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学位論文全文に代わる要約
Extended Summary in Lieu of Dissertation

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学位論文題目：
Title of Dissertation:
Fuelwood system in Mali - community perception and impact on forest structure
(マリ共和国における薪炭材システム－村落共同体の認識と森林構造への影響)

学位論文要約
Dissertation Summary

Fuelwood is main source of energy for many developing countries in the world. It is used for diverse purposes such as heating house, boiling water, cooking, and so on. For example in Mali, one people use 291kg/year of fuelwood to satisfy the need. Unfortunately fuelwood extraction from forest has lead to degradation of forest in several parts of the world. In order to mitigate the negative impacts of fuelwood extraction on forest, forest managers have introduced several policies and innovation. They have started afforestation and reforestation programs to catch up the amount extracted by fuelwood exploitation. They have introduced improved stoves which consumed less fuelwood compare to traditional one. They consider some parts of forest as protected forest, where it is illegal to collect fuelwood. Though there are those different attempts, fuelwood extraction still degraded forest in developing world.

In this research we analyzed perception of rural communities and assessed the effect of fuelwood extraction on forest structure, in order to solve the issues happened in fuelwood system in Mali.

Our research sites were Wassorola and Farako, two villages in Mali. In January 2010, a survey of 100 people was carried out to assess villager s opinions on the fuelwood issue and the lifestyles of the villagers of Wassorola. Interviews were conducted by face-to-face. Principal component analyses (PCA) of the data were applied to analyze the variation and structure of the data.

In order to analyses the effect of fuelwood extraction on forest structures, we set research plot both in protected and non protected forest in October 2011. And we randomly set up 5 plots of 20 m X 20 m in both types of forests. To quantify stand structure, we measured DBH (stem diameter at breast height) of all individuals larger than 4cm of DBH. We also counted the number of individuals with less

than 4 cm of DBH and number of stems for all the shrubs within plots. We identified all trees and shrubs in the plot.

Family units in Wassorola consist of large families with an average of 6.7 adults and 6.5 children. The education level of interviewees is low and 84% of them never attended school. Of the respondents, 83% was aware of the threat to their forest resource and 12% thought there is no solution to the problem.

Result of PCA analysis showed education and capacity to write and read have highest related factor. Large families tend to think their sourrounding forest depletion is due to natural reasons, or small families think it is due to human activities. This phenomen can be explained by the traditional ways of believe.

Non protected forest had 2,018 individuals (trees and shrubs) per hectare, with 35 species and 17 families. There was no tree with a diameter at breast height (DBH) larger than 60 cm. The basal area in the non protected forest is 6.79 m^2. Protected forest had 3,369 individuals per hectare, with 51 species and 19 families. Its largest tree had a DBH of 165 cm. The basal area in the protected forest was 16.15 m^2/ha.

These result reveal that protected forest had more trees, bigger trees and higher species diversity compared to non protected forest. We may concluded that protected forest perform well these functions.

This research is proved that local people are aware about high fuelwood consumption and that protected forest is effective in fuelwood collection area. This document is important for policymakers.