

# Dynamics of Spatial Transformation in Pekanbaru City During the Era of Regional Autonomy

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## ABSTRACT

Pekanbaru City in its development has gone through a number of periods of power in a span of more than two hundred years. The era of regional autonomy gave more authority to the regions to develop their cities. Stable economic growth has made Pekanbaru City one of the urbanization destinations in the Sumatra region. These two things make the morphology of Pekanbaru City has dynamically transformed into a metropolitan city. This study found that the city grows and develops no longer oriented to the city center, but has spread evenly to all parts of the city area. The road structure system is also no longer dependent on the main road around the city center, but has reached all other parts of the city. Urban transformation is still dynamic based on city government regulations and market forces.

**Keywords:** Pekanbaru, regional autonomy, urban transformation



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## 1. Introduction

The development and progress of cities can be observed physically through spatial transformation and the form of the city-forming environment. The development of the city in the morphological review emphasizes the forms of physical appearance of the city environment. Pekanbaru City is the capital of Riau Province which has historically been formed since 1784 [1]. For more than two hundred years, Pekanbaru City has experienced various kinds of dynamics to grow and develop into one of the largest cities on the island of Sumatra. The transformation process of Pekanbaru City has passed through various periods of power starting from the Siak Sultanate era, the Dutch colonialization era, the independence era of the Republic of Indonesia, the new order era, the reform era and regional autonomy to the present.

Since the era of regional autonomy, the development of cities in Indonesia has grown more rapidly due to better regional management authority. Pekanbaru City as the capital city of Riau Province, which has abundant natural resources, has experienced stable economic growth over the past twenty years. This condition makes

Pekanbaru City one of the urbanization destinations on the island of Sumatra. A good economic growth rate and a significant increase in population have made Pekanbaru City transformed into a metropolitan city. Morphologically, Pekanbaru City has experienced changes in land use patterns and the physical environment of the city, which is the focus of this study. A city is constantly changing morphologically along with changes in land use, road patterns and networks, and changes in building characteristics [2].

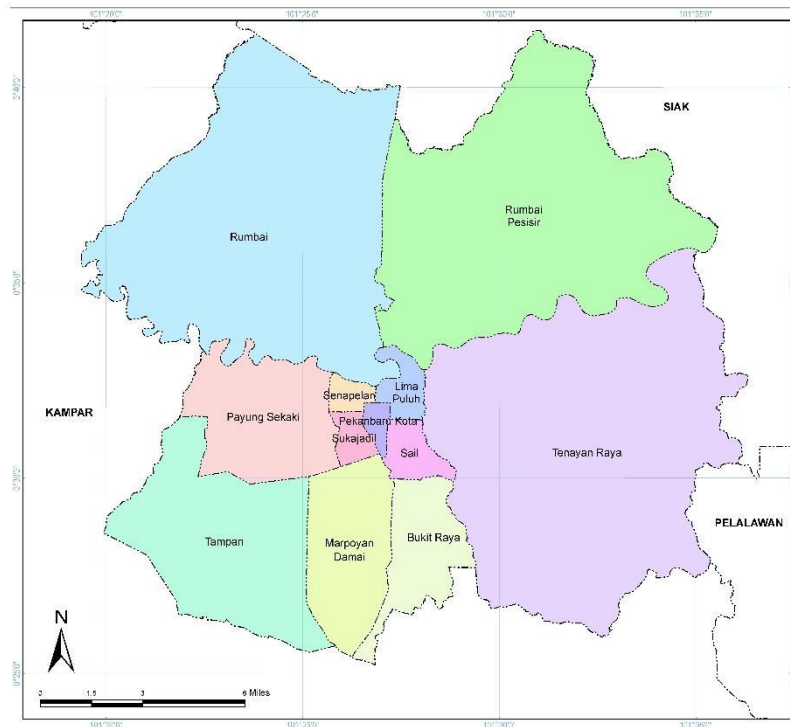
Increased urbanization is also a result of economic growth and the stability of regional development through local government policies [3]. As is common in cities that have good economic growth, the flow of money will be followed by the flow of people entering and looking for jobs and economic businesses. But on the one hand, the flow of urbanization also has an impact in accelerating the accumulation of urban growth and regional growth centers, especially those related to the trade and industrial sectors [4]. As a result of urban development, peri-urban areas are strongly influenced by land use change, accessibility, and infrastructure availability [5]. In addition to physical and spatial transformations, socio-economic transformations can be identified in the aspects of population density and community environment [6]. The trend of urbanization patterns will result in urban growth will occur in suburban areas that have a significant impact on the quality of the city environment, while illustrating the correlation between population density and spatial distribution in land use [7]. The transformation of urban development influenced by the dynamics of urbanization is related to aspects of density, regional continuity, growth clusters, concentration and urban core development. The morphology of a city is well transformed if the distribution of urban development is spread evenly throughout the city followed by changes in the spatial structure of the city and the existence of a network of connectivity between parts of the city. This pattern is much better than being concentrated in one part of the city [8].

