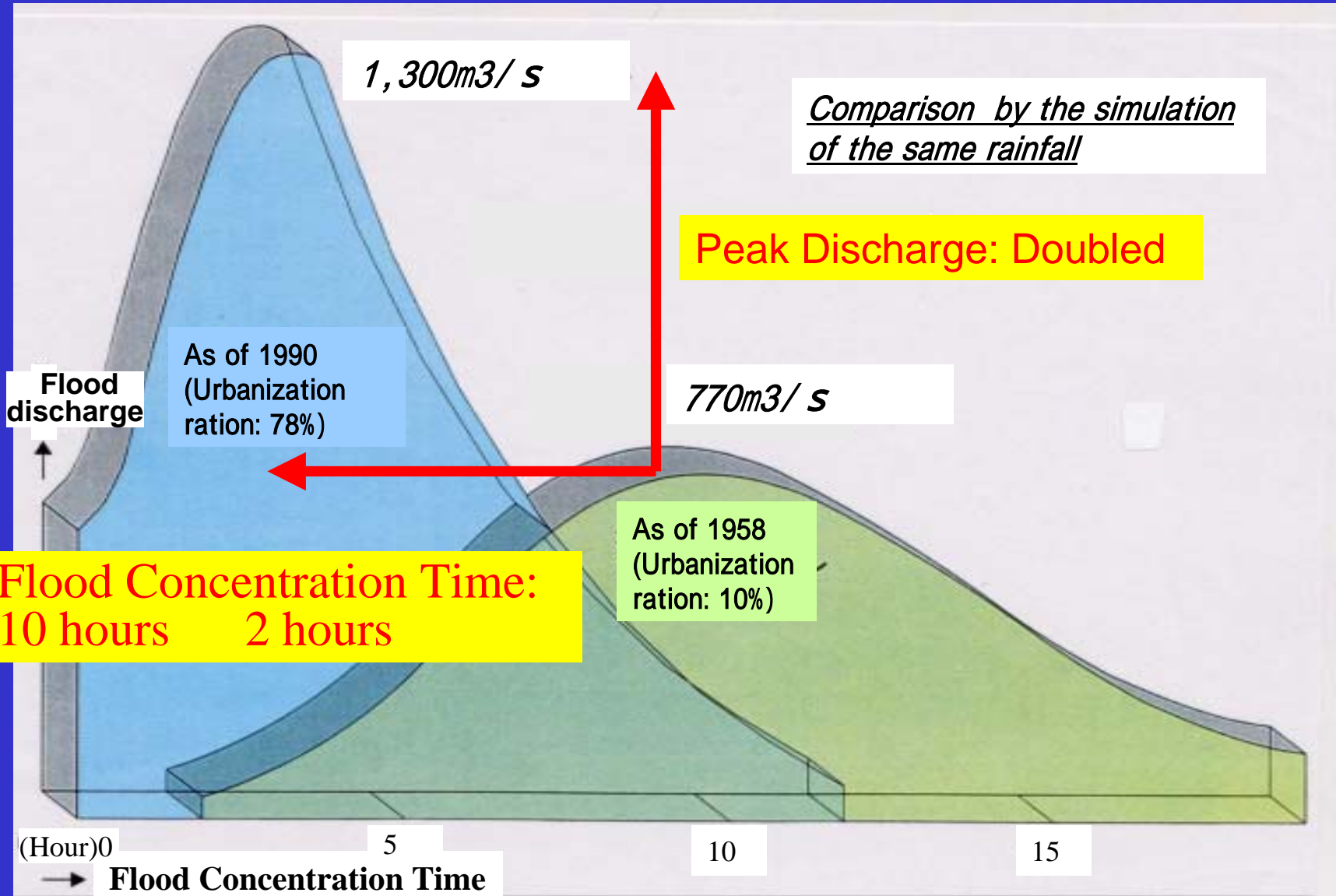


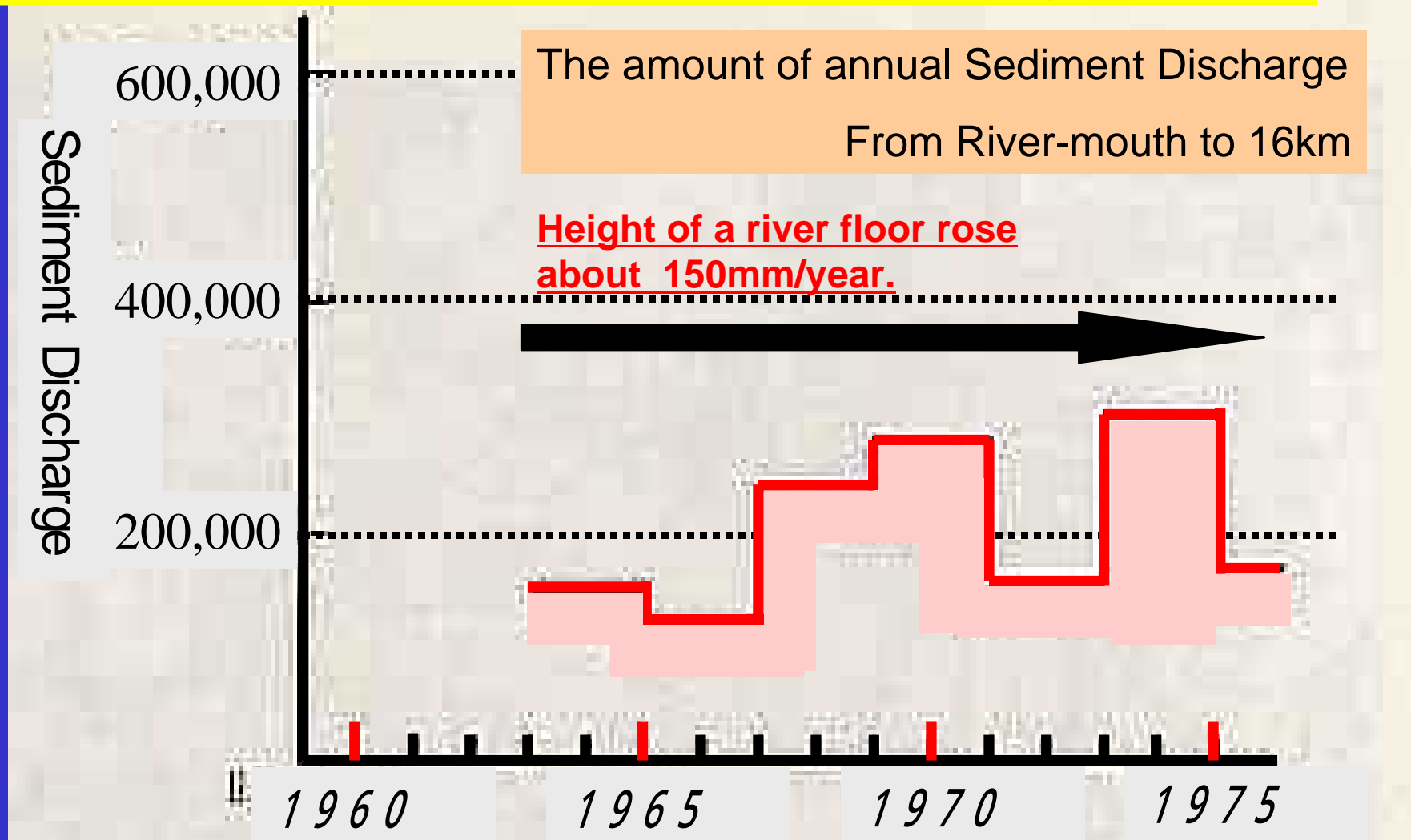
### 3 ) Issues in Tsurumi River basin

➤ Doubled peak discharge and Greatly reduced flood concentration time



### 3 ) Issues in Tsurumi River basin

- Accumulation of the discharged sediment due to the development decreased the river channel discharge capacity



