

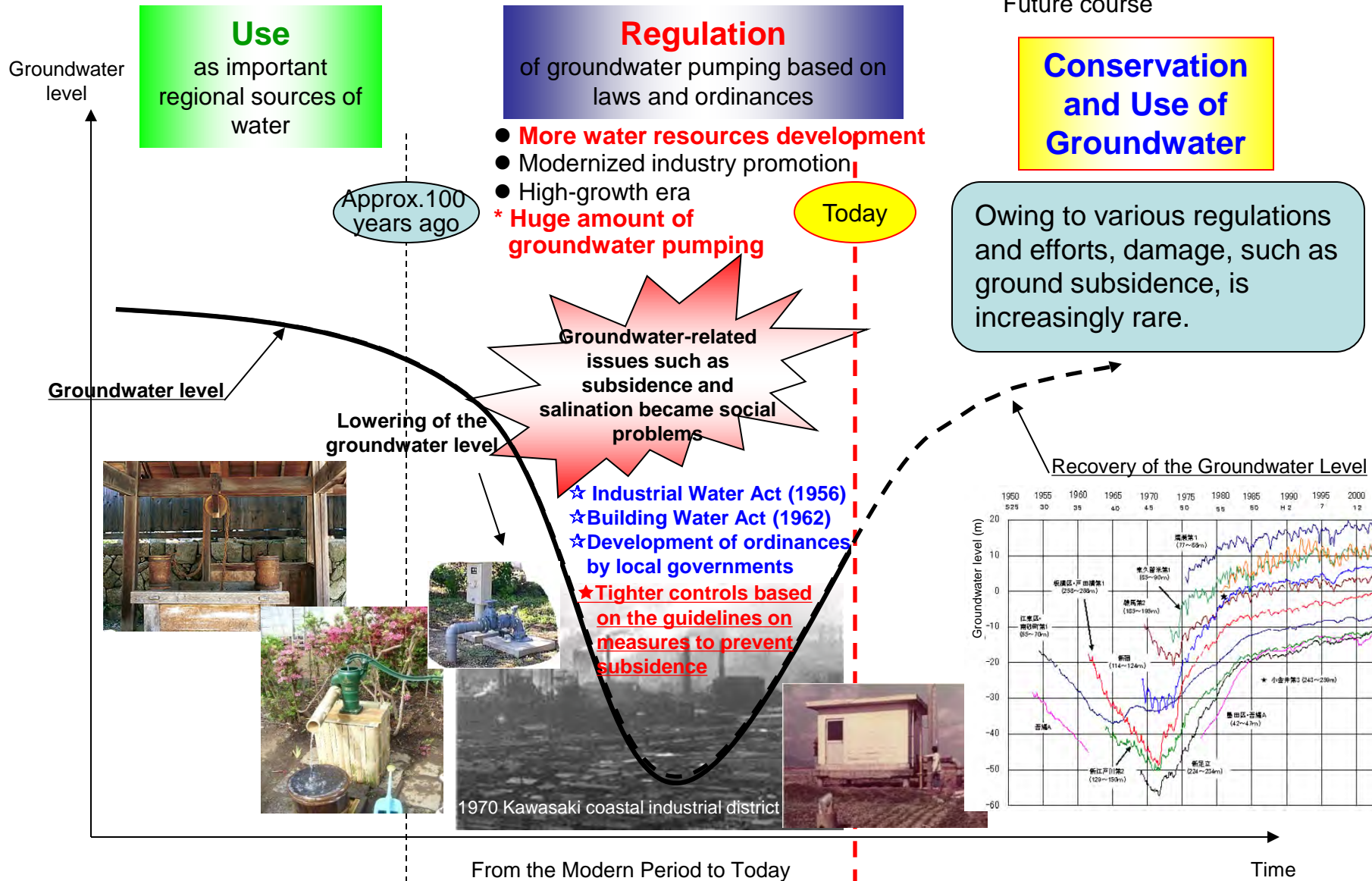


Countermeasures for Ground Subsidence in Japan

11th November, 2017

Japan Water Agency

Ground Subsidence by Huge Ground Water Use



Examples of Subsidence Damage

- **Zero-meter areas** below high water level caused by ground subsidence are **very vulnerable to floods including high tides**. There are also concerns about sea level rise etc. caused by climate change.
- If there is a high tide or other types of flood, there will be an immeasurable impact on society and economy.

