

Understanding the Relationship between Urban Morphology and Behavior Pattern (Case Study : Kampung Arab Malang, Indonesia)

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Abstract- Nowadays, cities in Indonesia have undergone many developments and rapid changes. Growth and development of a city is directly proportional to the socio-cultural, economic and political development. The development is also accompanied by population growth, either by natural or non-natural growth which leads to the formation of the morphological pattern of the city. This phenomenon causes changes in the physical characteristics of the area and may also impact on the behavior pattern that occurs. Accordingly, this research will explore the relationship between two main components of place – physical attributes and activities – and concentrates on the relationship between urban morphology related to people’s behavior patterns. This study uses typology-morphological analysis to appraise urban morphology and qualitative assessment to appraise people’s behavior pattern. The results of this study gained that some aspects of morphology of the area (ie land use, street pattern and building structure) have a direct relationship to the behavioral pattern. While the plot pattern has an indirect relationship to the behavioral pattern.

Index Terms- Behavior Pattern, Ethnic Village, Place Making, Urban Morphology.

I. INTRODUCTION

KAMPUNG Arab Kota Malang is one of the ethnic villages that survive from the colonial era to the present. This village is inhabited by ethnic Arabs with its cultural distinctiveness. There is a very close mutual relationship between the spatial configuration formed by the socio-cultural community [1]. Outdoor spaces allow people to meet planned and unplanned, within the community or outside. These include family relations, cultural groupings, local social connections, and group meetings through same interest. In a specific way, the outdoor spaces physically form as the outer perimeter or urban dwellings, precisely as public spaces. This kind of public spaces varies, by their typology or morphology [2]. Thus, the social character of an environment can be read through the spatial order and vice versa.

The study of ‘urban morphology’ analyzes the physical form by focusing on the patterns of streets, blocks/parcels and

buildings [3]. From these, he derives patterns of movement. Each place has a “unique address” [4]. Without explaining how it becomes identifiable he argued that “physical setting”, “activities” and “meanings” constitute the three basic elements of place identity. Drawing on that statements, places as a realm for “activities”, “physical attributes” and “conceptions” [5] (as shown on Fig. 1).

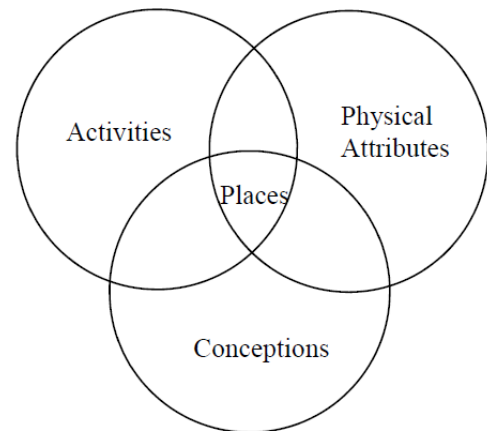


Fig. 1. Basic Elements of Place [5]

Considering theories of place, this study will present its conceptual and theoretical framework based on two main components of a place: physical attributes and activities. The link between these two components of a place has long been evaluated by public space researchers, particularly planners and urban designers. To provide the more clear illustration of the link’s importance, however, researchers must develop an alternative framework for the relationships of the two components of physical settings and activity. Therefore, the set of typologies of the physical features and activities must be refined, and more empirical knowledge of the actual use of the space and the activity-physical patterns relationship must be developed. The principal theories of place introduced above will form the foundation for this exploration. Especially, by considering the theory of place it would be adapted for

placemaking principles [6] through a proposed theoretical framework.

To obtain actual knowledge about the physical setting and behavior patterns relationships and this empirical knowledge in practice, in general, this research focuses on the theories of place and takes advantage of combined methodology including field direct observation and activity mapping. Thus, this thesis draws heavily on classic theoretical works, including the theories of Urban morphology [3] – and the specific theories of place [4] [5] and [6]. In terms of the research methodology, this study draws on a combination of empirical research [7], which is based on field observation and integrated method of activity mapping [8].