### 3 ) Issues in Tsurumi River basin



➤ **Frequent Flood damage**  
**September 1976**  
**Kohoku Ward**



### 3 ) Issues in Tsurumi River basin

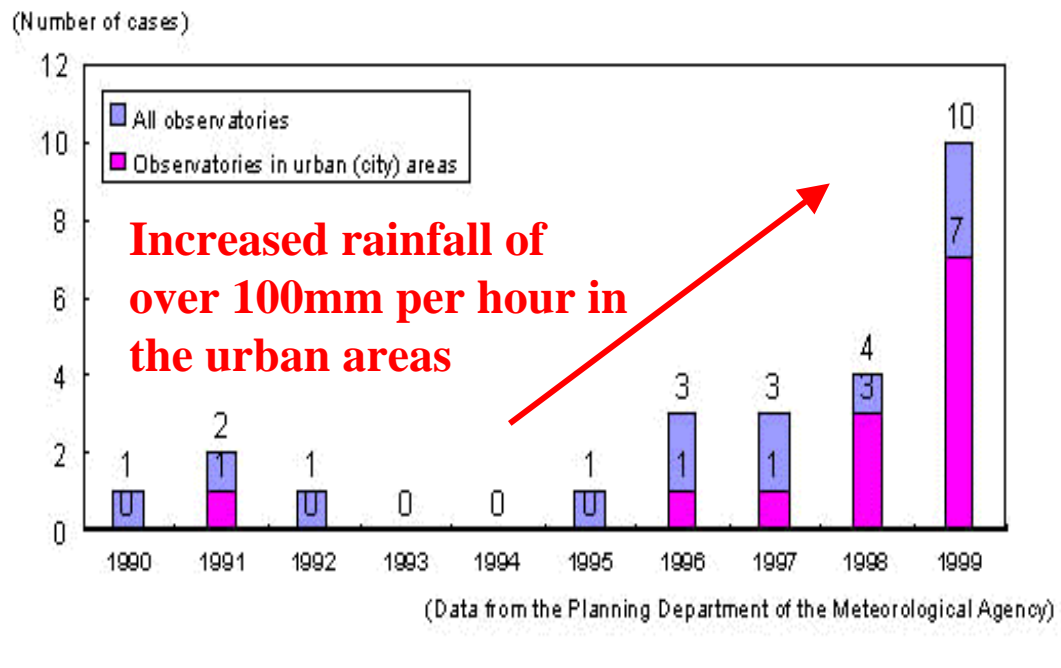


➤ **Frequent Flood damage**  
**September 1982**  
**Tsurumi Ward**



# 3) Issues in