

## **Sustainable Groundwater Use and Monitoring in Kanto Groundwater Basin in Japan**

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Over 38 million people live on the Kanto plain that includes the Tokyo metropolis. The Kanto basin can be called the Kanto groundwater basin from the standpoint of the subsurface fluid resources. The lower part of it contains brine groundwater including natural gas and iodine and the upper part of it contains fresh water. About 500 monitoring wells and about 5000 bench marks monitor the groundwater level and the land subsidence value in the Kanto groundwater basin. The groundwater level fell to the lowest point in the early 1970s. The level dropped to 60 m below sea level in the coastal industrial zone of Tokyo metropolis. In the 1970s the regulations were strictly adhered to in the southern Kanto groundwater basin. Then groundwater level recovered to 20m - 30 m below sea level and the lowest point moved to the northern part of it.

The lowering of the groundwater level causes the land subsidence. Consequently, the elevation of lowland Tokyo area subsided over 4.0m since the 1910s. Coincidentally, the areas below sea level were widely sprawled. These phenomena were recognized in the suburbs of Tokyo. Groundwater is still used over 3 million cubic meters per a day from the Kanto groundwater basin. It is a matter of great importance to the sustainable use of groundwater to decide the pumping volume in consideration of the change of the groundwater level and the ground movement with the law of dynamic equilibrium between man and nature due to the relations among human groups.