บทคัดย่อภาษาอังกฤษ

Title   Impacts of forest fire on the forest fertility and air quality in Chiang Mai Province

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ABSTRACT

Main objectives of this study are to evaluate relationship of forest fire locations and topography-related factors as well as land-use/land-cover (LULC) characteristics of Chiang Mai Province during 2009-2013 and to assess impact of forest fire on forest loss or degradation (based on forest type data extracted from Landsat imagery and MODIS-based vegetation index: EVI) and on air pollution intensification in both space and time aspects (based on the ground-based measurement data and the air quality index NDAI developed from the MODIS imager). Fire incidences were seen the most in March and, in total, about 53.9% were located in the deciduous forest, 23.8% in agricultural area and 16.2% in the fertile forest land. About 71% of the observed fires were found less than 1 km away from road network indicating that they should be initiated by human activities. Moreover, considerable amount of the active fire spots were located at very high altitude (e.g. > 1,000 m) which was believed to be result of the drifting agriculture. Investigation of the burned area revealed that it happened in the deciduous forest the most followed by the fertile forest and the agricultural land. This finding indicates that severe fire event seen in the forest might cause significant impact on forest ecosystem as a result. Moreover, the study shows that the developed NDAI data have high linear correlation with the reference PM10 data in use (R^2 = 0.661). And the formulated PM10 map from the derived NDAI data covering the whole provincial area with high accuracy (average error of 18%) was able to create air quality map (AQI map) to support rapid and up-to-date health warning process to people in the province.

Keywords : Forest fire, Air pollution, Air quality index, PM10, MODIS