SURFACE SOIL PORTAL SYSTEM FOR EFFECTIVE SURFACE SOIL EROSION MANAGEMENT

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Abstract: Topsoil is an important resource that provides a variety of public utility functions such as water resources, climate change mitigation, food production, and energy production. National institutes and research institutes have been carrying out many efforts and researches for the preservation and quality evaluation of such topsoil. However, topsoil – related data and research data are limited in their use in topsoil management due to the lack of a system that can easily provide the data. A web-based topsoil portal system in needed to provide such comprehensive topsoil-related data to the public and researchers. In this study, we constructed a topsoil resource management system that can provide various topsoil related data such as topsoil – related contents, topsoil quality data by water and watershed, and Korea Universal Soil Loss Equation (KUSLE) data. This system not only provides information such as definition, function, and education contents related to topsoil, but also Web-GIS-based topsoil loss prediction system and domestic water-based topsoil information system. The topsoil loss prediction system consists of a short-term topsoil loss prediction system and a medium-term and long-term topsoil loss evaluation system provided information on topsoil loss by agricultural fields. The domestic water-based topsoil information system consists of a water-based topsoil information system, a soil quality evaluation system for each land use, and a KUSLE topsoil information system, and provides a topsoil-related DB using the Web-GIS function. The water-based topsoil information system is a system that provides the necessary data for the topsoil quality evaluation in the form of TIFF files by dividing it into watersheds, administrative district boundaries, or user-desired watersheds. The soil quality evaluation system for each land use is a system that can check how the topsoil quality evaluation items in the watershed change according to the land use change of the agricultural field in the watershed. The user can select the agricultural field to change a land use type, and check the result of the topsoil quality evaluation by the table. The KUSLE topsoil information system is a system that divides KUSLE factor data into user-desired watershed and provides it in the form of TIFF file.
The provision of data related to topsoil through the construction of such a system will not only help the public and researchers, but will be also a service that provides information in an easy-to-understand format through the processing of Big Data, which is the main keyword of Korean Government 3.0.

Keywords: soil Resources, Soil Erosion, KUSLE, Big Data, Web GIS, Management System