Economic growth followed by population growth has put pressure on the utilization of urban space in Pekanbaru City. The dynamics of economic and population growth have accelerated since the era of regional autonomy, where there has been a rapid change in land use and the physical condition of the city. In line with the rapid population growth, the demand for life needs in economic, social, cultural, political and technological aspects also continues to increase, which has implications for the increasing need for urban space. Due to the limited availability of space in the city, the tendency to fulfill the need for space, housing and other city facilities will always take space in the suburbs. The process of urban development transformation is commonly referred to as "invasion" and the process of expanding the physical appearance of the city outward is referred to as "urban sprawl". Cities in developing countries are unprepared for the urbanization process, characterized by the absence of adequate planning for urban infrastructure development, which leads to sporadic urban expansion especially in suburban areas [9]. In general, the process of physical spread of the city is divided into three types, namely concentrically, linearly and jumping [10].

This research aims to explore the spatial changes of Pekanbaru City since the era of regional autonomy until now in the form of an urban morphology study. Through this study, it is focused to know how the process of transformation of Pekanbaru City occurred, from the aspects of land cover, building patterns and road networks.

## **2. Method**

The research approach of sequential explanatory used in this study, where the quantitative and qualitative approaches are applied in sequence. Qualitative research is applied to construct hypotheses based on phenomena of urban transformation process since the era of regional autonomy. Meanwhile, quantitative methods are used to explain the process of urban transformation presented in the form of GIS-based maps. The data collection procedures used in this research include observation, in-depth interviews, and documentation. In-depth interviews were used to collect informations related to the development transformation of Pekanbaru City. The analysis of the transformation of the city of Pekanbaru was carried out in three time periods, year of 2000, 2010 and 2020, which are covered all twelve subdistricts in Pekanbaru as shown in figure 1.



