

Human Activity Impacts on Urban Subsurface Environments

This project will assess the effect of human activities on the urban subsurface environment, although an important aspect of human life in the present and future it has not yet evaluated. This is especially true in Asian coastal cities where population numbers and density have expanded rapidly and uses of subsurface environment have increased. The primary goal of this project is to evaluate the relationship between the developmental stage of cities and various subsurface environmental problems, including extreme subsidence, groundwater contamination, and subsurface thermal anomalies. We will address sustainable use of groundwater and subsurface environments to provide for better future development and human well-being.

- PROJECT LEADER ■ **TANIGUCHI, Makoto** — RIHN
- CORE MEMBERS ■ **ADACHI, Itsu** — JICA
EHARA, Sachio — Kyushu University
FUKUDA, Youichi — Kyoto University
KANEKO, Shinji — Hiroshima University
KITAGAWA, Hiroyuki — Nagoya University
NAKANO, Takanori — RIHN
SHIMADA, Jun — Kumamoto University
ONODERA, Shin-ichi — Hiroshima University
YAMANO, Makoto — The University of Tokyo
YOSHIKOSHI, Akihisa — Ritsumeikan University

Securing water resources and clearing contaminated water caused by human activities in urban areas are global environmental issues in the 21st century. Heat island phenomena created by human activities are also a big environmental problem in addition to global warming. These global environmental issues that are caused by urbanization, should be addressed strongly and prevented, because population increase and concentration is occurring rapidly in urban areas.

This project will suggest better models for future development for human beings by reconstructing changes in urban environments (from present to past), and by developing integrated nature-social models (from past, present to future). Subsurface environmental indexes will be used from the points of view of (1) climate changes, (2) human impact, and (3) stages of

urban development and social policies. Water, heat, and material environments will be evaluated by investigating changes in groundwater resources using satellite data, reconstructions of climate changes and urbanization using subsurface thermal regimes, evaluations of contamination from preserved subsurface indexes.

Expected results of this project are evaluations of; (1) the relationship between urbanization and heat island phenomena, (2) changes in groundwater resources and its effective uses, (3) origins of contamination and pass ways of contaminants from land to ocean, (4) the relationship between stages of urban development and long term changes of environments mentioned above. This project will be partially advised by international projects such as UNESCO-GRAPHIC, GWSP, and IGBP - LOICZ.



Four Subjects and
Methods of this
Project