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STUDY OF ORIENTATION OF BUILDINGS IN KAMPUNG BANDAR, PEKANBARU CITY

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ABSTRACT

Kampung Bandar is a dense and irregular area with the highest population density in the city of Pekanbaru, which is located on the Siak River and was the starting point for the formation of Pekanbaru City. In contrast to integrated housing areas that have well-arranged building shapes and orientations, densely populated areas will have a variety of shapes and orientations, depending on the location where the house is located. The density of buildings with various orientations shapes the character of the area. In urban design theory by Shirvani (1985), one of the important elements in urban design is the shape and mass of buildings. The distance between one house and another, the width of the road, the boundaries around the building are important factors that will determine the shape and orientation of the building. The method is descriptive quantitative by conducting a field survey. This study considers building function and building accessibility. The research results show that the direction of the building tends to face building accessibility such as the surrounding road network.

KEYWORDS: Building Orientation; Kampung Bandar; Siak River.

1. INTRODUCTION

Settlement growth usually arises from water areas, with the driving factors of population growth and socio-economic activities on the water's edge. In waterside settlements, the direction of the building is usually facing the river bank. The riverbank is a very accommodating area for people to live and carry out their business [1]. Population growth along river flows is a factor in the increasing need for land space for the availability of facilities and infrastructure, cultural preservation, environmental conditions have an influence on settlement.

Indonesia as a maritime country has many riverside settlement locations. One of them is a settlement on the Siak River in Riau Province. The Siak River itself has a long history of the formation of various

settlements along its flow, one of which is Pekanbaru City. The city of Pekanbaru started from the Kampung Bandar area which is on the banks of the Siak River, this is proven by the placement of the Pekanbaru zero-point stone in Kampung Bandar Village.

This development is also supported by Kampung Bandar's position as the entrance gate to Pekanbaru City from land to water. So Kampung Bandar also became a fairly important trading location. Another thing that makes Kampung Bandar an interesting area is the heritage of historical buildings located nearby such as Tuan Kadi Shelter House, Perch Palace, Nur Alam Grand Mosque, Marhum Pekan Tomb Complex, Weaving House, eks Pelindo I Harbor and Pasar Bawah Tourist Market.



Information:

1. Tuan Kadi's Halfway House
2. Kampung Bandar Tenun House
3. Eks Pekanbaru Zero Point and eks Pelindo Harbor 1
4. Transit Palace of Sultan Siak Pekanbaru
5. Grave Complex of Marhum Pekan
6. Raya Pekanbaru Mosque (Mosque of Sultan Nur Alam)
7. Pasar Bawah Tourist Market.

Figure 1: Position of historical buildings in Kampung Bandar

Geographically, Kampung Bandar Village is close to Jalan Jendral Sudirman which is the main road of Pekanbaru city, so it can be said that the location of the Kampung Bandar area is very good, strategic and close to the Central Business District (CBD).

In urban design, building orientation is one of the physical design factors that responds to road directions and environmental conditions. Building orientation is also related to the aesthetics and comfort of residents in the building. Other factors that influence building orientation are contour conditions, thermal conditions and accessibility to the building.

Kampung Bandar is a dense and disorganized area, and there is minimal availability of public space to accommodate activities between residents. In fact, there are roads that can only be accessed by one motorbike, considering that this area has continued to develop from the sultanate era until now. So people ignore the value in determining the direction a building faces. The right orientation will increase occupant comfort, in a larger area it can be an added value in the research area.



Figure 2: Existing atmosphere in Kampung Bandar

As an unorganized urban village settlement, it is an ongoing problem if it is not identified. Considering that this area is located in the commercial center and government center of Pekanbaru City. The physical aspects to be studied focus on the direction the building faces. Where the direction of the building faces is the first aspect in development and will grow into city planning.

So, this research aims to identify the orientation of buildings in the riverside area in Kampung Bandar. To achieve the research objectives, descriptive qualitative research methods were used and data collection was carried out through field survey results. The qualitative method was chosen because the research aims to explore and understand individuals or groups related to social problems, in this case namely exploring and understanding the building orientation of the Kampung Bandar community.

