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Projected Housing Needs in the Priority Area of Tayan New City, Sanggau Regency, West Kalimantan

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ABSTRACT

The activities of government and economic centers in big cities are becoming an increasing attraction for the continuity of the migration process of people from various regions in Indonesia. However, limited development resources in the regions and the desire to break free from the limitations of the traditional environment are the driving factors for the continuation of the migration process from villages to cities. Along with the growth of the area of Sanggau Regency, West Kalimantan, which is characterized by a fairly high level of urbanization, concentration and increase in economic activity, increasing infrastructure needs, and population density, it is considered necessary to develop a new city in the Sanggau Regency area, which can accommodate the needs of regional growth. in this area. The emergence of a new city adds to the need for housing facilities for the community. The provision of housing facilities is prioritized in the Tayan Baru City Priority Area, Tayan Hilir District, Sanggau Regency to support economic activities in the Industrial Area. The method used in this study includes descriptive analysis. Primary data was obtained through direct observation to the location and conducted interviews and secondary data was obtained through a study of theory, literature and several sources from previous studies. The results of this study are recommendations for the number of housing needs and land area in Priority Areas as housing and supporting facilities for the community.

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1. INTRODUCTION

The concentration of various activities, particularly government and economic centers, in large cities has become a growing attraction for the ongoing migration of people from various regions in Indonesia. However, limited development resources in these regions and the desire to escape the constraints of traditional environments are driving factors for the ongoing migration process from rural to urban areas. This phenomenon has resulted in a significant and worrying population concentration in large cities. The dilemma faced is that urbanization and industrialization are not parallel phenomena. The real rate of economic growth within large cities is not balanced compared to the scale and speed of demographic growth. Population growth due to migration is faster than the increase in employment. As a result, there is a very worrying gap in socio-economic growth.

Expansion and growth in large cities must be controlled to a manageable level. The increasing acceleration of urbanization in the coming decades raises concerns about the environmental carrying capacity of large cities to absorb the increasing population growth. Currently, this already significant population increase has burdened large cities with various problems.

As an effort to ensure equitable development in Indonesia, the Government issued Presidential Decree Number 120 of 1993 concerning the Eastern Indonesia Regional Development Council. (DP-KTI) (Indonesia, KEPUTUSAN PRESIDEN REPUBLIK INDONESIA NO. 120 TAHUN 1993 TENTANG DEWAN PENGEMBANGAN KAWASAN TIMUR INDONESIA, 1993) which was then perfected by Presidential Decree Number 27 of 1994 (Indonesia, KEPUTUSAN PRESIDEN REPUBLIK INDONESIA NOMOR 27 TAHUN 1994 TENTANG PERUBAHAN KEPUTUSAN PRESIDEN NOMOR 120 TAHUN 1993 TENTANG DEWAN PENGEMBANGAN KAWASAN TIMUR INDONESIA, 1993), and further refined by Presidential Decree Number 54 of 1995 (Indonesia, KEPUTUSAN PRESIDEN REPUBLIK INDONESIA NOMOR 54 TAHUN 1995 TENTANG PERUBAHAN KEPUTUSAN PRESIDEN NOMOR 120 TAHUN 1993 TENTANG DEWAN PENGEMBANGAN KAWASAN TIMUR INDONESIA, 1995). This was further refined by Presidential Decree Number 75 of 1998 (Indonesia, KEPUTUSAN PRESIDEN REPUBLIK INDONESIA NOMOR 75 TAHUN 1998 TENTANG PERUBAHAN ATAS KEPUTUSAN PRESIDEN NOMOR 120 TAHUN 1993, 1993) and finally perfected by Presidential Decree Number 173 of 1998 (Indonesia, KEPUTUSAN PRESIDEN REPUBLIK INDONESIA NOMOR 173 TAHUN 1998 TENTANG PERUBAHAN ATAS KEPUTUSAN PRESIDEN NOMOR 120 TAHUN 1993, 1998)

As a follow-up, it was deemed necessary to take concrete steps and policies to be able to spur the growth of the Eastern Region of Indonesia by managing a mainstay region as a center of economic growth, so that Presidential Decree Number 89 of 1996 was issued (Indonesia, KEPUTUSAN PRESIDEN REPUBLIK INDONESIA NOMOR 89 TAHUN 1996 TENTANG KAWASAN PENGEMBANGAN EKONOMI TERPADU, 1996) which was then perfected by Presidential Decree Number 9 of 1998 concerning the establishment of Integrated Economic Development Areas (KAPET) (Indonesia, KEPUTUSAN PRESIDEN REPUBLIK INDONESIA NOMOR 9 TAHUN 1998 TENTANG PERUBAHAN ATAS KEPUTUSAN PRESIDEN NOMOR 89 TAHUN 1996 TENTANG KAWASAN EKONOMI TERPADU, 1998) The Equator KAPET was originally designated as the Sanggau KAPET. The Sanggau KAPET was established through Presidential Decree Number 13 of 1998 (Indonesia, KEPUTUSAN PRESIDEN REPUBLIK INDONESIA NOMOR 13 TAHUN 1998 TENTANG PENETAPAN KAWASAN PENGEMBANGAN EKONOMI SANGGAU, 1998) with an area of approximately 3.2 million hectares. Furthermore, based on the Decree of the Governor of West Kalimantan Number 188/2002

