat" (The Main Channel of West Branch North Tarum) in Karawang, and the channel will flow towards the Citarum River.

3.1.5. Topography
The Islamic Center Karawang Complex is located in West Java's lowlands with elevations mostly below 100 m above sea level. West Karawang District is included in the slope class of 0-2% (Table 2). The land's slope in the Karawang Islamic Center Complex is flat between 0-2% slope [2].

Table 2 The slope of Karawang regency

| Slope  | Sub-distric                                                                 | Large |
|--------|-----------------------------------------------------------------------------|-------|
| 0-2%   | Pakisjaya, Batujaya, Tirtajaya, Cibuaya, Pedes, Jayakerta, Lemahabang, Cilamaya Kulon, Cilamaya Wetan, Kotabar, Banyusari, Jatisari, Tirtamulya, Rengasdengklok, Kutawaluya, Tempuran, Rawamerta, Karawang Barat, Karawang Timur, Majalaya, Telagasari, Purwasari, Cikampek, Sebagian Telukjambe Barat, Telukjambe Timur, Sebagian Klari, Sebagian Tegalwaru, Sebagian Pangkalan, Sebagian Ciampel. | 80.44% |
| 2-15%  | Sebagian Ciampel, Sebagian Tegalwaru, Sebagian Pangkalan, Sebagian Klari, Sebagian Telukjambe, Sebagian Cikampek. | 8.93% |
| 15-40% | Sebagian Tegalwaru, Sebagian Cikampek, Sebagian Klari, Sebagian Telukjambe Barat, Sebagian Pangkalan. | 8.22% |
| >40%   | Sebagian Telukjambe Barat, Sebagian Pangkalan, Sebagian Tegalwaru | 2.95% |

Source: (Central Bureau of Statistics of Karawang Regency 2019)

3.1.6. Climate
Based on the user's questionnaire data, the most dominant deficiency in the Islamic Center Karawang Complex Landscape is the hot climate. The Central Statistics Agency of Karawang Regency is a lowland with an average air temperature of 27°C, air pressure of 0.01 millibar, 66% solar irradiation and 80% relative humidity, and wind velocity between 30-35 km/hour, the average length of blowing is 5-7 hours [2].

The most considerable rainfall occurs in February with 304 mm³ and the lowest rainfall occurs in August, which is 1 mm³. The highest number of rainy days appears in February, which was about 16 days. Whereas Rainfall conditions in West Karawang District, the most considerable rainfall occurred in February, which was 279 mm³ and the lowest rainfall occurred in July - September, which was 0 mm³ [2].

3.1.7. Vegetation and animals
The Karawang Islamic Center Complex vegetation is planted intentionally by humans, in random patterns, clumping together, following garden patterns, and lined up. Vegetation in
the Karawang Islamic Center Complex is planted for various purposes, such as shade, display or beauty, and road guidance. The types of vegetation planted in the Islamic Center Karawang Complex also vary from growth, such as ground cover, shrubs, and trees. The existence of a variety of vegetation in the Karawang Islamic Center Complex attracts animals to live there. Some of the animals found in the Karawang Islamic Center Complex are various kinds of insects and birds.

3.1.8. Visual
The viewpoint of the visual aspect of the Karawang Islamic Center Complex is magnificent of Al-Jihad Karawang Mosque with an octagonal star as its distinctive architectural design. Based on direct field observations, the Karawang Islamic Center Complex Landscape on the north is the main gate of the vehicle, the Karawang Regency Regional Library Building on the west, and the Karawang Islamic Center Building on the eastern part. At the same time, in the south is the old building, the P2TP2A, and Wisma Haji Building. While the outside view of the Islamic Center Karawang Complex Landscape, in the north is the Karangpawitan Field, Omega Hotel, and the commercial area; in the south and west. On the east side is the PT. Raharja Karawang services.

