

The Impact of Infrastructure Development of Ring Road on Ecological and Social Components Through Land Consolidation Program

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Abstract. The Pekanbaru City Government has launched a project to build the Pekanbaru Ring Road, which will effectively connect one route to another. The construction of the ring road will start from the eastern Tenayan Raya bypass entering through Badak street, and this road will cover a distance of 17 kilometers along the eastern route. During the implementation of the ring road development, the Pekanbaru City Government faces the issue of acquiring land owned by communities that are affected by the construction of the ring road. To address this, the Pekanbaru Government has undertaken Land Consolidation. Land Consolidation is a policy aimed at reorganizing the ownership, possession, use, and utilization of land and space according to spatial planning and providing land for public purposes in order to improve environmental quality and natural resource preservation. This is in accordance with the Regulation of the Minister of Agrarian Affairs Number 12 of 2019. The research methods used in this study include literature analysis, case studies, and data collection from primary and secondary sources. Ecological impacts of the development, in terms of spatial planning, show that 46 land plots owned by communities are located in Production Forest Areas. In 2020, the City of Pekanbaru issued Regional Regulation No. 7 of 2020 on the Spatial Plan, which resulted in the inability to proceed to the next stage of Land Consolidation. To address this, the Government applied for the release of the Forest Areas. Based on SK: 323/menhut-11/2011, land with granted rights before the Spatial Plan's approval can apply for release from the Forest Areas. If the rights were granted after the Spatial Plan's approval, then land swapping with other forest areas is allowed, as stipulated in Government Regulation No. 104 of 2015 regarding procedures for changing the designation and function of forest areas. Economically, the Land Consolidation project for the Ring Road has increased the value of community-owned lands and improved the income of the people. Socially, the Land Consolidation program for the ring road has the potential to address land conflicts during the development of the Pekanbaru Ring Road.

Keywords: Land Consolidation, Development, Pekanbaru Ring Road.

1 Introduction

The development of urban areas in Indonesia continues to progress rapidly from year to year. This progress cannot be separated from the increasing infrastructure development. As is known that the Indonesian government is currently very focused on infrastructure development. We can witness the construction of roads, both toll roads and public roads. With

the increasingly good road conditions, of course, it will further facilitate access to transportation between villages and cities, so as to accelerate the development and growth of cities in Indonesia.

Pekanbaru in figures 2021 states that Pekanbaru City has an area of 632.271 km² which has twelve existing sub-districts and 83 sub-districts, it is known that Tenayan raya sub-district is the largest sub-district with an area of 171.27 km², then followed by rumbai peisi sub-district which has an area of 157.33 km² and rumai which has an area of 128.85 km². In accordance with the data that researchers extracted from Pekanbaru in Figures in 2021 issued by the Pekanbaru City Statistics Center Agency. However, after April 2022, Pekanbaru has officially increased the number of sub-districts to 15. There are three sub-districts of expansion, namely Tuah Madani, Kulim and Rumbai. This expansion is an effort of the Pekanbaru City Government in equalizing development to every region in the city of Pekanbaru.

The Pekanbaru City Government has planned to build the Pekanbaru City Ring Road which will connect one lane with another more effectively. In the implementation of the construction of this ring road, the Pekanbaru city government is faced with the problem of land acquisition owned by the community affected by the construction of this ring road. In carrying out land acquisition, the Pekanbaru government conducts Land Consolidation. Land Consolidation is a policy of rearranging the control, ownership, use and utilization of land and space in accordance with spatial plans and efforts to provide land for the public interest in order to improve environmental quality and maintenance of natural resources. based on Agrarian Minister Regulation Number 12 of 2019.

The construction of ring road access in the 45 Sport Center - Terminal Cargo trajectory has common problems, namely land acquisition for road infrastructure development and land parcel arrangement in the right and left areas of the road. To realize the control, use and utilization of land that can improve people's lives, as well as ensure the availability of land for various needs of development activities and to support the implementation of agrarian reform, the policy of structuring the land use and utilization of land in the right and left areas of the road.

2 Literature Review

According to the Regulation of the Minister of Agrarian Affairs and Spatial Planning/Head of the National Land Agency of the Republic of Indonesia Number 12 of 2019 concerning Land Consolidation, Land Consolidation is a policy of rearranging the control, ownership, use and utilization of land and space in accordance with spatial plans and efforts to provide land for the public interest in order to improve environmental quality and maintenance of natural resources by involving active community participation.

