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Rejuvenation of groundwater age corresponding to rapid urbanization in Jakarta area, Indonesia

Makoto Kagabu^{1*}, Jun Shimada², Kazuyoshi Asai³, Makoto Taniguchi⁴

¹Grad. Sch. of Sci. & Tech., Kumamoto Uni, ²Grad. Sch. of Sci. & Tech., Kumamoto Uni, ³Geo Science Laboratory, ⁴Research Institute for Humanity and Nature

In Jakarta area (Indonesia), excessive groundwater pumping related to rapid increasing of population have caused groundwater-related problems such as brackish water contamination in coastal areas and land subsidence. In this study, we measured ¹⁴C concentration of groundwater collected from the same well, where Gehy and Sofner (1989) measured it in 1985, to compare groundwater age in two years. As a result, groundwater relative age of all groundwater become younger in 2008 than that of in 1985. Besides, CFC-12 (which can be the indicator of modern groundwater because of its production history) was somewhat detected even in the deep groundwater.

The groundwater flow simulation method revealed that the flux from shallow groundwater into deep groundwater increased after 1980s due to heavy groundwater pumping. This is considered the main factor of rejuvenation process of groundwater in Jakarta area. We plan to show the result of SF₆ sampling that performed in March, 2010.

Keywords: Groundwater age, Groundwater age tracer, Groundwater flow system, Groundwater flow simulation, Jakarta area, Indonesia