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Assessing Rural Land Resources through Spatial Analysis for Rural Development: A Case of Dieng Plateau, Central Java-Indonesia

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Abstract

The development of upland agriculture in South East Asia has caused direct impact on degradation of rural resources and socio economic where attitudes toward primary activities have been shifting to inadequate and over use of natural resource. The condition of natural resources particularly land is affected by both natural factors (physical environment) and land use decision of the responsible families while the resource base is influencing and limiting the economic activities.

In Indonesia where most of the potentially arable land has already been utilised, input intensification on crop land has reached up it technical or even economic limits. On the other hand, population growth has also been influencing the increasing demand on agricultural land and consequently changes non productive land such as forest land into cultivated land. High level demand on agricultural land in upland area is usually followed by land clearing in some steep slope areas where land need to be extended to fulfil the scarcity of land in term of production activity. Therefore, further soil degradation thus becomes the central issue of concern in study area since deforestation has been taking place as well as high population pressure in marginal areas.

This study has been conducted in Dieng Plateau region -one of important upland farming region in Central Java Province, Indonesia. The purpose of the study is to analyse land use-cover change during certain period and to assess the potential of soil loss regarding land use-cover change. As the first step of analysis, land classification with different period of Landsat images (1991 & 20101) has been employed through the remote sensing processing. Furthermore, spatial analysis of Geographical Information System (GIS) was applied to asses the quantification of land use-cover change and soil degradation in study area. The result shows that forest area has been degraded more than 50% from 1991 to 2001 and about 450 ha of study area have been shifted to the very high category of potential soil degradation.

Keywords: Geographical Information System, Indonesia, land use-cover change, satellite images, soil degradation