Tsurumi River basin

## ➤ Increased damage of the Torrential Rain

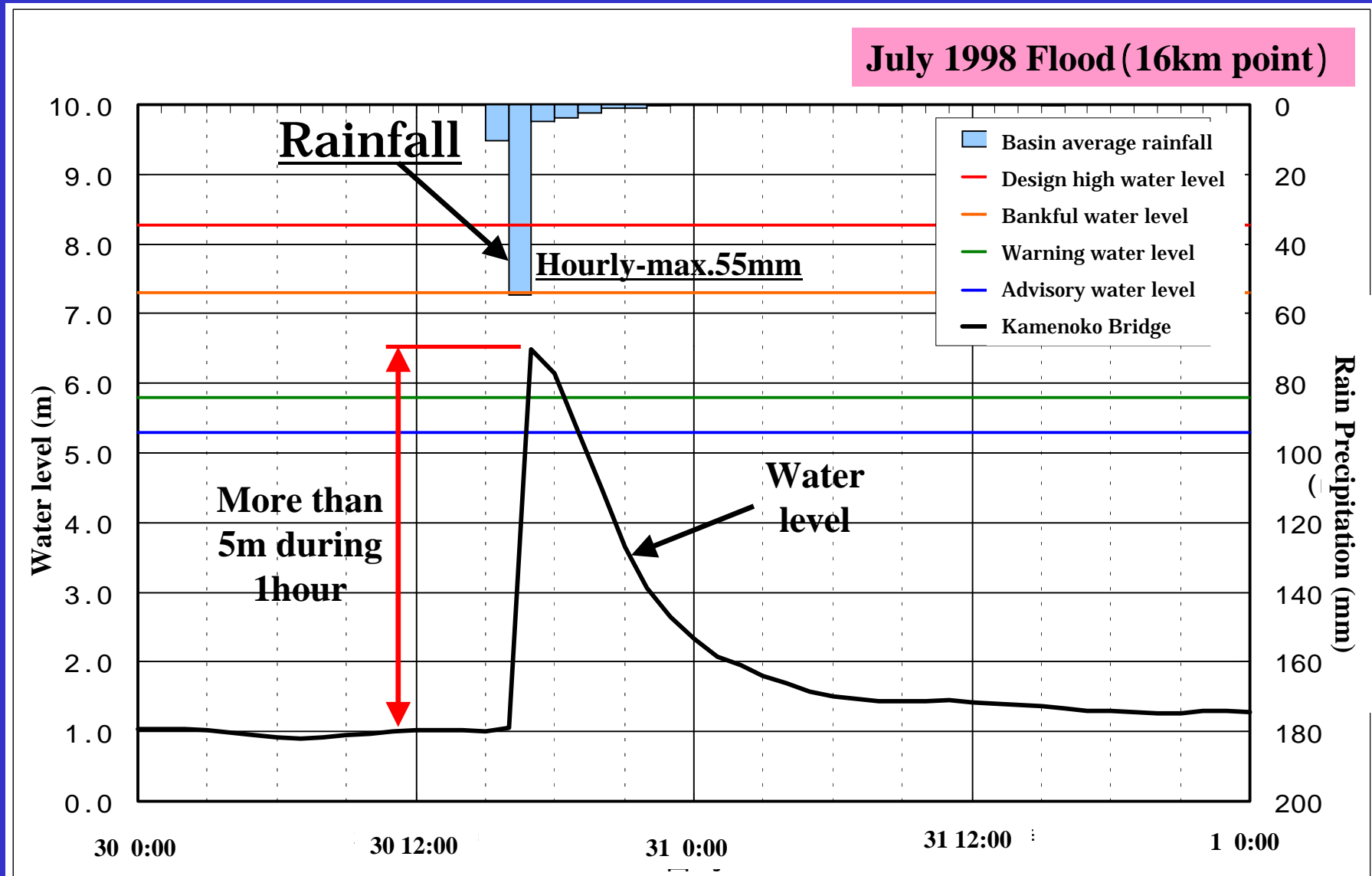


Increasing threats of underground complex in the urban areas



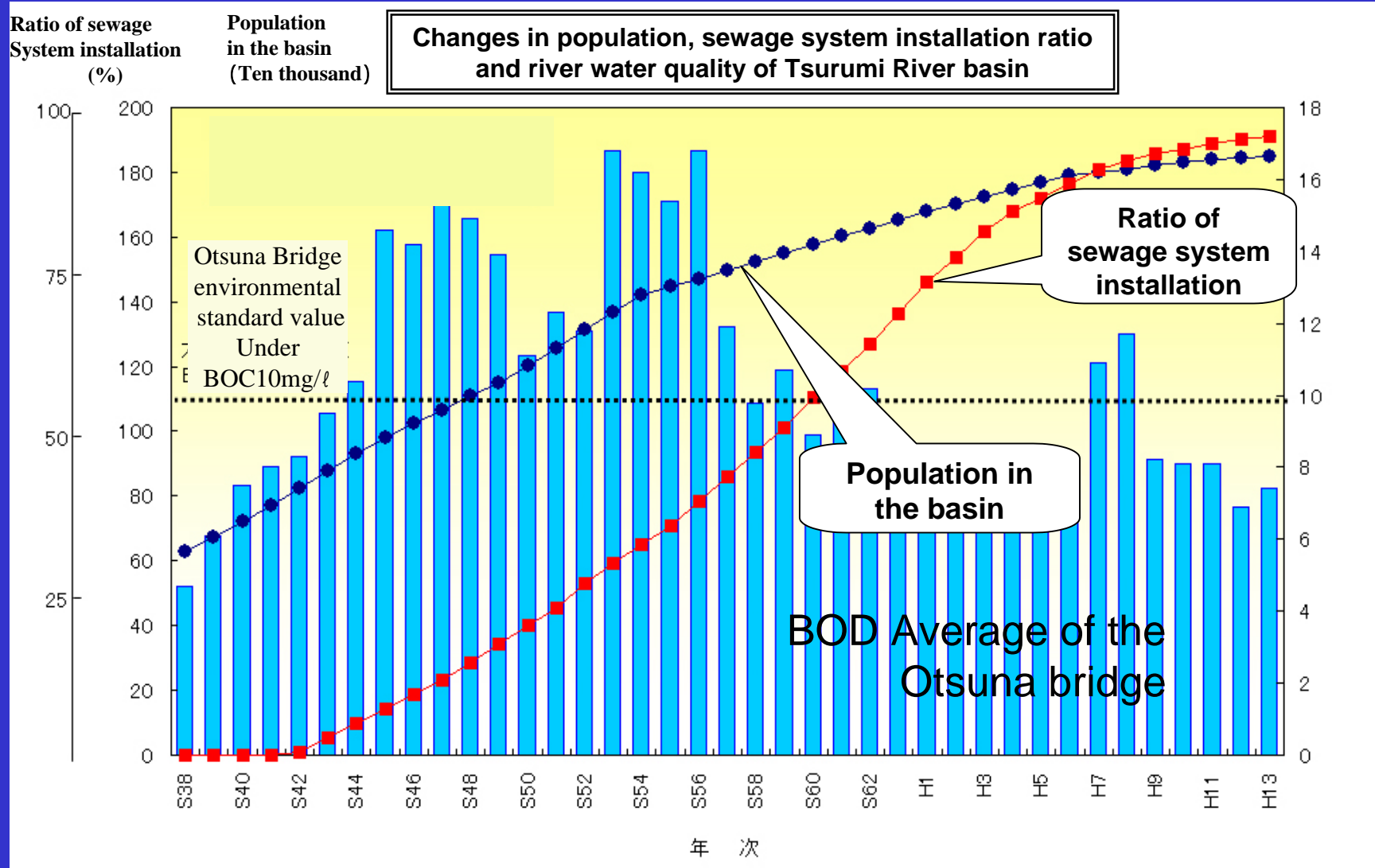
# 3) Issues in Tsurumi River basin

## ➤ Increased anxiety of the