Land Consolidation technique is a technique of rearranging the location and boundaries of land and facilities and infrastructure (road alignment) Land Consolidation is seen as an effective space utilization effort because it holistically utilizes space by rearranging the control and ownership as well as the use and utilization of land. After the RTRW/City allocates space or landscape designations, the implementation of the RTRW/City can be applied through the concept of Land Consolidation, especially for spaces/landscapes where the condition of land tenure and ownership is not orderly and the use and utilization of land is not orderly and the use and utilization of land is irregular (Sitorus, 2015).

3 Methodology

This research uses mixed methods, by combining quantitative and qualitative research, namely a combination research method by combining quantitative and qualitative research methods. Sugiyono (2018) explains that this mixed method is considered a perfect method because the weaknesses that exist in quantitative methods can be overcome by qualitative methods or vice versa.

This research was conducted in Pekanbaru City, the ring road project in West Rumbai Sub-district (Muara Fajar Barat Village, Palas Village), East Rumbai Sub-district (Okura Village, Sungai Ambang Village, Muara Fajar Timur Village), Tenayan Raya Sub-district (Tuah Negri Village, Tenayan Industrial Village, Bambu Kuning Village), and Kulim Sub-district (Kulim Village, Sialang Rampai Village) where the ring road Land Consolidation program took place. For GIS (Geographic Information System) based web sampling and interviews were conducted at the Pekanbaru City Land Office and BPN.

4 Results and Discussion

In 2013, the spatial planning of Pekanbaru City only drafted the Regional Regulation on the Pekanbaru City Spatial Plan 2013-2033. The draft RTRW of Pekanbaru City 2013-2033 at that time could not be ratified because the Regional Spatial Plan of Riau Province was still undergoing integration with the TGHK by the Directorate of Spatial Planning of the Directorate General of Planology of the Ministry of Forestry. The Regional Spatial Plan data or information needed in the Potential Land Consolidation Objects activity is about the direction of regional development, the city service center system and the determination of strategic area development locations. Since the 2013-2033 Pekanbaru City Plan had not yet been approved, the information on the direction of development of the Land Consolidation Area for the ring road project still used data from the Pekanbaru City General Spatial Plan, namely Regional Regulation No. 4 of 1993 dated January 28, 1993. Currently, the Regional Spatial Plan Regulation has been issued, namely Regional Regulation Number 7 of 2020 concerning the Pekanbaru City Spatial Plan for 2020 – 2040.

Mahi, 2016 states that the study of regional development in Indonesia has always been approached from sectoral and spatial aspects. The sectoral aspect of the study states more about the size and activities of a region's community in managing its natural resources. Meanwhile, the spatial aspect of the study is more indicative of the direction of sectoral activities or where the location and location of sectoral activities should be. The approach that refers to the sectoral and spatial aspects encourages the birth of a regional development concept that must be able to increase the efficiency of space use according to carrying capacity, be able to provide opportunities for sectors to develop and be able to improve welfare equally. The concept is classified in the concept of regional development based on spatial planning.

Regional development is an effort to harmoniously marry natural, human and technological resources, taking into account the environmental capacity itself. According to the Director General of Spatial Planning (2003), the basic principles in regional development are: (1). As a Growth Center, the development of the region is not only internal to the region, but must be considered the distribution or influence (spread effect) of growth that can be caused to the surrounding area and even nationally; (2). Regional development requires

cooperative development efforts between regions and is the main requirement for the success of regional development; (3). The pattern of regional development is integral, which is the integration of the regions included in the region through an equitable approach; and (4). In regional development, market mechanisms must also be a prerequisite for regional development planning.

The spatial study aims to obtain potential locations of Land Consolidation for the Pekanbaru City ring road project by conducting map overlay analysis and assessing the suitability of potential Land Consolidation locations based on the Pekanbaru City Spatial Plan Regional Regulation. The creation of a map indicating the potential locations of Land Consolidation is done with the following steps: (1). Create a suitability matrix of potential Land Consolidation locations by overlaying the land use map with the spatial polar plan of the Regional Spatial Plan (RTRW)/ Spatial Detail Plan (RDTR)/ Building and Environmental Planning (RTBL)/ Housing and Settlement Area Development Plan (RP3KP) and determine its suitability based on the existing classification. The table of the suitability matrix of potential Land Consolidation objects in Pekanbaru City can be seen in table 1 below:

Table 1. Matrix of suitability of potential Land Consolidation objects in Rumbai Sub-district, Pekanbaru City

