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Sustainable Groundwater Management in Asia

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Our Experience on Groundwater Management

Sustainable Water Resources Management Policy in Asian Cities (SWMP)

Our Goal

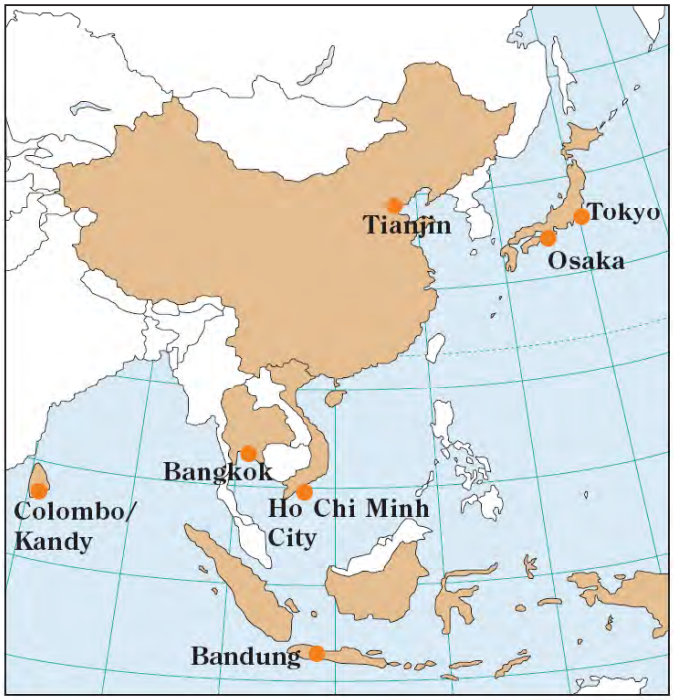
To propose integrated policy designs for sustainable water resource management in urban and peri-urban areas in Asia with consideration given to the current socio-economic status and its predicted changes during the next ten years

Research Target

Phase I: April 2004 ~ March 2007:
Groundwater quantity issues

Phase II: April 2007 ~ :
Groundwater quality issues

Study Area



Case study cities under SWMP

Issues on Groundwater Use in Asian Cities

Major problems related with groundwater use in many Asian cities are:

<Issues due to over-exploitation of groundwater>

- ✓ Depletion in groundwater table
- ✓ Land subsidence
- ✓ Saline water intrusion

<Issues on groundwater contamination>

- ✓ Human Health Damage
- ✓ Abandonment of Well leading to Decrease of Water Availability

In addition, **CLIMATE CHANGE** impact may add existing pressure on groundwater by i) impeding recharge capacities; ii) being called on to fill eventual gaps in surface water availability due to increased variability in precipitation; iii) groundwater contamination.

Situation of Groundwater Quantity Management in Bangkok

<Issues due to over-exploitation of groundwater and policy response>

Issue:

- Depletion in groundwater table
- Land subsidence
- Saline water intrusion

Response:

- Permission system of groundwater use
- Phase out of groundwater use as a source of public water supply
- Enhancement of public water supply systems
- Groundwater user charge
- Groundwater preservation charge in critical area

Impact of Land subsidence in Bangkok

Situation of Groundwater Quality Management in Tianjin

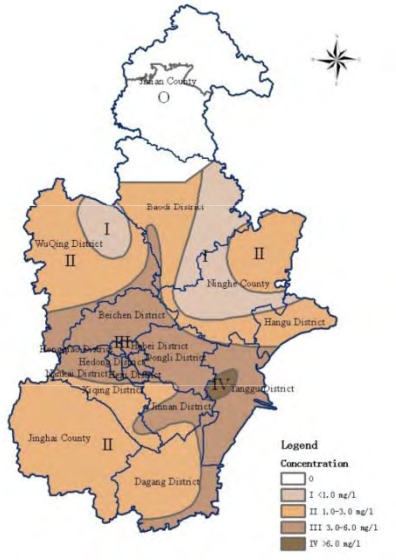
<Issues on groundwater contamination and policy response>

Issue:

- Health impact of fluoride contamination

Response:

- Treatment of contaminated groundwater (Membrane Filtration)



Source:
Report on the Distribution Law and Formation Mechanisms of the Major Pollutants in Tianjin Groundwater

