

## **Sustainable groundwater management in Anthropocene**

**Makoto Taniguchi\***

Global sustainability during the Anthropocene depends on the groundwater governance in Asia, this is not only because of large water footprints through global trade of agricultural/industrial materials, but also due to carbon emissions through human activities using groundwater in Asia. Challenges for the future of groundwater hydrology towards global sustainability are discussed from the viewpoints of system knowledge, target knowledge, and transformation knowledge. Regarding system knowledge, interactions between groundwater-food-energy nexus and environmental/economical impacts, and groundwater footprints with sustainability indices are essential as the center of information among nature, society and humanity. Back cast scenarios and future designs are important for target knowledge. Transformation knowledges are related to human behavioral changes and technological innovations. Natural and social tipping points, regime shifts, and resilience are keys for the future of hydrogeology and a sustainable society. Sustainable groundwater governance has cultural dependency because of differences in hydroclimate, hydrogeology, water management, and water culture in each area. Therefore, an interaction between humanity and nature is important for finding solutions towards sustainability for the current complicated and wicked global environmental problems.