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# Surface Erosion Process in Granite, Gneiss and Sedimentary rock Drainage basins in Korea

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In order to measure soil loss along the hillslopes and sediment discharge, field experimental plots were established on downslopes, 27-32 degree slopes with granite (Gr1, Gr2), gneiss (Gn) and sedimentary rock (Se) catchments. The plots were located according to uniform slope steepness and on smooth surfaces with natural vegetation. Monitoring of plots extended over a six month period from April to October, 2005. Plot surface areas ($10.5m^2$) were defined by two sidewalls of 3m length, one upper wall of 3 m length and the lower triangular apron contact. The walls were made of about 20cm high damp plastic cloth. The floor of the triangle was excavated to a 20cm depth under the soil surface and a plastic collecting drum was half buried and connected to the pipe. At the apex of apron, a 60cm internal plastic pipe was inserted to convey water and surface sediment in the approximately 45 liter sediment collector drum. Sediment yields were collected manually from the 10.5cm2 surface areas by brushing into plastic container drums every month after substantial rainfall. Sediments were analyzed through a dry sieve (above $0\varphi$) and organic matter was determined by loss on ignition at 550℃over 4 hours. In the plots, rainfall intensity was measured with a recording rain gauge. The runoff was measured by specially designed pre-calibrated flumes, equipped with water-depth probes. Sediment yields in plots were calculated from periodic sediment samples taken throughout the hydrograph. As a result of measurement from four erosion plots, high discharge and sedimentation were shown to be markedly associated with the occurrence of heavy rainfall events. The treatment effects on erosion rates were very obvious depending on difference of bedrocks. The highest discharge and surface erosion were generated in Gr1 and Gr2 catchments, whereas discharge and surface erosion were not generated in the Se catchment during the observation period. The highest sedimentation rate occurred at 1.21 g/l due to heavy rainfall event on June 27 in Gr1 catchment. In July and August, the highest sedimentation occurred in Gr2 catchment, where sedimentation rates were 0.26 g/l and 0.12 g/l, respectively. In Gn, the surface erosion and sedimentation were almost not generated during the observation period. However, a sediment discharge occurred as a result of extremely heavy rainfall event on August 11. The Se had no occurrence of surface soil erosion and sedimentation during the observation period. This indicates that the surface soil has low soil erodibility by surface flow during heavy rainfall. Generally, in terms of soil erosion and sedimentation rates compared to the other plots, the Gr2 had highest erosion and sedimentation rates in July and August. The highest sedimentation on the plot surface was revealed in the Gr1 and Gr2 catchments, which have less dense vegetation cover in the plot surface area than in the other catchments. This indicates the influence of soil surface compacting effects produced by heavy rainfall. The soil cover in The Gr1 and Gr2 catchments had higher erosion rates due to high rainfall erosivity and higher exposure of the surface soil to heavy rainfall events than in the Gn and Se rock catchments.