concerning the Expansion of the Kapet Sanggau Area to the Border District Area of Line I in Sintang and Kapuas Hulu Regencies and the Change of the Name of Kapet Sanggau to Kapet Khatulistiwa, KAPET Sanggau was renamed to KAPET Khatulistiwa with an area covered by it of 5.3545 million hectares.



Figure 1. West Kalimantan Region

[source of <https://data.kalbarprov.go.id/group/pemerintahan>]

The coverage area of KAPET Khatulistiwa includes Singkawang City, Bengkayang Regency, Sambas Regency, Sanggau Regency, Sintang Regency, Landak Regency, and Kapuas Hulu Regency.

The development concept for KAPET Khatulistiwa is through an approach to improving the economy and industry supported by infrastructure, increasing creativity and the economy, in accordance with the potential it has. Based on the Decree of the Governor of West Kalimantan Number 530/2405/Ekban-C of 2013 concerning the Acceleration of Industrial Areas in West Kalimantan, there are 3 (three) industrial areas in West Kalimantan Province that are prioritized for development, namely: (a) Semparuk Industrial Area (KIS) in Sambas Regency which is directed towards the agricultural processing industry; (b) Tayan Industrial Area (KIT) in Sanggau Regency which is directed towards the downstream palm oil industry; and (c) Mandor Industrial Area (KIM) in Landak Regency which is directed towards the rubber processing industry. As a National Strategic Area (KSN), the Government through the Ministry of Public Works has prepared a draft Spatial Plan for KSN KAPET Khatulistiwa designating the Tayan Industrial Area as one of 7 (seven) strategic areas in the KAPET Khatulistiwa region. The Tayan KI Zone is the Tayan area and its surroundings, with the leading sector being bauxite mining.

In line with regional development, the Regional Government of West Kalimantan Province, some of whose cities and districts are part of the Equatorial Region, is striving to direct development by utilizing regional space to be efficient, effective, harmonious, balanced and sustainable, issuing Regional Regulation of West Kalimantan Province Number 5 of 2004 concerning the West Kalimantan Provincial Spatial Plan (RTRWP). (Barat, 2004) RTRWP as the basis and policy for integrated development patterns in the regional scope. Regional spatial development strategies include the development of settlement center systems, urban and rural areas, development of regional infrastructure systems, development of prioritized areas and management of land use, water, air and other natural resources.

In 2010, along with the growth of the Tayan Industrial Estate, Sanggau Regency, which is characterized by a relatively high level of urbanization, concentration and increase in economic activity, increasing infrastructure needs, increasing population density, and others, it was deemed necessary to develop a new city in the Sanggau Regency area, which is expected to accommodate the needs of regional growth in this area. Efforts to develop

this new city must begin with comprehensive regional planning. The emergence of a new city is marked by the availability of infrastructure in the form of facilities, infrastructure and utilities to facilitate the needs of the community. Tayan Hilir District is one of the districts in the Sanggau Regency area and is located in the western part of the Sanggau Regency area. To meet the needs of the new city development, it is necessary to project the level of housing facilities to support regional/city facilities.

2. RESEARCH METHODS

This study utilizes both primary and secondary data. Primary data were obtained through direct observation at the location and in-depth interviews with relevant parties. Secondary data were obtained through theoretical studies, literature reviews, and several sources from previous research, including journals, government regulations, and other sources that can be used as references. The method used in this study is descriptive research through quantitative and qualitative approaches. Some of the data are the results of a study conducted during the Technical Assistance Program for the Preparation of New City Development Plans in the Tayan Industrial Area, Sanggau Regency, West Kalimantan Province, from 2014 to 2015. The data were then processed and analyzed according to the needs of this study.

3. RESULTS AND DISCUSSION

3.1. Foundation for Regional Development

The basis of regional potential development policy, particularly in Sanggau Regency, West Kalimantan, is the issuance of national regulations and their derivatives, including Presidential Regulation Number 32 of 2011 concerning the Masterplan for the Acceleration and Expansion of Indonesian Economic Development (MP3EI) 2011-2025 (Indonesia, PERATURAN PRESIDEN REPUBLIK INDONESIA NOMOR 32 TAHUN 2011 TENTANG MASTERPLAN PERCEPATAN DAN PERLUASAN PEMBANGUNAN EKONOMI INDONESIA 2011-2025, 2011), as a direction for Indonesia's economic development until 2025. In accordance with the natural and resource potential and geography of Kalimantan Island, the focus of the development of the Kalimantan Economic Corridor in the MP3EI is centered on the Production and Processing of Mining Products and the National Energy Barn. This is reflected in the list of MP3EI fast-track investment plans which are dominated by the main economic activities of energy (oil, gas and coal) and minerals (bauxite and steel) and based on the plan for the acceleration and expansion of economic development in the Kalimantan Economic Corridor, there are 3 (three) main economies developed in the West Kalimantan corridor, namely palm oil, bauxite/alumina, and timber.

