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THE CONCEPT OF INDONESIA'S AEROTROPOLIS DEVELOPMENT IN WEST JAVA KERTAJATI

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Abstract

The development of airports in Indonesia is seen from the service and security aspects, at present the airport services have not been maximized because they have exceeded capacity due to the lack of operational supporting facilities and the development of passenger improvement. The development of Soekarno-Hatta International Airport has exceeded passenger capacity and Husein Sastranegara Airport is still used as a support for military defense. The purpose of this study is to identify the factors that influence the development of the Aerotropolis concept in Kertajati and develop a model of Aerotropolis concept development that is suitable for development in Kertajati, West Java. This research method was carried out using a descriptive qualitative research method. The results of this study indicate that the factors that influence the development of the Aerotropolis concept in Kertajati are topography, land slope, land use, are not prone to disasters and have accessibility to get to the region. The Aerotropolis concept development model in Kertajati uses design schematics and related theories about Aerotropolis from John D. Kasarda. The concept of Kertajati Aerotropolis as meeting the needs of non-aviation areas which is also a supporter of Kertajati Airport activities as the center of the city. Suggestion from the research that has been done is that the development of the Aerotropolis area must be carried out in order to become an economic driver in the region because there are several non-flight activities and it is necessary to conduct further studies and studies on airports and urban areas as the center of the development of the Aerotropolis area.

Keywords: *Airport Development in Indonesia, Qualitative Descriptive Kertajati Aerotropolis Concept*

Preliminary

Indonesia is the largest archipelago country in the world consisting of 17,504 islands. To connect and connect one island to another island, transportation modes are required, namely land, sea and air transportation. Of the three modes of transportation, air transportation is the trend of transportation modes today, because it is more efficient in travel time to the destination.

The development of airports in Indonesia is seen from the aspect of service and security aspects at this time is not optimal because it has exceeded capacity, and is caused by a lack of operational supporting facilities and increasing passenger.

The increase in the number of aircraft passengers has had an impact on the airport management industry due to the higher frequency of passenger arrivals and departures at airports as economic development develops where the airport as the aircraft is located.

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The West Java Provincial Government has made a Provincial Strategic Spatial Plan that plans for the West Java International Airport and is named the Kertajati Aerocity Concept.

The components in the Kertajati Aerocity plan concept include; apartments, hajj halls, hotels, industrial estates, central parks, recreation areas & sports centers, research education, green open spaces, trade and services, settlements, restaurants, utilities, warehousing, and showrooms of West Java's superior products.

In addition, access to the Kertajati Aerocity area is needed by developing railroad transportation modes. The concept of the Kertajati Aerocity area plan by the regional government will be reviewed based on the land allotment plan in the existing area.

The development of the air transportation industry must be accompanied by various efforts to improve airport facilities and infrastructure to provide comfort for users of an increasingly large air transportation mode. The development of passengers at Soekarno-Hatta International Airport has exceeded passenger capacity. With the number of domestic passengers at Soekarno-Hatta International Airport in 2013 as many as 20.659.308 people, in 2014 as many as 20.265.692 people, and in 2015 as many as 17.275.546 people. Whereas the number of international passengers at Soekarno-Hatta Airport in 2013 was 6.371.577 people, in 2014 there were 6.244.840 people, and in 2015 there were 5.700.816 people.

Husein Sastranegara Airport should be a military airport, but also functioned as a civil, domestic and military airport. Until now, Husein Sastranegara Airport is used as a support for military defense. The number of domestic passengers at Husein Sastranegara Airport in 2014 was 2,176,306 people and for the number of international passengers in 2014 it was 675,465 people.

From the Strategic Spatial Plan of West Java International Airport Province and Kertajati Aerocity and its planned components by the West Java Provincial Government, a deeper study is needed so that the problems that occur at Soekarno-Hatta Airport and Airport Husein Sastranegara can be overcome by the construction of Kertajati Airport.

The location to be planned for the development of Kertajati Airport is located in Kertajati District, Majalengka Regency, West Java.

The development of Kertajati Airport will begin in 2020 and will be built and supported by the central government, regional governments and other stakeholders so that it can be realized to support the economic development of the CIAYUMAJAKUNING region and also the development of the surrounding area.

Understanding Aerotropolis is an airport that was originally built far from the city, but with time, the development of urban activities at the airport makes the airport into a city that has supporting facilities in it.

Regional airports in the form of Aerotropolis will function as growth generators, which are independent and able to serve regional activities around the airport.

Airport is an area on land and / or waters with certain limits used as a place for aircraft to land and take off, boarding passengers, loading and unloading goods, and place for intra and intermodal transportation, which is equipped with aviation safety and security facilities , as well as basic facilities and other supporting facilities.

The main facilities available at the airport include, terminal, apron, taxiway, ATC (Air Traffic Controller) and runway. While facilities for commercial services include shopping, dining and drinking, as well as passenger comfort services such as banks, ATMs, money changers, CIP Lounges, offices, spas and massages.

The airport also functions as one of the economic drivers of a region. The role of airports today is demanded to be more than just a gateway for embarkation and debarkation of air transportation that connects domestic, regional and global areas. The transformation carried out by other airports in the world is not only providing aviation infrastructure, but also providing commercial facilities within and outside the airport area.

In addition, airports in Indonesia have a national airport structure that is a national airport system that describes airport planning based on spatial planning, economic growth, regional comparative advantage, natural and geographical conditions, intra and intermodal transport integration, environmental sustainability, safety and aviation security and integration with other development sectors.

The national airport structure is realized in the framework of implementing an airport that is reliable, integrated, efficient, and has global competitiveness to support national and regional development with an archipelago vision.

Scope of Study Material

Based on the objectives outlined above, the scope of study material includes:

1. Study of the factors that influence the development of the Aerotropolis concept in Kertajati, Kertajati District, West Java.
2. Use of the planning stages of the Aerotropolis development concept, related to the need for air transportation and passenger growth at Soekarno-Hatta Airport and to be an economic driver in the eastern part of West Java and western Central Java with an economic center in Cirebon.
3. The focus of Aerotropolis development is more towards the passenger business and activities with a focus on industry and education based on high technology and equipped with settlements and other facilities.

Research Methods

In the research on the Development of Kertajati Aerotropolis Concept in Kertajati Sub-District, Majalengka Regency, it was conducted using a descriptive qualitative research method. This descriptive research includes collecting data to test the hypothesis or answer questions about the final status of the research subject. As for the qualitative approach that is by way of interviews with local governments and experts relating to the development of the Aerotropolis concept in Kertajati, West Java.

