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## THE CHANGES OF LAND USE AND AEROTROPOLIS CONCEPT IN TEMBUNG REGION, DELI SERDANG, INDONESIA

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**ABSTRACT:** *Tembung region is one of the potential area in Deli Serdang, North Sumatra, Indonesia to be developed as an aerotropolis area. A new urban form where cities are built around airports speedily connecting time-sensitive suppliers, manufacturers, distributors, and business people to distant customers, clients, and marketplaces. And it happens in Tembung where many people from Medan and other big cities move to Tembung and even some of them lives nearer to the Kuala Namu International Airport just to open a new business and hope because this area has developed rapidly. Many businesses are open around this area. Tembung becomes 'a pretty lady' to live in.*

**KEYWORDS:** *Land use; Aerotropolis; Tembung; Business area; Commercial*

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### INTRODUCTION

Tembung region is a strategic area development for directly adjacent to Medan city supported by easier accessibility, mode of transportation and roads. In this region, it stands some universities: State University of Medan (Unimed), State Islamic University of North Sumatra (UIN) and Medan Area University (UMA). The existence of Haji Hospital type A also gives a great impact to the development of Tembung Region. Tembung position is strengthened by its position as a primary arterial road track and the provincial transportation gateway Kuala Namu International Airport to the city of Medan. With a potential growth center, this region has a strong appeal for people to build residential and business premises, causing changes agricultural area into an area built.

In spatial patterns of development land conversion of non-awakened (agriculture) and undeveloped land (residential or trade) looks on accelerating the construction of houses and shop-houses that occur along primer road Medan-Tembung-Sei Rotan-Batangkais and along the primary road connecting the village in region Tembung ribbon pattern forming type of land use. The development of undeveloped land occurs sporadically throughout the primary road which show random spread rate (sprawl development). Changes in land use and fields into commercial buildings along the primary road show rapid acceleration although the designation does not correspond with the technical direction of development RDTRK Deli Serdang which sets the region to the allotment of residential rather than commercial area.

## METHODOLOGY

The development of the region can be defined as a dynamic process and interaction with the theoretical scholarly study of practical experience in order to improve the level of welfare in the form of activities to add, increase, improve or expand regional development aspects. The development of urban areas in order to fulfill the needs of the community activities are characterized by a form of intensive development of the region in terms of providing infrastructure facilities, housing, trade facilities, public facilities and social and recreational facilities complement. The complexity of the development of the region has a broad spectrum that requires a comprehensive approach to understanding development including economic aspects, social aspects (social setting), the institutional aspects of the institution (institutional setting) and environmental aspects (natural and man-made behavior). The purpose of regional development rests on efforts to reduce the development gaps in achieving the public welfare (Miraza, 2005). In fact, the achievement of the development goals of the region often led to development gaps, especially in border areas, hinterland as an area of fast growing development (Bintarto, 1983; Adell, 1999; Rahardjo, 2006; Jonah, 2008; Soetomo, 2009; Pradoto 2011; Sirojuzilam 2011; Boateng et.al, 2014).

The regional development dynamics are in line with the theory of concentric zones (Burgess, 1925) which is then developed by Sinclair (1967), namely that the construction will likely begin at the center of the city (agglomeration) with a direction widening toward the outskirts of the city (the border area/hinterland). This suburban areas become a fast growing area, specifically as urban regions experiencing such a juxtaposition of the urban atmosphere and ambience of rural / agricultural.