Saitama
Tokyo
Kanagawa
Chiba

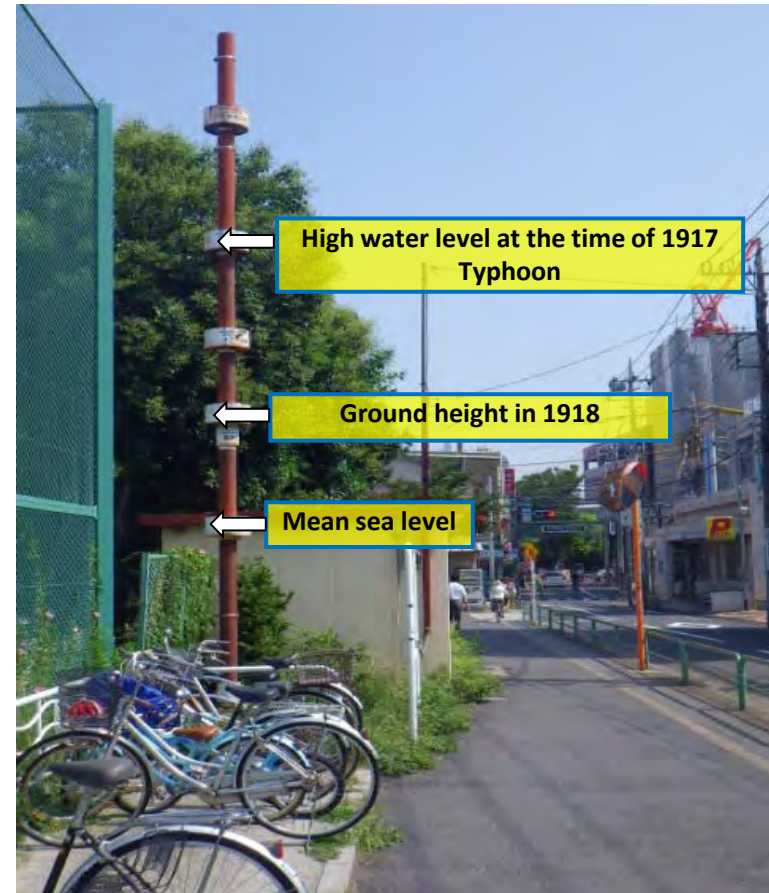
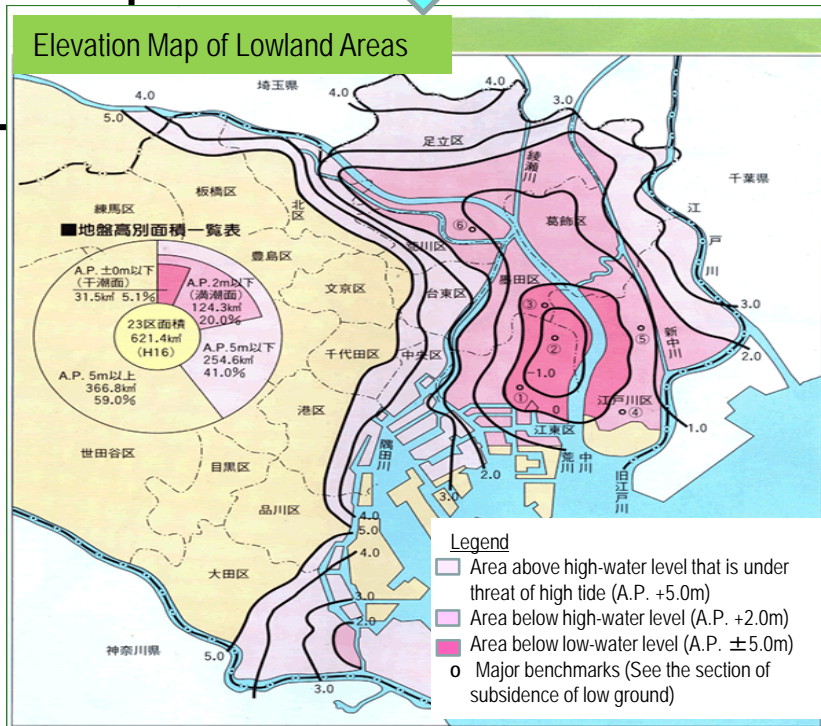


Photo: Minamisuna, Koto-ku

Source: "Lowland River Projects in Tokyo", River Division, Bureau of Construction, Tokyo Metropolitan Government

Examples of Subsidence Damage



Relocation of Large Scale Factories

- Restriction Act of Industry/factory (1959)
Regulation of new founding or extension of large scale factories in restricted area.
- Ordinance on Acquisition and Operation of Old Factory Site after Relocation (1964)
Conservation of urban environment at old factory site after relocation and advance acquisition of land for public infrastructure and urban development.
- Ordinance on Intermediation of Funds Loan for Pollution Control of Tokyo (1969)
Intermediation of funds loan at low interest to purchase pollution control equipment or relocate factory from Tokyo with tax incentives.