In its implementation, the development of activity centers in West Kalimantan Province includes: (a) National Activity Center (PKN); (b) Regional Activity Center (PKW); (c) Promotional Regional Activity Center (PKWp); (d) Local Activity Center (PKL); and (e) National Strategic Activity Center (PKSN). In PP Number 26 of 2008 concerning the National Spatial Planning Plan (RTRWN) (Indonesia, PERATURAN PRESIDEN REPUBLIK INDONESIA NOMOR 26 TAHUN 2008 TENTANG RENCANA TATA RUANG WILAYAH NASIONAL, 2008), The PKN, PKW, and PKSN have been established in the West Kalimantan Province. Meanwhile, the activity centers established in the West Kalimantan Provincial RTRW include PKWp and PKL.

In total, there are 1 (one) PKN; 8 (eight) PKW; 5 (five) PKWp, 5 (five) PKSN, and 41 (forty-one) PKL established in West Kalimantan Province. Of the activity centers mentioned above, the activity centers established in Sanggau Regency in general and Tayan New City in

particular are as follows: (a) PKW established in Sanggau City and Entikong City; (b) PKSN established in Entikong City; and (c) PKL established in Balai Karangan, Kembayan, Tayan, Sosok, and the Peace Center.

3.2. Tayan New Town

New cities are often also referred to as planned cities, namely cities whose development is planned and designed from the beginning, so that they grow and develop more or less according to the plan. Since ancient times, the development of new cities has been carried out for various purposes, including: (a) as a new center of power or government; (b) in the context of moving the center of power or government; (c) supporting the utilization of natural resources; (d) supporting higher education activities; and (e) to overcome problems in big cities, such as traffic problems, slum housing, environmental pollution, and others.

There are many definitions/understandings of new cities put forward by experts, including Frederick J Osborn (1977) (Whittick, 1977) which states that a newly established city is a city designed to fulfill the level of harmony in the lives of its residents based on the size of the specified coverage, has an industrial area, and is surrounded by a rural environment. The emergence of a new city designed as an independent city, seeks to provide activities (work activities) for its residents so that the city can become a place to live for the community (natural residents) and newcomers.

In line with the West Kalimantan Provincial Spatial Plan (RTRW), plans are underway to establish a new city in Tayan Hilir District. Tayan Hilir District is one of 15 districts in Sanggau Regency, with an area of 1,050.50 km² and ranking sixth (8.17%) (Sanggau, Kabupaten Sanggau Dalam Angka 2017, 2017) of the sub-districts in Sanggau Regency. Geographically, Tayan Hilir District is located between 109.9° East Longitude - 110.1° South Latitude and 0.1° North Latitude - 0.1° South Latitude. Tayan Hilir District borders Balai and Tayan Hulu Districts to the north, Meliau and Parindu Districts to the east, Toba District to the south, and Kubu Raya Regency to the west.

Tayan Hilir District is strategically located along the Trans Kalimantan Highway and the Kapuas River, Indonesia's longest river. The current road distance from Tayan City to the capital of Sanggau Regency is approximately 100 km, while the distance to the capital of West Kalimantan Province is approximately 110 km, with 90% of the road being paved.

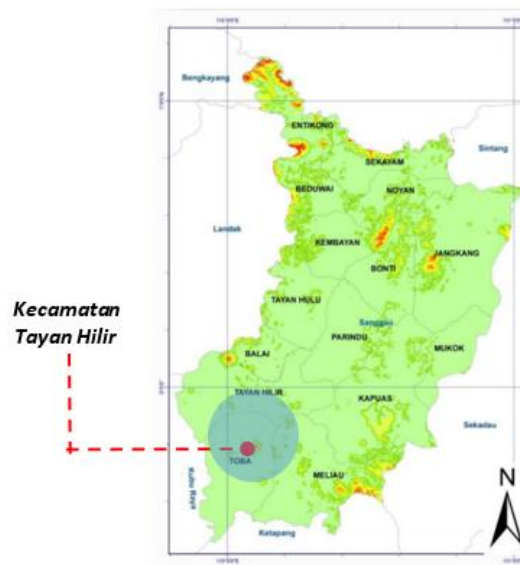


Figure 2. Location of Tayan Hilir District

[Source : <https://diskominfo.sanggau.go.id/kmfsgu-img/2020/02/SIPD-2019.pdf>]

The capital of Tayan Hilir District is in Kawat Village and Pedalaman Village. The planning area for Tayan New Town is located in Tayan Hilir District. The planning area for Tayan New Town covers parts of four villages in Tayan Hilir District, namely Kawat Village (51 km²), Pulau Tayan Village (1.4 km²), Pedalaman Village (68 km²), and Sejotang Village (64.5 km²). The development center of Tayan New Town will be in the capital of Tayan Hilir District, namely Kawat Village, Pedalaman Village, and Pulau Tayan Village.