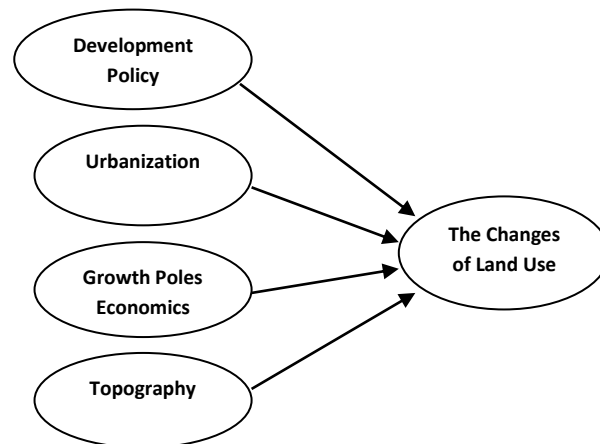
Spatial plan of North Sumatra 2012-2018 clearly shows intensive attention to the synergy of development in the region bordering reflected in the concept of urban linkage fast growing region Mebidangro (Medan, Binjai, Deli Serdang and Karo) as a bordering region (cross border development).

In fact, the implementation of development Mebidangro in the region bordering the city of Medan and Deli Serdang has not shown the existence of synergy to support and optimally utilize their spread effect (positive values) hinterland as a fast growing development areas. Until now it looks no comprehensive attention in handling the administration and management of the construction of the border towns (Sirojuzilam, 2011).

Theoretically, the change in land use other than the encouragement of regional development (push factor) is also influenced by the attractiveness of the location (pull factors), among others, capital accumulation resulting in regional spillover, a change of residence (natural and migration), physical potential and The local non-physical location, availability of infrastructure (public facilities and special facilities), land use planning and technological progress (Sirojuzilam, 2011). So far the phenomenon of regional development that occurs in the hinterland region has attracted attention in some researches with a variety of contexts such as agglomeration (Rosenthal, 2001; McCann, 2004; Ellison, 2010; Matti, 2011), urban sprawl (Giyarsih, 2001; Brueckner, 2006), urbanization (Mohan, 2006; Soetomo, 2009).

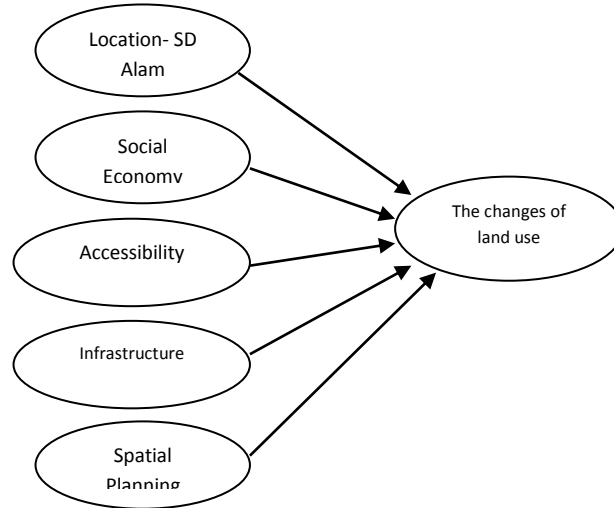
This research takes place in the regional development hinterland region with an emphasis on land use changes in the architectural context intended as an exploration and enrichment for knowledge development planning in Indonesia. Several studies reveal variable influences which are quite complex, among others, performed by Didik Okta Pribadi et al, (2006) in several cities such as Batam, Malang, Pematang titled "Model Change Land Cover and Factors Affecting" uses several variables as the following scheme:

**Figure.1**  
**Research Framework of Didik O Pribadi (2006)**



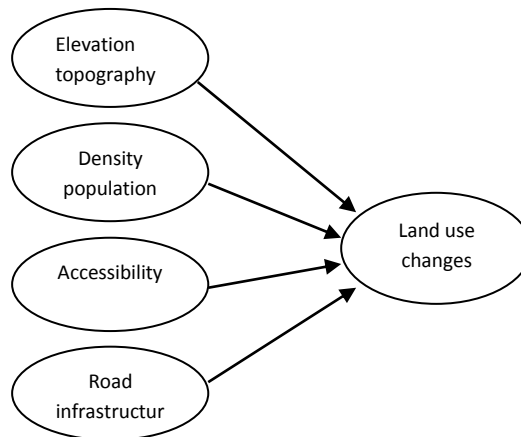
The study of land use change reveals variable influences which are quite complex performed by Hedwig van Delden (2011) with the title "Integrating Socio-Economic and Land Use Models to Support Urban and Regional Planning" with the research scheme changes in land use as follows:

**Figure.2**  
**Research Framework of Hedwig van Delden (2011)**



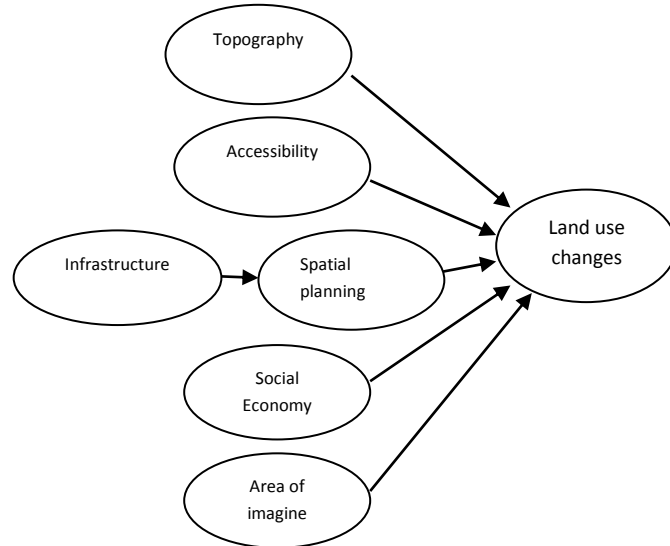
This study also reveals considerable influence complex variable among others performed by Luca Salvati (2014) when it is examined under the title "Spatial Determinants of Land Use Changes in an Urban Region (Attica, Greece) between 1987 and 2007 "in which the scheme of the research is as follows:

**Figure.3**  
**Research Framework of Salvatti Luca (2014)**



While the study "The Effect of Regional Development Factors Against Land Use Changes in Deli Serdang designs a research by looking the background issues and the complexity of the phenomenon which is different with other studies as described as follows:

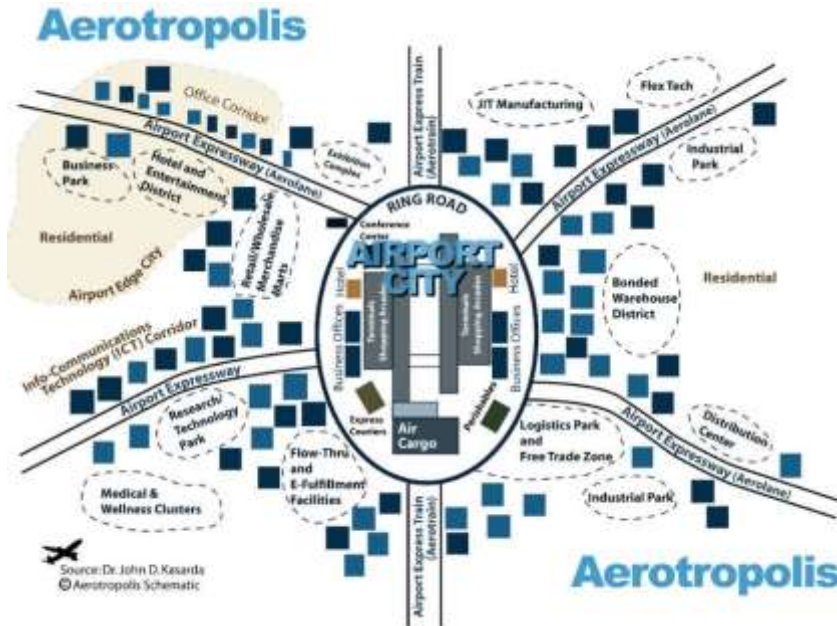
**Figure.4**  
**Research Framework of Dwi Lindarto (2016)**