Fluoride contamination in Tianjin

Groundwater treatment plant in Tianjin

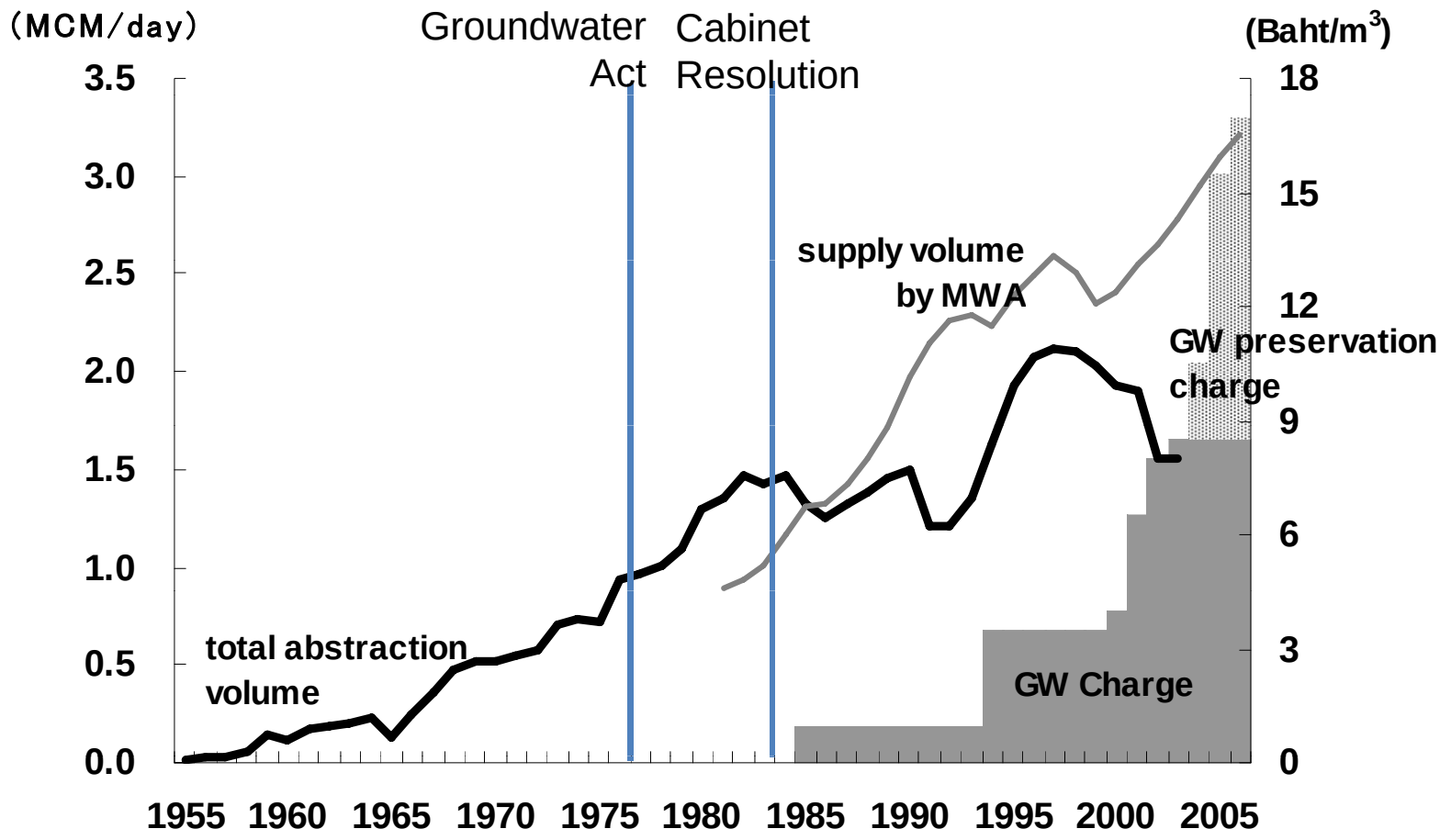
Policy Recommendations

Regulation of groundwater abstraction is a powerful policy tool to mitigate the over-exploitation of groundwater. In order to enhance the enforcement of the groundwater regulation, economical incentive/disincentive measures such as groundwater charge and provision of alternative water resource to groundwater should be implemented at the same time.