The West Kalimantan Provincial Spatial Plan (RTRW) establishes 17 (seventeen) Provincial Strategic Areas (KSP), consisting of KSP from the perspective of economic growth interests; KSP from the perspective of natural resource utilization and high technology interests; and KSP from the perspective of environmental function and carrying capacity interests. Regarding the Sanggau Regency area, there are 3 (three) KSP located in Sanggau Regency, namely: (a) Tayan Industrial KSP which was established based on the perspective of economic growth interests. This area was developed with the leading sectors of mining, plantations, and industry; (b) Bauxite mining KSP located in Sanggau Regency. This KSP was established based on the perspective of economic growth interests, with the leading sector of bauxite mining; and (c) Mount Nyut Penrisen ecosystem KSP which was established based on the perspective of environmental function and carrying capacity interests.

Tayan Industrial Cooperative in accordance with West Kalimantan Provincial Regulation No. 5/2004, has designated Tayan as a region that is prioritized for development with the criteria of an area that plays a role in supporting the development of strategic sectors and is an area that has the potential to grow rapidly.

Tayan Industrial Estate is administratively located in Tayan Hilir District, Sanggau Regency with a planning area of approximately 225 Ha. The area complies with the criteria of a strategic area based on economic interests as regulated in PP No. 26/2008 concerning the National Spatial Plan, including the following: (a) The designation of Tayan Hilir District (Tayan City) is outside the forest area (other use areas) and is not burdened with permits because it has been designated as an industrial area in the Sanggau Regency Spatial Plan for 2014-2034; (b) The accessibility of Tayan City is relatively open to regional and foreign markets. Tayan City is located on the primary arterial road network connecting Pontianak City, Entikong City, the southern region of West Kalimantan Province, and Central Kalimantan Province. In addition, Tayan City is included in the National Economic Corridor as a Masterplan program for the Acceleration and Expansion of Indonesian Economic Development for 2011-2031; and (c) Tayan City is relatively close to the center of oil palm plantations, palm oil processing factories, rubber processing factories, and mining industries.

The spatial planning of the Tayan Industrial Estate aims to make the Tayan Industrial Estate an integrated, safe, comfortable, productive and sustainable Green Industrial Estate based on the development of the downstream palm oil industry. The spatial planning policy for the Tayan Industrial Estate includes: (a) Construction and development of the downstream palm oil industrial estate as the main framework in the development planning of West Kalimantan Province; (b) Construction and development of complete and integrated industrial estate infrastructure; (c) Development of the area that takes into account the surrounding environment.

3.3. Growth and Needs Projections

3.3.1. Economic Growth

One of the macro indicators to see the performance of regional economic development is to look at economic growth through one of the indicators, Gross Regional Domestic Product (GRDP).



Figure 3. GRDP Growth Rate Kab. Sanggau of 2011-2018
(Sanggau, Sanggau Regency in Figures 2019, 2019)

The GRDP of Sanggau Regency, in 2014, amounted to Rp. 12,911.81 billion, the largest contribution came from the agriculture, forestry and fisheries business sector at 32.42%. The manufacturing industry business sector contributed 20.18% and the wholesale, retail, and car and motorcycle repair business sector contributed 11.87%. During the 2011-2014 period, the growth rate of GRDP of Sanggau Regency experienced increases and decreases. In the 2011-2012 period, the economic growth rate increased by 0.95, from 5.08 (in 2011) to 6.03 (in 2012). However, it decreased in the 2013-2014 period. From 2015 to 2018, the GRDP of Sanggau Regency was relatively above 4%. A significant increase occurred in 2016, reaching 5.35%, but in 2017 and 2018 there was a slowdown compared to the previous year.

The economy of Tayan Hilir District is dominated by the agricultural sector, particularly plantations, and the mining sector, particularly bauxite mining. Although an industrial area will be built in the Tayan area, industrial activities are still relatively limited to small/home industries. The Tayan area has significant mining potential and is located in the southern part of the city (bordering the Toba District). Therefore, in the future, this mining area can support the city's economy with the development of industrial areas around the mines.