Torrential Rain



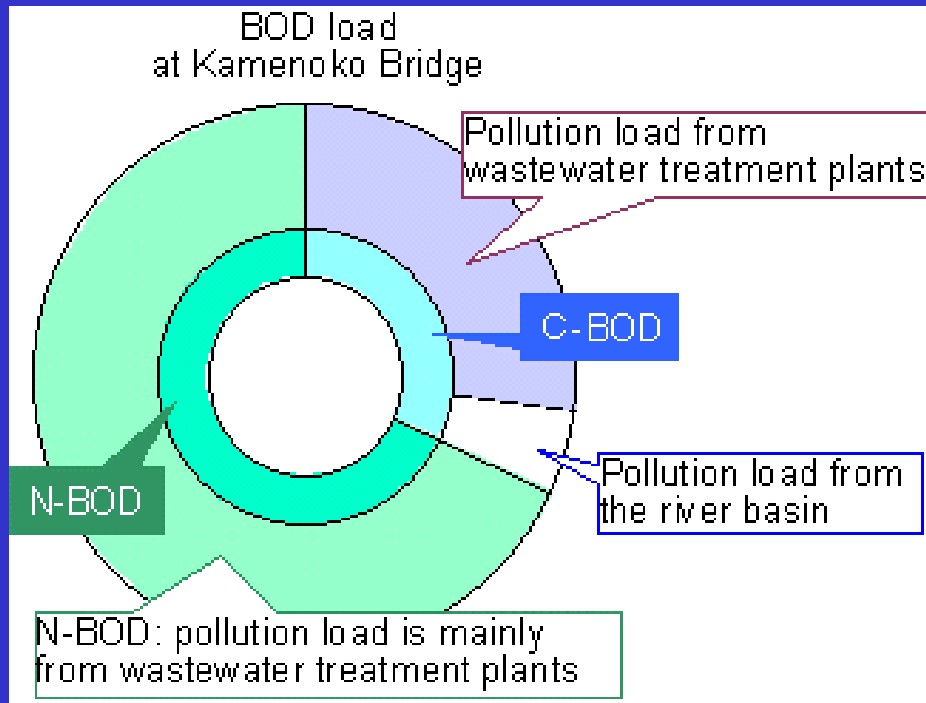
# 3) Issues in Tsurumi River basin

➤ Increased damage of the Torrential Rain and landside water



# 3) Issues in Tsurumi River basin

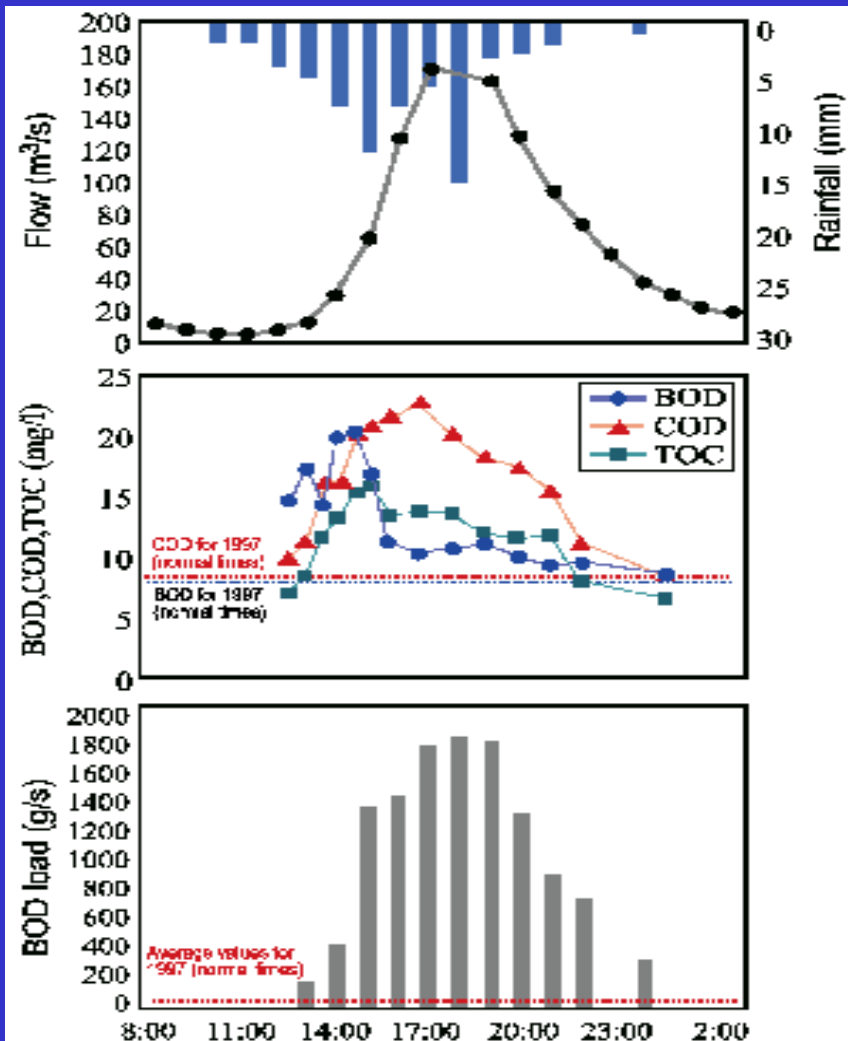
## ➤ Issues in water quality improvement



