



Thesis Abstract

Species-Site Compatibility Analysis Using Pair-wise Ranking Approach with GIS for Logged-Over Areas in Kraya Commune, Santuk District, Kampong Thom Province, Cambodia

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The study 1) characterized and evaluated the biophysical and socio-economic conditions of the Kraya Commune, 2) formulated and developed a model that would measure species-site compatibility to help guarantee the success of the reforestation program in the Commune; 3) documented the criteria used and examined the consultative process with the various stakeholders in generating weight/ranks for their choice of reforestation species; and 4) provided recommendations to policy makers and planners for the successful rehabilitation of the degraded forest areas.

Local people were interviewed to find out their perception of the reforestation program, preferred tree species to be planted, and the constraints that may be encountered. Focus group discussions (FGD) were also conducted for 20 representatives from the different villages in the Commune regarding the pair-wise ranking method. The FGD also developed scales and weights on the various criteria for plant growth, and the constraints for the reforestation program using the pair-wise comparison method. The ecological requirements of the preferred tree species and the site characteristics were obtained from secondary data. Site characteristics and species requirements were matched using ArcView 3.2 GIS to analyze the species-site compatibility for the top five preferred tree species: *D. alatus* Roxb., *H. odorata* Roxb., *T. javanica* Bl., *P. macrocarpus* Kurz., and *A. cochinchinensis* Pirre. The seed supply of these priority species was also determined by local people.

In the Kraya Commune, the tree species were mostly non-commercial class. The area has five soil types which area deep and acidic. It is flat to gently sloping with low elevation. Annual rainfall ranged from 1,400 to 1,800 mm. Most of people in this commune are farmer. Forest resources are important source of their livelihood. The relative weights showed that the priority tree species was 0.201. Soil depth and soil types accounted for 0.198 and 0.171, respectively. In addition, the relative weights of soil pH, slope, rainfall, elevation and seed supply were 0.065, 0.022, 0.146, 0.033, and 0.164, respectively. In general, majority of the area were found highly compatible to all species, except for *T. javanica* Bl. which has low compatibility.

Using pair-wise ranking approach, analyst can translate qualitative survey into quantitative value that can be analyzed without bias. This method can save time and resources. However, the ecological requirements of tree species and site condition needs further study.