

The Implementation of Aerotropolis and Eco-Airport Concept Towards Kertajati International Airport Introduction

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Abstract

As more and more aviation-oriented businesses are being drawn to airports and cities along with transportation corridors radiating from them, a new urban form is emerging -- The Aerotropolis -- stretching up to 20 miles (30 kilometers) outwards from some airports. Aerotropolis; a combination of giant airport, a planned city, a shipping facility, and a business hub. This paper is aimed to explain the aerotropolis business model at Kertajati International Airport and to suggest that the aforementioned airport practice the eco-airport concept. In this study, the method used was qualitative, in which the factors around the proximity of Kertajati International Airport influence the nature of the airport operations. Journals and articles were reviewed as references for this research. Based on the results of this study, it is suggested that there are four main critical factors for the development of an aerotropolis and that the importance of implementing the eco-airport concept has been identified.

Keywords: Aerotropolis, Eco-airport concept, Business Hub, Economy, Airport.

INTRODUCTION

As a result of the growth of passenger and cargo volumes, airports continue to grow on a huge scale. It is not only those related to air transportation infrastructures but also those related to free trade areas, logistics centers, shopping centers, and hotel clusters around the airport vicinity (Graham & Guyer, 2000) . Various types of business activities create an effect on the acceleration of growth around the airport area. The business or its activities that underlies the airport models are (1) passengers, services and goods, business sectors; (2) the growth of the airport area which continues to increase in size and economic interests and (3) airports operators in terms of financial and their business partners benefits (Appold & Kasarda, 2011). The airport city concept shows that airports can do many things besides providing services by developing non-aviation commercial facilities and

services while focusing on the income (Appold & Kasarda, 2011). The growth of air transport implies an increasing demand for airport services, which then evolves into the need to provide more effective and efficient airport terminal services. The Indonesian government has established a new airport in Majalengka, Kertajati International Airport. Kertajati International Airport's development was planned in early 2011 as a complementary of Soekarno Hatta International Airport and in lieu of Husein Sastranegara International Airport. In early February 2011, initial construction was yet to start although land clearing had been done. The construction of the toll road access to Kertajati International Airport was initiated in early 2011. Majalengka is one of the districts in West Java that has the potential to be developed into something bigger than just a city with an international airport. (Tri Tjahjono dan Eny Yuliawati, 2017) Since the construction of the Kertajati International Airport, the possibility of improving this area into something bigger that could potentially help boost the nation's economy has been discussed. Professor John Kasarda explained the definition of Aerotropolis as "A multimodal freight and passenger transportation complex which supports efficient, cost-effective, sustainable development in a defined region of economic significance, centered around a major airport" (Kasarda, John D. and Lindsay, Greg, 2011). The function of airports is transformed into a city complex where capital-intensive business and commercial relations are integrated. If it is analogous to a metropolitan city, the airport becomes a central area or in other words the Central Business District (CBD) in an Aerotropolis (Kasarda, 2008).

Kertajati International Airport development consists of three packages of workmanship. The first package consists of road, drainage, parking, and ramp interchanges. The second package consists of main roof interiors, electrical and plumbing, boarding lounge, bird's eye view, and ACP architecture. The last package consists of the development BIJB Kertajati operational building in the form of the incinerator, meteorology, ground water tank, road area, and airport fire

security device. As for its roof shape is she of a peacock, as it is the only icon in Indonesia.

By 2015 Kertajati International Airport successfully built 1800 Ha of land and a runway (measuring 2500 x 60 meters) which would be extended to 3000 x 60 meters. The airport has three stages of operation. On May 24, 2018, The Presidential Aircraft Indonesia was the first aircraft that performed a smooth landing in the airport. The second landing was on D-10 to D+10 on the 2018 Eid-Fitr celebration. The third operation was during the Hajj flight 2018, with 2000 passengers from two districts of Majalengka and Sumedang.