**Figure 1** Administration Map of Pekanbaru City

### 3. Result and Discussion

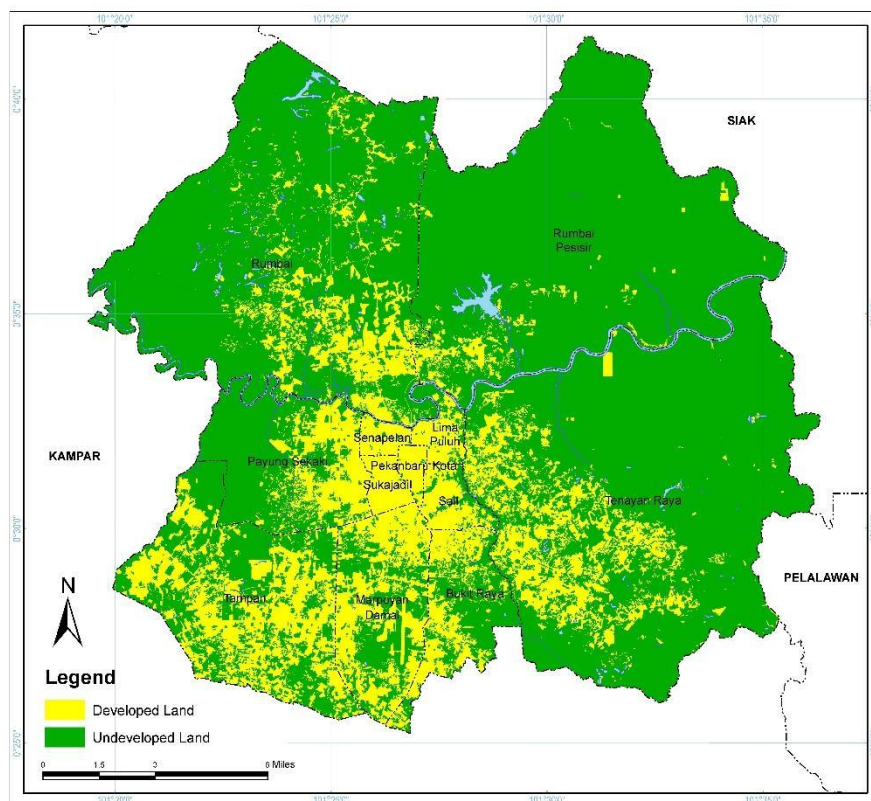
Pekanbaru City as a city dominated by trade and service activities, since the era of the Sultanate of Siak has become a destination for traders and job seekers from various regions on the island of Sumatra. Since the era of reform and regional autonomy, the development of Pekanbaru City has accelerated, characterized by economic growth and followed by population growth. These conditions have a major impact on the spatial and physical condition of the city. This study tries to draw the spatial and physical changes of the city since the beginning of the implementation of regional autonomy until 2020. Spatially, the use of urban space has increased dramatically, if seen from the comparison between developed and undeveloped space in the last twenty years.

Based on Table 1, it can be identified that there is a significant increase in built-up land in Pekanbaru City along with population growth, from 58.06 km<sup>2</sup> in 2000, 105.44 km<sup>2</sup> in 2010 to 160.63 km<sup>2</sup> in 2020. Based on the distribution of regional spatial growth, Tampan Sub-district is an area with significant development of built-up land each year, where in 2000, the built-up land area in Tampan Sub-district was only 10.95% of the total land area of Pekanbaru City, increasing to 17.27% in 2010 and reaching 26.46% in 2020. The position of Tampan Sub-district which is on the entrance route to Pekanbaru City from the West Sumatra region, the presence of several large universities and the development of the trade and service sector are factors that cause Tampan Sub-district to become the fastest growing area in Pekanbaru City. Several sub-districts in Pekanbaru experienced stagnant regional growth, as a result of the absence of available land for new development. Sail Sub-district, Pekanbaru Kota Sub-district, Sukajadi Sub-district, and Senapelan Sub-district are areas in Pekanbaru City that have almost no undeveloped land. The distribution of built-up areas in the city of Pekanbaru in 2020 can be seen in Figure 2.

**Table 1** Development of Land Cover Area of Pekanbaru City in 2000-2020

No.	Sub District	Developed Land			Undeveloped Land		
		2000 (km <sup>2</sup> )	2010 (km <sup>2</sup> )	2020 (km <sup>2</sup> )	2000 (km <sup>2</sup> )	2010 (km <sup>2</sup> )	2020 (km <sup>2</sup> )
1	Tampan	6,40	18,70	42,55	51,90	39,60	15,57
2	Payung Sekaki	7,50	12,74	18,75	35,65	30,45	24,40
3	Bukit Raya	9,52	13,10	15,72	14,65	11,12	8,50