2. Research Methods

2.1 Determination of Research Area

The research was conducted in Kampung Bandar Village. Administratively, this area is located in Senapelan District, Pekanbaru City, Riau Province. This research focuses on functionally dense and densely populated areas. Based on the land contour of the river surface, it is divided into 3 zones, namely the transition zone between the bank and the mainland, then the mainland zone which is closer to the commercial center (figure 1). Segment 3 starts from the area closest to the city center, then the first segment is the area closest to the Siak River. This segment will describe the road system traversed starting from the city center which has the most active mobility to the riverbanks where activity tends to be quiet. As the boundary between the north and south zones are Trading Road, Kota Baru Road and Siak River. Meanwhile, the east-west zone is bordered by Jalan Panglima Udan and Jalan Kampar, with a building population of 363 buildings.

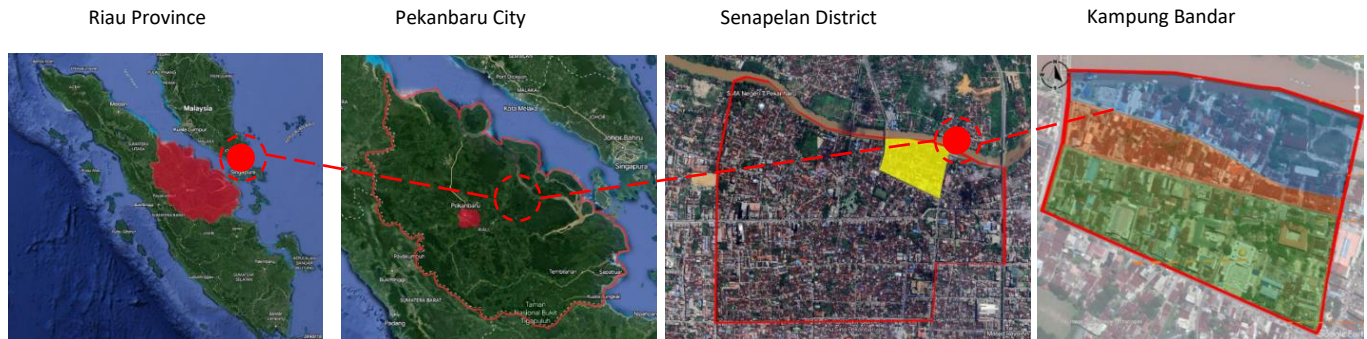


Figure 3: Location map of Kampung Bandar Subdistrict and Division of Research Segments

2.2 Methods of Analysis

In this research there will be 3 observation steps. The steps taken in this research started from selecting a problem formulation, through field surveys and collecting secondary data through literature regarding the research location and urban design theory. To answer each problem formulation, we will refer to the theoretical basis.

The resulting data will be grouped based on segments, building materials, road patterns and functions presented in map form. The results of other analyzes are presented in table form which will then produce valid conclusions to find answers to the problem formulation. In analyzing the research problem using descriptive qualitative with case study research. Researchers interpreted the data obtained through observations and interviews. The data interpreted and the method of determining data collection based on theory.

Table 1. The stages of data analysis method

Theory	Indicators	Collected Data
Settlements on land have their buildings oriented facing the main road while waterside settlements face the water with a pattern following the shape of the water or a linear pattern [2]	Accessibility	Road pattern layout
It is easy to change the orientation of a semi-permanent building if the residence does not match the main function and needs [4].	Building Function	Area map divided based on building function
River bank settlement patterns are generally linear patterns that lead to paths or nodes in the	Orientation towards Path or Node	Layout based on building orientation

Theory	Indicators	Collected Data
area, because they are lined up along the river bank following the shape of the river [3].		
Building orientation that influences interactions between building owners [3].	Front to front, Front to back, and Front to side.	Data on number of buildings

In order to collect data regarding the results of field observations and to be able to directly experience the atmosphere when standing on the banks of the Siak River, Kampung Bandar, the researcher made the following observations:

1. Observe and measure infrastructure and road patterns at the research location.
2. Observe the position of special buildings at the research location.
3. Carry out a schematic building layout based on function and identify building orientation based on building materials.
4. Identify public spaces and environmental roads that have the potential to become building orientation factors.
5. Observe the types of activities at the research location.

