

1. INTRODUCTION

The growing population in the recent years had a great impact on both agricultural and non-agricultural land use. As human density increase, rapid conversions of prime agricultural land to housing development and other use exert an upward pressure on land price, encouraging land speculation. Large proportions of these converted areas are suitable for agriculture. It is likely that more marginal land utilized for crop production and the expansion of cultivated area into forested area will be more noticeable soon.

There is an urgent need for sound land use planning and management based on understanding of land quality and their physical and economic suitability. The process whereby the suitability of land for specific uses is assessed, is called "*land evaluation*" (FAO, 1985). Land evaluation procedures compare relevant kinds of land use and their environmental requirements with land mapping units and their qualities or attributes. It is related to physical, economic and social context of the areas they are to serve.

Manual land evaluation is tedious and error prone process, certain land characteristics which are necessary for estimating land quality may not be easily obtained. Spatial data generated by geographic information system, GIS, is required to be integrated into such a system. There are also need for integrating methods that automated land evaluation procedures using decision trees to determine land quality for a specific environment.

The aim of this study is to develop land evaluation method by using an expert system, Automated Land Evaluation System (ALES) model, for facilitating rapid, flexible and more accurate evaluation of land. GIS is used to produce spatial information required as inputs into ALES and to produce suitability maps and attribute tables to be used in the database system for agricultural planning.

The followings are the research objectives:

1. To construct a land evaluation model based on ALES framework with emphasis on developing decision procedures for Land Use Requirement (LUR) of major Land Utilization Types (LUT) to fit bio-physical and socio-economic conditions in northern Thailand.
2. To evaluate Land Mapping Units (LMU) of Phrao District, Chiang Mai for physical and economic suitability based on the constructed model.
3. To compare the results using the constructed model with the existing land use practices and economic suitability of the same area and suggest improved procedures for automated land evaluation.