Following on from the principal theories and concepts of place, this thesis will contribute to the urban design literature by synthesizing the place theories, adding as well, a practical combined methodology in data collection and analysis. Therefore, this study is an attempt to clarify how physical settings impact people’s activity patterns within the urban public space. Answering such research questions will fill the gap between theory and practice in this particular part of the place-making and urban design process.

II. RESEARCH ELABORATIONS

This research belongs to a qualitative research because it aims to explain the empirical facts that exist in a narrative form and in a comprehensive picture of the physical (typology-morphology) and behavior pattern in Kampung Arab Malang. Data collection can be grouped into four interrelated parts, ie presentation of area’s data, presentation of building data, presentation of data having special characteristics, and participant data [9]. To obtain actual knowledge about the physical setting and behavior patterns relationships and apply this empirical knowledge in practice, in general, this research focuses on the theories of place and takes advantage of combined methodology including field direct observation and activity mapping.

Aspects of the research are physical aspects and behavior aspects. Physical aspects associated with elements of urban morphology, that is, *land uses*, *plot pattern*, *street pattern* and *building structure*. Behavior aspects associated with necessary activities, optional activities, and social.

This study is using typological-morphological analysis to analyze the morphological characteristics of Kampung Arab

III. RESULTS AND FINDINGS

Considering basic elements of place [5] this result will present two main components of a place: physical attributes and activities, and its relationship in between.

A. Physical Attributes – Urban Morphology

In this study, the discussion of physical attributes is reviewed through the urban-morphology theory. In general, morphological studies emphasizes spatial forms and their characteristics :

First, Land Uses. Land use is a key component in the region's growth. This component is considered as an activity system generator (activity system) that determines the pattern and direction of growth of the region [14]. Land uses of study

Malang urban area. The typo-morphological analysis is done by a figure-ground technique. The figure-ground technique is useful in understanding form and is a powerful tool for identifying textures and patterns of an urban fabric [10].

The primary tool for studying daily basis consisting mapping and direct observation, particularly focus on identifying the connection between the use of space with the urban morphology and the location it occurs. These methods were following the type of survey in the previous research performed [11] collaborated with the tracing method [12], which appraises on classify type of activities, including necessary, optional and social activities. Mapping observation was conducted to record the pattern and use of space and the location of engagement. The researcher walked through the street in study area and collected in the map sheet the activities of people engaged in, the behaviours, and the locations. People that were just passing by and not engaged in the activities on the street were not recorded [13].

This study was conducted in 2018 and included Kampung Arab Malang’s area as shown in Figure 2. Kampung Arab Malang has administrative boundaries as follows:

- North Boundary: Ade Irma Suryani street
- South Boundary: Nusa Kambangan street
- East Boundary: Sutan Syahrir street, Halmahera street
- West Boundary: Ade Irma Suryani Gg III street, Selayar street

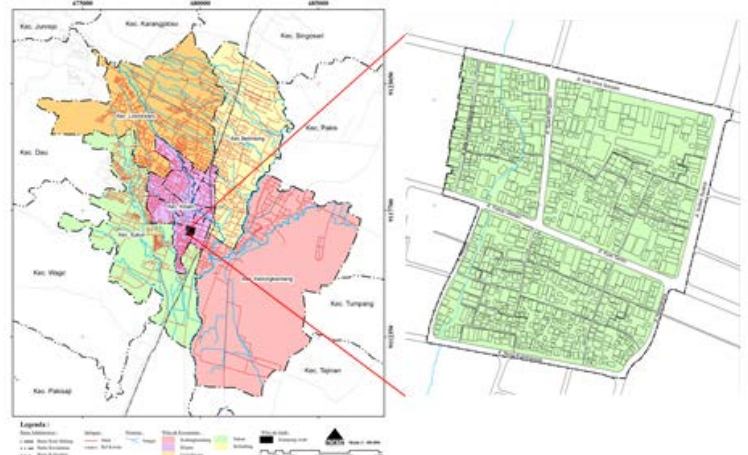


Fig. 2. Administrative Boundary of the Study Area

area dominated by trade buildings services, worship, government, funerals, and settlements. Buildings with a service trade function are centered on the perimeter segment.

Second, Plot Pattern. The plot pattern or typology is a solid void configuration within an area [10]. Plot pattern of Kampung Arab Kota Malang is an organic pattern, dominated form of irregular building blocks that causes a deflection road.