No.	Sub District	Developed Land			Undeveloped Land		
		2000 (km <sup>2</sup> )	2010 (km <sup>2</sup> )	2020 (km <sup>2</sup> )	2000 (km <sup>2</sup> )	2010 (km <sup>2</sup> )	2020 (km <sup>2</sup> )
4	Marpoyan Damai	10,75	20,12	22,65	20,10	10,78	8,25
5	Tenayan Raya	2,98	12,98	22,32	172,10	162,10	152,08
6	Lima Puluh	3,98	4,35	4,39	1,25	0,90	0,85
7	Sail	2,98	2,99	2,99	1,30	1,28	1,26
8	Pekanbaru Kota	2,12	2,12	2,12	0	0	0
9	Sukajadi	3,89	3,90	3,88	0,075	0,07	0,07
10	Senapelan	2,90	2,92	2,89	0	0	0
11	Rumai	1,15	5,54	11,69	112,60	108,22	102,05
12	Rumbai Pesisir	4,16	6,60	10,68	170,60	168,10	164,05
	Total	58,06	105,44	160,28	580,44	532,86	477,70



**Figure 2** Developed and Undeveloped Land of Pekanbaru City in 2020

In addition to examining land use changes in the last twenty years, the study of spatial transformation of Pekanbaru City also identified changes in building patterns. In 2000, the building pattern of Pekanbaru City had a development orientation that centered towards the city center, namely around the area of government office buildings, the governor's office and the mayor of Pekanbaru. The area that was the initial growth area of Pekanbaru City is the city center which includes Pekanbaru City Sub-district, Senapelan Sub-district, Sail Sub-district, Lima Puluh Sub-district and Sukajadi Sub-district. Most of large and important buildings were built along Sudirman Street, which is the main access to the city center. Since 2010 until 2020, the building pattern has spread more evenly throughout the city.

Similar to the development of large cities in developing countries such as Lusaka in Zambia, the development of the city occurred rapidly since 2020 and started from the city center and main roads, which expanded according to the distribution of economic and industrial activities [11]. Urban development in Pekanbaru began to spread to parts of the region that became the new growth centers of

the city such as Marpoyan Damai, Tenayan Raya, Bukit Raya, Rumbai and Tampan sub-districts. Tampan sub-district is a rapidly growing area where commercial, office and educational buildings are the most dominant facilities in the area. The pattern of urban expansion differs from one part of the city to another, where one of the most influential is the population and population density distribution [12], along with other aspects of natural, cultural, socio-economic, technological, political and urban policy conditions [13]. Spatial changes in the city have an impact on the adaptation process in the pattern of social activities of urban communities, especially the relationship between local communities and migrants. This condition occurs mostly in suburban areas where migrants are more likely to settle [14]. Along with the spirit of decentralization and the era of regional autonomy, cities in Indonesia through local government policies can manage cities to become more developed. This condition is in line with the development of cities in China which is influenced by decentralization policies, market mechanisms and globalization factors [15]. Research on dynamic urban spatial change is intended to provide a perspective for interpreting, orienting and formulating interventions at the practical guidance stage [16].

The street structure system is an important part of the physical and spatial formation of the city. The road network system is a means of supporting mobility and is influenced by the pattern of community activities. City growth is followed by the need for roads as the main transportation infrastructure. Based on BPS data of Pekanbaru City (2010), the growth of road development increased from 2,546.64 km in 2010 to 2,694 km in 2020. Before the era of regional autonomy, the development of Pekanbaru City was mostly directed in the city center and along the Sudirman road. After 2000, the city's development became more spread out which was supported by the development of several other main roads as the main backbone of the city's mobility and economic growth. Tuanku Tambusai street, Arifin Ahmad street, Soekarno Hatta street, Subrantas street, Riau street and S.M. Amin street are some of the streets that have been transformed into new growth areas that are more evenly distributed in various areas of the city.

#### **4. Conclusion**

Since the era of regional autonomy, the development of Pekanbaru City has experienced a process of spatial and physical transformation of the city as one of the major cities on the island of Sumatra. The dynamics of spatial changes in the city are influenced by economic growth factors through trade activities, services, and education. The growth of the city, which was originally only in the city center, over the past twenty years has been evenly distributed throughout the city. The fastest growing parts of the city are areas that have high economic activity, have land reserves for housing development and other city facilities. The transformation factor of the city structure in the form of roads is also an important factor in the spatial transformation of the city.

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#### **6. Conflicts of Interest**

The authors hereby affirm that there is no conflict of interest regarding the publication of this research study.

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