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Determinants of Forest Cover Dynamics in the Margins of Protected Forest Areas

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Abstract

The Lore Lindu National Park in central Sulawesi Indonesia hosts a unique collection of endemic species. They are very important for biodiversity and conservation. However, land use in this region has continued to change substantially, and conversion to agriculture by the rural communities is the major source of deforestation in this area. Since rural communities at the forest margins certainly should however play a significant role in maintaining the stability of the rainforest, a better understanding of the socioeconomic dynamics is beneficial in decelerating the pressure on forest degradations. This paper aims to assess the socioeconomic and geophysical factors that drive changes of land use from forest to non-forest. We use non-linear spatial panel econometric models. For this purpose, we applied spatial panel econometric models for the first time to the study of land use. Our analysis presents the dynamics of forest covers using spatial and socioeconomic data from 2001 and 2007, obtained from Landsat images and surveys in 80 randomly selected villages respectively. The land use persistence between the two periods indicates that 83.7 per cent land that was not forest before remained as non forest the next period, while 95.2 per cent land that was forest before remained as forest the next period. The results show that population density, share of irrigated land at the villages and the mean of annual rainfalls were significant to influence changes of land use from forest to non-forest. To maintain the sustainability of the environment and thus to ensure rural welfare, the suggested policy options such as investment on irrigation scheme and population growth control should be implemented.

Keywords: forest cover dynamics, spatial panel analysis, deforestation, land use change, lore Lindu National Park