Based on 2014 data from the Sanggau Regency Mining and Energy Service, currently in Tayan Hilir District there are 20 bauxite mining/excavation industries consisting of 7 (seven) industries that have operating and production permits, while 13 (thirteen) have exploration permits (Sanggau, Kabupaten Sanggau Dalam Angka 2015, 2015)

Currently, Tayan has a large potential for oil palm plantations, where there is already a palm oil/crude palm oil (CPO) industry so that in the future the palm oil plantation (CPO) industry can support the city's economy by building industrial areas around the plantations.

3.3.2. Population Growth

Based on data from Tayan Hilir District in Figures in 2015, the population of Tayan Hilir District in 2015 was recorded at 33,196 people, consisting of 17,276 male residents and 15,920 female residents. The population of Tayan Hilir District is spread across 15 (fifteen) villages. On average, each village consists of 1,500 to 4,000 people. Pedalaman Village and Sungai Jaman Village have the largest populations, with 4,263 and 3,457 people, respectively. In 2020, the population of Tayan Hilir District reached 36,710 people, consisting of 19,029 male residents and 17,681 female residents.

Table 1. Population of Tayan Hilir District

No	Village in Tayan Hilir District	An area (km2)	Number (of Souls)				
			2015	2016	2017	2018	2019
1	Lalang	162,00	1.582	1.609	1.636	1.662	1.687
2	Kawat	51,00	3.197	3.265	3.332	3.398	3.464
3	Pulau Tayan Utara	1,40	2.650	2.684	2.717	2.748	2.779
4	Pedalaman	68,00	4.263	4.391	4.521	4.652	4.785
5	Tanjung Bunut	48,00	2.152	2.164	2.174	2.183	2.191
6	Sebemban	13,50	960	983	1.006	1.029	1.052
7	Beginjan	20,50	2.095	2.171	2.249	2.328	2.408
8	Sungai Jaman	101,00	3.457	3.496	3.533	3.568	3.602
9	Emberas	85,00	1.526	1.536	1.545	1.553	1.561
10	Melugai	109,10	1.536	1.549	1.561	1.571	1.580
11	Cempedak	62,00	2.115	2.187	2.259	2.331	2.404
12	Sejotang	64,50	1.862	1.896	1.930	1.963	1.995
13	Subah	161,50	1.981	2.013	2.044	2.074	2.104
14	Tebang Benua	20,50	1.494	1.506	1.517	1.527	1.536
15	Balai Ingin	77,50	2.326	2.346	2.365	2.382	2.398
	TAYAN HILIR	1050,50	33.196	33.769	34.389	34.969	35.546

The population growth rate in Tayan Hilir District varies between villages, ranging from 0.06% (Balai Ingin Village) to 6.51% (Pedalaman Village). On average, the population growth rate in Tayan Hilir District is 1.98%.

With an area of 1,050.50 km², the average population density in Tayan Hilir District was only 32 people/km² in 2015, and 35 people/km² in 2020. Pulau Tayan Utara Village has the highest population density (1,893 people/km²). This is because the area of Pulau Tayan Village is relatively small compared to other villages in Tayan Hilir District. Pulau Tayan Utara Village is a village with a small island area located in the Kapuas River with an area of only 1.40 km².

The family size in Tayan Hilir District is approximately 3.64. The population in the Tayan New Town area is estimated based on the percentage of population distribution estimated to be within the new town planning area. For example, some residents living in Sejotang Village are located or distributed within the Tayan New Town planning area, while others are not within the planning area.

Based on the data in Table 1 above, a population projection can be made until 2035 in Tayan Hilir District, specifically for the villages included in the Tayan new city planning area. The population projection is based on natural growth and population increases due to the impact of leading industrial or economic activities in the Tayan Industrial Area. The calculation method uses a geometric model. (Michael Rinaldi Clipper Rumengan, 2019)

$$r = \left(\frac{P_t}{P_o} \right)^{\frac{1}{t}} - 1$$

P_t = population in the year -t
 P_o = population in the base year
 t = time period
 r = population growth rate

To find the population projection, use the calculation method as below :
 (Statistik, 2010)

$$P_t = P_o (1 + r)^t$$

P_t = population in the year -t
 P_o = population in the base year
 t = time period
 r = population growth rate

Dari 2 (dua) model perhitungan tersebut diatas, didapatkan hasil laju pertumbuhan penduduk dan proyeksi jumlah penduduk pada 4 (empat) desa yang masuk dalam wilayah perencanaan kawasan kota baru Tayan.

Table 2. Population Growth Rate and Projection

No	Village in Tayan Hilir District	Number (of people)		Growth Rate	Population Projection		
		2015	2020		2025	2030	2035
1	Kawat	3.197	3.358	0,9875%	3.527	3.705	3.891
2	Pulau Tayan Utara	2.650	2.562	0,6732%	2.649	2.740	2.833
3	Pedalaman	4.263	5.844	6,5121%	6.409	7.688	9.786
4	Sejotang	1.862	2.334	4,6223%	2.926	3.667	4.597
Total New City		11.972	14.098		15.511	17.800	21.108

The table above shows the projected population of Kawat Village, North Tayan Island, Pedalaman, and Sejotang in 2025, 2030, and 2035. The population of Pedalaman and Sejotang villages is not entirely within the new city planning area; only 60-80% of the area is included in the planning area.