This research method explains and describes the variables of the present that occur with the future, which are the focus of research in solving problems objectively and actually through primary and secondary data that have been obtained and then analyzed to get the final result. By knowing the facts and theories related to the development plan of the Aerotropolis New City, so that indicators can be obtained to compare with ideal conditions.

Research data

The data used in this study is a combination of primary data and secondary data including: field survey (observation), library research and interviews. The following are the primary data used in problems in this region.

- ❖ Observation:

Field observations are made through direct observation to the research area. This observation emphasizes the physical condition of the environment, accessibility such as toll roads, ports and railways, and land use patterns (spatial use) which are then carried out documentation.

- ❖ Interview:

Done with the aim to better understand and explore the problems in this study. Interviews were conducted with agencies, residents and Aerotropolis experts related to the research conducted.

Whereas secondary data was obtained or collected by researchers from various existing sources (researchers as second hand). Secondary data can be obtained from various sources such as the Central Bureau of Statistics (BPS), books, reports, journals, and others.

Analysis Method

The analytical method used in the study of Aerotropolis Kertajati concept development studies. This is necessary to obtain an overview of the factors that influence the development of the Kertajati Aerotropolis concept and how the model of the development of the Kertajati Aerotropolis concept is then linked to theories. The analytical methods used in the variables studied include:

1. Site analysis

In conducting the site analysis, the physical condition of the existing environment, such as land slope, topography, wind speed, land use, climatology, and urban service standards (clean water, resilient, green space, telecommunications, and electrical energy needs for the needs of the new city Aerotropolis.

2. Accessibility

In the regional analysis of access, an analysis of access points to get to the Kertajati Aerotropolis area and public transportation to get there. As well as major facilities such as toll roads, train stations, and ports. This is to find out the distance and access that can be traversed to get to the Kertajati Aerotropolis area.

3. Policies

Policy analysis related to the development of Aerotropolis in Kertajati is needed as a guideline for planning and developing Aerotropolis Kertajati in accordance with applicable regulations so as not to cause land abuse and land use and not to the detriment of the surrounding community.

4. Mixed Used

In planning a new city using Mixed used by combining several components that support each other in one area in order to create a complete and sustainable region. In the mixed use level of the product theory is used because this theory serves as a description of the placement of facilities that are in mixed use according to three levels.

5. Block Plan

After doing some analysis above, it can be made a block plan with the concept of Aerotropolis, namely by plotting the area in accordance with zoning / designation.

Regional Analysis

Kertajati Subdistrict is located in the northern part of Majalengka Regency including in East West Java and the Ciayumajakuning development area (Cirebon-Indramayu-Majalengka-Kuningan) which will function as an industrial corridor with direct access to the Karawang Regency Industry and Bandung Metropolitan Area, where it will developing the CIAYUMAJAKUNING area at the same time.

Likewise, this connectivity will be supported by several types of transportation infrastructure such as the CISUMDAWU toll road (Cileunyi - Sumedang - Dawuan) that connects Metro Bandung to Kertajati, the Cikapali (Cikampek - Palimanan) toll road connecting the Karawang Regency Industry to Kertajati and from Kertajati to Cirebon , and the construction of trains from Bandung to Kertajati and from Kertajati to Cirebon.

In addition, the development of ports / sea transportation in Cirebon planned by PT. Pelindo is as a supporter for the liaison between modes of transportation in the movement of passengers and goods and the results of resources to and from Kertajati. Therefore, in the Kertajati District West Java International Airport was built to carry out the Spatial Planning as a Strategic Area of West Java Province.

The background of the development of airports in Indonesia such as Soekarno-Hatta Airport and Husein Sastranegara Airport is also the reason for the construction of the West Java International Airport / Kertajati Airport which serves to improve air transportation. Services that must be prepared for activities at the West Java International Airport are the areas where there are services available to increase non-flight activities.

For this reason, planning for a new city, Aerotropolis Kertajati, is needed as a means to meet the need for non-aviation areas which also support Kertajati Air Force activities as the center of the city.

From looking at physical conditions, utilities in the planning area, regional land use, road conditions and accessibility aspects can be identified as factors that influence the development of Kertajati Aerotropolis.

Judging from the physical condition, the topography of the planning area has a relatively flat slope, has wind speeds ranging from 3 knots to 5 knots blowing from the South and Southeast, except in April to July blowing from the Northwest, and for land use. located in the area of cultivation that can be built and the type of land is a settlement, plantations, irrigated fields and fields.

Meanwhile for the road conditions that are already quite good and based on the results of interviews by the Binamarga Department of Majalengka Regency, the Aerotropolis area will be widened by 20 meters. As well as existing accessibility aspects such as the Cikapali Toll Road and Cisumdawu toll road plans, reactivation of the railroad tracks, and development plans by PT. Pelindo.

Application of Aerotropolis Concepts in Several Cities with Airport Centers

A. Aerotropolis concept at Incheon-Seoul Airport, South Korea

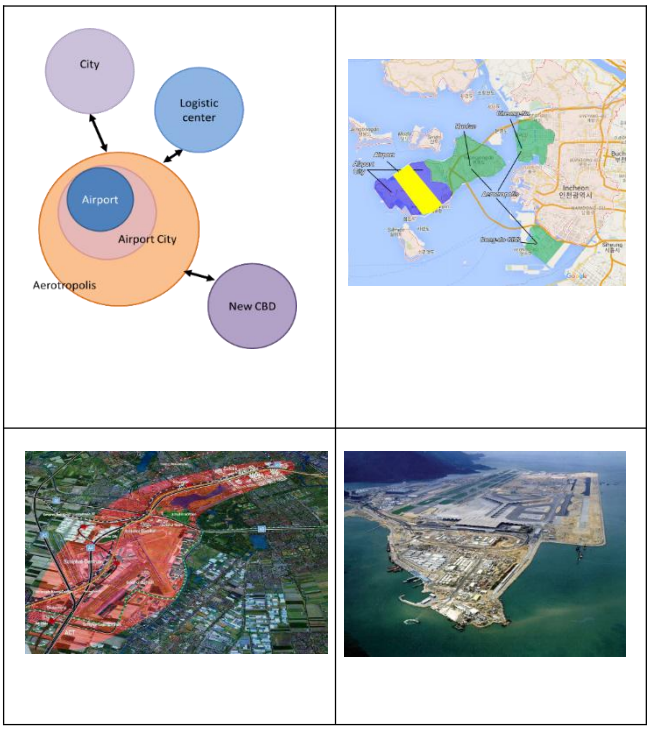
Incheon International Airport is the largest airport in South Korea and is located 48 km (30 miles) West of Seoul. Incheon Airport began construction in November 1992. The construction of the airport was built on reclamation between Yeongjong Island and muddy Youngyu Island. The construction was carried out for 8 years with a trial period of 6 months and the airport was opened in March 2001.