N BOD Measure

New water quality issue  
= Endocrine Disrupter

## Water quality measure for the rainy day

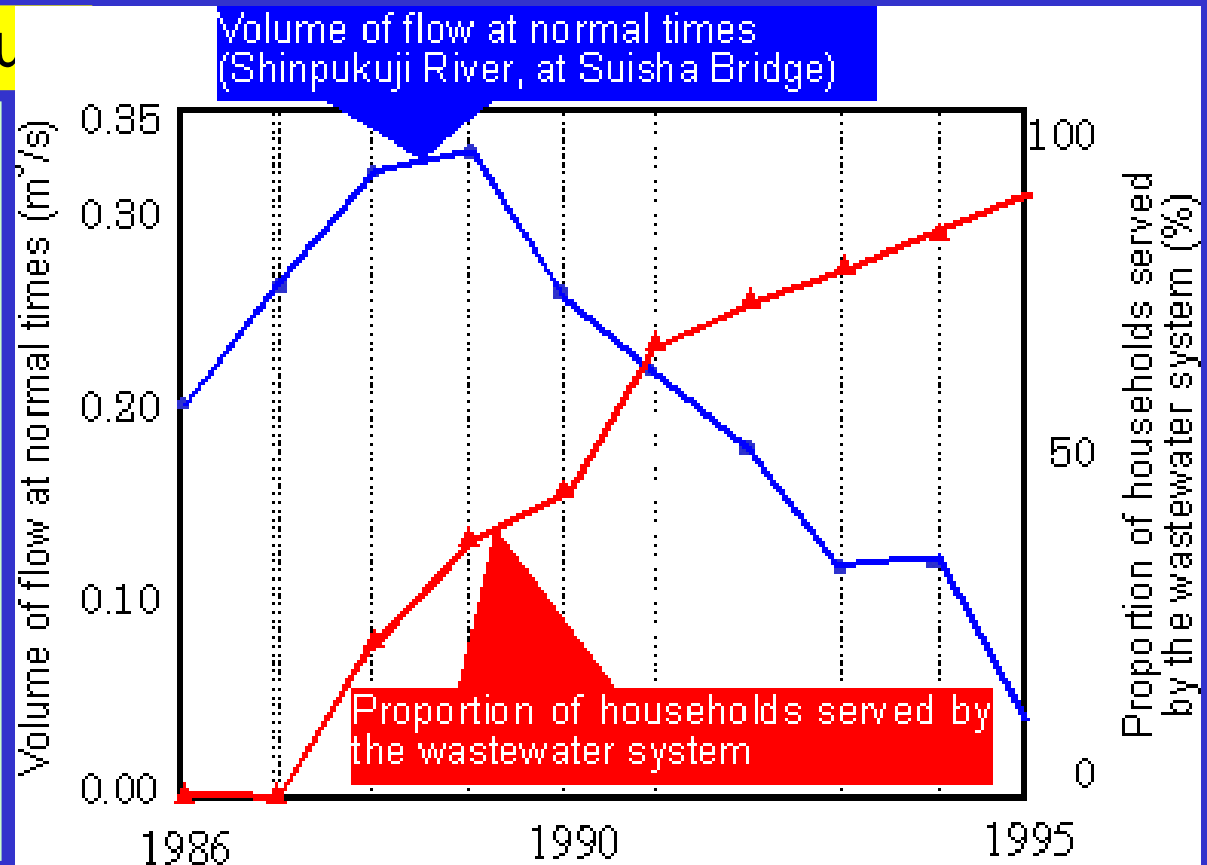




# 3 ) Issues in Tsurumi River basin

## ➤ Normal