Third, Street Pattern. The basic element of a void in Kampung Arab Kota Malang is an open linear system and has 4 levels of road hierarchy namely, secondary collector, local primary, local secondary and local roads. The most commonly found of tissue are straight, deflection and dead-end. Deflection and dead-end road forms have limited physical and visual access.

The inner road hierarchy has different levels of privacy: public, semi-public and private.

Fourth, Building Structure. From the mapping of the physical aspects of the building structure, found the arrangement of the irregular mass of buildings, especially in the boundary area of the river. There are various types of building mass typology, such as the typology of high-fenced buildings and typology of curtained buildings.

B. Activities – Behavior Pattern

In this study, the discussion of behavior pattern is reviewed by activity mapping. Activity mapping is done on the whole area of Kampung Arab Malang City. Activities in outer space categorized in three categories namely; necessary activities, optional activities, and social activity [11]. Here is a map of the spread of activity Arab Kampung Malang City.

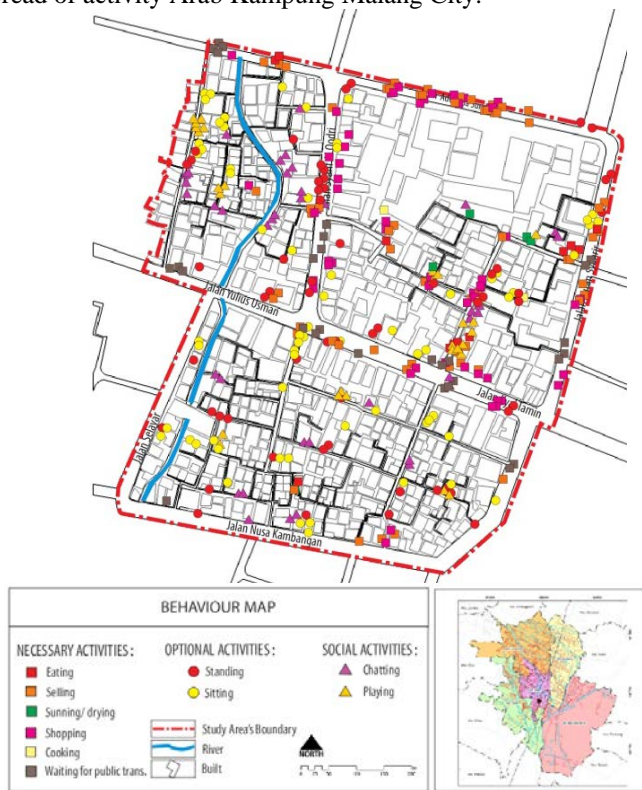


Fig. 3. Behavior Pattern of Study Area

Referring to Figure 3, the necessary activities that are found are trading and shopping. This is because the dominant land use in the study location is trade and services. The most common type of activity is the optional activity of sitting. Optional activity can occur when there are physical and environmental conditions that support the occurrence of such activity [14]. Many residents are using a short fence as a seat. There are many residents who perform social activities such as playing and talking along the alley shade even without adequate public furniture.

C. The Relationship between Urban Morphology and Behavior Pattern

The element of place interpreted into three more operational terminologies [15]. Two of them are; the physical locale and activity linked to this locale. From these statements, it is

important to explore the relationship between local physical aspects and activities. Therefore, to strengthen the sense of place of ethnic kampongs concerning urban morphology (land use, road network and building structure) and behavior pattern of Kampung Arab Town of Malang need to be explored.

First, Land Uses and Behavior Pattern. From the result of land use map and the behavior pattern distribution in Figure 4, can be seen that the activity tends to be crowded on the street with the type of mixed use.

