

## 論文の内容の要旨

論文題目

Uncontrolled Growth and Urban Green Area Provision  
in Peripheral Cities of Jakarta Metropolitan Area

(ジャカルタ都市圏周縁都市における非コントロール型成長と緑地施策に関する研究)

氏名

ディアー ファトマ

More than half of the world's population is currently living in urban area, and the number is expected to continue rising. Rapid urbanization causing the urban population increase happens mostly in Africa and Asia. Urbanization in most megacities is expected to slow down in the future. Along with urbanization, built area expands to provide human activities and taking over the unbuilt area in the urban peripheries.

Rapid urbanization in JMA happens as a consequence of Foreign Direct Investment, which started in the 1970s. The investment was mostly spent in Jakarta due to available infrastructures. Growth in JMA is often called as sprawl because the urban expansion in the region happens due to landed housing developments which expanded outside the border of Jakarta. However, the characteristics of sprawl that happens in JMA shares the characteristics of urban expansion in Asian developing countries, where patches of new residential area interlaced with densifying existing settlements, agriculture land, and industrial area, known as *desakota*.

Jakarta Metropolitan Area (JMA), the result of the urban expansion of Indonesia's capital city, Jakarta, is noted as one of the few megacities that are expected to grow in the next 30 years. This region is considered vulnerable to climate change due to reoccurring natural and manmade disasters. The continuous land cover change caused by urbanization resulting decline of green area is regarded as one of the causes of these disasters. Due to this reason, the government of Indonesia enacted a revision of spatial planning in 2007 which requires that urban area in Indonesia provide 30% of its area as green areas. This requirement is interpreted as 30% of the urban administrative area because execution of spatial planning in Indonesia lies on municipality level. However, despite the passing of the requirement, green area in the urban municipalities in JMA continues to decline. With the exception of Tangerang City, which green area includes the international airport, green area in urban municipalities around Jakarta has gone below 10% by 2013.

The decline of green area in JMA urban areas is a result of uncontrolled growth. Along with the increase in population in Jakarta, the capital city has issued several master plans and policies to control the growth and expansion of the city. However, these policies and plans were not able to curb the growth of the city, nor that it could control the change from unbuilt to built land. This is especially happening in the municipalities immediately outside Jakarta, where land use control is considered lax in comparison to Jakarta. Once a land area is changed from unbuilt to built land, it is considered to change it back again. Previous research on JMA mostly covers the regional level or

focusing on Jakarta as its core. Research on municipality level governance related to land use, and especially green area provision, in the peripheral cities in JMA is still scarce. This signifies the importance of researching on green area provision in the peripheral cities.

Previous research shows local level often unable to implement national level policy because of limited resources. Implementation of land use policy at the local level can be summarized into three types; 1) public ownership of green area and its management, 2) regulations including zoning and building permits, and 3) incentives. Based on these, the research analyzed green area provision in JMA peripheral cities by analyzing these specific points.

This research aims to mitigate further loss of green area in the peripheral cities of Jakarta. To achieve this aim, it is important to study the implementation of the urban green area requirement in its executive level. Tangerang Selatan was chosen as a case study in this research because it is the latest urban municipality formed in the latest urban administrative restructuring in JMA. Four objectives are defined to achieve the aim; 1) to outline the chronological of urbanization process in JMA in relation to land use change and green area provision, 2) to analyze the national and municipality level policies and regulations related to green area provision and pinpoint the problems of national level regulations and policies implementation into the municipality level ones, 3) to analyze how land use control is executed in Tangerang Selatan, and 4) to provide recommendation to improve green area provision in the case study and JMA.

JMA was formed by the expansion of Jakarta into its surrounding municipalities. The idea of JMA has existed since the 1960s. At the beginning of FDI, at the end of 1960s, the master plan of Jakarta planned to implement green belt as applied in western countries. However, this plan failed as the urban areas continued to expand. In the mid 1970s, a new master plan to deconcentrate Jakarta was supported by construction of toll roads that connect Jakarta to its surrounding municipalities. The increase of population within Jakarta that followed initiated two points, the first one is to build housing area outside of Jakarta administrative area, and the second one is to put industrial area away from the city center. These points were stated in the master plan released in 1987 which planned the expansion of Jakarta towards east and west. Based on this masterplan, new industrial areas were built in Tangerang Region and Bekasi Region. On the other hand, the policy to increase housing area was implemented by releasing initial permit to developers for a residential area.

