

The Road to Domestic Wastewater Treatment

During the rapid economic growth of the 1960s, nationwide water pollution caused serious social problems in Japan. It was found that the wastewater discharged from factories and other commercial facilities, the delay in construction of sewerage systems and the untreated gray water from household Tandoku-shori Johkasou, which is designed for treating wastewater from exclusively flush toilets, accounted for this problem. In 1970, the Water Pollution Control Act was enacted to strengthen the regulation on the industrial wastewater, therefore, proportion of the pollutants derived from domestic wastewater had increased comparatively, and became a main source of water pollution in public water bodies.

In 1980s, a new type of small-scale Johkasou known as ‘Gappei-shori Johkasou’ (referred to as Johkasou thereafter), which can be used for treating both black water and gray water at household level, was developed. The small-scale Johkasou spread rapidly in suburban areas and rural areas which are not suitable for constructing sewerage systems. New installations of Tandoku-shori Johkasou were forbidden from 2001.

With the emergence of small-scale Johkasou, it became possible to take countermeasures against various kinds of water pollution due to domestic wastewater, and this resulted in great improvement in water environment and water recycling in Japan.

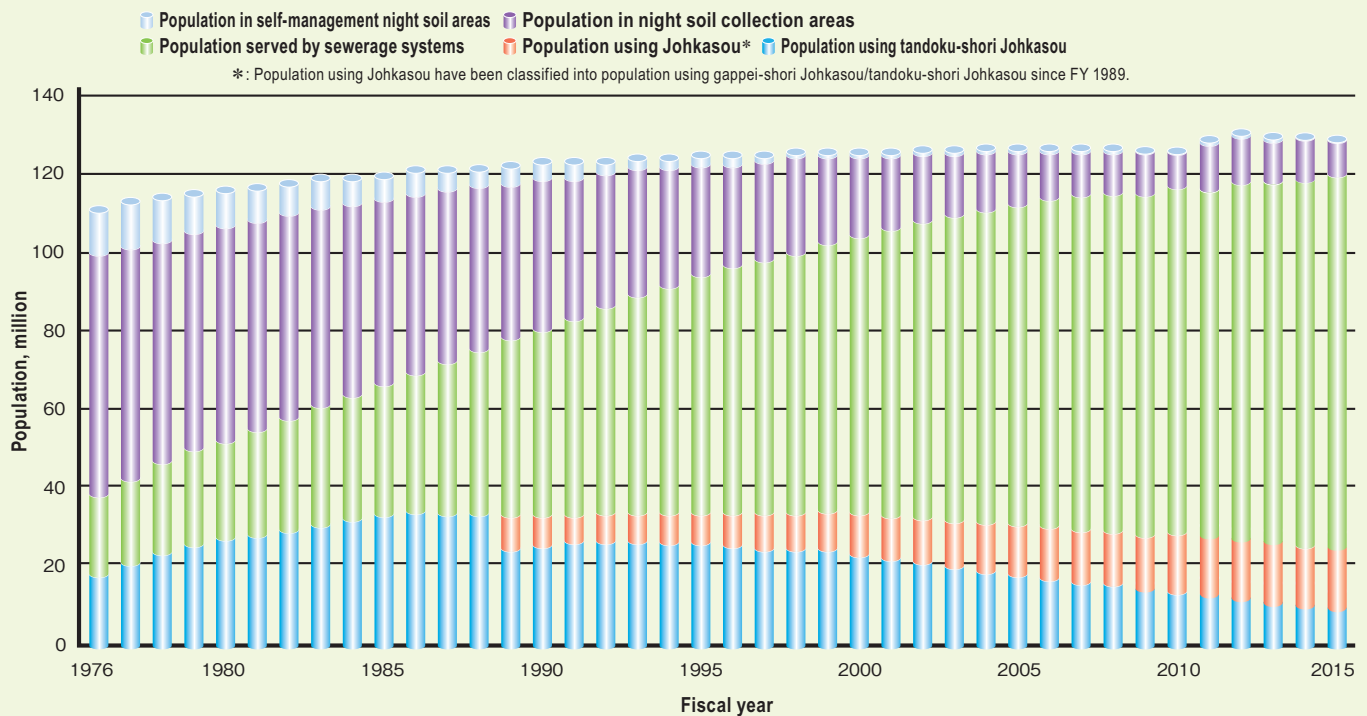


Figure 5 Population trends for night soil treatment and domestic wastewater treatment