The choice of the location of Incheon Airport considers the potential of serving a quarter of the world's population, within 3.5 hours. With these considerations the construction of the airport was prepared not only to serve airport activities (passengers and goods) but to serve as a tourist destination developing new city areas complete with recreational facilities such as golf areas, spas, bedrooms, parks within the airport and the Korean Culture Museum, settlements and business districts such as industry and warehousing. In other words, the construction of this airport applies the Aerotropolis concept.

This concept proved successful with indications that Incheon Airport became the 6th busiest airport in Asia in serving the number of passengers and the 5th busiest airport in the world in serving cargo and the 11th busiest airport in the world in the movement of international passengers in 2008. Incheon Airport It is projected that in 2018 it will serve 62 million passengers, of which 65% are passengers from Japan and China and 35% are passengers outside Japan and China.

So, the conclusion from the application of the Aerotropolis concept at Incheon Airport is the potential for strategic locations to be developed as new destinations. The basic concept is that the airport is not just a means of transportation but is a major destination as a center for urban activities and tourism with the development of new cities.

Below is a picture of the scheme for applying the Aerotropolis concept at Seoul, South Korea Airport and its location.



Source: Exposure on Aerotropolis by Bausali Lubis and google.com

Picture 1

Schema of Aerotropolis Concept Implementation and Aerotropolis Location at Incheon International Airport Seoul, South Korea

B. Aerotropolis concept at Dubai International Airport, United Arab Emirates

The application of the largest Aerotropolis concept is in Dubai, precisely located in Dubai World Central (DWC) with an area of 145 km2 about twice the size of Hong Kong Island and is designed to be an independent economic zone. Al Maktoum International is projected to become the largest airport in the world with planned 16 million tons of cargo and more than 220 million passengers annually.

Dubai World Center is divided into eight zones namely housing, logistics, aviation, commercial, social assistance center, exhibition, golf area and the airport itself.

This plan is expected to be completed in two stages over six to eight years. Existing facilities at DWC include a compatible runway for A-380 aircraft, a passenger terminal with a capacity of 5 million passengers per year, a cargo terminal building with a capacity of 1 million tons per year and 92 meters air traffic control tower.

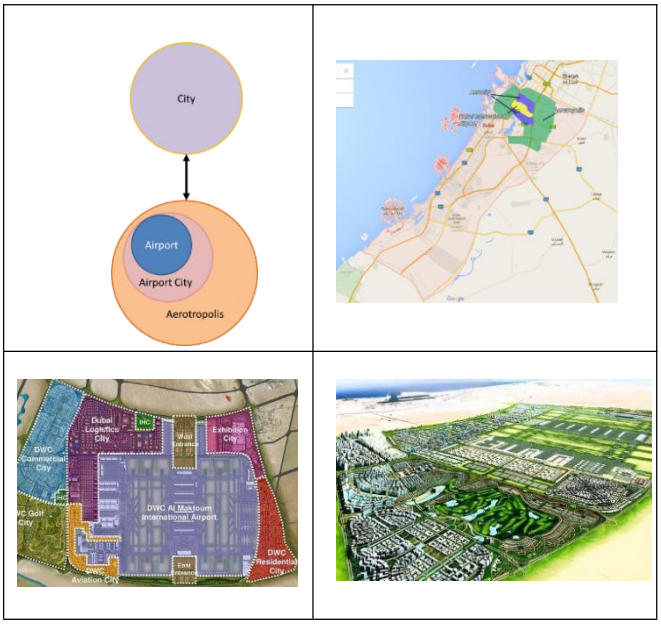
An integral part of DWC is the flight zone. This flight zone is designed to meet industrial needs, from design and development to aircraft operation and use, serving the practical needs of MROs, FBOs, light industry, R&D and educational facilities. With a location centered between the eastern and western worlds, DWC will be able to function as a global trade hub and provide access to the MENASA region (Middle East, North Africa and Soulth Asia) markets where there are around a quarter of the world's population.

These DWC logistics zones are all set to provide efficient regional and global distribution infrastructure, logistics contracts, integrators, freight forwarders and agents. The logistics district is a free zone environment that offers storage and distribution and serves the needs of the global supply chain. Corridor logistics allow seamless connectivity between Al Maktoum International and the port of Jebel Ali, which is the sixth largest container terminal in the world. Direct access to the road network and planned Etihad rail network which will be completed in 2018 creating a fully multimodal logistics platform.

Mohsen Ahmed, Vice President of the logistics district, believes DWC Dubai as a global HUB - SPOKE, offers companies access to untapped markets and creates new trade flows - for example from Africa to CIS countries.

Dubai World Central is a perfect example that has been designed to support such rapid economic development. What DWC is doing is creating a complete ecosystem that offers speed, unlimited connectivity and access to facilities that will empower businesses to propel Dubai as a leading global economy.

Below is a picture of the Aerotropolis concept scheme at Dubai International Airport (Dubai World Central), United Arab Emirates and its location.



Source: Presentation on Kertajati R-80 Presentation by Prof. Dr. Ir. Basauli Umar Lubis, M.S

Figure 2
Aerotropolis Concept Scheme in Dubai World Central, United Arab Emirates

Based on the discussion above regarding the application of the Aerotropolis concept in several cities with an airport center, a matrix of the Aerotropolis concept was made in several cities which included a study of the location of both its physical character and strategic location, proximity to major cities around it and the role of the region. For more details, see Table 4.6 Matrix of Application of Aerotropolis Concepts.

Table 1

Matrix of Application of Aerotropolis Concepts

Aerotropolis	Location			Role of Regions
	Physical Characteristics	Strategic Location	Proximity to big cities	
Incheon International Airport	The reclamation results from muddy land due to tides	- Located on an island separated from Seoul. - Close to East Asia (China and Japan) and Southeast Asia within 3.5 hours	Different islands between Seoul and Incheon	Because it is separated from Seoul, Incheon has the role of the region as a new city that provides urban service facilities

Aerotropolis	Location			Role of Regions
	Physical Characteristics	Strategic Location	Proximity to big cities	
Dubai World Central	Hard land and desert	Potential to reap markets in MENASA (Middle East, North Africa and South Asia) = a quarter of the world's population.	Intended to create a new region	The new area with 8 core zones, namely, housing, logistics, aviation, commercial, social assistance center, exhibition, golf area and the airport itself.