From the results of observations of buildings at the research location, a map of the area consisting of building functions, road conditions, and building orientation is produced. This data will be presented in map form to make it easier to understand.

3. RESULTS AND DISCUSSION

This section presents the data obtained, data analysis, specific findings.

3.1 Building Accessibility Analysis

In reaching activity centers, especially open areas, there are two circulation systems in the Kampung Bandar area, namely a pattern that responds to the contour of the land, where the circulation pattern of the main land road (local road) forms a linear pattern following the flow pattern of the Siak River. There are 3 main roads, namely Trading Road, Kota Baru Road as a collector road and Senapelan Road as an Arterial Road. Kampung Bandar is located between 2 bridges connecting the north and south of Pekanbaru city, namely Jl. Road rifles are important.

This area has a port, but the port is now no longer used and has been moved to the Limapuluh Kota sub-district. This closes people's access to the Siak River. Apart from that, building a road network in the waterfront segment is considered quite difficult, because of the high cost of building roads in contoured areas. Geographically, this road is closest to the river so it is the last road to be passed. Because of this, activities in segment 1 are quieter and dominated by houses.

Based on SNI 03-1733-2004 concerning Procedures for Planning Residential Environments in Urban Areas, environmental roads must have a width of 1.5 to 2 m. From the results of field observations, local roads leading to people's homes have a level of accessibility that is difficult to pass because they are narrow. There are also a number of houses that use someone else's land or yard as access or a path to their house. Apart from that, on Jalan Perdagangan there are also several roads that cannot be passed by motorized vehicles because the house area is lower than the collector road/main road so there are stairs at the end of the road (figure 4) to enter the residential area.



Figure 6: Placement of stairs along Perdagangan Street

The research location in Kampung Bandar has a pedestrian path in the area. For connecting circulation between residences, there are many small roads (alleys) with a width of 0.5 meters to 1 meter (figure 7) which function as pedestrian paths and also motorbike paths, but specifically for motorists the use of the road is limited, due to the size of the road. different.



Figure 7: neighborhood roads in Segment 3

Walking spaces (alleys) are used by the community as pedestrian or driving routes limited by building walls, and are also used as open spaces for gatherings, open spaces for children to play, daily activities (private vehicle parking).

3.2 Building Orientation Analysis

From the literature regarding orientation from various points of view, there are several dependent variables that influence orientation, namely: Building materials and ease of circulation (accessibility) of the building.

There are 2 types of building orientation classification based on building accessibility. First, orientation towards the path or node: for buildings that have affordable building access. Second, Front to front, Front to back, and Front to side orientation: for buildings that have difficult building access.



Figure 8: Orientation Map in Kampung Bandar

3.2.1 Building Function Analysis of Building Orientation

The functions available are residential, residential and shops, commercial shops, offices, educational institutions, mosques, reserve buildings and ports. Building orientation will be assessed based on

accessibility which is divided into two, orientation towards paths and orientation towards nodes. After knowing based on accessibility, orientation will be divided into 3 types based on surrounding buildings, namely Front to front, Front to back, and Front to side.

1. Segment 1 (Land Area)

This land segment is directly located in Kota Baru and Jalan Senapelan, a road with access to the Pekanbaru Lower Market Tourist Market and Siak IV Bridge and towards the center of Pekanbaru City. This segment consists of 161 buildings, with various building functions in them. For the Pekanbaru Grand Mosque area, besides the main mosque building, there are supporting function buildings surrounding the mosque. This supporting building is oriented towards the mosque so that it faces the side of the mosque or front to side without blocking access to the orientation of the main mosque building.

