

学位論文の要旨 (論文の内容の要旨)  
Summary of the Dissertation (Summary of Dissertation Contents)

論 文 題 目  
Dissertation title

**Spatial and Temporal Patterns of Tropical Forest Landscape Prioritization for Conservation Planning: A Case Study in Sultan Adam Forest Park, Indonesia**

広島大学大学院国際協力研究科  
Graduate School for International Development and Cooperation,  
Hiroshima University  
博士課程後期 開発科学専攻  
Doctoral Program Division of Development Science  
学生番号  
Student ID No. **D113713**  
氏 名  
Name **BENI RAHARJO** Seal

This study was aimed to develop and assess the application of the conservation prioritization, in terms of spatial and temporal patterns, in the area prioritization of the forest landscape for conservation planning with the study site of Sultan Adam Forest Park, Indonesia. It tries to formulate the appropriate prioritization framework, to prepare the biophysical conditions data and assess their spatial and temporal changes, to assess the spatial and temporal patterns of the preservation prioritization, to assess the spatial and temporal patterns of the rehabilitation prioritization, to formulate the proposed contribution of the forest landscape conservation prioritization for forest landscape zonation, and to assess the optimum proportion for conservation priority and to assess the sensitivity of the conservation prioritization framework in forest landscape.

Chapter 1 discussed the background, problem statement, objective and aims, significance, framework, and the study site. Since Indonesian forests have been divided into Forest Management Unit (FMU), forest management practice at the FMU level certainly contributes to the sustainability of the Indonesian forest. Sultan Adam Forest Park (SAFP) was selected as the study site due to its wide ecosystem types and significant size. SAFP is also among few FMUs that have been formally assigned and passed the development phase.

Chapter 2 consisted of the literature review and methodological approaches. The application of the landscape approach was highlighted. The two identified conservation tasks, namely the preservation and rehabilitation, were used as the main prioritization goal in a GIS-based multi-criteria analysis. The framework for conservation prioritization of the forest landscape was developed. It has multi-criteria of tasks, components, sub-components, and parameters. Management preference were accommodated by weighting techniques using Analytic Hierarchy Process (AHP) as the weighting method. In addition, other weighting methods were also used for assessing the sensitivity of the developed framework.

Chapter 3 assessed forest landscape biophysical conditions for landscape prioritization. The lowest level criteria are parameters that were estimated from the landscape biophysical conditions. The spatial and temporal analysis were carried out to assess the related parameters on the vegetation, forest fragmentation, species' status, settlement, accessibility, forest fire, soil erosion, topography and land management criteria. An additional of hazard prevention was also included which was used for the sensitivity analysis. The spatial and temporal patterns of the biophysical conditions certainly affect the spatial and temporal patterns of the prioritization.

Chapter 4 analysed the spatial and temporal patterns of the preservation prioritization in tropical forest landscape. The preservation priority area was analysed in two decadal period of analysis. The resultant preservation priority in 1993, 2003 and 2013 were assessed spatially and temporally. The inclusion of the threat component significantly changed the preservation prioritization. It was also found that the changes in the preservation priority area were related to the change of the biophysical conditions. The importance to assess the preservation priority and its spatial and temporal patterns in forest landscape is highlighted.

Chapter 5 analysed the spatial and temporal patterns of the rehabilitation prioritization in tropical forest landscape. The rehabilitation priority area was analysed in two decadal period of analysis. The resultant rehabilitation priority in 1993, 2003 and 2013 were assessed spatially and temporally. It found that the inclusion of the recoverability component significantly changed the resultant priority area. The changes in the rehabilitation priority also linked to the change of the biophysical conditions, spatially and temporally. The resultant rehabilitation priority area is less temporally changed compare to the preservation priority. The importance of the assessing the spatial and temporal patterns of the rehabilitation priority is underlined.

Chapter 6 formulated the proposed contribution of the forest landscape prioritization for forest planning. The new concept of the prioritization regimes was proposed. It is observed that in the period of 1993-2003 and 2003-2013, conservation and preservation regimes decreased while rehabilitation and enhancement regimes increased. The spatial and temporal patterns in the proposed prioritization regimes are significant. Current zonation in SAFFP has a moderate agreement with the proposed prioritization regimes. Further, the proposed prioritization regimes were proposed as one of the considerations for forest landscape zonation. Since the prioritization regime acknowledged the spatial and temporal patterns, its application was recommended in mid-term or short-term forest plans. This chapter shows the functionality of the prioritization regime as the complement of the zonation or special zone assignment in FMU.

Chapter 7 assessed the optimum proportion of the priority area and assessed the sensitivity of the conservation prioritization framework in forest landscape. Even the linear and logarithmic models show their good performances, however, neither one of them was consistently favorable over another. The optimum proportion was also hard to be consistently defined since it depends on the spatial and temporal change of the preservation and rehabilitation prioritizations. Thus, arbitrary proportion for determining priority area in forest landscape still the appropriate option. On the weighting sensitivity, it can be concluded that if the forest manager has sufficient resource, the AHP is the favorable method. Meanwhile, for lacking of prior study and information on decision-making preference, any of equal, proportionally equal and rule-of-weight methods can be used with insignificant differences. This chapter also confirmed that criteria selection has a wide spectrum of choices without significant difference in the result. Since the prioritization or framework could not be evaluated in terms of right or wrong, for this reason, developing the acceptable, repeatable and objective framework is considerably appropriate in conservation prioritization.

Conclusion and recommendation were presented in Chapter 8. It shows the general conclusion in the summary of findings, scientific contribution of this study and its limitation. In addition, the recommendation on the basic idea of implementation and the future perspective were discussed.

備考 論文の要旨はA4判用紙を使用し、4,000字以内とする。ただし、英文の場合は1,500語以内とする。

Remark: The summary of the dissertation should be written on A4-size pages and should not exceed 4,000 Japanese characters. When written in English, it should not exceed 1,500 words.