## DISCUSSION

The development of Kuala Namu International Airport as a hub of international air transport by adapting the concept of Aerotropolis (Kasarda, 1991) has an attractiveness of land-use change which exists in the surrounding area of Kuala Namu Airport. Aerotropolis concept as Centered Urban Development is the concept of regional development with strong economic perspective as drivers of regional development around the airport. Generally aerotropolis concept is intended as development around the airport as a centered core service as a regional economic generator. Aerotropolis spatial concept is the center of economic growth (central city), infrastructure corridors and aviation-oriented business clusters supported by a mixed-use residential development. Aerotropolis as a new urban form with multi-core commercial capital (the airport city) as a center of industrial clusters; office park, free zone trades, hotels and leisure centers while a residential district is placed on secondary roads away from the primary path. It is somewhat at odds with the actual conditions in the field as research of Schaafsmaa et al (2008), revealed the development of land by real estate development just a lot of leads on primary roads as a strategic location for housing business. The concept of land use can be described as follows:

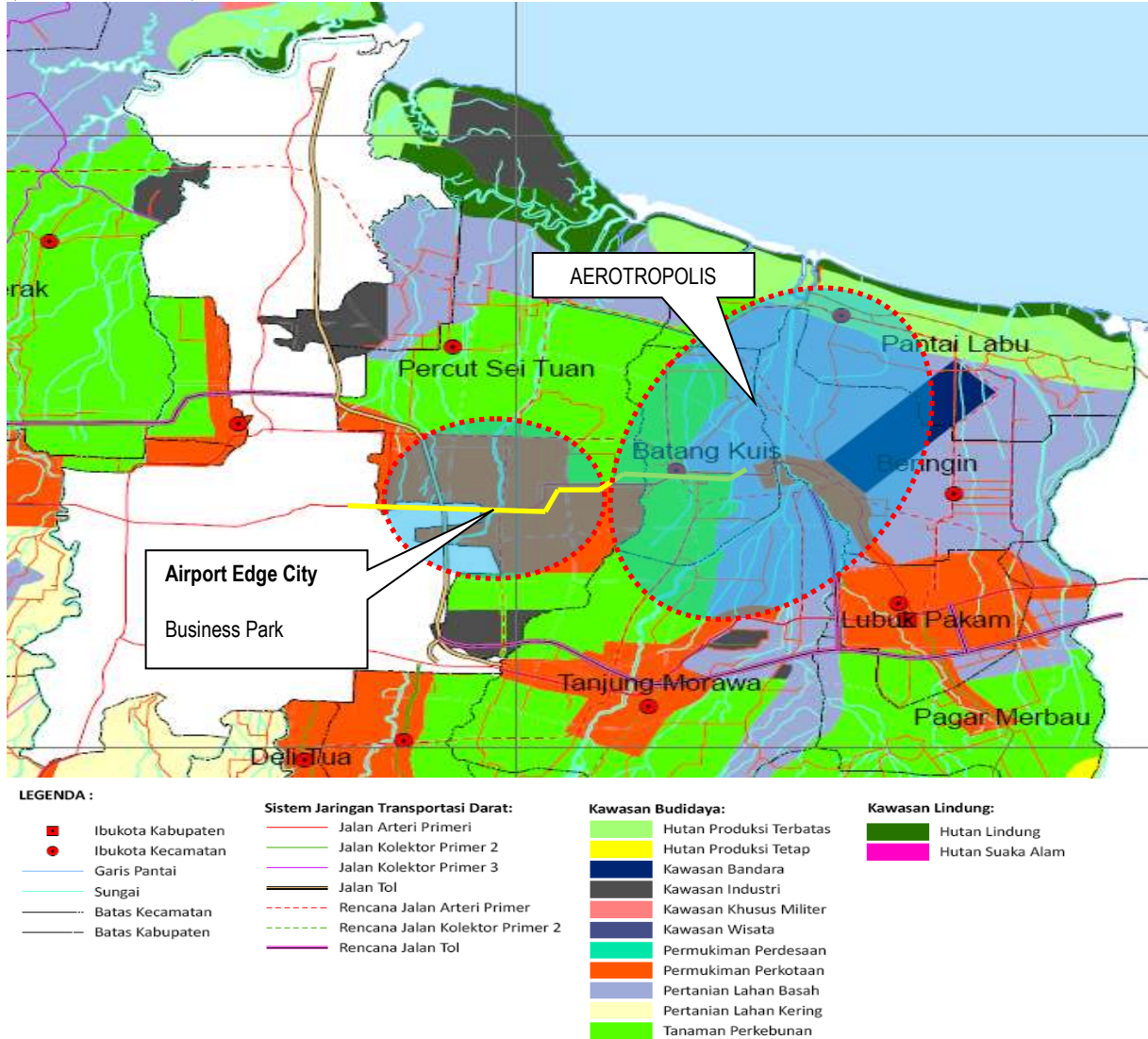
**Figure. 5**  
**Aerotropolis Zoning Concept (source: Kasarda, 1991)**



