# SEEK FOR BETTER SAFE AND SUSTAINABLE DRINKING WATER SUPPLY

## —IMPROVEMENT OF WATER QUALITY AND PRESERVATION OF WATER RESOURCE—

Hisaya TSUBOUCHI

*Key Words: Drinking water, Mineral water, Water quality standard, Advanced water treatment system, Urban river, Water resource, CODEX standard, Advanced treatment of sewage effluent*

### 1. Research background and objectives

Consumption of mineral water has been increasing against a background of concerns about tap water quality (Figure-1). This research aims to propose measures for sustainable and better safe drinking water supply.

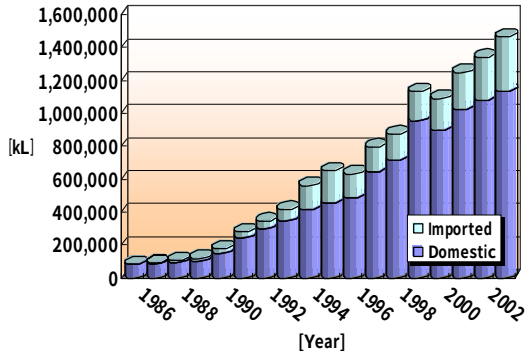


Figure-1 Made from statistical data of Mineral Water Association of Japan

### 2. Current state and issues of drinking water

Firstly, I analyzed various kinds of drinking water to understand the level of drinking water quality. Secondly, I compared several water quality standards to review them.

**(1) Analysis of drinking water quality**

I analyzed metals, anion, volatile organic compounds in tap water (Atsugi City), ground water (Kyoto City) and mineral water (29 kinds). As a result, it could not be said that the mineral water quality was always better than tap water and ground water.

**(2) Drinking water quality standard**

There are several types of standards about tap water and mineral water. When they are compared, standard for mineral water is looser than that of tap water in its number of items and standard value. And also, there exist gaps between Japanese and CODEX standard (international standard) in the point of definition of natural mineral water.

**(3) Concerns about mineral water utilization**

・Increase of greenhouse gas by transport energy because quarter of mineral waters are imported.
・Massive disposal of the PET bottles.
・Very expensive compared with tap water.

**(4) Issues of tap water**

Several results of surveys show that unpleasant smell and taste, health risks due to polluted resources are main factors affecting less-drinking of tap water.

### 3. Current state of water resources in urban area

Improvement of resource water quality is essential to improve tap water quality. Tama river, one of important water resource in Tokyo, contains sewage plant discharge 50% of its flux. It shows that traditional approach is insufficient to preserve tap water resources in urban area.

### 4. Proposals for improvement of drinking water quality and water resource preservation

**(1) Setting new mineral water quality standard**

I proposed a new mineral water quality standard which accommodates both Japanese standard of tap water and CODEX standard, and respond to consumer's requirements for quality.

**(2) Improvement of tap water quality by innovating advanced water treatment system**

Advanced water treatment system is efficient to improve tap water quality, but it has not widely spread because of cost problems. I introduced an example of ABC (Account-Based Cost) analysis of water rate of Tokyo, which shows advanced water treatment system is economically feasible.

**(3) Water resource preservation by improving water quality of sewage plant effluent**

We need to shift our focus to quality of sewage effluent which plays important role in urban water cycle to improve water quality.