Population growth due to the impact of industry is calculated based on labor needs in the industrial and mining sectors. Activities with the potential for population growth include industrial areas, large-scale plantations, mining, and construction development. Based on the data analysis, the projected population growth due to the impact of industrial, plantation, and mining activities is as follows:

Table 3 Projection of Population Increase Due to Main Economic Activities in Tayan New Town until 2035

No.	Economic Activities	Population (People)				
		2015	2020	2025	2030	2035
1	Kawasan Industri		2.880	5.760	8.400	12.240
2	Perkebunan Besar		1.028	2.060	3.088	4.116
3	Pertambangan		572	1.144	1.712	2.284
4	Pembangunan Jembatan		4.081	4.551	5.076	5.662
			8.561	13.515	18.276	24.302

Data Source: Technical Assistance Study for the Preparation of New City Development Plans in the Tayan Industrial Area, Sanggau Regency, West Kalimantan Province – 2014-2015, Analysis Results

In 2035, the population will reach 45,410, consisting of 21,108 people added due to natural growth and 24,302 people from the impact of leading economic activities. The table below shows the projected population of Tayan New Town until 2035.

In line with population projections for the new Tayan city, based on natural growth and additional growth due to activities, the need for housing and supporting facilities is also increasing. Population projections and scenarios are used to project the space requirements for the development of the new Tayan city.

Table 4 Population Projection in Tayan New Town until 2035

No.	Area/Activity	Population Projection				
		2015	2020	2025	2030	2035
A	NATURAL GROWTH					
1	Kawat	3.197	3.358	3.527	3.705	3.891
2	Pulau Tayan Utara	2.650	2.562	2.649	2.740	2.833
3	Pedalaman	4.263	5.844	6.409	7.688	9.786
4	Sejotang	1.862	2.334	2.926	3.667	4.597
		11.972	14.098	15.511	17.800	21.108
B	ADDITIONAL IMPACT OF ACTIVITIES					
1	Kawasan Industri		2.880	5.760	8.400	12.240
2	Perkebunan Besar		1.028	2.060	3.088	4.116
3	Pertambangan		572	1.144	1.712	2.284
4	Pembangunan Jembatan		4.081	4.551	5.076	5.662
			8.561	13.515	18.276	24.302
		11.972	22.659	29.026	36.076	45.410

In general, the number of houses needed is the main basis for determining the space requirements for the development of the new city of Tayan.

3.3.3. Housing and Land Need Level

The calculation of housing needs for the increasing population of Tayan New City until the end of the planning year is carried out using the following assumptions:

- 1 (one) family (household) has/needs 1 (one) house unit.
- Family size (household) is 4-5 people. The number of houses needed is based on the number of households..
- Land requirements for house plots are based on a balanced density strategy 1 : 2 : 3 (Indonesia, Peraturan Pemerintah Republik Indonesia Nomor 12 Tahun 2021 Tentang Perubahan Atas Peraturan Pemerintah Nomor 14 Tahun 2016 Tentang Penyelenggaraan Perumahan Dan Kawasan Permukiman, 2021), namely with the following details: (a) Small plots with an average plot area of 150 m² (0.015 Ha) per house with a proportion of 50%; (b) Medium plots with an average plot area of 300 m² (0.03 Ha) per house with a proportion of 30%; (c) Large plots with an average plot area of 400 m² (0.04 Ha) per house with a proportion of 20%.
- Allocation of infrastructure, facilities and utilities amounting to 30% of the land area for housing.
- The housing density norm is 50 units/Ha or 200 people/Ha.

The assumptions and standards above are used to obtain an estimate of the number of housing needs in the Planning Area until 2035, by calculating natural population growth.

Table 5 Prediction of Housing Unit Needs and Housing Land Needs (Natural Growth)

No.	Description	2015	2020	2025	2030	2035
A.	Population (people)					
	Desa Kawat	3.197	3.358	3.527	3.705	3.891
	Desa Pulau Tayan Utara	2.650	2.562	2.649	2.740	2.833
	Desa Pedalaman	4.263	5.844	6.409	7.688	9.786
	Desa Sejotang	1.862	2.334	2.926	3.667	4.597