Rational use of water, such as water reuse and recycling of wastewater, ought to be more of a priority in comprehensive water management policy, especially for the industrial sector which is the major groundwater user and has growing water demands.

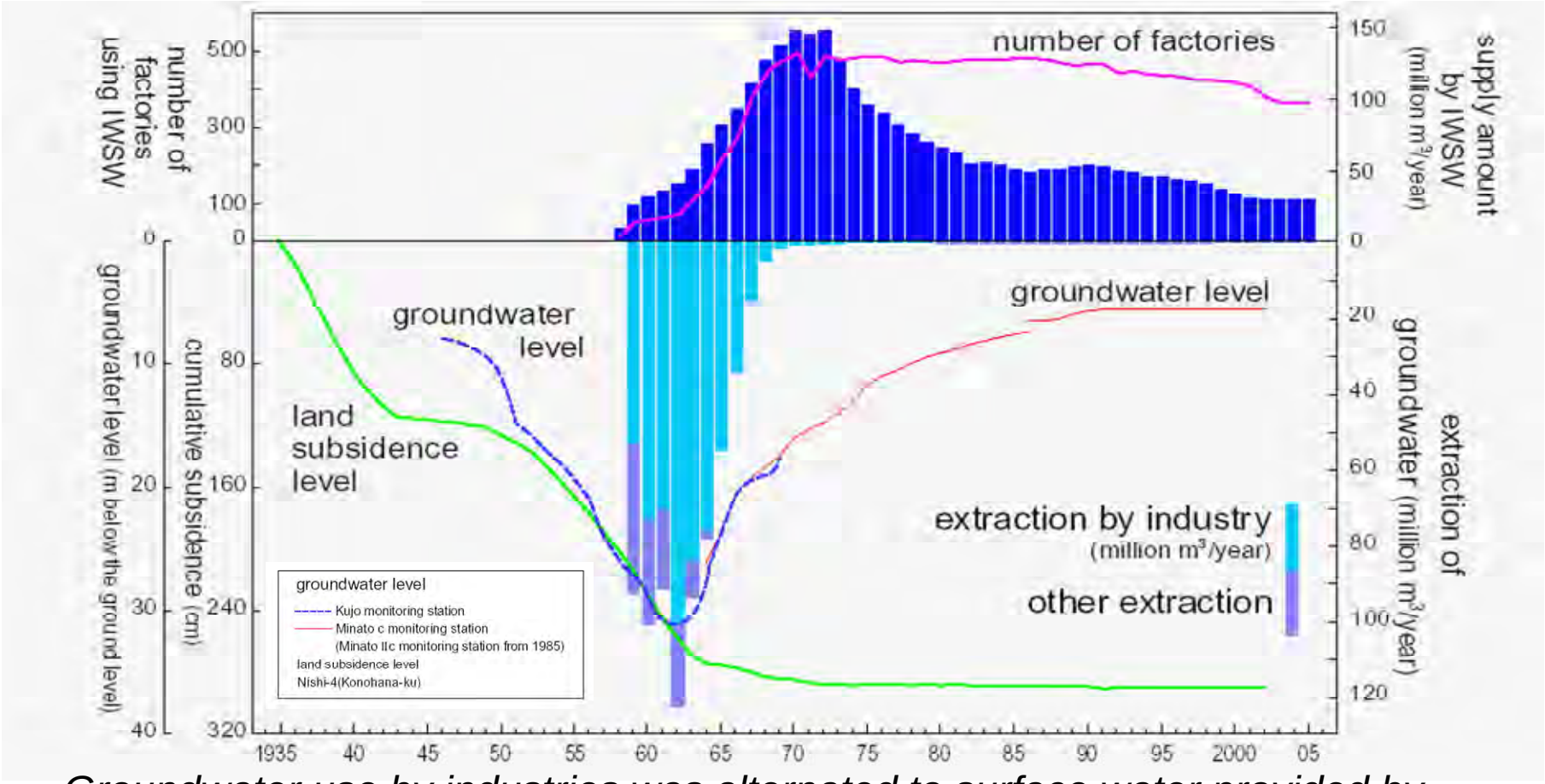
Groundwater quality management only by central government is now facing difficulties in implementation, because groundwater contamination is site specific issue. For better groundwater management, a new framework of groundwater quality management should be developed in the respect of decentralization and stakeholder involvement.

