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Analysis of 5 years land cover transition for a study area in Central Kalimantan, Indonesia

Yan Gao[1]*, Robert Gilmore Pontius Jr.[2], Kazuyo Hirose[2], Mitsuru Osaki[4], Hendrik Segah[3], Takashi Kohyama[4]

[1]Post-doctoral researcher, [2]Associate Professor, [3]Assistant Professor, [4]Professor

The purpose of this paper is to analyze land-cover maps from two points in time for a study area within Central Kalimantan, Indonesia, in order to characterize the systematic land-cover transitions. Through this study we analyze whether the observed transitions appear to have occurred under a systematic or a random process, according to the quantitative information in the transition matrix. We construct the transition matrix to show the magnitude of each transition and to analyze the amount of gain and loss of each land cover category between 2000 and 2004. The amount of gain of a category is assessed relative to the distribution of the other categories in 2000 to compute the magnitude of the transitions be expected if the process of gain were distributed randomly across the 2000 landscape. The expected gain under a random process is then compared to the observed gain to distinguish between random and systematic transitions. In a similar manner, the expected loss under a random process is also compared to the observed loss in order to distinguish between random and systematic transitions, in terms of the losses. This paper also analyzes the net change and swap change between land cover categories. For this analysis, the net quantity change is less than 10% of the study area, while the total change is close to 35%, the latter due to considerable swap changes, which is about 25%. We identified the systematic transition between grass/scrubland and bare land. Despite the big quantity change between forest and bare land, the change is not systematic, which means when the forest loses, it is not especially vulnerable to bare land and when the bare land gains, it does not target on forest. The big quantity change is simply due to the fact that these two classes are the two largest classes in the landscape. This in depth analysis has enabled the quantification and visualization of the major signals of transitions of land cover in the study area.

Keywords: Land cover transition, Change matrix, Central Kalimantan