The purpose of this airport is to overcome the density of passenger aircraft users at Soekarno Hatta International Airport. This airport can accommodate large-bodied jet aircrafts. In fact, the departures of passengers from Jawa Barat province can be accommodated at this airport. Currently, a toll road from Cileunyi - Sumedang - Dawuan is being built. With this toll road, Husein Sastranegara Airport will be integrated with Kertajati Airport. To complement the inter-modal connectivity, Kertajati Airport will be equipped with airport railway lines to attract interests and shorten the passengers' time from Jakarta and from Bandung. Kertajati International Airport has the potential to be an aerotropolis area. Aerotropolis is the development of an integrated area consisting of housing, offices, hotels, and other commercial activities. Therefore, Kertajati International Airport can be a city center that lifts the economy of Majalengka city. In addition, the incorporation of commercial functions into airports could develop the proximity of the airport with retail complexes, offices, hotels, and other relevant facilities (Appold & Kasarda, 2011)

Airports have become the new dynamic centers of economic activity, incorporating several commercial and entertainment services inside passenger terminals, while simultaneously developing their landside areas with businesses (Peneda, 2010). Built with the concept of aerotropolis business concept, Kertajati

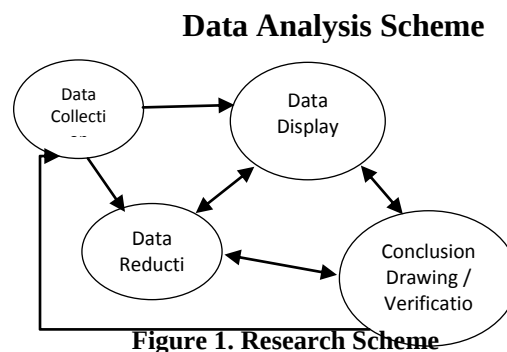
Airport will provide Indonesia the opportunity to improve its service in the aviation world. In designing Kertajati International Airport, the concept of eco-airport becomes an option to maintain the environment within the airport area as well as the area around the airport.

Eco-Airport (ecological airport) can be interpreted as a concept of an airport with the aim to create a healthy and environmentally friendly establishment. Currently, the new eco-airport concept is developed in five airports, namely Soekarno Hatta (Jakarta), Juanda (Surabaya), Ngurah Rai (Denpasar), Hang Nadim (Batam), and Sultan Mahmud Badarudin II (Palembang). The development of eco-airport was preceded by the establishment of Eco-Airport Council in each airport. The implementation of eco-airports for carbon emissions is done by planting trees, using environmentally-friendly building materials, reducing the use of glass in order to avoid global impact, calling on airlines to use new types of aircraft, cultivating cars in apron areas using biofuels, as well as diverting long-term operations with solar powered cells that can also decrease the airport operational costs. Sultan Muhammad Salahuddin Airport which is located in West Nusa Tenggara became one of the airports in Indonesia that is currently using solar electricity and can save about 15 million per month.

RESEARCH METHODS

This research was conducted using qualitative approach to describe in details how Kertajati International Airport can become an Aerotropolis with layouts, infrastructures and economic sectors centered on airports as airport cities while practicing the concept of an eco-airport. Kertajati International Airport is built in the heart of the Majalengka city, which was formerly an agricultural area and was used as a source of livelihood for the people of Majalengka who in majority work as farmers.

The data analysis technique used in this study is an approach developed by Miles and Huberman which includes (after data collection) data reduction and data separation from unfocused and over detailed ones, so that the data would show patterns or themes. Next is to display data (data display) which serves to help understand the further analysis of an information or event. The last process is the conclusion drawn by the researcher based on the pattern and theme. The conclusion is carried out continuously, which is done while the data reduction and data display are carried out. (Miles, Huberman, & Saldana, 2014)



DISCUSSION AND RESULTS

Kertajati International Airport, which was built in West Java, Majalengka, is implored to be developed into an Aerotropolis as well as to apply the eco-airport concept. With the development of Aerotropolis around the airport, it could help boost the economy in the city of Majalengka. Moreover, the wheels of business around the airport could be more dependent on suppliers and consumers from out of town or abroad compared to the business district around the proximity of the city. This is due to the fact that the Aerotropolis commercial area is practically built to be the backbone of the aviation-related businesses which includes millions of visitors and airports users through their usage and activities within the airport area.