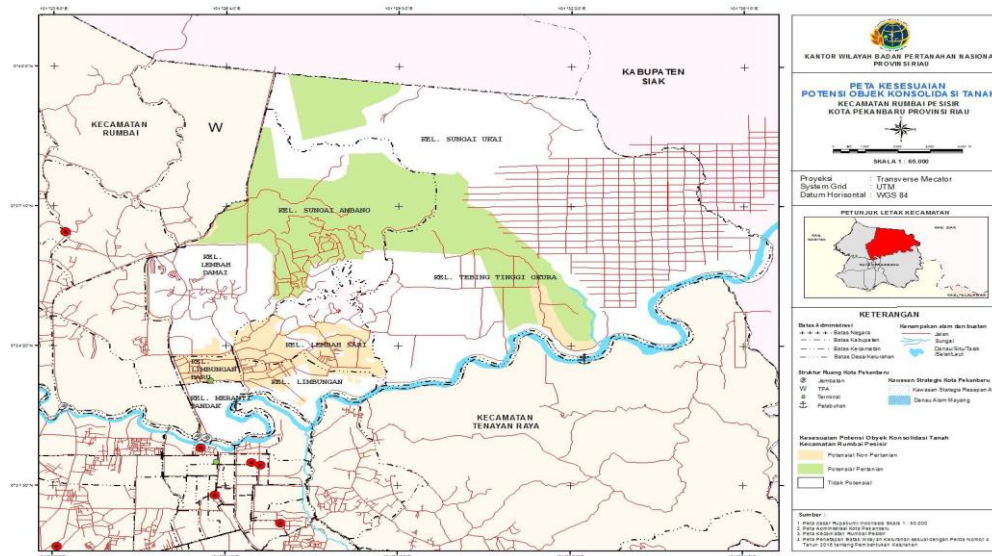
Land use in the Rumbai subdistrict	Spatial use directions						
	Lake	Education facility	Protection forest	Caltex Region	Conservation area	Payung sekaki Area	Trade and service area
Leisure accommodations	NP	TP	TP	TP	TP	TP	TP
Lake	NP	NP	NP	NP	NP	NP	NP
Forest	NP	NP	NP	NP	NP	NP	NP
Agriculture processing industry	NP	NP	NP	NP	NP	NP	NP
Installations	NP	NP	NP	NP	NP	NP	NP
Public service	NP	NP	NP	NP	NP	NP	NP
Government service	NP	NP	NP	NP	NP	NP	NP
Education services	NP	NP	NP	NP	NP	NP	NP
Worship services	NP	NP	NP	NP	NP	NP	NP
Market	NP	NP	NP	NP	NP	NP	NP
Storage	NP	NP	NP	NP	NP	NP	NP
Dryland agriculture	NP	NP	NP	NP	NP	NP	NP
Organized housing	NP	NP	NP	NP	NP	NP	NP
Disorganized housing	NP	NP	NP	NP	NP	NP	NP
Transportation infrastructure	NP	NP	NP	NP	NP	NP	NP
River	NP	NP	NP	NP	NP	NP	NP
Empty land	NP	NP	NP	NP	NP	NP	NP

Description : land consolidation report, Dinas Pertanahan 2018

Keterangan : P = Potential

NP = Non Potential

Land consolidation of the Ring Road project trajectory in spatial studies can be seen on the Pekanbaru City Potential Suitability Map. The potential suitability map of Pekanbaru city is shown in Figure 1.



Regarding spatial planning, problems that occur in the field, especially in Trase IV. B, in 2020 the Regional Regulation on Spatial Planning has been ratified, namely Regional Regulation Number 7 of 2020 concerning the Pekanbaru City Spatial Plan 2020 - 2040. In Trase IV.B there are 46 parcels of community land affected by Land Consolidation affected by limited production forest areas, currently the Pekanbaru City government is taking care of the Ministry of Environment for a request to bleach limited production forest areas.

With regard to the use and utilization of land as stipulated in Article 13 of PP 16/2004: (a) the use and utilization of land in protected areas or cultivated areas must be in accordance with the function of the RTRW area; (b) the use and utilization of land in protected areas must not interfere with natural functions, not change the landscape and natural ecosystems; (c) the use of land in cultivated areas must not be abandoned, must be maintained and prevented from damage and (d) the use of land in cultivated areas does not conflict with each other, does not interfere with each other and provides an increase in added value to the use of the land. Land requested for limited production forest area bleaching, the first step is to release its status from the state forest area, for Pekanbaru city infrastructure activities whose licenses are issued by the Pekanbaru City Government whose areas are limited production forest areas are processed through applications through the Ministry of Environment.