The plan of regional development policy in Kuala Namu much adopts from the Aerotropolis concept developed by Kasarda (1991). In the constellation of regional development in Deli Serdang, the road corridor crosses the territory of Kuala Namu Airport, Percut Sei Tuan, especially in Tembung Region. Thus, the position of Tembung becomes a very strategic location in the development of the concept of Aerotropolis in Deli Serdang. With regard to the concept of Zoning Aerotropolis, it can be seen the position of Tembung directed into Airport City Edge with the designation zoning business park, office corridor, hotels and entertainment district, hence the policy development Tembung should lead to the concept of zoning in favor of sustainable development in view of the infrastructure of the corridor which has been clearly established as a factor of potential land-use change expressed in this research. Alternative land may be made based on the image of the region influenced by changes in land use is the potential appeal of recreation in the form of surface water (ponds) and the plantation environment. Forms of urbanization region requires adaptability of the declining role of agriculture in Tembung and strengthening the role of recreation and tourism functions as a form of functioning changing land nuanced the urban functions (Makhzoumi, 1997; Antrop, 2004). The incremental planning in Tembung region is possible to take into account the tendency of the changing patterns of land use, infrastructure plans, potential as an edge city of aerotropolis:



**Figure.6**  
 Tembung Region as an Airport Edge City  
 (Analisis, 2016)



## CONCLUSION

The phenomenon of development of border regions (cross-border development) in hinterland region nuanced urban land use changes cause problems of uncontrolled tend to sprawl. Tembung Regional District of Percut Sei Tuan as urban fringe/edge city on the outskirts of Medan grow as a result of demographic bonus growth centre hinterland. Potential topography, accessibility, infrastructure, socio-economic, regional images and spatial planning policy in Deli Serdang district are rural pull factor as an attraction for urbanization characterized by the intensity of the

change in land use (urban land use change). With the aim of exposing what factors influence the development of the region to changes in land use in Deli Serdang, it could be concluded as follows:

1. Factors topography, accessibility, infrastructure, socio-economic, regional images proved to be the attraction factor influencing changes in land use especially for aerotropolis development in Tembung. Factors RDTRK spatial planning program which is part of the Government's program Tembung Deli Serdang Region is able to mediate as intervening factors influence infrastructure significantly with change in land use. Factors image area can be considered as an aspect of promoting regional indigenous wisdom as a material planning land use area.
2. Changes in land use that occurred in the area of zoning Tembung raises specific sectors where the position of Region Hinterland zone residential sector is not only influenced by the position of the core city of the Business Central District (concentric type of development), but has a tendency along roads parallel to the commercial designation form a ribbon type development. In a theoretical study classical concept of sector growth centers Homer Hoyt then Tembung Region regional development raises new concentric sector.
3. In the constellation of planning with the concept of Aerotropolis Deli Serdang Region Airport Tembung an Edge City is worthy of development priorities for the development of residential areas, office and hotel-recreational corridor. This research reveals an alternative land use planning based approach to planning trends-the tendency of drivers to change rural land affected by the pull factor Tembung Region as a development model of participatory rational regional planning.

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