JMA has experienced urban administrative restructuring four times. The restructuring is done to increase the effectivity of public services to the citizens. Based on the previous restructuring, it is done when the population in a certain area reached approximately one million people. It is indicated that considering the projected increase of JMA population; urban administrative restructuring is bound to happen again. Because municipality level is the one responsible for implementation, it is important to identify which levels of urbanization urban administrative restructuring happened and which areas might face restructuring into an urban municipality in the future.

This research analyzed the change of land cover in Tangerang Region, the region on the west side of JMA. The land cover analysis was done by classifying land cover using Landsat data from the year 1990 to 2015 at five-year intervals. The results are then used for analyzing where built area is likely to occur and to perform k-means cluster analysis to find out during which levels of urbanizations the restructuring happens. The result of land cover classification shows that growth in Tangerang Region after 1990 spread from the industrial area which was the result of Jakarta's expansion policy, as well as expanding from Jakarta. It also points out that the expansion of built area has gone over the 25 km radius into Tangerang Regency. The change into built area happened along arterial streets which connect toll road exits and along toll roads connected to Jakarta. With the plan to develop new toll roads in Tangerang Region, it is expected that built area around the toll roads will increase, especially in Tangerang City and Tangerang Selatan, where the toll road are planned to pass the existing unbuilt area in these municipalities. The cluster analysis shows that during the time a new urban municipality was made, there were districts that were not yet urbanized. Based on the findings of land cover classification and cluster analysis, this research recommends that the urban green area requirement should be applied on district level before a new urban municipality is formed.

To analyze what are the problems in adapting national policy into municipality level,

especially in a new municipality formed due to urban administrative restructuring, regulations and policies that apply to green area provision in Tangerang Selatan were selected and analyzed. The regulations were organized to find the hierarchy and relations from one to another, and then they were summarized and highlighted on the points related to green area provision and control. Contents of the regulations are compared between each other and to add the depth of discussions, interviews with municipality level government, developer, expert, and practitioners were done. Three main problems were found; 1) inconsistencies different levels of regulation due to lack of vertical coordination 2) municipality government do not have resources to draft necessary detailed regulation, 3) spatial plan and building regulations are not suitable in all parts of Tangerang Selatan, and 4) although incentive and disincentive has the potential to increase contribution of green area by private sector as intended, the municipality is not yet ready for implementation.

Despite incompleteness of regulations in Tangerang Selatan, the municipality still performs land use control. Thus, as a follow-up of the analysis on the regulation, practical implementation of green area provision in Tangerang Selatan was analyzed. The municipality is controlled land use through building permit requirements. Requirements are noted down for different types developments based on available information from government agencies' home pages, observation, and interview with government agencies, developers, practitioners, and experts. Because 80% of Tangerang Selatan is a residential area, this research focuses on three types of residential developments in Tangerang Selatan. It is found that similar requirements to provide green area cannot be applied to all types of developments, and it limits the prospect of mitigating green area. Requiring 30% of the green area within a development is only doable in new town development. The private sector of this scale also shows interest in providing green area. However, the developer expressed clearer regulation is needed because at this moment decision making is done by negotiation case by case. Clearer regulation is expected to become a base to start a negotiation. On the other hand, small residential development can only be required to provide smaller green area because requiring green area cause the price of houses become more expensive, while in organically developing settlement, the requirement is not applied due unclearness of the existing buildings and land lot. The municipality also admitted during the interview that land use control is only done during the planning stage, but no assessment is done following the completion of the project. They, however, indicated that the citizens showed potential to monitor development because of they actively report on developments that do not follow regulation.

As a recommendation, to reduce the decline of green area in the future, increasing green area within private development would be necessary. However, to increase private sector contribution providing clearer regulation and adding incentive for extra contribution is needed. Increasing the capability to monitor and control land cover change is necessary, which can be improved by increasing the availability of data, increasing the capability of evaluators, and increasing the capability of citizens to participate in monitoring.

As a conclusion, this research has covered on how urbanization in JMA happens and analyzed the problems within the implementation of urban green area requirement at the municipality level. This research also has given recommendations to improve the current practices, for the regional area in face of further urbanization process and urban administrative restructuring, as well as for peripheral cities where green area is already scarce and in threat of further decline. The research contributes to the discussion on urbanization in Asia. This research adds discussions on *desakota* region on urbanized stage, because it is only recently that *desakota* region lost almost all of its agriculture activities and became totally urbanized.