Source: Analysis Results, 2016

Kertajati Aerocity Plan for 2010 by the Regional Government of West Java Province

The Kertajati Aerocity Plan proposed by the Regional Government of West Java Province in 2010 has the same concept pattern as the plan in 2014. The only difference is the designation of the core area where the industrial area is close to the airport area, while the residential area is close to the toll road access. Meanwhile, the commercial area is located near the airport and industrial area and is equipped with recreational facilities and a cultural center.

For more details, see figure 4 of the 2010 Kertajati Aerocity Plan by the Regional Government of West Java Province.

Figure 3

Kertajati Aerocity Plan for 2010 by the Regional Government of West Java Province

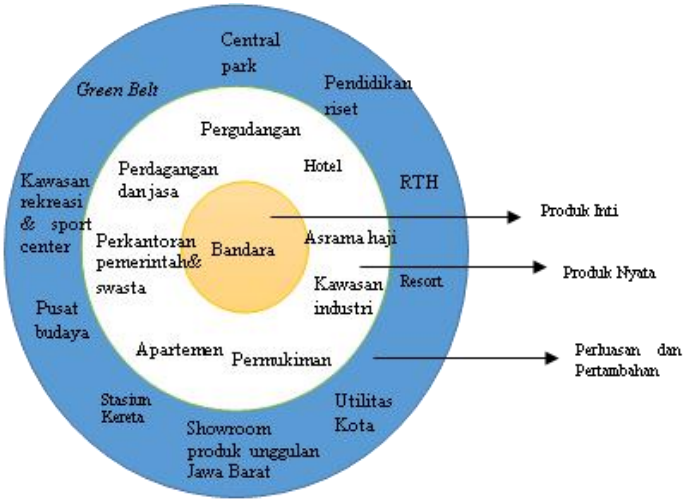
The conclusion for the Kertajati Aerocity plan proposed by the Regional Government of West Java Province in 2010 is that the Kertajati Aerocity concept in 2010 is only related to the more dominant centers of business, industrial and residential activities. Therefore, Kertajati Aerocity's plan is not said to be Aerotropolis because there are no related industries such as aircraft maintenance industry, aircraft component industry, and industries that can become export commodities. This concept has violated existing concepts and was made by John D. Kasarda.

Kertajati Aerocity Plan 2014 by the Regional Government of West Java Province

The Government of West Java Province has designated the Kertajati Subdistrict as the Provincial Strategic Area, namely the development and development of the West Java International Airport and Aerocity Kertajati. The regional government has planned to allocate Kertajati Aerocity's core area.

(a) Three Level of The Product Analysis of Kertajati Aerocity Plan by the Regional Government of West Java Province

From the analysis of Three Levels of the Product, we will see what products in the Kertajati Aerocity area in 2014 are physical and non-physical. For more details can be seen in Figure 4.



Source: West Java Provincial Government Housing Settlement Office

Figure 4

Kertajati Aerocity's Three Level of The Product Analysis 2014 made by the Government of West Java Provinc

From the picture above it can be concluded that the Kertajati Aerocity area is a core product, namely the airport is in the central circle or the first circle. In this analysis, it can be seen the components that exist in real products and expansion / increase in the Aerocity Kertajati area.

The second circle explains what components support the core activities or core products of the Aerocity Kertajati area, which have components such as:

1. Settlements
2. Industrial Estate
3. Government & Private Offices
4. Apartments
5. Trade and Services
6. Hotels
7. Hajj Dormitory
8. Warehousing

And for the last circle or the third circle that is as an extension and addition in the form of supporting facilities from the Kertajati Aerocity area and components contained in the third circle, namely:

1. Central Park
2. Research Education
3. Green Belt
4. RTH (Green Open Space)
5. Recreation area & sports center
6. Cultural center
7. Train Station
8. City Utility
9. West Java flagship product showroom
10. Resort

(b) Kertajati Aerocity Components of the Regional Government of West Java Province

The Kertajati Aerocity component planned by the West Java Provincial Government has made a plan in the form of allocating a core area of ± 5,000 Ha and intended for visitors and workers at the airport. The area designation component can be seen in Figure 4.31 Kertajati Aerocity's Core Area Designation Plan..

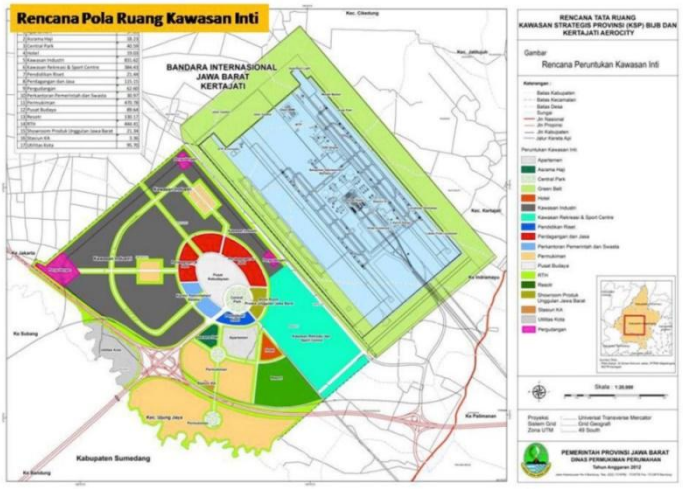


Figure 6

Kertajati Aerocity Core Allocation Plans, 2014

The Designation of the Core Area above has a component as a facility to support airport activities in one region. The components of the planned design of the core area are.

. Industrial Estate & Warehousing

Industrial and warehousing area is a component in Kertajati Aerocity. This area is near the airport and the edge of the area adjacent to the Cikapali toll road. This area is 595 Ha.

2. Residential Areas (Apartments, Hotels, Settlements and Resorts)

This residential area is far from the West Java International Airport and on the edge of the area close to the Cikapali (Cikopo-Palimanan) toll road. In the residential area, there are several components in the planned designation of Kertajati Aerocity's core area, namely:

a. Settlements in the core area of Kertajati Aerocity are divided into two types, namely low-cost housing

b. Apartments, Hotels and Resorts

3. Commercial area

The commercial area is a component in Kertajati Aerocity. The commercial area here is trade and services in the middle between other regions. The trade and service area is intended to support the activities of visitors and residents.

4. Green Open Space (Central Park, green belt)

Green open space is also a component in Kertajati Aerocity. Green Open Space in this area is a central park and the location is in the middle of the Kertajati Aerocity area. This central park functions as an area to gather with family, children's playground and socializing place.

