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Study of house orientation and their placement towards sustainable Islamic residential area

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Abstract. Indonesia is a country which exhibits full of dynamic in its physical development. There are existing kampongs, within the city rapid development growth, preserve with their abundant cultural and traditional potentials. Muslim kampongs are one of the traditional settlements embedded with significant Islamic characteristics. Religious or belief factor is one of the issues that determine occupational typology. In traditional society, this is a dominant aspect that signifies their community identity. In this research, the leading indicators include the nature of law, faith in religion and culture, design principal from Sharia law, and social principal. This study aims to investigate the relationship between traditional settlement patterns with religious influences, especially Islam in Indonesia through house orientation and their placement. This paper adopts a content analysis method to achieve the research objective of “Islamic Housing Typology.” From the content analysis, it is discovered that the orientation and house placement has a significant relationship with the Muslim worldview. The existence of mosques and boarding schools are some of the factors forming the orientation of Muslim residential areas. This study enhances the existing literature on the importance of house orientation and their placement in the Muslim residential area.

1. Introduction

Indonesia is the largest Muslim country in the world. It is stated that 15% of the world's Muslims (23% of the world's population or exactly around 1.57 billion people) are in Indonesia. Moreover, 86% of Indonesia's population are Muslims. It illustrates how rapid the process of development of Islam in Indonesia is. It was begun in the eighteenth century by Wali.

Islamic history in Indonesia has left a valuable cultural heritage [1]. There are ancient kingdoms in Indonesia, which embraced Islam as a whole [2]. They have placed Islam in the highest position in managing all aspects of life reflected in their patterns of life and social interaction. It is reflected in the pattern of space, the structure of the masses, as well as the shape of the house and its residential environment. The settlement, as one of the cultural results in the Islamic era, has formed an environmental identity that has enriched the face of the city as a whole. Representation of Muslim settlements is an attempt to describe the spatial pattern of Islamic settlements based on the historical heritage of Islam in Java.

From the background above, researchers need to examine the relationship between traditional settlement patterns and religious influences, especially Islam in Indonesia. These efforts are carried out to foster local character in the design of settlement patterns and accommodate universal Islamic values in building and settlements in Indonesia that are more characteristic and sustainable.



2. Literature Review

Orientation changes the direction of view of a room or building on the environment can be related to cosmos law, social-cultural factors, and religion [3]. In this study, the direction of residential buildings to the road, the cosmos law, and religious elements will be increased. A literature review will be utilized to conduct the process to support the conception of sustainable Islamic settlement. There are related literature about Muslim kampongs in Indonesia and principal of traditional Islamic settlement.

2.1. *Typology muslim kampungs in indonesia*

Urban planning in Indonesia cannot be separated from the role of the Dutch architect, Thomas Karsten [4]. The design structure is one of them. It is grouping settlements based on ethnic groups, like the current situation in Semarang and Malang, where the final structure forms affect the existence of pre-existing settlements. The settlements that took place at that time were in the form of urban kampongs, which were a new design of urban settlements. It could be seen in the urban formation history of Malang, where there was an area devoted to ethnic groups to settle in a city [2]. On numerous settlement groups, there are kampongs inhabited by Muslims majority, which were old kampongs with traditions and religious activities. They are still preserved and maintained, such as Kampung Kauman and Kampung Arab, in cities of Java.

Discussions about Muslim kampung cannot be separated from the settlement. The kampung, as part of the built environment, is one form of settlement. According to communities in Indonesia, the kampung is identical to the 'ndeso,' slum, less organized, and maintaining the area. On the other hand, there are kampung areas that have specific characteristics.

2.2. *The principal of traditional islamic settlement*

Some factors influence the formation of Islamic cities [5]. Also, topography and morphology contribute an impact on city development. The Islamic cities reflect the general socio-cultural, political, and economic structure of the newly formed society. In general, it states that these linkages follow:

- a. Natural laws; the first principle is in the form of adaptation to the shape of buildings and urban planning through climatic conditions. They express the response to weather conditions and topography.
- b. Religious and cultural beliefs, thus giving the mosque a central position in spatial and institutional hierarchies. The cultural belief separates public and private life by splitting spatial rules between usability and territory. The town was designed with narrow streets and cul-de-sac to divide the public and private domains while also considering land use to separate male and female areas. As a result, there are more economic activities in public space and the main road than in residential areas.
- c. Design principles derived from sharia law, the Islamic cities also reflect sharia laws in regulating relations between public and private space, and between neighbor and community group.
- d. Social principles, social groups in the city are usually based on the perspective of common ancestry, ethnicity, and culture. A social forum is needed to bring them together in terms of solidarity, social order, defense, and religious celebrations.

Islamic principles in the built environment based on two approaches [6]. They are named as social approach and physical approach. In a social approach, it is described that the "ummah" includes strong social interactions between neighborhood, family, and individual whereas the physical approach consists of the natural environment, commercial urban environment, residential environment, educational facilities, industry, and the house itself. In a residential or residential environment, there is an inter-residential closeness as an embodiment of the concept of "ummah," which emphasizes the strength of social interaction. Social constraints avoided by eliminating the gap between occupations.

