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Study on Conversion Permission Standard based on Topographical and Ecological Indices in South Korea

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Since 1970s, South Korea has been developed rapidly in the aspects of economy and industry over 40 years due to the Economic Development Plans led by the Korean government. Consequently, urbanization has been accelerated and the population then began to be flowed into major cities. In result, many parts of forestland in South Korea have been changed into urban areas by urban expansion and population migration under forestland conversion permission by South Korean Forestland Management Law. However, such permission standards cannot help being friendly to the development due to the line of national policy, and so several environmental problems, i.e., topographical and ecological changes, have been caused over couple of decades. In this study, therefore, we suggested new enhanced permission standards in terms of topographical and ecological protection in converted forestland. In Mountainous Districts Management Act of Korea Forest Service, slope and elevation criteria have been operated to regulate the indiscriminate use of risky land parcels when forestland is converted to other land use types. However, it is impossible to consider topographical variation with only such two indices in the land parcel because the indices values are averaged in each target parcel. Therefore, for supplementing insufficient criteria, the slope gradient by Catena was suggested by converted land use types. Furthermore, the ecological indices and criteria such as stand age, Diameter at Breast Height (DBH) and soil depth were considered in this study according to the forestland-watershed and -use types on converted target parcel. Firstly, we suggested flexible degree criteria by 14 land development types as topographical standards for forestland conversion. Secondly, the ratio of 'risky slope' below 40% in a target forestland parcel was defined to decrease the risk of disasters such as landslides. Thirdly, standard of ecological condition were proposed as ecological score by integrating stand age, DBH and soil depth classes in the target forestland parcels by 5 forestland-watershed and 14 land use types. As a result, we could prepare acceptable standards in South Korean that can reduce topographical and ecological damages by converting other land use type.