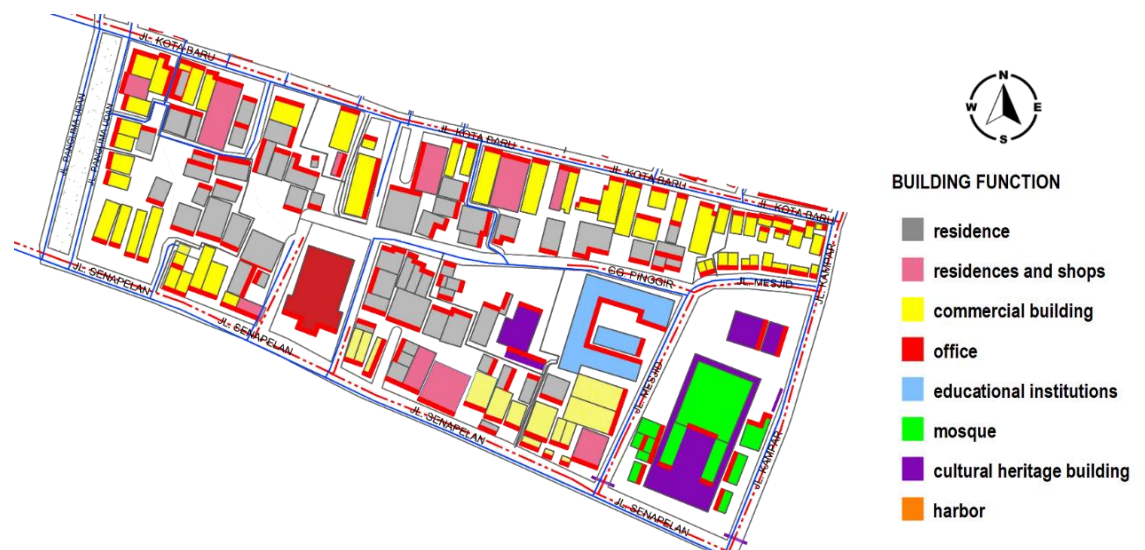


Figure 9: Mainland Segment 3 Building Functions

In this land segment, the orientation of the front to back type of building is less than in the previous segment, because there is still a lot of land that can be used as access to the building. Commercial shopping buildings 62 of the 68 buildings are oriented towards the road (path). The supporting buildings around the mosque are oriented to the main mosque building.

In this segment, there is a phenomenon where buildings with residential functions tend to be located inside the area (figure 10) and buildings with economic development functions are located outside the area. This is because it is an important area that passes from the north to the south of Pekanbaru City. From the results of interviews with the people who live there. Some of them are selling their land because land prices in this area are quite high. Judging from the original residence (figure 11) which

is still preserved, the land area in this area is large enough to sell or build a new building at the front of the house (figure 12). That's why the original residence is behind the commercial building.