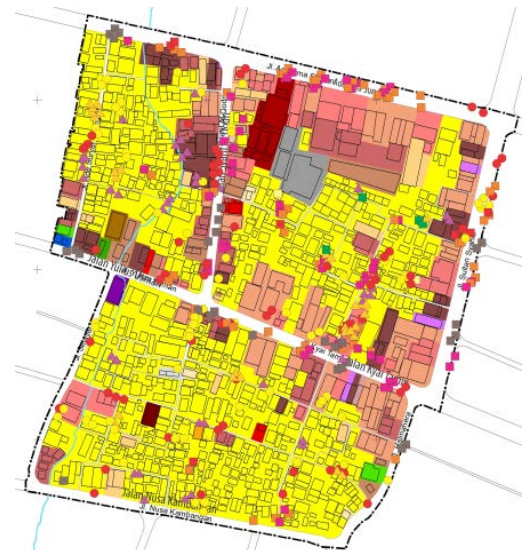


Fig. 4. Land Uses and Behavior Pattern

Second, Plot Pattern and Behavior Pattern. Most of the building block in the area of Kampung Arab Kota Malang is irregular. This building block creates a deflection path. The pattern of the plot area affects the street pattern. Therefore, the plot pattern has an indirect relationship to the behavioral pattern.

Third, Street Pattern and Behavior Pattern. The interrelationship analysis between the morphology of the area (streets pattern) and other place-forming elements is divided into 3 main parts: the road hierarchy, the level of road privacy and the form of the street pattern.



Fig. 5. Road's Hierarchy and Behavior Pattern

Referring to Figure 5, it can be seen that the pattern of activity tends to be crowded on the road with the primary local hierarchy. This condition caused by the primary local road that equipped by the form of commercial land use and services that attract the occurrence of primary, optional and social activities. Kampung Arab Kota Malang has the same activity intensity pattern, which is directly proportional to the path that has hierarchical order.

The inner road hierarchy marks different levels of privacy: public, semi-public and private. Street privacy in urban environments is the process of arranging interactions with others aimed at increasing or decreasing interactions. [16]



Fig.6 Level of Privacy and Behavior Pattern

Referring to Figure 6, it can be seen that more activity is found on the street with the level of public privacy. The intensity of this activity tends to decrease as the level of road privacy. This condition illustrates that the intensity of activity in Kampung Arab Kota Malang is directly proportional to the level of privacy of tiered roads (public to private). The level of privacy of this road becomes the rule of the extent to which strangers and inhabitants can access the road.



Fig. 7 Road's Form and Behavior Pattern

Referring to Figure 7, it can be seen that people tend to perform activities on a straight road because it is more freely

both views and movements, which result in the accumulation of activity on a straight road. This condition leads to a dual role road space; as a means of circulation and also as a space of activity.

Fourth, Building Structure and Behavior Pattern.

Referring to Figure 7, at the level of privacy of the semi-public to the private, high-intensity activities are found in Typology B (high fence - 2.5m - high fence). Many activities found in this location due to the massive barrier between public spaces (roads) and private (houses) in the form of a high fence gives the user space freedom to perform activities more freely. Whereas low intensity activity is found in Tipologi A (curtain-2m-high fence).



Fig.8 Building Structure and Behavior Pattern

From the results of these conclusions can be found trends in the typology of roads and structures in relation to the use of space Kampung Arab Kota Malang (as shown in Table 1). Here is a division of the intensity of activities that have been divided into 3 main groups, such as high-intensity, medium-intensity and low-intensity.

Table 1 Intensity of activity on each typology of the physical component of the area

Typology	High-Intensity	Medium-Intensity	Low-Intensity
Land Uses	Mixed use	Residential	-
Hierarchy of Roads	Primary Local Roads	Collector, Secondary Local Roads	Local Roads
Privacy Level of Roads	Public	Semi-Public Private	-
Road's Form	Straight	-	Linear-curve, T-junction, deflection, + junction, dead-end
Building Structure	Typology C	Typology B, Typology G	Typology A, D, E, F, H, and I

IV. CONCLUSION

The results of this study have a direct relationship to the behavioral pattern. While the plot pattern has an indirect relationship to the behavioral pattern. From the studied relationship between urban morphology and behavior pattern of Kampung Arab Malang area can be concluded that :

- The more diverse the land uses, the more activity is found
- The higher the road hierarchy, the more activity it finds
- The more private the privacy of the road, the less activity is found.
- Activity is often found on a straight road, because it is more freely both sight and movement.
- Activity is commonly found in home typologies with high fence boundaries rather than houses with curtain borders

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