No.	Description	2015	2020	2025	2030	2035
	Total population	11.972	14.098	15.511	17.800	21.108
B.	Number of Households (KK)	2.394	2.820	3.102	3.560	4.222
C.	Number of House Needs (units)					
	Kavling Besar (20%)	479	564	620	712	844
	Kavling Sedang (30%)	718	846	931	1.068	1.266
	Kavling kecil (50%)	1.197	1.410	1.551	1.780	2.111
	Total Housing Units	2.394	2.820	3.102	3.560	4.222
D.	Amount of Land Required (Ha)					
	Kavling Besar (0,04 ha)	19,16	22,56	24,82	28,48	33,77
	Kavling Sedang (0,03 ha)	21,55	25,38	27,92	32,04	37,99
	Kavling Kecil (0,015 ha)	17,96	21,15	23,27	26,70	31,66
	Total Land Plots (Ha)	58,66	69,08	76,01	87,22	103,43
E.	Kebutuhan untuk RTH (Ha)	17,60	20,72	22,80	26,17	31,03
F.	Kebutuhan PSDU (Ha)	8,80	10,36	11,40	13,08	15,51
G.	Kebutuhan Fasilitas Perdagangan (Ha)	8,80	10,36	11,40	13,08	15,51
H.	Lahan Cadangan (Ha)	2,93	3,45	3,80	4,36	5,17
	Total Land Requirement (Ha)	96,79	113,98	125,41	143,91	170,65

The need for housing facilities is due to the development of economic activities in the new city area of Tayan.

Table 6 Prediction of Housing Unit Needs and Housing Land Needs (Economic Activities)

No	Description (Activities)	2015	2015-2020	2021-2025	2026-2030	2031-2035
A.	Population (people)					
	Kawasan Industri		2.880	5.760	8.400	12.240
	Perkebunan besar		1.028	2.060	3.088	4.116
	Pertambangan		572	1.144	1.712	2.284
	Pembangunan Jembatan		4.081	4.551	5.076	5.662
	Total population	0	8.561	13.515	18.276	24.302
B.	Number of Housing Needs (Units)					
	Kawasan Industri		720	1.440	2.100	3.060
	Perkebunan Besar		257	515	772	1.029
	Pertambangan		143	286	428	571
	Pembangunan Jembatan		1.020	1.138	1.269	1.416
	Total Housing Units	0	2.140	3.379	4.569	6.076
C.	Amount of Land Required (Ha)					
	Kavling Perumahan		34,30	55,07	74,94	100,47
	Kebutuhan PSU (Ha)		14,73	23,66	32,21	43,17
	Total Land Requirement (ha)	0	49,03	78,74	107,15	143,64

Data Source: Technical Assistance Study for the Preparation of New City Development Plans in the Tayan Industrial Area, Sanggau Regency, West Kalimantan Province – 2014-2015, Analysis Results



Figure 5. Land Use



Figure 6. Zoning of Tayan Priority Area

Source: Data from the Technical Assistance Study for the Preparation of New City Development Plans In the Tayan Industrial Estate, Sanggau Regency, West Kalimantan Province

Public facilities, such as offices and commercial areas, are zoning along main roads. Each cluster is planned to cover approximately 60-70 hectares, with green open space as a catchment area, road infrastructure, and housing utilities. Each cluster is equipped with supporting facilities, including social and public facilities, located at the center of the cluster's orientation.

