

Study on renovation of water cycle system at Yokohama-city in FY 1996

Whole term

1996.7 ~ 1997.3

1. Purpose

Recently, departments and agencies related to water management within the local and central governments tend to emphasize on importance of conservation of water environment and renovation of water cycle system. It is now strongly believed that such attempts should be carried out in a comprehensive and systematic manner under a common basic policy, with coordination prevailing among the related departments.

Accordingly the Sewage and Wastewater Management Department and the River Bureau within the Ministry of Construction are preparing 'the Manual for renovation of water cycle system'. To formulate this manual, several model watersheds were selected in some cities, and the appropriate scheme of the renovation work in each basin was determined. The information derived from these case studies were utilized in the manual preparation.

This study is aimed at determination of renovation scheme of water cycle system in the 'Hirato-Nagatani river basin' located in Yokohama. This is one of the model watersheds as selected in the aforementioned investigation. In FY 1996, comprehensive appraisal of the existing water cycle system and assessment of the corresponding problems in this basin were conducted.

2. Result

2.1 Characteristics of 'Hirato-Nagatani river basin'

Investigations were carried out on the following items to characterize the basin.

- Natural Features: Geological and geographical state, hydrological aspects and meteorological condition, existing groundwater quantity, existence of spring, distribution of areas covered with greenery.
- Social Features: Population, land use, zoning, industry, water supply and drainage systems, river development situation, history of previous floods.

2.2 Change in water cycle system

The change of water cycle system in this basin was investigated from the view points of water quantity, water quality, ecology, and other water related amenities.

(1) Water Quantity (Water Balance)

Water balance for the years 1954 and 1993 were estimated. Comparison of the data revealed the following changes in water balance caused by urbanization in this basin- the increase of rainwater flow, decrease of groundwater flow, increase of water supply from outside of the basin (increase of drainage to outside of the basin), decrease of evapotranspiration.

(2) Water Quality

Water qualities of Hirato-Nagatani River meet the environmental quality standards near Watado Bridge located at its downstream, but fail to comply with the standards near Yanagi Bridge at its upstream. This indicates the existence of areas having improper sewage system within this basin which act as sources of water pollution.

(3) Ecology

No ecological study has ever been conducted in this river basin. However information derived from investigations concerning species and population of fishes, benthic organisms, and algae in the neighboring Koyasu-River, Kawakami-River, Maioka-River, and Kashio-River, enables classification of those rivers as 'clean' or 'polluted'.

(4) Access to waterfront

In addition to changes in water quantity and quality aspects, access to waterfront has also been declining because of spatial changes. Spatial changes even resulted in considerable loss of waterfront.

2.3 Problems pertaining to water cycle system in the basin

Following countermeasures were pointed out as essential:

Control of rainwater flow, Conservation of usual/normal river flow, effective utilization of water resource, Recovery of evapotranspiration, Improvement of water quality, Conservation and recovery of ecology, Recovery and creation of water related amenities, Reclamation of waterfront

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Keywords

Hiratonagatani River, renovation of water cycle system, water balance, access to waterfront