

# Restoration of Singapore River (Singapore)

Urbanization caused the pollution of Singapore River whose water became dark and unclean. In order to revitalize the river, strict measures were taken including pig farming prohibition in the area, and moving roadside food vendors, who had discharged wastewater, into buildings.

Singapore imports the half of its water from rapidly-growing Johor Bahru in the neighbor country Malaysia. The country has been eagerly working on: water development using domestic catchment; recycling sewage; and importing water from multiple sources.

## ◆ Key to Restoration

- Water purification
- River development unified with the city – garden island

Singapore view (garden city)



## ◆ Overview of the River

Singapore is an island country of the dimension of 682 km<sup>2</sup>, which corresponds to Lake Biwa in Japan. Though situated in quite rainy area in the world, as its land being small and flat, it has only poor water retention functionality. There are no rivers to serve as the water supply. The country is very packed with the population of 4.1 million in the limited land. Water demand is still increasing as the government invites industries. Since the domestic supply cannot cover the total consumption, the half of the country's water usage relies on the neighbor Malaysia.

Since stable water supply affects the fate of a nation, Singapore is dealing with water recycle as well as water supply development.



## ◆ Project Efforts for Restoration

### [Water purification]

Strict measures were taken including pig farming prohibition in the area, and moving roadside food vendors, who had discharged wastewater, into buildings. When water purification plan was completed, land value and its utilization was demonstrably raised, especially in city center and the area connecting to the river and the canal. In 1987, fish returned to the river and even people could safely swim in the river. Catchments were constructed thereafter, and some are opened to the public for boating and fishing.

The country prepared an underground sewage system through the island and constructed a number of dams to channels and rivers nationwide, so that the wastewater and wastes from houses and factories completely flew down the sewage system, and that clean rain water alone is collected in the channels and to the dams. With these efforts, it has become possible to domestically supply 6300-gallon water, half of the daily water consumption.

### [River development unified with the city – garden island]

The theme of Singapore model city planning covers: publicly-owned land; and creation of beautiful cities including roads, houses, parks, and rivers. Waterfront is a key for high-quality life: sand beaches have been created in riverbeds and people can enjoy sunbathing and water skiing; paved walking trails have been prepared on the both side of Singapore River; old shops and warehouses have been repaired into restaurants and cafes.



Normal Singapore River



Swollen Singapore River

Source: National Land Technology Policy Research Institute document "Toward human-nature symbiotic basin for urban restoration -- people, water, land, and environment --" Katsuhide Yoshikawa (<http://www.ne.jp/asahi/yoikawa/suikei/sub1-13.htm>)

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Council of Local Authorities for International Relations ([http://www.clair.or.jp/j/forum/forum/sp\\_jimu/162\\_1/](http://www.clair.or.jp/j/forum/forum/sp_jimu/162_1/))