



Evaluating soil erosion history using fallout radionuclides in semi-arid grassland, Mongolia

H. Kato (1), Y. Onda (1), Y. Tanaka (2), M. Tsujimura (1), G. Davaa (3), D. Oyunbaatar (3)

(1) Graduate School of Life and Environmental Sciences, University of Tsukuba, Japan, (2) Department of Geography, Kyung Hee University, Korea, (3) Institute of Meteorology and Hydrology Mongolia, Mongolia (hiroakis980@ybb.ne.jp / Phone: +81-29-853-6883)

Overgrazing is considered to be the cause of accelerated erosion and subsequent land degradation in semi-arid grassland, Mongolia. However, estimating soil erosion rate is difficult because few field data is currently available in Mongolia. In this study, two experimental watersheds with different grazing pressures were selected in the Kherlen river basin in north-eastern Mongolia. One site is Kherlen Bayan Ulaan (KBU; 6.9 ha), experienced high grazing pressure as wintering grounds for livestock. The other is Baganuur (BGN; 7.6 ha), where livestock numbers have been increasing after the introduction of market economy in 1991. Fifty soil cores were collected within the two experimental watersheds to determine the spatial distribution of Cs-137 and Pb-210ex inventories. A high erosion rate was estimated in KBU watershed but low erosion rate was estimated in BGN watershed by diffusion and migration model using Cs-137 inventories. Inventory ratios of Pb-210ex to Cs-137 in soil collected at the reference site and eroded area within the experimental watersheds were analyzed. The inventory ratios of eroded areas were higher in KBU watershed but lower in BGN watershed than the reference site. These data suggested deceleration of recent soil erosion in KBU watershed, where intensive soil erosion occurred in the past, whereas acceleration of soil erosion was indicated in BGN watershed, where the numbers of livestock had been increasing in the last decade. These results suggested that inventory ratio of Pb-210ex to Cs-137 can be used to evaluate the temporal changes of soil erosion rate.