3.2. Social and cultural aspects
The population growth in The Karawang Regency has the same number as Karawang District. The highest population density in Karawang Regency occurs in West Karawang and Klari District. The people religion in Karawang Regency is mostly Islam [2].

The Karawang Islamic Center Management Agency has activity programs, as follows:

1. Education and training sector
   - The Tahfidz Quran training and education
   - Islamic Center Karawang workshop with the Muslim community
2. Dakwah sector
   - The PHBI – Tabligh Akbar
   - Fajr prayer congregation program
3. Socio-cultural sector
   - The week of The Karawang community culture
4. Economics and business sector
   - Food court Islamic Center Karawang Unit
5. Public relations sector
   - Consolidation between elements of society and Islamic mass organizations
   - Journalism Training
6. Facilities and infrastructure sector
   - Cleaning, arranging and renovating the entire area of Islamic Center Karawang
   - Inventory of assets in the Islamic Center Karawang

3.3. Historical aspects
The interview was conducted with Ustadz Endang Muliana, the elder of the Al-Jihad Karawang Mosque and vice chairman of the Al-Jihad Mosque's DKM for the 2017-2022 period. He explained that the land used as the Islamic Center Karawang Complex was rice fields that the government took over. The first building in the Karawang Islamic Center Complex is Masjid Al Jihad Karawang, then that other buildings have been built. The construction of additional buildings took place gradually at different times (Table 3).
### Table 3 The identity of existing buildings in the Karawang Islamic Center Complex

| Name of Building                  | Year of Construction | Function                                                                 |
|----------------------------------|----------------------|--------------------------------------------------------------------------|
| Karawang Islamic Centre Building | The early 2000s       | ● There are rooms used by BAZNAS, SATGAS, Diskominfo Karawang, etc.       |
|                                  |                      | ● A place to hold Islamic events                                         |
|                                  |                      | ● Office of the Karawang Islamic Center Management Agency                |
| Al Jihad Karawang Mosque         | ● 1960: 1st construction | ● Place for prayer, dzikir, reciting the Quran, preach                    |
|                                  | ● 2010: 2nd construction | ● A place to hold Islamic events                                         |
|                                  |                      | ● The DKM Office of Masjid Al Jihad Karawang                             |
| Region Library of the District Karawang | 2010              | ● A place to read books                                                  |
|                                  |                      | ● Where to find book references                                          |
|                                  |                      | ● Book collection place                                                  |
| Multipurpose Hall Building       | 1991                 | ● A place to hold events, such as weddings, circumcisions, seminars, etc. |
| Wisma Haji Building              | 1994                 | ● Temporary residence for prospective pilgrims                          |
| Child Empowerment and Protection Office Building | -               | ● Office for Women’s Empowerment and Child Protection Office            |
| P2TP2A Building                  | -                    | ● Head office for Integrated Service for Women and Children Empowerment |
| MUI Building                     | The early 2000s       | ● Management office of MUI Karawang Islamic Center branch                |
|                                  |                      | ● HMI office of Karawang Islamic Center                                 |

#### 3.4. Institutional aspects
Based on the Regent's Decree Number: 978/Kep.899-Huk/2017 concerning the Management of the Islamic Center Management Agency for the Karawang Regency service period 2017-2022, the Karawang Islamic Center's institutional structure is submitted to the Karawang Islamic Center Management Agency which is responsible to the Regional Government Karawang Regency.

#### 4. Analysis and Synthesis

##### 4.1. Physical and biophysical aspect analysis

#### 4.1.1. Location and site boundary
*The Karawang Islamic Center Complex* has approximately 1.59 hectares or 15,957.21 m² with an open space area of 10,549,703 hectares or 66.11% of the total built-up area of 5,407,503 hectares or 33.89% of the whole area. The open space area larger than the built space in the Karawang Islamic Center Complex should support the existing building spaces, such as being a garden around the building, but this function is not optimal yet. The research questionnaire data to the visitors from different districts to the Karawang Islamic Center Complex visited it as a stopover place for performing prayers only.

