Analysis of Spatial Patterns and Estimation of Carbon Emissions in Deforestation Area Using GIS and Administrative Data with the Article 3.3 of Kyoto Protocol

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This study purposed to analyze the spatial pattern and estimate the amount of carbon emission at the deforestation area in Inje-gun, Gangwon province of Korea. Inje-gun is located within the northeastern part of Gangwon-do. Ninety-five percent of the Inje-gun is covered with forest, and of those forested areas, ten percent is artificial forest and most types of forests were *pinus densiflora*, *pinus koreaiansis*, and *Oak*.

We first construct the GIS database using FGIS and administrative database. The FGIS database, consisting of spatial forest management information including compartment, sub-compartment, administrative border, forest type (4th) and road networks. Spatial forest management, thinning, silviculture and cutting document, deforestation document (1992-2008 years) were entered into GIS database. FGIS database was provided by Korea Forest Service.

The area size and spatial patterns of deforestation area were analyzed during the study period according to the article 3.3 of Kyoto protocol. Forest administration data for 17 years from 1992 to 2008 was entered into a database, and area size which confirm to land register was 30ha. Fifty-nine percent of deforestation area was found within 50m of the road network, and forty-six percent of the area was found which had slope less than 10 degree. Theoretical carbon emission based on IPCC criteria was estimated at 2,049 tc.

*Key words*: Kyoto protocol, Deforestation, spatial pattern, Biomass, GIS