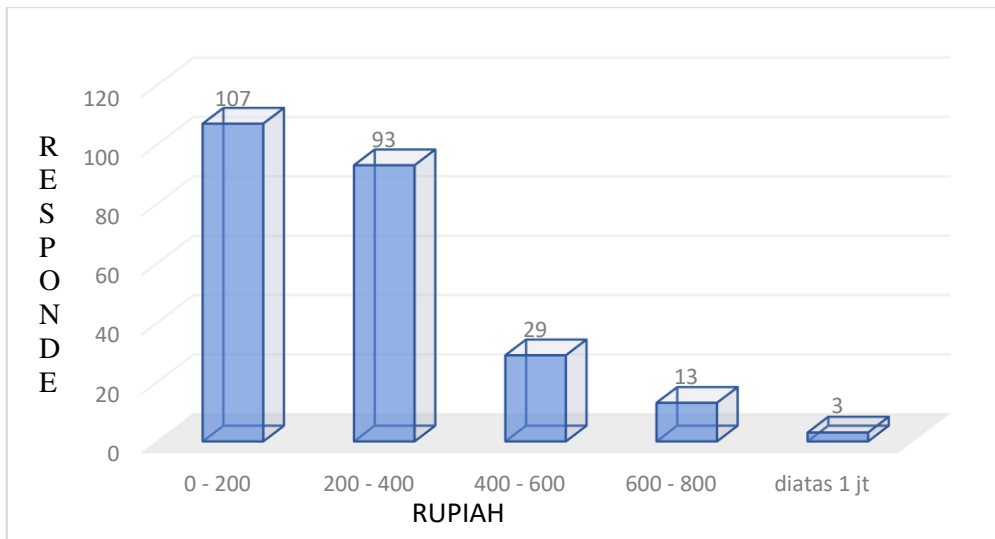
Limited Production Forest (HPT) according to Article 1 point 10 of Government Regulation No. 104/2015 on the procedures for changing the designation and function of forest areas is a forest area with factors of slope class, soil type, and rain intensity after each is multiplied by a weighing number having a value between 125 and 174 outside Protected Forest areas, nature reserve forests, nature conservation forests, and new parks.

Changes in Limited Production Forest based on PP 104/2015, plantation business activities whose licenses were issued by the local government based on the Provincial / City spatial plan stipulated by local regulations before the enactment of Law No. 26 of 2007 concerning Spatial Planning and based on the applicable spatial plan remain in accordance with the previous spatial plan but based on the Forestry Law, the area according to the last forest area: (a) are convertible production forest areas, processed through forest area release; (b) are permanent production forest and limited production forest areas processed through forest area swap.

Within a maximum period of one year from the enactment of GR 104/2015, an application for forest area release or forest area swap can be submitted to the Minister of Environment and Forestry of Indonesia (LHKI), forest area release and forest area swap are partial forest area designation changes, forest area change is the change of forest area to non-forest area. Forest area swap is the change of permanent production forest area and or limited production forest to non-forest area balanced by including replacement land from non-forest area and convertible production forest. and productive convertible production forest into permanent forest area. Forest area swap is carried out with the following provisions; (1) the forest area is guaranteed to remain at least 30% (thirty percent) of the area of watershed areas, islands and provinces with proportional distribution; (2) maintaining the carrying capacity of the forest area remains viable. (PP 104, 2015).

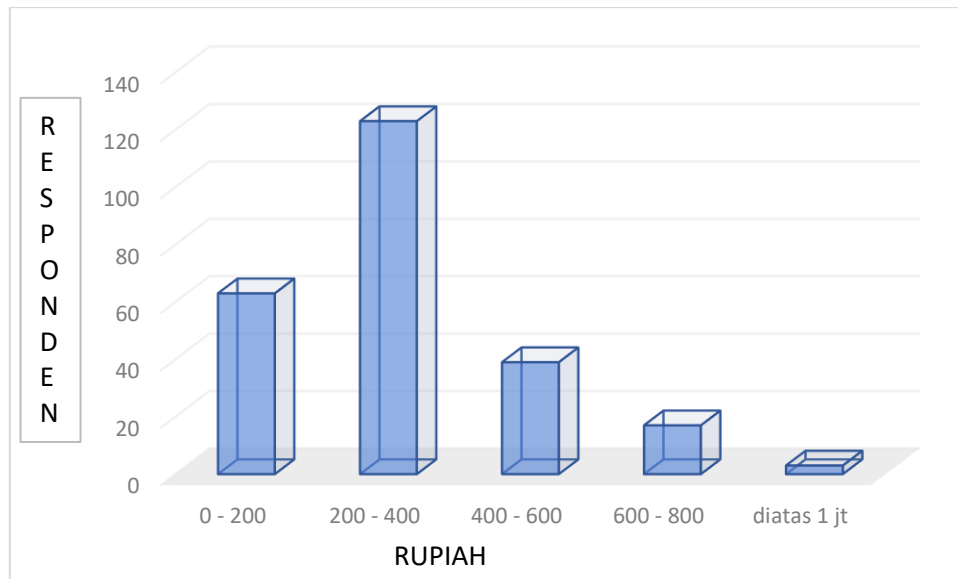
4.1 Economic and Social Impact Results of Land Consolidation Construction of the Ring Road Project