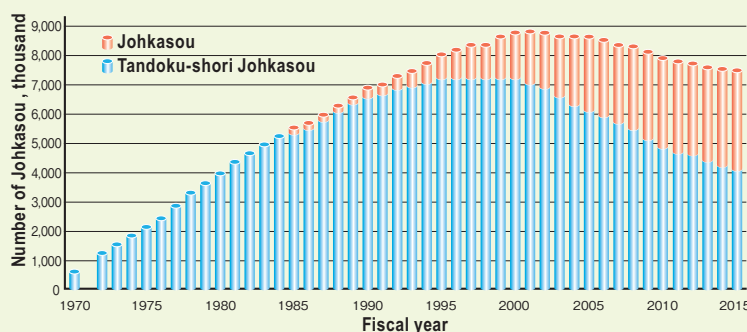


Figure 6 Number and trends of installed Johkasou

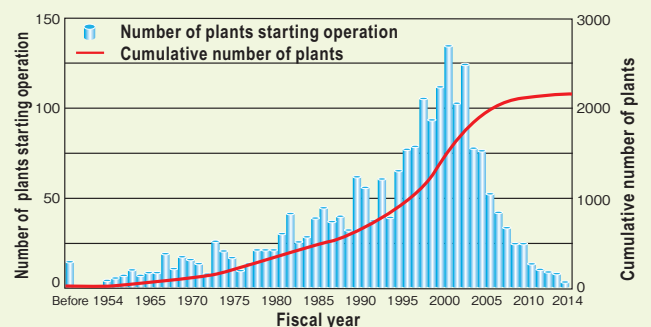


Figure 7 Number and trends of sewerage treatment plants⁽⁵⁾

Column 2 Quantity and quality of domestic wastewater

The daily amount of domestic wastewater is about 200 liters per person in Japan.

Among all kinds of wastewater from houses, kitchen wastewater causes most of the pollutant loads. The next factors are the wastewater from toilets, and then the wastewater from washing and bathing.

All the wastewater from houses is called 'domestic wastewater.'

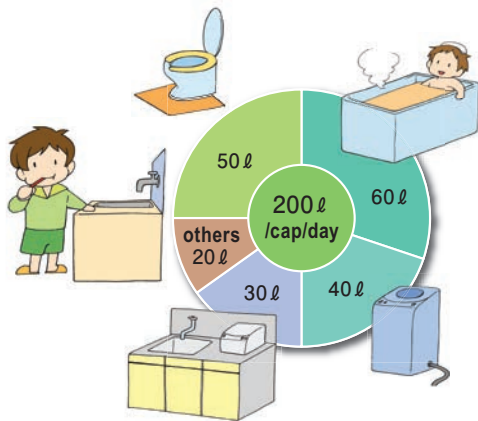


Figure 8 Daily amount of domestic wastewater

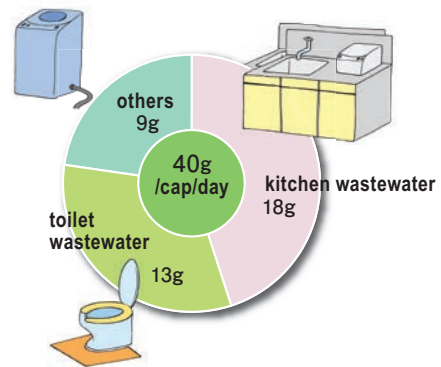


Figure 9 Pollutant loads (BOD) of domestic wastewater

Kitchen wastewater accounts for about 45% of the total pollutant loads of domestic wastewater, because it contains lots of fat and oil components.

The amount of fresh water needed for diluting 100ml of liquid kitchen wastes to maintain a survivable environment (in terms of BOD 5mg/l or lower) for fishes is shown in Figure 10.

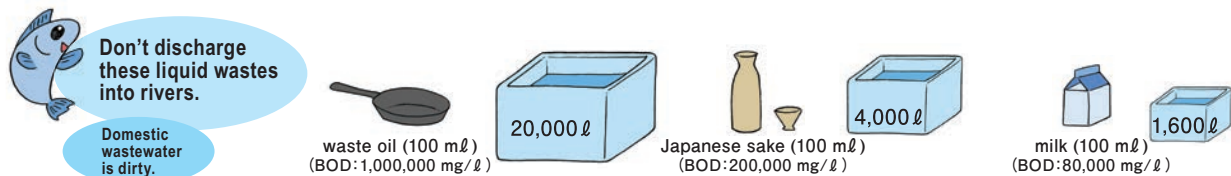
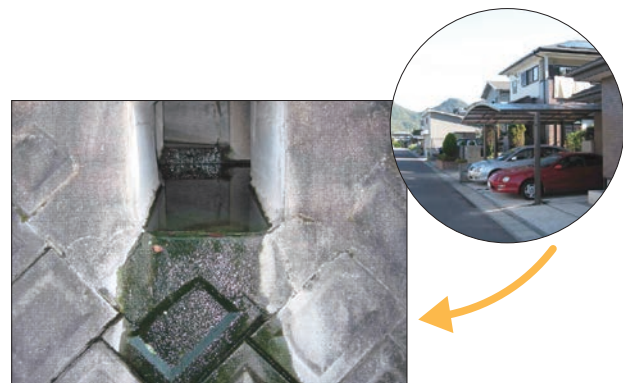


Figure 10 Examples of liquid kitchen wastes with high pollutant loads

Column 3 Effect of environmental improvement by Johaksou installation



A road gully in tandoku-shori Johakasou installation area in 1970s (where whitish sludge was attached to)



A road gully in Johakasou installation area in 1990s (where clear water was flowing)