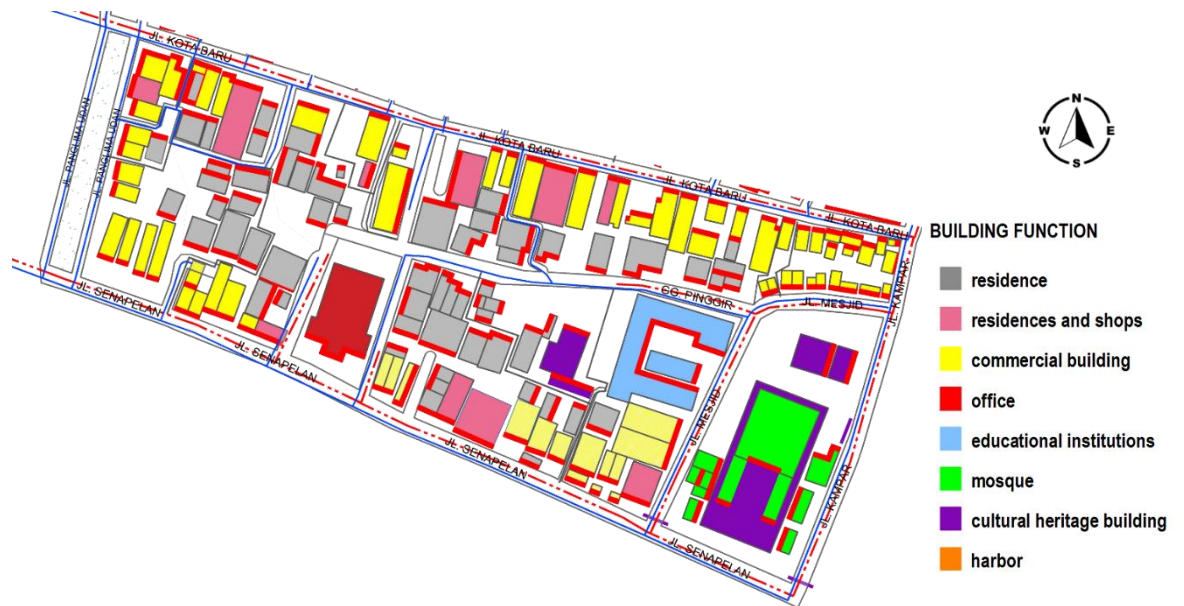


Figure 10: Residential Phenomenon behind Commercial Buildings



Figure 11: Residential Residence in Kampung Bandar with a Large Yard



Figure 12 : Residential whose front yard is used as a commercial building

2. Segment 2 Transition

This Transition Segment is directly located on Jalan Dagang and Kota Baru, a road with access to the Pasar Bawah Pekanbaru Tourist Market and the Siak III Bridge. This segment consists of 97 buildings which are dominated by residential functions. There are 3 building functions, namely residential, residential and shops and commercial shops.

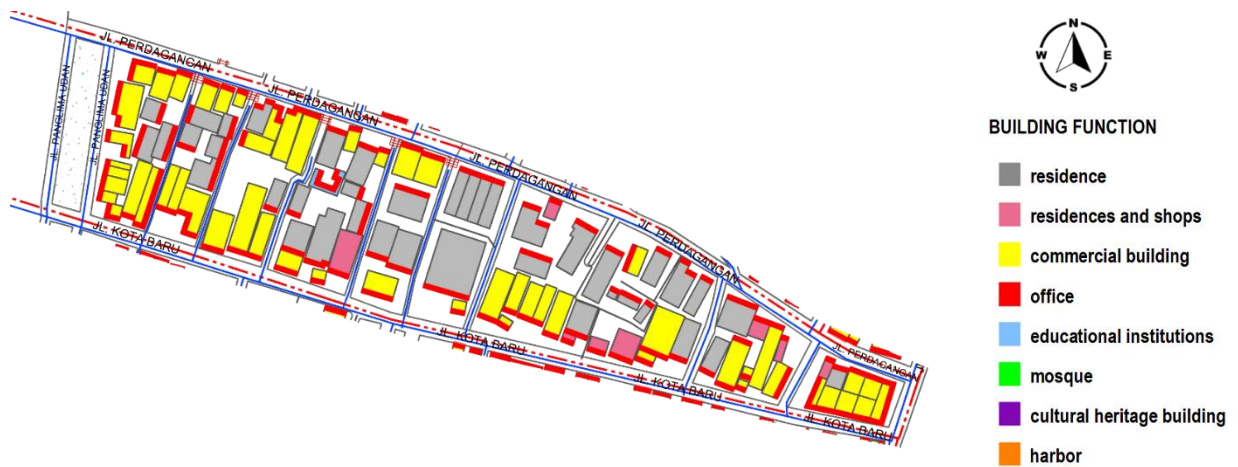


Figure 13: Function of Building Segment 2 Transition

Because the transition area is surrounded by Collector Road access (Perdagangan street and Kota Baru Street), 81 of the 97 buildings have an orientation facing the path. Consists of 50 commercial shops, 23 residential and 8 shophouses. From Figure 13, you can see that the commercial shop building is the outermost part close to the road. This cannot be separated from its function as a place to sell.

The transition section has different land contours between the buildings on Jalan Pedagangan and Jalan Kota Baru. On the commercial road, the buildings are lower than the road and have difficult access for four-wheeled vehicles. Buildings in this area choose to be oriented towards local roads which are connected to Jalan Kota Baru which has easy access for vehicles. There are also buildings with stilt structures, so that the yard and road are at the same level.



