Modeling the Natural Occurrence of Selected Dipterocarp Genera in Sarawak, Borneo

ABSTRACT

Dipterocarps or Dipterocarpaceae is a commercially important timber producing and dominant keystone tree family in the rain forests of Borneo. Borneo's landscape is changing at an unprecedented rate in recent years which affects this important biodiversity. This paper attempts to model the natural occurrence (distribution including those areas with natural forests before being converted to other land uses as opposed to current distribution) of dipterocarp species in Sarawak which is important for forest biodiversity conservation and management. Local modeling method of Inverse Distance Weighting was compared with commonly used statistical method (Binary Logistic Regression) to build the best natural distribution models for three genera (12 species) of dipterocarps. Database of species occurrence data and pseudoabsence data were constructed and divided into two halves for model building and validation. For logistic regression modeling, climatic, topographical and edaphic parameters were used. Proxy variables were used to represent the parameters which were highly (p>0.75) correlated to avoid over-fitting. The results show that Inverse Distance Weighting produced the best and consistent prediction with an average accuracy of over 80%. This study demonstrates that local interpolation method can be used for the modeling of natural distribution of dipterocarp species. The Inverse Distance Weighted was proven a better method and the possible reasons are discussed.