#### 4.1.2. Accessibility and circulation
Based on the regulation of the Minister of Public Works Number 03/PRT/M/2014 concerning Guidelines for Planning, Provision, and Utilization of Pedestrian Network Infrastructure and Facilities in Urban Areas, that the main road/access conditions on Jl. Jenderal A. Yani is classified as a good one because it has complete road attributes by
pedestrian facility standards. The circulation analysis map is presented in Figure 2.

4.1.3. Type of soil
*If it is viewed from the main nutrient source characteristics*, alluvial lowland soils generally have a reasonably high mineral content of feldspars [4]. The high mineral content of feldspars affects the productivity of paddy soil because the soil will contain high reserves of Ca and K nutrients. The soil fertility level is maintained in the long term. Based on alluvial lowland soils' chemical characteristics, soils generally have relatively good chemical properties because the formation of the ground occurs in basins or plains, which are areas for material accumulation and deposition. The way to overcome micronutrient deficiencies, both primary and secondary, which is not too obvious, can be done by fertilizing it with fertilization recommendations and applying agricultural lime based on soil test results.

4.1.4. Hydrology
Based on direct field observations, the hydrological system for water systems and drainage channels has no problems. There are no obstacles in the hydrological system and drainage channels on site, such as clogging, water pollution, etc. The hydrological analysis map is presented in Figure 3.

4.1.5. Topography
The existing Islamic Center Karawang Complex state is included in the flat topography category of around 0-2%. A land slope of 1-5% is an ideal land slope category for various spatial functions without the need to face problems in shaping the land face (grading) [5]. However, this land slope category can be related to the hydrological system on the site, and the visual aspect, significantly if the soil type in this land slope category cannot absorb water properly and can cause monotony. One of the efforts that can be made to reduce visual redundancy on a flat site is by changing the atmosphere spatially. It can be formed by using colors on landscape elements, strengthening focal point characters, and adding other components, such as vegetation, walls, and buildings.

4.1.6. Climate
A microclimate is a site-specific climate created from topography, vegetation, openness to the wind, shadow patterns caused by buildings and trees, height from sea level, and site correlation to a large area of water [6]. The research site's temperature is included in the optimal warm comfort class [7]. Karawang Regency has a wind speed class classified as class 4 with moderate wind properties and can fly the paper flying and move the twigs and small branches [8]. The effort to overcome the microclimate problem increases shade vegetation,
creates a pergola or gazebo, and provides a water element that can give a dark atmosphere, control the microclimate, and become comfortable for visitors or users.

### 4.1.7. Vegetation and animals

Analysis of vegetation conditions [5] in the Islamic Center Karawang Complex has the process of vegetation consists of three main things, structural uses, environmental functions (environmental services), and visual functions (visual services). The same size and shape vegetation will create low visual interest compared to various sizes and shapes [5]. Based on direct observations in the field, the animals found in the Islamic Center Karawang Complex are multiple insects and birds. To increase the diversity of animals in the Islamic Center Karawang Complex is by expanding the variety of vegetation to attract animals to come in it. The types of plants in the Quran related to Islamic gardens. There is some consideration the types of plant which can live and be used in the site, such as [9] [10]:

1. As mentioned in the Quran in the Islamic garden
2. Visually resemble what the Quran says in the Islamic garden (habitus, exciting part)
3. Supporting to function and aesthetics

The plants are *Acalypha macrophylla*, *Alpinia purpurata*, *Bougainvillea sp.*, *Cheilocostus globosus*, *Ficus benjamina*, *Ficus carica*, *Ficus elastica sylvie*, *Ficus longifolia*, *Ficus lyrata*, *Ficus nitida*, *Gomphrena globosa*, *Heliconia rostrata*. *Azedarach*, *Phoenix canariensis*, *Phoenix sylvestris*, *Punica granatum*, *Quisqualis indica*, *Senna pendula*, *Spathiphyllum sp.*, *Vitis vinifera*, and *Ziziphus mauritiana*.