Figure 14: Road conditions are higher than the buildings on Perdagangan Street



Figure 15: House on stilts on Perdagangan Street

3. Segment 3 Waterfront

The Water Edge segment is directly on the banks of the Siak River to Jalan Dagang. This segment consists of 105 buildings which are dominated by residential functions. There are also 3 reserve buildings, 2 mosques and several commercial buildings.



Figure 16: Map based on building function in Segment 3 Waterfront



Figure 17: Buildings in Segment 3 Waterfront

From the data above, 89 buildings are oriented towards paths, either to Jalan Pedagangan or local roads, which grow following the growth of buildings. Meanwhile, the other 16 buildings face the node or are behind other buildings. This area is dominated by residential functions with a front-to-front orientation between one residence and another residence.

3.3 Discussion

The lack of existence of the Siak River affects the orientation of buildings on the river banks in Kampung Bandar Village because there are no more buildings above the river waters. If what is meant is orientation based on the use of water transportation. It cannot be used as a factor in the direction of the building because not all communities have water transportation, because its use is minimal. The people on the edge of Kampung Bandar have jobs on land. This is influenced by the tendency for community activities to be predominantly carried out on land.

Table 2. Data of orientation building in Kampung Bandar

Building Function	Accessibility to	Orientation Direction			Total
		<i>Front to front</i>	<i>Front to back</i>	<i>Front to side</i>	
Residence	Path	109	41	12	162
	Node	6	7	4	17
Residence and shops	Path	17	0	2	19
	Node	0	0	0	0
Commercial building	Path	124	7	2	133
	Node	3	0	0	3
Office	Path	1	0	0	1
	Node	0	0	0	0
Educational institutions	Path	3	0	0	3
	Node	2	0	0	2
Mosque	Path	2	0	0	2
	Node	0	0	0	0

Cultural heritage building	Path	6	0	0	6
	Node	0	0	0	0
Harbor	Path	1	0	0	1
	Node	0	0	0	0
Total Directional Orientation		274	55	20	349
Total Direction to Path		327			
Total Direction to Node		22			

The first type of building orientation is front to front, namely the orientation of the building where the faces of the buildings are facing each other. This type is the best type of orientation because residents can see other residents in front of them, thus allowing for social interaction. In this area, the front-to-front type is supported by the use of a transparent fence. However, the road is not too wide, making it seem as if one house is very close to another house. Residents' privacy is likely to be slightly compromised. The second type of building orientation is front to back, that is, when one face of the building faces the back of another building. This type is the most unfavorable type of orientation because social interaction between residents will be difficult to occur. The third type of building orientation is front to side, namely when one face of the building faces the side of another building. This type of orientation is considered less good because of limited access to interaction between residents.

Of the three types of orientation, 326 buildings are path-oriented (road network) and 350 buildings have various functions, 274 buildings are front to front. This proves that in densely populated residential areas such as Kampung Bandar, there are still quite good social relations between one resident and another.

4. CONCLUSION

The conclusion must refer to the research objectives and contain general conclusions from the research results, not repeating the abstract, in the form of paragraphs, not points.

The development of the shape and orientation of buildings in settlements in Kampung Bandar, Pekanbaru City is determined by two things, namely the existence of open areas (nodes) and road networks (paths). The road network is the main choice because people can easily access entry/exit routes from the house for those who have motorized vehicles and it also makes buying and selling transactions easier because this area is also dominated by commercial buildings.

Meanwhile open areas (nodes) are the next choice. Residents can do various activities such as chatting with neighbors, drying clothes and playing.

As a continuation of the research from this research, it is recommended that future researchers conduct studies related to the physical design of the city and the direction of the buildings facing the Suangai Siak Stream. The study can be carried out on a smaller segment. Meanwhile, building orientation factors can be done by developing several variables mentioned above. So that this research can develop the potential that exists in Kampung Bandar, especially historical tourism and cultural heritage.

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Author Profile



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