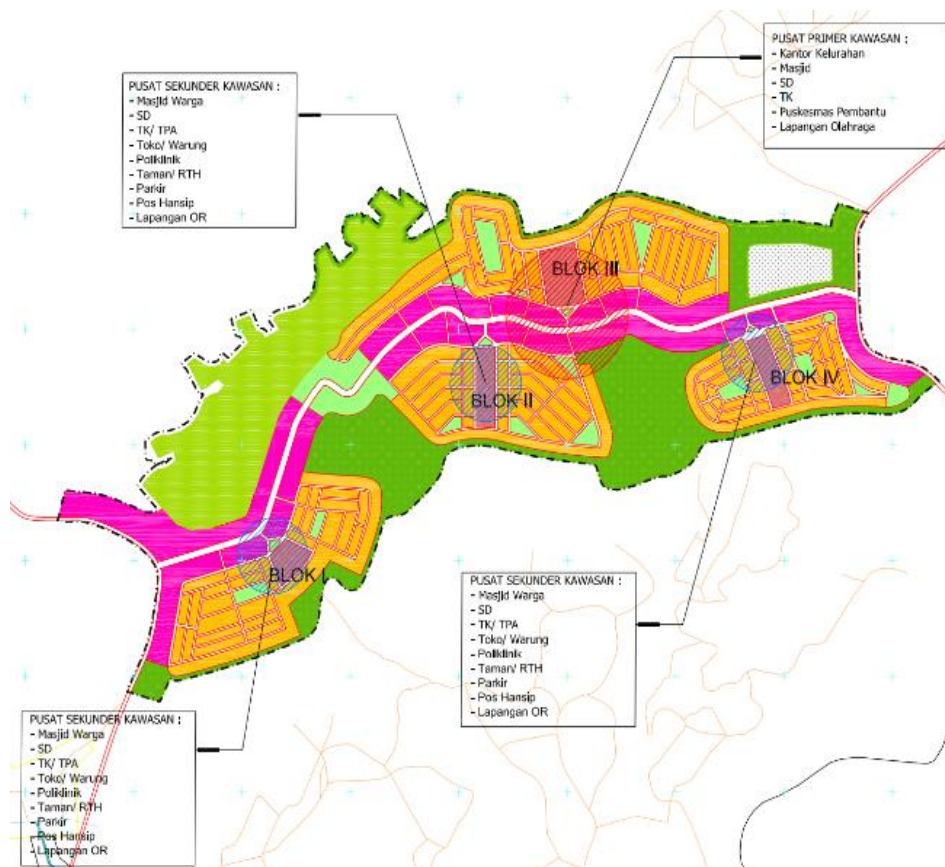


Figure 7. Tayan Priority Area Block Plan

Source: Data from the Technical Assistance Study for the Preparation of New City Development Plans In the Tayan Industrial Estate, Sanggau Regency, West Kalimantan Province

The primary center of the area is located in the center of the site, extending the site's length so that each cluster's reach is relatively equal. The primary center is provided to meet the needs of residents based on housing and settlement standards, and the primary center is supported by three secondary centers in the form of social and public facilities.



Figure 8. Example of Cluster-4 (primary access)



Figure 9. Secondary Center and Open Space Facilities

Data Source: Technical Assistance Study for the Preparation of New City Development Plans in the Tayan Industrial Area, Sanggau Regency, West Kalimantan Province – 2014-2015, Analysis Results

Infrastructure in the form of roads, in accordance with minimum standards and requirements using 3 (three) types of roads, namely primary arterial roads (10 m wide x 2 lanes); primary collector roads (8 m wide); and primary local roads (7 m wide).

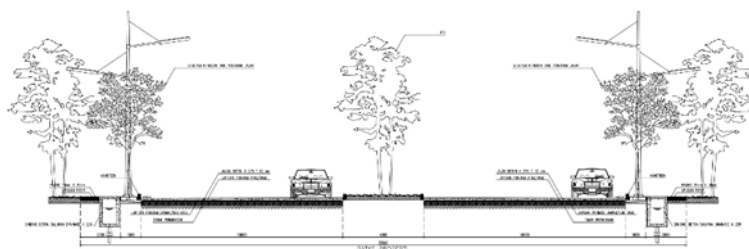


Figure 10. Primary Arterial Road

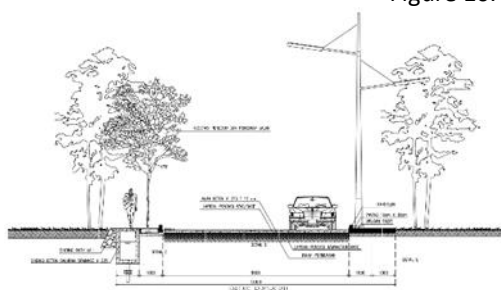


Figure 11. Primary Collector Road

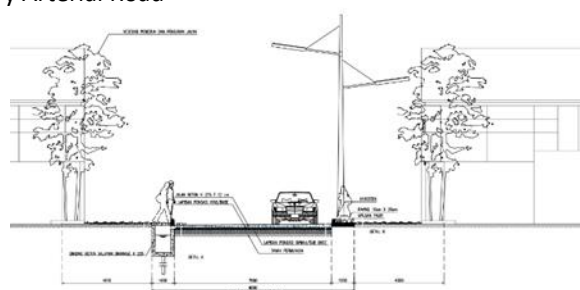


Figure 12. Primary Local Road

4. CONCLUSION

The development plan for the new city of Tayan in Tayan Hilir District, Sanggau Regency is one of the efforts of the central and regional governments to facilitate the acceleration of economic development through the KAPET Khatulistiwa program launched by the government since 1998. The acceleration of regional economic growth, especially in Sanggau Regency through large plantation industrial activities, mining, the emergence of industrial areas and the addition of infrastructure in the form of roads and bridges, needs to be supported by housing facilities for workers, both those from Sanggau Regency and from outside the Regency. The movement of economic activities requires a relatively long time, up to 20 years. With such a long time, it is necessary to facilitate the need for housing facilities planned within that period.

In line with the growth of economic activity, it is necessary to determine priority areas as the beginning of the development process. The determination of the Priority Area of Tayan City provides 412.53 hectares of land for housing facilities and supporting facilities. Based on the study of the technical plan for the development of the new city of Tayan, with the natural population growth rate and immigrants, from 2015 to 2035, which reached 45,410 people, so that 10,298 housing units are needed and an area of 314.29 hectares is needed. In terms of quantity, the results of the study of the level of housing needs and supporting facilities are very adequate in the Priority Area of New City of Tayan.

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