5. Hajj hostel

Hajj hostel is a component in Kertajati Aerocity. This Hajj hostel is close to the residential area. Hajj boarding is planned in the Kertajati Aerocity area by the regional government, because West Java International Airport will be planned as a departure for pilgrims from West Java.

6. Recreation Areas & Sport Centers

The Recreation Area and Sport Center are located near residential and commercial areas and close to the airport. This area is a supporting facility for other regions.

7. Cultural Center

The cultural center is a component in Kertajati Aerocity. The cultural center area is located in the center of the Kertajati Aerocity area and close to the airport, it will be an attraction for tourists who come. The place of this cultural center serves to introduce the culture of West Java such as dances, musical instruments, and typical foods of West Java.

8. Research Education

The education and research area is a component in Kertajati Aerocity. This area has an area of 47.7 hectares and the location of this region is in the middle or center of the Keratjati Aerocity area, thereby facilitating coverage. This education and research area functions as a place for learning and at the same time a place for research on new technologies related to the West Java region. This area is also an attraction for tourists visiting West Java.

9. West Java flagship product showroom

West Java's superior product showroom area is a component in Kertajati Aerocity. This area is near the airport area, the recreation area is in the middle of the Aerocity area. This showroom serves as a place to introduce West Java's superior products and a place to market West Java's superior products to the tourists who come. This showroom can help improve the economy in the Kertajati region as well as the surrounding community and the people of West Java.

10. Government and Private Offices

Government or private office is a component in Kertajati Aerocity. This area is in the middle of an area adjacent to an industrial area, commercial area and residential area. Government / private offices dealing with industrial and commercial activities

11. Utility of the city

The city utilities are located far away in the Kertajati Aerocity area, which is opposite the Cikapali toll road, so that the layout does not interfere with activities within the area.

(c) Conclusion of Kertajati Aerocity in 2014 Regional Government Planning in West Java Province

Based on the elaboration of the Kertajati Aerocity planning component planned by the local government. It can be concluded that the planning of Kertajati Aerocity has an incomplete component to support the Aerotropolis area where the activity center is at West Java International Airport. In the 2014 Kertajati Aerocity plan, only Hajj boarding and the industry are not related to aviation.

In the Aerotropolis concept created by John D. Kasarda explained that Aerotropolis is an airport with business activities, residential activities, and industry in particular, among others:

1. The aircraft maintenance industry
2. Aircraft component industry
3. Industries that can become export commodities

Based on the conclusions of the Kertajati Aerocity plan in 2014 and 2010 by the West Java Provincial Government previously, as well as the elaboration of the Aerotropolis concept in Incheon, South Korea and in Dubai, United Arab

Emirates. That the Kertajati Aerocity planned by the Regional Government of West Java Province is not in accordance with the Aerotropolis concept created by John D. Kasarda. The Aerotropolis concept covers the business district, settlements, and especially the aircraft industry area.

Proposed Aerotropolis Concept in Kertajati, West Java

A. Basis of Planning

The basis of planning is seen from the Spatial Planning of the Province of West Java, namely the stipulation of West Java International Airport (BIJB) and Aerocity Kertajati as the Provincial Strategic Area (KSP). The objectives are:

- Making Kertajati Aerotropolis the center for the spread of secondary economic activities.
- Increase regional economic growth based on regional potential.
- Increase the global competitiveness of West Java Province and encourage accelerated investment growth.
- Improve services to the public in the field of air transportation.

In addition, the planning foundation is also seen from the Spatial Plan of Majalengka Regency, which explains that Kertajati Subdistrict as a central system of urban activities and service functions of Local Activity Centers (PKL) as commercial and service areas, integrated industrial zones, BIJB areas, development of urban areas "aerocity ", And agriculture.

Regional regulations on the Development and Development of West Java International Airport and Kertajati Aerocity which explain the concept of development and mention:

1. The development of Kertajati Aerocity aims to support the existence of airports in enhancing global competitiveness.
2. Development of Kertajati Aerocity is integrated with airport development.
3. Kertajati Aerocity covers industrial, trade and tourism areas, and settlements.
4. Kertajati Aerocity covers an area of ± 5,000 Ha consisting of airports of ± 1,800 Ha and Aerocity covering ± 3,200 Ha.
5. The area of Kertajati Aerocity area can be increased according to the needs and Spatial Planning of the Provincial Strategic Area (KSP) of BIJB and Kertajati Aerocity.

B. Kertajati Airport as the Aerotropolis Center

Based on a quote from the Aerotropolis theory from Romero Joaquin which explains that the airport as the center of the city is Aerotropolis. In addition, there has been a development in commercial, housing and industrial activities in the surrounding areas due to connectivity and accessibility through the transportation system. Thus, the theory citation as a foundation to conceptualize the development of Aerotropolis at Kertajati Airport as the center of Aerotropolis.

Kertajati Airport is the center of Aerotropolis because it is located in a location that has physical characteristics, strategic location and proximity to major cities in Indonesia and the role of the region described below:

❖ Physical characteristics

Based on physical characteristics to establish Kertajati Airport as the center of Aerotropolis that is the use of land in the form of fields, gardens and rice fields as well as in areas that have flat land slope and around the airport area, there is still wide enough available vacant land. So from the physical characteristics can be developed for new cities in which there are aviation industry area, aircraft component industry, logistics, residential and commercial areas.

❖ Strategic Location

Judging from the strategic location of the planning area, the location of Kertajati Airport as the center of Aerotropolis is determined, namely the presence of trans-Java accessibility across the Kertajati region which makes it a potential

area for growth and there are abundant Natural and Energy Resources in the Kertajati region and surrounding areas. The location of the airport is very strategic because within a radius of 100 km there is the Port of Cirebon, railway lines, toll roads. In addition the location of this airport as a link between major cities in Indonesia and in other countries with a short period of time. For more details, see Figure 7 and Figure 8.