### 4.1.8. Visual

A view must be exploited or analyzed because it is a potential site [1]. A picture that could be potential on the site is called a good view. One of the potential good views in the Islamic Center Karawang Complex that can be developed is an octagonal star, the unique/distinctive architectural design of the Al-Jihad Karawang Mosque, the center of the Karawang Islamic Center Complex. The octagonal star is an example of a typical Islamic geometrical pattern and can be developed into the design concept of this study with a geometric line formation. The octagonal star is a pattern resulting from the evolution of Islamic Geometrical Patterns (Figure 4) [11]. The visual analysis map is presented in Figure 5.

![Figure 4](image1.png)  
**Figure 4** Evolution Islamic geometrical patterns

![Figure 5](image2.png)  
**Figure 5** Map of analysis visual

### 4.2. Social and cultural analysis

The research questionnaire results identified that most visitors/respondents know the information related to the Islamic Center Karawang Complex due to the location of the
Islamic Complex. Center Karawang is on the edge of the provincial road Jl. Jend A. Yani and is in the middle of Karawang City. Meanwhile, the length of visits by visitors/respondents who visited the Karawang Islamic Center Complex was 30-60 minutes (40%), 15-30 minutes (30%), > 60 minutes (16.67%), and for < 15 minutes (13.33%).

5. Concept

5.1. Basic concept
The basic concept for Karawang Islamic Center landscape design is "Oasis Garden." This basic concept is obtained based on the problems and potential of the site. The presence of an "Oasis Garden" is a contrasting thing in the hot environment. As a result, "Oasis Garden" is like a heavenly garden in the world that creates comfort and beauty of the human environment; people call it "Paradise" [12]. An example of the basic concept of "Oasis Garden" is applied in the garden of Shazdeh Garden, Iran (Figure 6). The idea of philosophy in the Islamic Center Karawang Complex's landscape design is "The Phase of Human Life." This philosophy was born from the Oasis Garden, which has a meaningful life for humans and other living things in the arid desert. Human life is divided into three (3) phases, the stage in the womb towards birth, the world life, and death.

![Figure 6 The basic concept of "Oasis Garden"](image)

5.2. Design concept
The design concept used is a geometric line that develops an octagonal star as the distinctive design of the Al-Jihad Karawang Mosque. The geometric line design concept originates from this octagonal star found in hot climates like Arabia. Arab countries and other Islamic countries have a distinctive Islamic ornament art called "Arabesque". Geometric lines or straight lines are the characteristic formations of Arabesque. Besides, the octagonal star is a pattern resulting from the evolution of Islamic Geometrical Patterns and then transformed into the design concept (Figure 7) [11].
5.3. Design
Several products are produced at the design stage, including the concept of space, circulation, facilities and utilities, vegetation, block plans, site plans or drawings of site plans, cutouts, illustrations or perspectives, and detailed drawings.

6. Conclusions and suggestions

6.1. Conclusion
The Karawang Islamic Center Complex is also an essential function in developing Islam in Karawang Regency, which has a majority Muslim population. It is a strategic location in the heart of Karawang City, on Jl. General Ahmad Yani No. 10, Kelurahan Karangpawitan, West Karawang District, Karawang Regency makes the Islamic Center Karawang Complex a critical building that can support public activities image of Karawang Regency name. There are various landscape characters in the complex landscape of the Islamic Center Karawang. There are also different kinds of potentials and obstacles in the Islamic Center Karawang Complex that must be exploited and repaired.

6.2. Suggestion
This study can be a consideration and reference in designing the landscape of the Islamic Center Karawang Complex based on an Islamic garden, and can be implemented by the local government of Karawang Regency. However, the number of pools in this design and considering visitor behavior will require extra maintenance so that cleanliness is maintained and has aesthetic value and good comfort value for visitors.

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Attachment

Siteplan