

Preliminary result of the heavy metal contamination in urban area rivers in Ulaanbaatar, Mongolia

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Environmental pollution in capital city Ulaanbaatar in Mongolia, which is caused by many factories such as coal usages and heavy vehicle traffic, is serious problem for public health. In the mining area, heavy metal pollution of rivers and soils is being continuously occurred. However, with a limited number of trained personnel, the government policies cannot be implemented, and laws and regulations cannot be enforced.

The government supported joint research project started to contribute the human resources in Mongolia based on the research output of scientific elucidation of the environmental pollution problems in case area of the Tuul and the Kharaa rivers basins, northern Mongolia.

Our preliminary study has conducted on several river sediment samples in Ulaanbaatar area. Totally 73 river sediment samples were collected from main stream of Tuul river, and its tributary rivers of Selbe, Gachuurt and Ulaistai rivers. 12 metals (Cr, Mn, Co, Ni, Cu, As, Se, Cd, Sn, Sb, Ba, and Pb) were analysed by ICP-MS (Agilent 7700x). Then, the contamination factor (CF) values and the pollution load index (PLI) [1] were calculated from analytical results.

The PLI values of metals in the sediment of Tuul river ranged from 0.01 to 358. The value of the PLI in Tuul river increases with the dense of the population. The higher value of the PLI (>40) was pointed in downstream of the Central wastewater treatment plant. High values of the PLI also observed in main tributary rivers Gachuurt and Uliastai and fall season in the Selbe river. The extremely high value of the PLI is observed near the Uliastai river bridge.

The value of contamination factor (CF) for As shows low degree of contamination (CF<1), Mn, Co, Ni, Cu, Cd, Sn, and Pb show moderate degree of contamination (CF>1), Cr shows very high degree of contamination (CF>6) near the wastewater treatment plant in Tuul river. In the case of Selbe river, the CF for Pb, Ba, and Se show low degree, other metals show a moderate degree of contamination in both of fall and spring seasons.

These results indicate that the urban area rivers are polluted by heavy metals and contamination level is depending on the source points.

[1] Tomilson, D.C., Wilson, D.J., Harris, C.R., Jeffrey, D.W., 1980. *Helgol. Wiss. Meeresunters* 33, 566–575.