Source: PT. BIJB (West Java International Airport)

Figure 7

Kertajati area within a 100 km radius

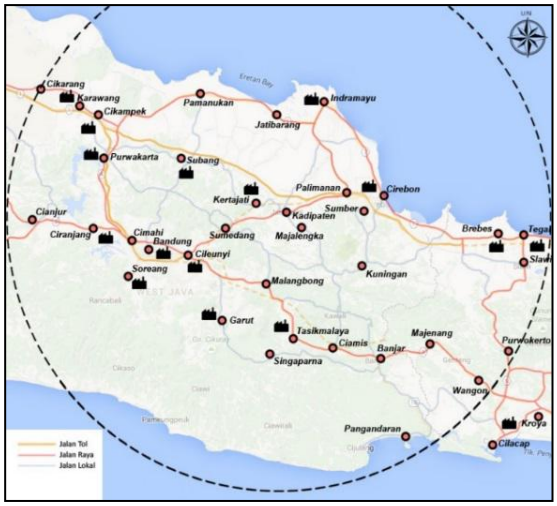
Source: PT. BIJB (West Java International Airport

Figure 8

Kertajati area within a 100 km radius

❖ Proximity to the City in West Java and Central Java

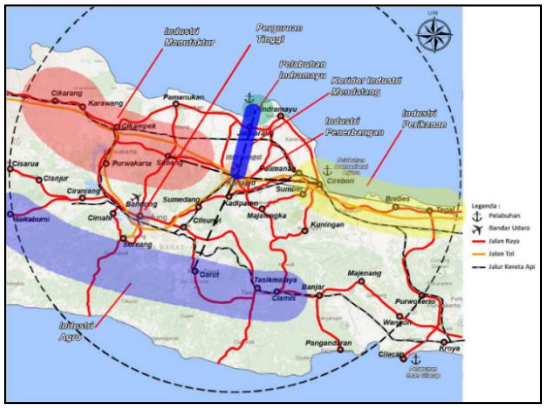
Regarding Kertajati Airport as the center of Aerotropolis, proximity to cities in West Java and Central Java is located within a radius of 100 km. There is a distribution of activity centers around the Kertajati area, namely education centers located in the city of Bandung, the port of Indramayu, centers of manufacturing, agro industries, fisheries industries located in Cikarang, Cimahi, Indramayu, Tasikmalaya, Cirebon, Brebes and Tegal. For more details, see Figure 9 and Figure 10.



Source: PT. BIJB (West Java International Airport

Figure 9

Industrial distribution within 100 km radius of Kertajati



Source: PT. BIJB (West Java International Airport

Figure 10

Distribution of Activity Centers around the Kertajati area

From the results of the matrix with four aspects of planning in considering making the concept of Aerotropolis in Kertajati, namely:

1. Concept
   a. The Kertajati Aerocity Plan for 2010 and 2014 was proposed by the regional government of West Java Province to apply the Aerocity concept.
   b. Incheon, South Korea applies the Aerotropolis concept
   c. Dubai, United Arab Emirates also applies the Aerotropolis concept
   d. The proposed concept applies the Aerotropolis concept based on John. Kasarda and see examples from other cities that already use this concept.

2. Space Components
   a. The Kertajati Aerocity Plan for 2010 and 2014 proposed by the regional government of West Java Province has the same spatial component but the designation is different
   b. Incheon, South Korea, has a component of space that serves as a tourist support and as packing of goods to be sent to other regions.

c. Dubai, United Arab Emirates, has a very complete component of space, as seen from the increasing need for aircraft use
d. The proposed concept has almost the same components as in Dubai. But in the priority space component is the aircraft industry and airport facilities supporting facilities, which operate like a city.

3. Layout
   a. Physical Character in each region is different. As is the case in Dubai which has a physical character in the form of a desert and in Incheon in the form of reclamation
   b. The Strategic location in the local government plan is the same as the proposed concept.
      Then in Incheon is located on an island separated from Seoul and adjacent to the East Asian region (China and Japan) and Southeast Asia within 3.5 hours.
      And for Dubai the layout there has the potential to reap markets in the MENASA region (Middle East, North Africa and South Asia)
   c. Proximity to big cities
      - Based on Kertajati Aerocity's plan, it is the same as the proposed concept, which is within a 100 km radius, close to medium cities in the West and Central Java regions.
      - In Incheon there are different islands between Seoul and Incheon.
      - In Dubai it is intended to create a new region.

4. Role of Regions
   - Kertajati Aerocity's plan was made by the local government in the same way as the proposed concept, namely as economic growth in the surrounding area and the East West Java region.
   - Incheon, South Korea is a new city that provides urban service facilities.
   - Dubai, United Arab Emirates, its role as Dubai World Central which has 8 core zones namely, housing, logistics, aviation, commercial, social assistance center, exhibition, golf area, and the airport itself.

So from the explanation above, the proposed Aerotropolis concept applies the concept from Dubai and Incheon, because the two cities already meet the requirements in applying this Aerotropolis concept.

For the Aerocity Kertjati Plan that has been planned by the regional government of West Java Province, the existing space component cannot be said to be Aerotropolis. Therefore this concept will plan the allocation of space for the aircraft industry and other supporting areas.

In planning the concept of developing Aerotropolis Kertajati with a planning area of ± 3,200 Ha. Then it has a capacity of around 320,000 inhabitants with the following calculation:

$$\text{Capacity} = 20\,\% \text{ (land area)} \times \frac{5 \text{ (assumption of a house per person)}}{100}$$

$$\text{Capacity} = 20\% \text{ (32.000.000 m2)} \times \frac{5}{100}$$

$$= 320.000 \text{ life}$$

So for the capacity in the Aerotropolis Kertajati area around 320,000 inhabitants. Regarding this capacity, it is based on the Technical Guidelines for the Analysis of Physical and Environmental Aspects of the Department of Public Works.

In making the zoning plan for the area, a number of analyzes are performed first and the following steps are needed:

- Analysis of Regional Access

Kertajati Aerotropolis area is in the northern part of Majalengka Regency and the entire village is located in Kertajati District. The eight villages include Mekarjaya Village, Palasah Village, Kertasari Village, Kertawinangun Village, Kertajati Village, Babakan Village, Mekarmulya Village, and Sukamulya Village.

The Kertajati Aerotropolis area is crossed by the Cikapali toll road (Cikopo-Palimanan) which connects East West Java with West Baguian Central Java. And to go to the area provided by the primary collector road which is connected to the Cikapali toll road.

- Site Analysis

Kertajati Aerotropolis area has a height of 30 meters above sea level with a slope of land between 0-15% which is spread in the Kertajati District area. Land use in the area consists of rice fields, plantations and fields.

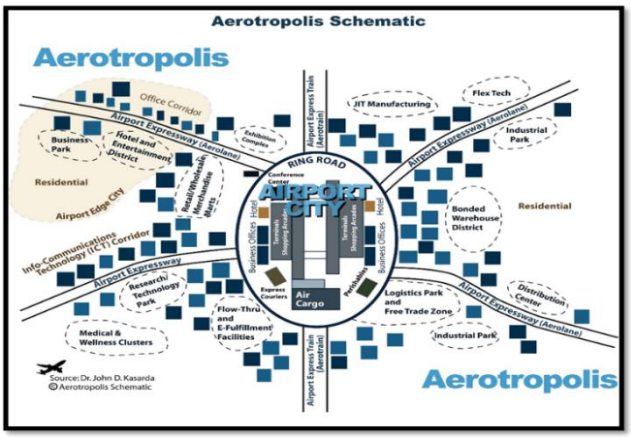
In the analysis of this region consider the area that will discuss the highlands and this location because of the West Java International Airport, so this area was developed as the Kertajati Aerotropolis.

