

Assessing Climate Change Impact for Forest Sector Considering Uncertainties

- Case Studies for Landslides and Biomass -

Ho Gul Kim, Sun Yong Sung, Dong Kun Lee*

dklee7@snu.ac.kr

PART 1. Assessment of Landslides Hazard Areas

Damages due to extreme weathers, such as heat waves, floods, heavy rainfall, and typhoons have increased. Various disasters have been increased by these extreme weathers. Especially, landslides is one of the most dangerous disaster in Republic of Korea. Finding landslide hazard area is very important to reduce damages. Information of landslide hazard area could be utilized to make adaptation policies. Therefore, the objective of this study was assessing landslide hazard areas by using statistical model. Especially various scenarios will be applied as independent variables to decrease climate change uncertainties. The spatial scope of study was Gangwon-do, Republic of Korea. The temporal scope of study was 2006, 2020s, 2050s, and 2090s. Maxent model was used to assess landslide hazard areas. Relevant variables (weather, topography, soil, and vegetation) for model were studied by literature review. RCP (Representative Concentration Pathways) 4.5 and 8.5 climate change scenarios were selected as future climate data. As a result of assessment, potential landslide probability maps were made for each target year. Policy makers can utilize the maps to make adaptation plan, because it could showed dangerous areas to landslide clearly.

PART 2. Assessment of Biomass in Forest

Forest ecosystem plays important role in mitigating climate change. The total amount of carbon absorption can be calculated by productivity of forest ecosystem. The productivity of forest ecosystem is highly affected by climate change and other environmental variables. Therefore the relationship between productivity of forest ecosystem and environmental variables are analyzed by using MODIS data and correlation analysis in this study. Relationship among Net Primary Productivity (NPP) from 2000 to 2010 and environmental variables are analyzed throughout the Republic of Korea. We found that the bioclimatic variables are more significant than normal climatic factors. In addition, net productivity of forest has peak on 30~40 years. When implementing mitigation strategy it is necessary to renew the forest in 30 to 40 years to maximize the efficiency. As a result of this research, the environmental variables and its interaction between NPP was found. This research provided starting point for further assessment of future carbon

sequestration