2.3. *Principal sustainable islamic settlement*

The principles underlying design in Islamic architecture as follows [7]:

- a. Function-form Relationship (Architecture that prioritizes function over form)
- b. Respect for Environment (Architecture that respects the environment)
- c. Cleanliness (Maintaining a clean body, occupancy, yard, streets, markets, rivers, and everything)

- d. Comprehensive Excellence (Architecture with all its aspects must realize the idea of overall excellence in Muslims in all situations and their endeavors)
- e. Promoting just social interaction (Architecture that must be promoted and at the same time and be a field of fair social interaction)
- f. "*La darar wa la dirar*" (The principle of the prohibition on harm and repaying death)
- g. Indigenous versus foreign influences (The principle of maintaining authenticity but does not rule out the possibility of receiving influence from outside)

Meanwhile, another researcher argues that there are several sustainability principles and guidelines in the Qur'an, which include [8]:

- a. *Adl* (Justice): regulates the relationship between human and another living thing;
- b. *Mizan* (Balance): regulates not only the social and economic relation of human but also the environment, especially in ensuring the balance of nature, the use of resources and the life cycle of all living things;
- c. *Wasat* (Middleness): Choosing the middle way in economic planning, social behavior, scientific activities, ideological views, material, and water and energy consumption;
- d. *Rahmah* (mercy): regulates all aspects of human relations and the life of all animals, plants, and insects including micro-organisms;
- e. Trust (representation): Humans are considered representatives appointed by the Creator, for all earth assets;
- f. *Taharah* (spiritual purity and physical cleanliness): produces an individual satisfied through spiritual purity, aware of the presence of his / her Creator, which will produce a balanced society, live in harmony with the environment; hygiene that will produce healthy communities without air and water pollution, and produce a clean economy without usury and deceptive marketing techniques and business transactions;
- g. *Haq* (belief and human rights): Trust in all matters that recognized the rights of each living creature (humans, animals, and plants);
- h. *Ilm Nafi'* (usefulness of knowledge and science): Knowledge, whether theological, scientific, or technological, must be beneficial for others (individuals and society), including future generations.

3. Methods

The method in this study is content analysis. Based on this method used, data were gathered through literature with the same theme, about typology architecture, especially in housing orientation and their placement, and traditional Islamic settlement pattern.

4. Discussion

The physical aspect of form a Muslim kampong typology is based on the theory that Muslim cities reflect the socio-cultural, political, and economic structure in general of the newly formed society [5]. In general relates to natural law, the adaptation of buildings to climate influenced by wind direction, the solar orbit, and rain. Building parameters that are influenced by natural law is the form of building orientation and open space. In Indonesia, it is necessary to consider the solar orbit. The solar will do orbit from east to west. It makes the placement towards the house tends to the South or North. This tendency is based on the consideration to avoid direct light to the window or door in the morning and evening which tends to dazzle the eyes. It includes the existence of open space in the house to maximize the incoming light. Subsequently, religion and culture belief in the form of mosques exist as a center of Muslim activity and pesantren as a center of Islamic-based education. The relationship would be seen between public functions in the form of religious and educational activities in settlements with private areas in dwellings by involving the role of kampong street. The factor of Muslims believes that Qiblat as a direction for prayer, both obligatory and sunnah prayers. It reflected in orientation mosque placement. The newly built mosque is located in the middle of residential areas tend to place the mihrab in Qibla so that the entrance is in opposite Qibla. On the other hand, the mosque that was built after the infrastructure was in existence kept put the mihrab in Qibla so that the door facing the mosque could

lead in any orientation, depend on the road. It is regular that the direction of the buildings around it is aligned with the orientation of the mosque.

In addition to the Qibla, in Javanese society, there is generally a belief in putting orientation of building in harmony with North and South axes [9]. It originated from the heyday of the Islamic Mataram kingdom in Central Java. The life of the Sultan or tradition in the palace is considered as one of the sources of tradition in Muslim societies, especially in Central and East Java at that time. The castle as a place of Sultan or King, as a symbol of God's representative on earth (*kalifatullah*), became a reference both physically and spiritually. The tradition is still widely believed by the people today. There are courts that still exist today in Surakarta, Yogyakarta, and C, in which the building orientation tends to adopt the North-South axis. As in the Yogyakarta palace, they consider Mount Merapi on the Northside and the South Sea on the Southside of the palace as corners, so the orientation is North and South. Although there is a case when it is associated with mythology, in principle it turns out that it is in harmony with natural law [10-12].

Design principles derived from sharia law include hijab arrangements [13]. Hijab as a barrier between mahram and non-mahram has implications for the existence of the yard and terrace on Muslim dwelling. The terrace is acted as a transitional space or boundary between outside and inside. On the outside area of the house is considered a non-mahram area, so that the terrace will be designed more accessible for Muslim residents to select guests who come who do not interfere with circulation in front of his house. d. Social principles; social groups in the city usually based on the perspective of heredity similarity, ethnicity, and culture, which is formed by the order in the settlement. In the Muslim group, they have a collective activity that supports their worship, thus impacting the residential arrangements. It can be seen in Muslim residential, such as Kampung Arab and Kampung Kauman, in several cities in Java and Kalimantan. The form of activities such as recitation, *affected*, *tahlil*, *burdah*, which held in mosques and people's homes, affects the layout of the residential space.

5. Conclusion

To conclude, the application of Saoud's principles relate to building orientation and placement in Muslim villages. Based on natural laws and traditions carried out by the community in general in Indonesia and Java in particular. One of the sources of culture related to building orientation is the palace building, which in the past was the center of Islamic government like Keraton Yogyakarta, Keraton Surakarta dan Keraton Cirebon. That the house, besides facing the street, also considers nature as the center of the cosmos, including the Qibla direction in Islam. That the house besides facing the street, also considers nature as the center of the cosmos, including the Qibla direction in Islam.

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