

## Surveillance study on Sagami river water circulation restructuring

Whole term

2001.7 ~ 2002.3

### (Purpose)

In the basin of the Sagami River, water permeation areas such as mountains, forests, agricultural land, etc. decreased in accordance with the rapid increase of population and the progress of urbanization such as animated industrial activities, and the function of culturing rainwater for groundwater and the water holding and water storage function of storing rainwater temporarily and discharging it lowered to a great extent. On the other hand, however, citizens' concern in water as a spot where they can have calmness and comfort and their requirements for an affectionate waterside have been getting higher year by year, thus diversifying the citizens' needs for water so much.

The sewerage in the basin of the Sagami River got started in 1969 with the aim of improving people's environment and improving the water quality of the Sagami River. The sewerage treatment population diffusion rate is 88% (as of the end of 2000), being higher than the national average of 62%, and many citizens are enjoying a hygienic environment. Therefore, the sewerage in the basin of the Sagami River greatly contributes to the water quality conservation of the Sagami River.

However, the water quality of the branches and waterways of the Sagami River has not been improved and remains on the same level, and many problems related to water circulation and water environment such as the decrease of the flow rate of rivers at a normal time due to the increase of rainwater impermeable areas and the drying-up of groundwater have begun coming to light.

Under such circumstances, in this examination we studied the possibility of practical use of a "water-circulation creation type basin sewerage system" to create the sound water circulation of the basin of the Sagami River.

### (Result)

#### 1. Study of the needs and possibility of practical use of a water-circulation creation type sewerage system

##### 1) Concerning citizens' needs and the potential of water use

From our questionnaire about water environment to the city and towns we came to know that rivers and waterways in which the necessity of improvement of a waterside environment is high distributed widely in the basin of the river and that the potential of using regenerated water and water for miscellaneous use such as toilet water and sprinkled water in parks, etc. was high.

##### 2) Study of the possibility of practical use of regenerated water circulation

There are two reduction methods in a regenerated water circulation method. One is a water supply type of supplying regenerated water from a water treatment plant, and the other is a satellite type of returning highly treated water to cities by arranging a small-scale treatment facility. Economical advantageousness was shown through the calculation of an economical bloc in the reduction method of the water supply type and the analysis of expense vs. effect of the satellite type.

##### 3) Necessity of rainwater circulation

Measures for permeation and storage of rainwater have been taken in the basin of the Sagami River. Further reconstruction of rainwater circulation for restoring the groundwater and spring water which decreased according to urbanization is required together with the reconstruction of regenerated water circulation.

#### 2. How the reconstruction of water circulation should be

According to the results of the macro calculation of water income and expenditure, it has been found to be important (highly effective) to restore the water circulation and water environment at the level of branches of the Sagami River, in the water environment reconstruction of the basin of the Sagami River. They have decided to change the sewerage in the basin of the Sagami River to the "water circulation creation type basin sewerage system" in addition to the diffusion of sewerage based on the scale merit. Thus, it is necessary to combine the introduction of a water circulation reconstruction method fit for local characteristics based on regenerated water circulation and the effects of water circulation with the aim of reconstructing the water circulation in the basin of the Sagami River and to reconstruct the "water circulation creation type basin sewerage system" efficiently and effectively.

### (Future tasks)

As a result of this examination, we have recognized that it is necessary to efficiently develop the "water circulation creation type basin sewerage system." In order to further promote the water circulation reconstruction in the basin of the Sagami River, we extracted the following tasks.

#### 1. Risk management in returning regenerated water to the basin and increasing the amount of water of brooks

#### 2. Estimation of long-term effects of reconstruction measures for rainwater circulation

#### 3. System and bearing of expenses related to the reconstruction and operation of the water circulation creation type basin sewerage system

#### 4. Analysis of effects when regenerated water circulation and rainwater circulation are integrated

It is necessary to conduct a case study concerning income and expenditure, etc. and analyze the effects of the two integrated measures by using small basins characterized by the conditions of soil and topography, usage of

land, and the like in the basin of the Sagami River as the target of the case study.

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Water circulation, Aquatic environment, Regional sewerage system, Treated water circulation, Rain water circulation