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学 位 論 文 概 要
Dissertation Summary

学位請求論文（Dissertation）

題名（Title）　　GIS-Based Spatial Analysis for Supporting the Location of Welfare Facilities for the Elderly Using Open Data

　　　　　(邦訳)　　　オープンデータを用いた高齢者福祉施設の配置計画支援のため *GIS* を用いた空間解析

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学位論文概要（Dissertation Summary）

1 Introduction

This Ph.D. research aims to use the GIS-based spatial analysis and open data to support the location of welfare facilities for the elderly (WFE) by two aspects of the evaluations of spatial distribution for WFE and explorations of possible solution for difficulties in implementing the location. It contributes to help the government sectors identify the location more accurately and alleviate the difficulties in implementing the location of WFE. The proposed methods are improved based on the needs to enhance the location support of WFE in Tokyo.

2 Case studies and Methods

In the context of unbalanced relationship between supplies from WFE and demands of elderly population who cannot acquire services, where to locate WFE has been a problem long troubled the government sectors. Based on this, (1) we first make an overall analysis of the distributive relationship between the distribution of WFE and population by building a coupling degree model. It addresses the needs to improve the evaluation of distribution for facilities at a relatively micro level. The result may help the government sectors analyze the reasonable degree of the relationship between the distributions of WFE and population. (2) We continue to calculate a beds-needed index for assessing the allocation of special elderly nursing homes by introducing a parameter-improved floating catchment area method. It addresses the needs to improve the focuses on the access and potential demand of elderly population in assessing the allocation. The result may help the government sectors assess suitable areas for locating the SENHs in the short-term construction. (3) Besides the evaluations for the current situation, we then propose an integrated framework which contains two models of measuring the spatial equity and evaluating the potential to discern potential facilities that can be transformed into elderly day care centers. It addresses the needs to ease the difficulty in implementing the location due to available sites shortage. The result may help the government sectors investigate the potential facilities that can be used to transform into elderly day care centers to ease the difficulty. (4) Another way of redevelopment to deal with the difficulty of a shortage of available sites is proposed. We use an integrated approach which contains two frameworks of identifying potential sites using a four-step identification method and establishing the priority of identified sites using a multi-criteria evaluation, to evaluate potential sites for redevelopment. It addresses the needs to consider how to support the location by redevelopment which have the condition to implement in priority that can be used to locate the facilities. The result helps to explore the potential sites of redevelopment where the location of facilities can be implemented.

3 Conclusions

As proved by this dissertation, the GIS-based spatial analysis and open data with these two aspects (four case studies) are useful for supporting the location of WFE. The results are able to evaluate the suitable sites and explore possible solutions to support the location of WFE based on evaluated coupling degree, shortage areas, or prioritized situations in the present or future urban areas.