Discharge Issue

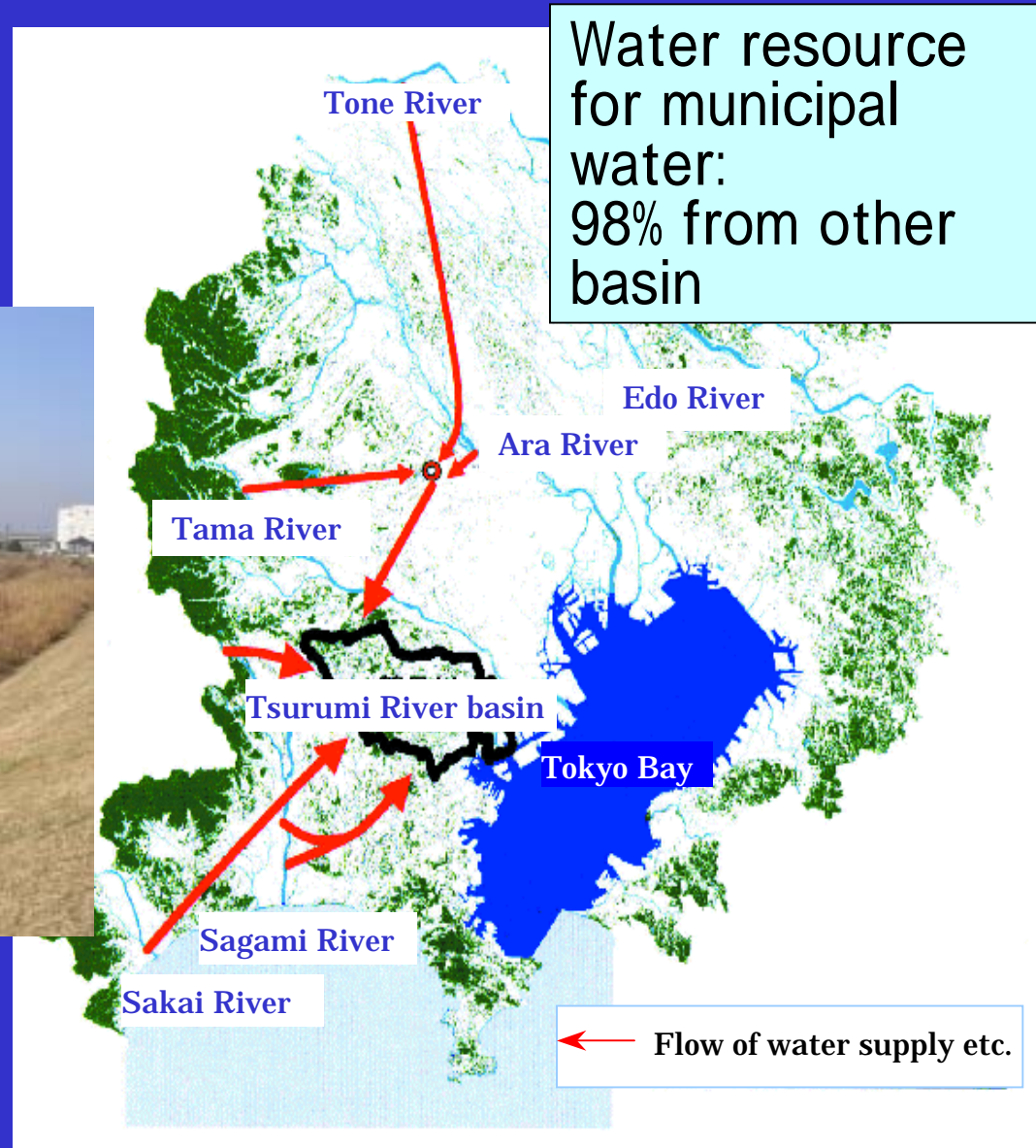
- Bypass by the Sewage System Improvement
  - concrete block revetment (Shutoff of groundwater inflow)
- Decreased water volume in upper reach