Effectiveness of Groundwater Charge in Bangkok



Groundwater use charge and groundwater abstraction in Bangkok

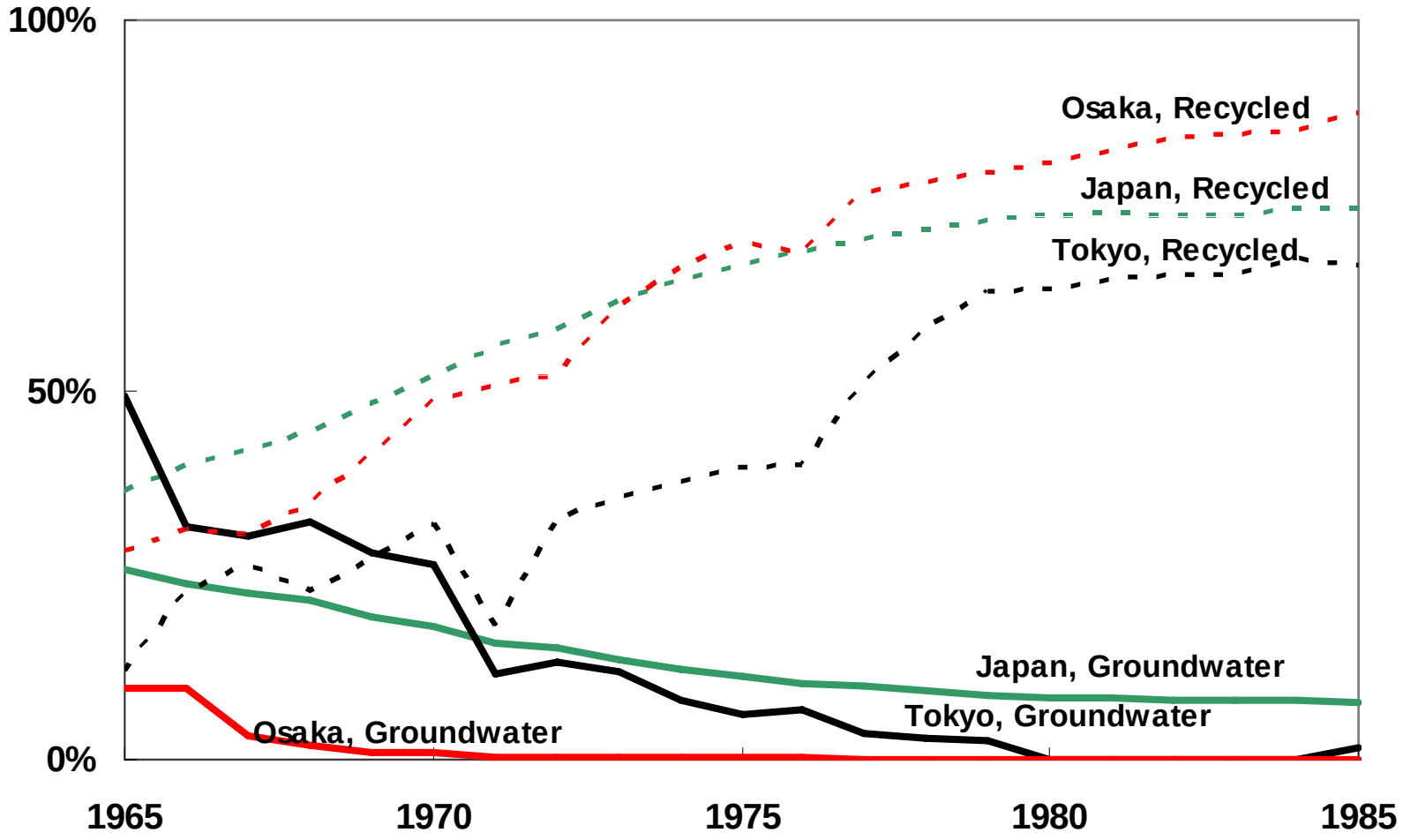
Alternative Water to Groundwater in Osaka City



Groundwater use by industries was alternated to surface water provided by the Industrial Water Supply Works (IWSW) in Osaka City

(IGES Policy Brief #4, March 2006)

Dependency of Groundwater and Recycled water in Industrial Sector in Japan



Percentage of groundwater and recycled water in industrial sector (Tokyo, Osaka, Japan)

Thank you