The results of the survey in the field can be seen that before the Land Consolidation program of the ring road project, the price of land along the Kulim Subdistrict road to Muara Fajar Timur Road, East Rumbai Subdistrict based on the questionnaire distributed, there are the following answers: (a) The range of land prices per meter is Rp. 0, - up to a range of Rp. 200,000, - of the two hundred and forty-five respondents that researchers conducted there were one hundred and seven or as much as 43.67% who stated the price of land before the Land Consolidation of the ring road project. (b) The range of land prices per meter around the ring road is Rp. 200,000, - up to a range of Rp. 400,000, - there are twenty nine respondents who stated out of two hundred and forty-five respondents or as much as 37.96% of the questionnaires distributed. (c) Range in land prices between Rp. 400,000, - to the range of Rp. 600,000, - there are twenty-nine respondents who stated for the price of land per meter. (d) Price range of Rp. 600,000 to 800,000, there were thirteen out of two hundred and forty-five or 11.84% of respondents distributed and (5) Price range above Rp. 1000,000, there were three respondents or 1.224% who stated the price of land in this range. A comparison of land prices before Land Consolidation for the construction of the ring road can be seen in Figure 2.



The results of the survey in the field after the construction of the Land Consolidation of the Pekanbaru City ring road project, out of two hundred and forty-five questionnaire samples distributed, there were the following answers: (a) The price range of Rp. 0,- to Rp. 200,000,- per meter can be seen there are sixty-three respondents or as many as 25.72% who chose in this range. (b) in the land price range of Rp. 200,000, - to the price range of Rp. 400,000, - there are one hundred and twenty-three respondents or 50.20% who chose this land price range. (c) the price range of Rp. 400,000, - Rp. 600,000, - there were thirty-nine respondents or as many as 15.92% of the two hundred and forty-five respondents who chose this land price, (d) the range in the price between Rp. 600,000, - to the price of Rp. 800,000, - there were seventeen respondents who chose or as many as 6.94% and (e) Range in land prices above Rp.1000,000, - per meter of the fifteen questionnaires distributed there were three respondents who chose this range or as many as 1.224%.

From the data above, it can be seen that the price of land in the sub-districts of East Rumbai, Rumbai, West Rumbai, Tenayan Raya before the Land Consolidation (KT) of the ring road project was highest at around Rp. 0,- Rp. 200,000,- per meter. For a comparison of land prices after the construction of the Ring Road Land Consolidation can be seen in Figure 3



The impact of the construction of the Land Consolidation of the ring road is that the price of land value around the ring road area can increase but not the increase in land prices is not too significant. The results of the research from the distribution of questionnaires after the land consolidation of the ring road project, the highest range is Rp. 200,000, - Rp. 400,000, - . When compared with the data before the Land Consolidation of the ring road project, it can be seen that the highest range is at the price of Rp. 0, - to the price of Rp. 200,000, - per meter. This means that the construction of roads due to the Land Consolidation of the ring road project can increase the value of community land prices around the ring road.

5 Conclusion

Legal Impact of Land Consolidation, spatial aspects there are 46 parcels of community land in Trase IV.a affected by the Production Forest Area, in 2020 the Pekanbaru City Spatial Plan has been ratified by Regional Regulation Number 7 of 2020 concerning the Pekanbaru City Spatial Plan 2020 - 2040, 46 parcels cannot continue the Land Consolidation process to the next stage, the Pekanbaru City Government submitted an application to release the Forest Area, according to Decree : 323 / Menhut-11 / 2011 that land whose rights were issued before the RTRW was ratified may apply for the release of the Forest Zone, if it is issued above the RTRW then exchange the Forest Zone, this is based on Government Regulation Number 104 of 2015 concerning procedures for changing the designation and function of forest areas. Economic impact, with the Land Consolidation program of the Ring Road project, it increases the price of community-owned land and increases community income.

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