# 3 ) Issues in Tsurumi River basin

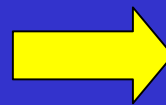
## ➤ Normal Discharge Issue

Abundant water volume in the downstream due to sewer discharge

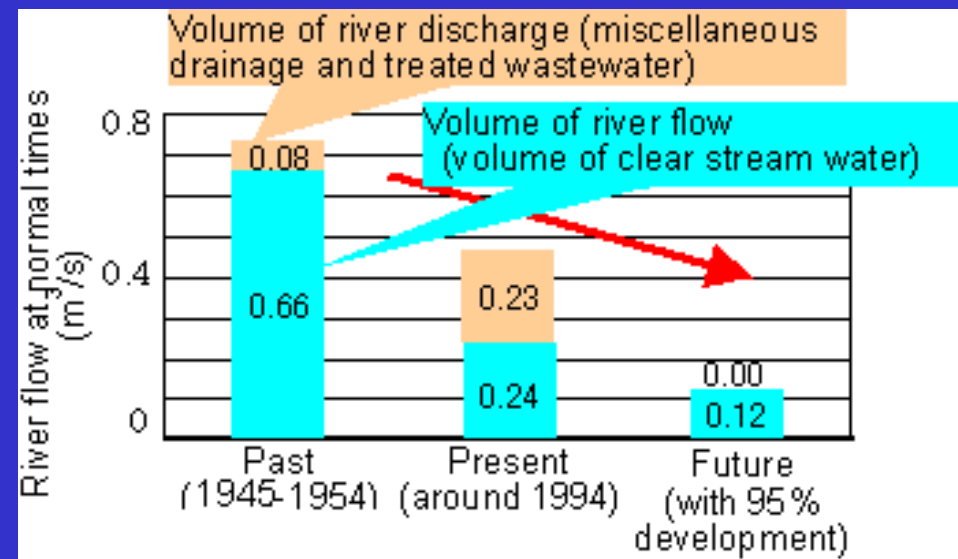
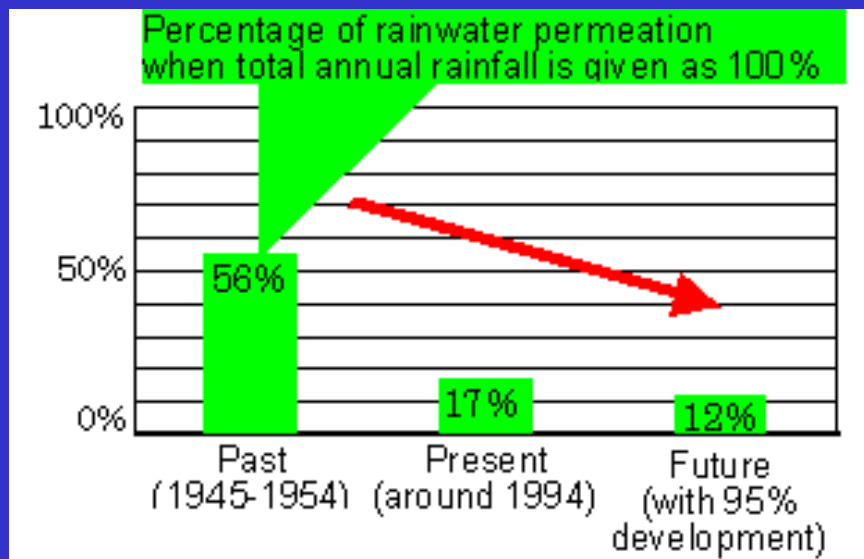


### 3 ) Issues in Tsurumi River basin

➤ Decreased rainfall infiltration



➤ Decreased river discharge  
➤ Decreased clean water



### 3 ) Issues in Tsurumi River basin

- Issue in river improvement emphasizing flood control

Steep revetment

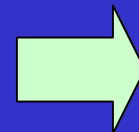


Crowded urban area



Revetment

- Difficult access to the water
- Unsuitable for inhabitation and growth of creatures



Inappropriate for utilization in times of earthquake/fire