In order for Kertajati International Airport to develop into an Aerotropolis, it has to incorporate these few aspects:

1. Manufacturing Industry
2. E-commerce
3. Logistics and telecommunications
4. Hotels
5. Entertainment and exhibition centers
6. Office spaces
7. Wholesale trade center
8. Integrated transportation facilities

BIJB Kertajati International Airport is projected to trigger the birth of an aetropolis with the establishment of an aero city area managed by BIJB through its subsidiary PT BIJB. It also received a mandate from the West Java Provincial Government (Perda No. 22 of 2013) to develop and manage the airport and Kertajati Aerocity. Kertajati Aerocity is located south of West Java International Airport with an area of 3,480 H.a. This region has six clusters, namely:

- Aerospace Park: The center of the aviation industry with an integrated ecosystem.
- Logistics Hub: Logistics and distribution center with multimodal concepts.
- Energy Centre: Sustainable renewable energy sources to support industrial activities.
- Business Park: Business, finance and ICT centers to support the industry in the region.
- Creative Technology Center: The center of scientific development with high-level research and development and manufacturing center.
- Residential Township: Exclusive residential area with property rights for foreigners.

To move towards Aerotropolis, PT BIJB has a master plan that is integrated with the RTRW and RDTR so as to minimize the risk of Urban Sprawl. Kertajati International Airport is also ready with the establishment of the airport with the aerotropolis concept due to the driving factors of the aerotropolis concept.

Kertajati International Airport also plans to become the state liaison in the world with several development plans that were to be carried out by the airport. The construction carried out by Kertajati International Airport will relate to the increase of the number of passengers who will use air transportation services from year to year. Kertajati International Airport also plans to carry out a sustainable development up to the year 2032. In accordance with the planned phases of the development based on KP 954/2014, until 2030, BIJB Kertajati will only have one passenger terminal with the following development

- a) Phase 1A Development (2018-2024) Terminal area 96.280m² with the capacity of 5.6 million passengers/year (Level of Service A)
- b) Phase 1B Development (Estimated in 2024-2027) Expansion of the terminal to 121,100m² with the capacity of 17.2 million passengers/year (Level of Service A)
- c) Phase 2 Development (Estimated in 2027-2030) Expansion of the terminal to 162,150 m² with the capacity of 22.8 million passengers/year (Level of Service A)
- d) Phase 3 Development (Ultimate) (Estimated in 2030-2032) The expansion of the terminal to 209,500 m² with the capacity of 29.3 million passengers/year (Level of Service A) Construction of the 2nd terminal is very possible if the construction of stage 3 (ultimate) has reached full capacity

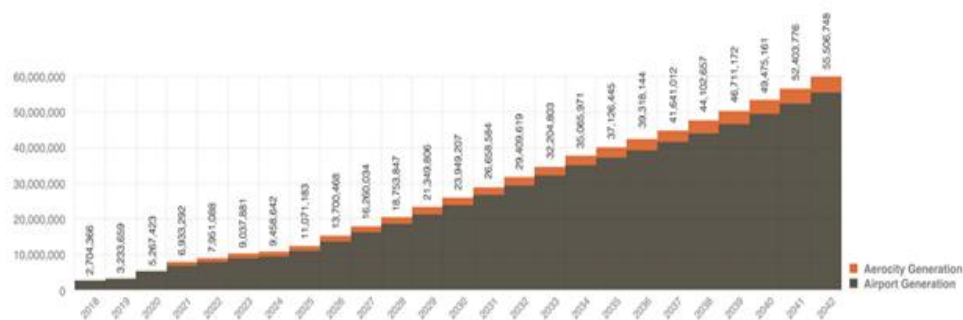


Figure 2. Passenger forecasts from year to year

Kertajati International Airport has predicted the number of passengers from year to year. It can be observed that annually, the number of passengers will increase. Therefore, Kertajati International Airport has to do development on a year to year

basis. One of them is the concept of aerotropolis in which Kertajati International Airport will also be used as a meeting airport for all foreign countries. The basis of this development of aerotropolis is to transform the airport from a transportation node into an economic node while still adhering to the safety, security, and services of aviation. The existence of the aerotropolis concept is also an attraction for business and commercial players due to the fact that an airport is usually only a passive facilitator. However, with this concept, the airport becomes an active controller for urban and economic development around the airport.