Kertajati Aerotropolis Planning Concept

The concept plan for the development of the Aerotropolis area in Kertajati uses the Aerotropolis design schematic from the theory of Kasarda and Gred in his book titled 'Aerotropolis The way we live next' and a mixed used concept that combines residential, business, industrial and commercial areas within one region.

The Aerotropolis design schematic is divided into three, namely core flight activities, airport-related activities, and airport-oriented activities. Of the three activities, the Multiple Nuclei urban space structure which functions as one of the growing ponts, namely Kertajati Airport as the center of the city and there are areas that form such as the development of the Aerotropolis due to activities at the airport.

Aerotropolis Kertajati is part of the northern development area of Majalengka Regency with the main function being the development of commercial, industrial, social service centers, and housing development. The development of the Aerotropolis area will also use the Mixed Used Concept. For more details, see the Aerotropolis design schematic drawings and planning concepts.



Source: Book Aerotropolis We'll live next, John D. Kasarda

Figure 11

Schematic of Aerotropolis Design

Three Level Analysis of the Product

From the analysis, the Three level of the product functions to see what products are at the stages of developing the Aerotropolis area at Kertajati Airport and then used to determine zoning areas or land allotments within the Kertajati Aerotropolis area. Below are the stages of developing the Kertajati Aerotropolis area from the Airport city, Aeropolis and Aerotropolis stages using the Three level of the product analysis.

Based on the analysis of the three levels of the product in the development of the Aerotropolis region can be explained in several stages, namely:

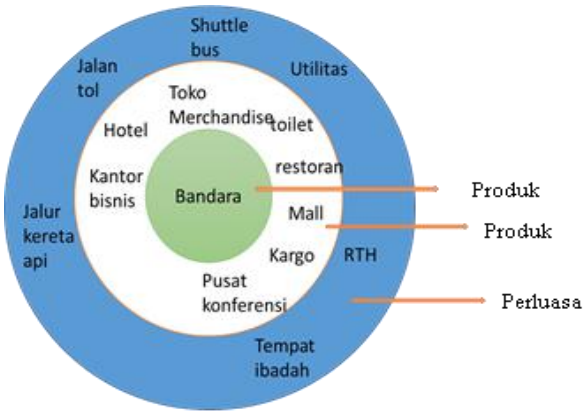
- Phase I of Airport City Development

At this stage the development of Airport City was carried out due to the construction of Kertajati Airport which needed facilities to support airport activities. Phase I can be explained that the core product in this region is the airport as a development center in the first circle. The second circle explains what components support the core activities or core products of the airport, namely having components such as:

1. Hotels
2. Cargo
3. Restaurants
4. Mall
5. Place merchandise
6. Business office
7. Conference center

And the last which is the third circle in the form of expansion or addition in the form of supporting facilities from the core products, namely airports and components such as:

1. Utilities (electricity, clean water, drainage, solid waste)
2. RTH
3. Place of Worship
4. Toll Road
5. Railroad Tracks
6. Shuttle bus



Source: 2016 Analysis Results

Figure 12

PHASE I Airport City

- Phase II of Aeropolis development

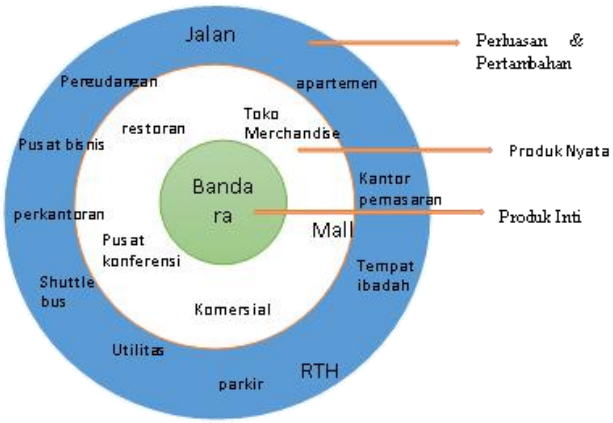
At the Aeropolis development stage to support airport activities such as export and import, so at this stage a warehousing area was built to store goods. Phase II can be explained that the core product in this region is the airport

as a development center in the first circle. The second circle explains what components support the core activities or core products of the airport, namely having components such as:

1. Merchandise Shop
2. Restaurant
3. Conference center
4. Mall
5. Commercial center

And the last which is the third circle in the form of expansion or addition in the form of supporting facilities from the core products, namely airports and components such as:

1. Toll Road
2. Warehousing
3. Apartments
4. Business center
5. Offices
6. Shuttle bus
7. Utilities
8. Parking
9. RTH
10. Place of worship
11. Marketing office



Source: 2016 Analysis Results

Figure 13

PHASE II Aeropolis

➢ Phase III development of the Aerotropolis area

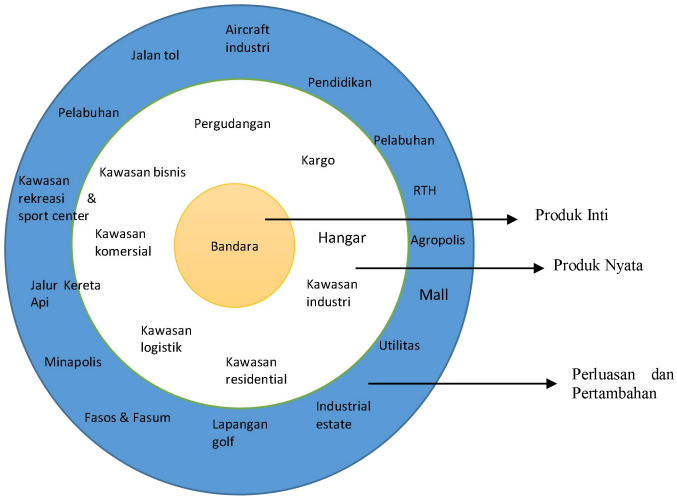
In stage III industries such as the aircraft industry and other industries are developed and followed by the development of other regions. It can be explained that the core product in this region is the airport as a development center in the first circle. The second circle explains what components support the core activities or core products of the airport, namely having components such as:

1. Industrial Estate
2. Commercial Area
3. Business District
4. Warehousing

5. Cargo
6. Hangar
7. Logistics Area
8. Residential area

And the last which is the third circle in the form of expansion or addition in the form of supporting facilities from the core products, namely airports and components such as:

1. Aircraft industry
2. Hotels
3. RTH
4. Golf Course
5. Mall
6. Recreation areas
7. Port
8. Minapolis
9. Agropolis
10. Social Facilities and Public Facilities
11. Railroad Tracks
12. Toll road
13. Education
14. Sport center
15. Industrial esatate
16. Utilities



Source: 2016 Analysis Results

Figure 14

PHASE III Aerotropolis

Zoning of the Kertajati Aerotropolis Area

Zoning determination of the Aerotropolis area in Kertajati is based on the application of the Aerotropolis concept in several cities, this application is taken from the theory of Kasarda and Romero and from the results of the analysis of three levels of the product included in the zoning determination of the Aerotropolis area. In addition, the planning area has been determined by the regional government, namely eight villages. Allotment of the Kertajati Aerotropolis area consists of 7 zones, namely:

1. Industrial Estate (industry and warehousing)

For industrial and warehousing designation, it is stated in one and the same zone, but the distribution is divided into industrial sub-zones and warehousing sub-zones.

The industrial sub-zone consists of various activities and types of industries which must have been adjusted to the desires and characteristics raised, namely green industries that are environmentally friendly, high-tech industries and labor-intensive industries, including the dry textile industry which have no potential to cause pollutants. In addition, the developed industry is an industry that still has a relationship with airport activities. The height of the building and

the emissions released are also limited so as not to interfere with the security of the West Java International Airport / Kertajati Airport because it is still within the limits of the airport KKOP.

Warehousing sub-zone is an area designated as a place to store goods / warehouses that technically must comply with regulations and legislation. Activities in this sub zone are activities related to the storage of goods both for and / or from industrial areas and from the airport and outside Aerotropolis Kertajati.

2. Business areas (offices, trade and services)

The office, trade and service area to be developed is an office that is able to accommodate business activities and the needs of the city that are related to activities at Kertajati Airport.

This zone is divided into two types based on the basic building coefficient (KDB) of 50% and 30% by having high access in the form of pedestrian lanes connected to the mass transportation network and connecting lines between buildings and supported by public facilities and adequate energy technology supply.

Whereas the main trade and service area which functions as a service center for trade and service activities on a city and regional scale is allocated around the city center. Types of facilities developed include:

a. Market
b. Plazas, malls, supermarkets and shops
c. Factory outlets / showrooms of industrial products in Kertajati Aerotropolis and Majalengka Regency and West Java.
d. Exhibition Center
e. Banks and other financial services
f. Concert hall
g. Salons and other supporting facilities.

3. Residential area

The housing development effort is carried out in 2 forms, namely landed housing and vertical housing.

- Land Landed housing zones are divided based on basic building coefficient (KDB), the first is medium-high and low KDB housing. The type of housing adapted to the needs in Kertajati Aerotropolis and broken down into types of small houses, medium houses and large houses.
- Vertikal Vertical housing zones are divided based on basic building coefficients (KDB), the first is medium-high and low KDB housing. Medium-high KDB vertical housing is a zone intended as a high-rise residential area that is equipped with shared facilities and green open spaces.

4. Public and Social Service Facility Areas

Development of public and social service facilities in the form of education, health, worship.

- Placement Primary schools are sought not to cross the road environment with a radius of achievement of the area served a maximum of 1000m2.
- Health facilities in the form of developing hospitals, which are large hospitals and clinics.
- Ambangan Floating worship facilities are based on the number of needs of each existing religious population. Worship facilities for Muslims with a city service scale in the form of the Great Mosque and Islamic Center equipped with parking spaces and other supporting facilities will occupy a land area of at least 2 hectares. The Islamic Center and the Great Mosque are one of the Aerotropolis Kertajati icons because this airport will function as a hajj airport in 2018.

5. Recreation Areas and Green Open Space

The Recreation Area is an amusement park in the form of a theme park and has a technological function and a Green Open Space for the Kertajati Aerotropolis will be placed in the river border area, and in other zones.

6. Sport Center

Sport centers are placed in housing, around the business and trade and services area.

7. Utilities,

Inside the utility area there is a water treatment plant, sewage treatment until there is an electricity distribution network and is placed in a land far from the settlement.

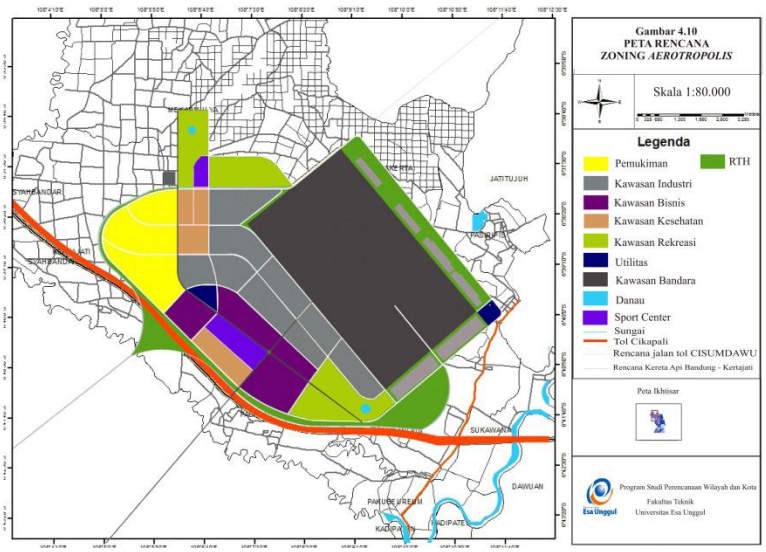


Figure 15

Map of Zoni Aerotropolis Plans

Conclusion

After doing the stages step by step from observing, identifying and analyzing the factors that influence the development of the Aerotropolis area and the concept and development models that are suitable to be made at Kertajati Airport which acts as the center of the city. then this research produces the following conclusions:

1. Kertajati Aerotorpolis Region in Majalengka Regency, West Java influences
2. factors such as topography, land slope, land use, are not prone to disasters and have accessibility that makes it easier to get to the area and the area is the Provincial Strategic Area. Besides that, the proximity to big cities and other centers of activities that can be developed as minapolis and agropolis.
3. The Aerotropolis development concept model in Kertajati follows the Aerotropolis design scheme cited in John Kasarda's book titled "Aerotropolis Well Live Next" and the concept of mixed use. This concept model also sees examples of Aerotropolis concepts in several cities such as Incgeon, in Dubai which have characteristics that are not too much different.

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