

論文審査の要旨
Summary of Dissertation Review

博士の専攻分野の名称 Degree	博 士 (工 学)	氏名 Author	ANDHANG RAKHMAT TRIHAMDANI
学位授与の要件	学位規則第 4 条第①・2 項該当		
論 文 題 目 Title of Dissertation Urban Climate Challenges in Growing Cities of Southeast Asia: Urban Heat Islands and Global Warming			
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〔論文審査の要旨〕 Summary of Dissertation Review			
<p>The main objective of this study is to project the alterations of urban climates in the growing cities of Southeast Asia in the near future. Major cities in this region are suspected of experiencing urban heat islands due to the recent rapid urbanization and the urban temperature is anticipated to rise further not only due to the further urbanization but also due to the accelerating climate change. There are a number of studies that analyze the effect of land use changes on its urban climate, but the relevant studies are almost absent in the growing cities of Southeast Asia in which the land use conditions dramatically change due to the rapid urbanization. This study would provide useful insights for policy making in urban planning for Southeast Asian cities in designing climate-sensitive cities based on numerical simulation results.</p> <p>The thesis is composed of nine chapters. After giving the introduction (Ch. 1) and the literature review (Ch. 2), the research methodology and data used are described in Ch. 3. The descriptions of numerical models used are presented in this chapter. The following chapters (Ch. 4-7) show the results of the simulations. Ch. 4 analyses the effect of land use changes on urban climates in the cities of Hanoi and Johor Bahru, respectively. The results show that the daytime peak air temperature is projected to remain at almost the same level as the current condition even after the implementation of the master plan. However, the high air temperature areas (40-41°C) would expand widely over the planned built-up areas. On the other hand, the nocturnal air temperature would increase by up to 2-3°C over the expanded built-up areas. Ch. 5 examines the influence of global warming on urban climate in Hanoi for the year 2030. The results show that the urban air temperature is expected to increase along with the global warming. In the 2030s, the average air temperature increase in the existing urban areas is projected to be up to 2.1°C, of which up to 1.5 and 0.6°C are attributable to global warming and land use changes, respectively. Global warming contributes, at most, 71% of the temperature increase in existing urban areas of Hanoi City in the 2030s. Ch. 6 illustrates the influence of anthropogenic heat release on urban climate by taking Johor Bahru for example. Ch. 7 particularly focuses on the impacts of urban warming on indoor thermal comfort as well as cooling loads in urban houses of Hanoi as a case study. Ch. 8 discusses the countermeasures for the future urban warming in these growing cities. Ch. 9 summarizes the key findings from the respective chapters as conclusions, followed by the discussion on future studies.</p> <p>The candidate has published five refereed papers as well as six refereed conference papers, and presented twelve papers in conferences. Thus, the committee has confirmed that the candidate has the sufficient capability for awarding the Doctoral Degree in Engineering by IDEC, Hiroshima University.</p>			