The role of the central and regional governments in the development of the aerotropolis concept is very important. Their support is needed because the infrastructures such as hotels, offices, and industry must be neatly arranged in accordance with the spatial layout at the Kertajati International Airport. The initial capital that must be owned by the government is the commitment to the stakeholders for the construction of the Kertajati International Airport as an aerotropolis. They must pay attention to the integration between modes of transport to Kertajati International Airport.

Aerotropolis exists when the radius or range of the impact of the airport is not only around the airport but with a minimum of 25 miles from the airport. Presently, the airport and aerocity which are the forerunners of the new aerotropolis are planned in an area of 1,800 Ha and 3,480 Ha. The biggest challenge is how to realize the synergy with the spatial layout of the projected area into an aerotropolis. This cannot be done by PT BIJB alone but with stakeholders (especially with the government as the holder of the spatial authority and stakeholders as a business factor)

The concepts that has to be considered to build Kertajati as an aerotropolis airport are airport planning, business planning, and urban development planning. Airport planning is land use planning, master plan, facilities, infrastructure, logistics, flight operations safety area (KKOP), and boundaries area noise (BKK). On the other hand, business planning is the investment planning, economic studies, aerotropolis

business, and risk analysis. While urban development planning is the planning land transportation, housing, entertainment places, and environmental impact assessment. The rise in the economic state in the area around Kertajati International Airport will also be accompanied by social changes. Before, the social life was built only in the surrounding community. Therefore, the existence of an airport will undoubtedly make the life of a more modern society. In addition, there is a shift from the life of farmers to industrial and trade sectors. The community must be able to improve the quality of education in order to compete and be able to feel the economic changes.

From the beginning of the construction of Kertajati International Airport, the airport has implemented an eco-airport system, it can be seen from the shape of the airport building. All the international airports such as Ruangpura I and Angkasapura II have been ordered to implement the eco-airport system. With the implementation of the eco-airport system, it will affect the comfort and shade of the airport visitors. Plants planted around the airport can absorb CO₂ from vehicles and planes. The functions of the trees in front of the airport is also to produce oxygen and reduce air pollution. In improving the development of the eco-airport system, Kertajati Airport can pay attention to several things such that airlines at Kertajati Airport can use new types of aircraft, try cars in the apron area using biofuel, and divert long-term airport electricity operations by solar panels (solar cells) which can also save airport operating costs.

The impact of using eco-airports could also be able to reduce the use of carbon emissions, in which the energy saving is quite large, given the level of environmental damage that has been very severe in the airport area. The presence of eco-airport is a step forward in the efforts to protect the environment such as open space arrangements, vegetation park, better waste management system, and the use of solar panels or LEDs to save energy. All of these are worth considering.

CONCLUSION

In implementing the aerotropolis concept at Kertajati International Airport, the airport can pay attention to the interests of several parties such as the government, airlines, investors and several communities in order for the implementation of the aerotropolis concept could be accepted smoothly. For the airport to be recognized internationally, the development of the aerotropolis concept could prove to support the globalization of the airport. The development has to be strategic and possesses a target so that the aerotropolis concept can be realized quickly. The rapid implementation of the aerotropolis concept at the airport will also have an impact on surrounding environment where the community will feel more advanced especially in the Majalengka region.

The need for support from the government and stakeholders in the implementation of the aerotropolis concept has to be direct. The business activities could prove to also contribute to make Majalengka more advanced. The eco-airport system that has been implemented by Kertajati International Airport will also give an impact to every airport visitor who could feel the comfort and ease. The implementation of the eco-airport concept could also reduce all negative activities from operational activities at the airport. With the construction of the Kertajati International Airport, it has been dedicated as an airport that implements an eco-airport system so there must be an improvement of the eco-airport system that has been implemented.

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