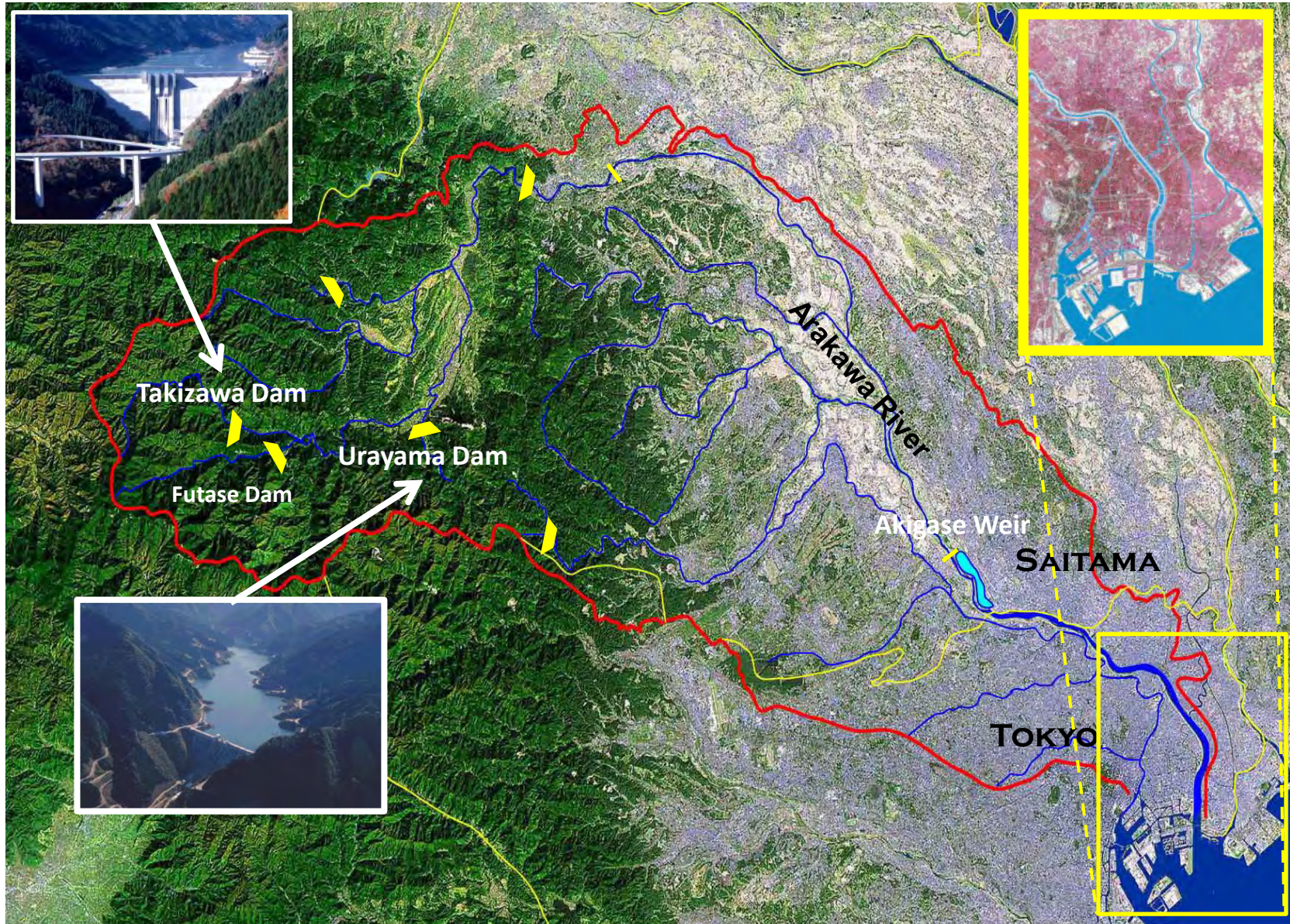
	Inside Tokyo	Seaside (*1)	Inland (*2)	Others	Not clear	Total
Number	77	159	67	23	4	330

Table : Area and numbers of relocated factories from the Tokyo Lowland for 11 years from 1975 to 1986
(Department of Labor and Economic Affairs of Tokyo Metropolitan Government, 1988)

*1: Chiba, Kanagawa, Saitama Prefecture

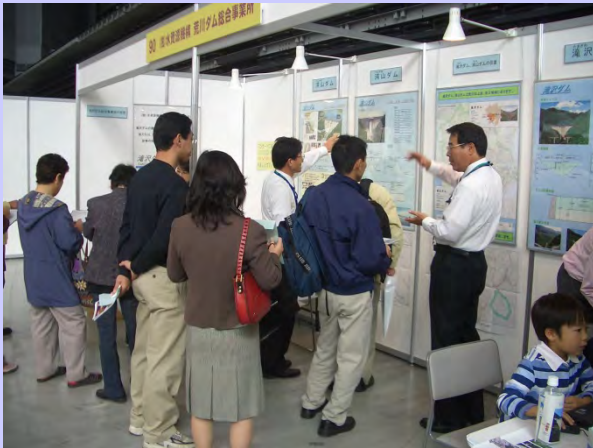
*2: Tochigi, Gunma, Ibaragi, Yamanashi Prefecture

More Water Resources Development (Conversion to Surface Water by Dam Supply)



Necessity of Various Ways to Enhance the Downstream Awareness

Public relations activities
in awareness events



Providing friendly information
through website



Communication between
headwaters and downstream reach



Workshop on environment in headwater area