



# **Agricultural Land Suitability Analysis for Yen Khe Hills (NgheAn, Vietnam) using Analytic Hierarchy Process (AHP) Combined with Geographic Information Systems (GIS)**

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**Abstract:** Yen Khe commune of NgheAn province, Vietnam is a hilly area where physical and environmental conditions limit the development of agriculture. For proper planning and management of this hilly terrain, land suitability analysis has been done using Analytic Hierarchy Process (AHP) method combined with GIS based multi criteria decision making approach. Satellite images and Digital Elevation Model (DEM) were used in conjunction with field data for the development of land suitability maps. Pair wise comparison matrix was used to determine weight of the parameters. Results of the AHP-GIS method showed that 12.33 per cent of land surface is highly suitable for agriculture, 20.33% moderately suitable, 29.26 per cent marginally suitable, and 38.08 per cent unsuitable. In this study, the areas where further agriculture development can be done have been suggested within the limitation of land development laws of Vietnam, considering socio-economic requirement and maintaining tradition of local inhabitant. AHP-GIS approach adopted in this study for the development of land suitability map would be helpful for agriculture development in the hilly area of Vietnam and also other part of the world with proper land use management.

**Keywords:** Agricultural land suitability analysis, Analytic hierarchy process (AHP), Geographic information systems (GIS), Vietnam, Multi-criteria decision analysis (MCDA)