

Groundwater charges in Bangkok – A case of groundwater management in Asian cities

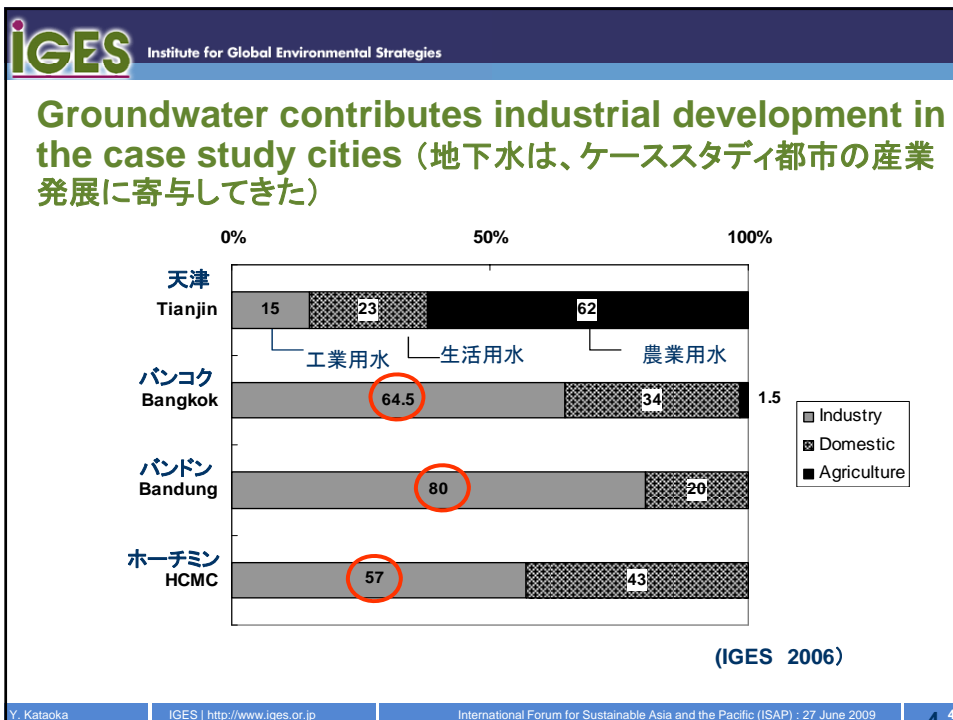
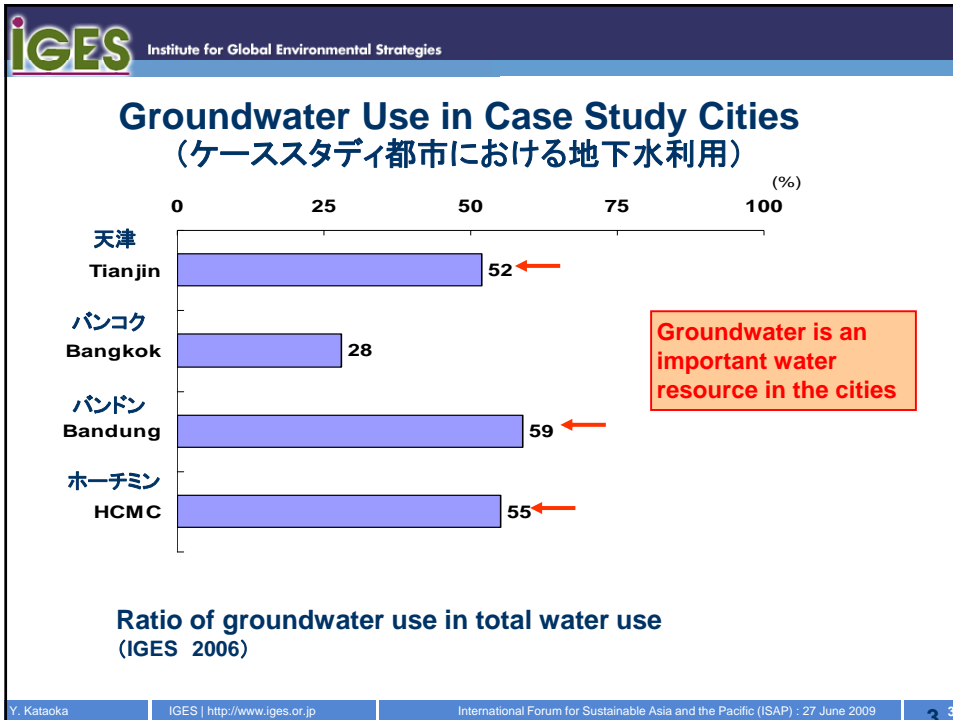
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Research on Sustainable Water Management Policy (「持続可能な水管理に関する研究」(2004 -)



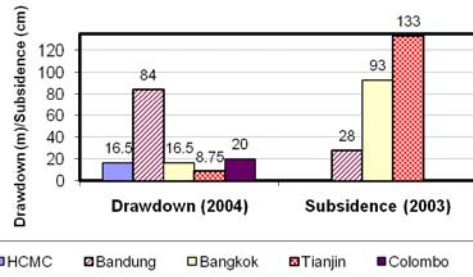
Comparative study on
groundwater
management in seven
Asian cities

アジアの7都市に
おける地下水管理に関
する比較研究を実施



Problems caused by excessive groundwater use (地下水の過剰揚水による問題)

- ✓ Depletion in groundwater table and land subsidence due to over extraction of groundwater
 - In China, groundwater level has declined in 30% 194 key cities in regions monitored (WEPA, 2007).
 - In Manila Philippines, groundwater abstraction has lowered groundwater table by 2.4m per year.



Land subsidence in Bandung



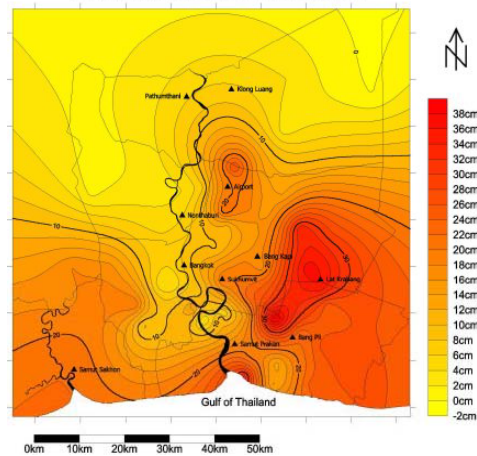
Land subsidence in HCMC

Cumulative drop in water level and land subsidence in some Asian cities (IGES, 2007)

Land Subsidence in Bangkok (バンコクの地盤沈下)

- **Because of groundwater Depletion**
 - Water level drawdown
 - More difficulty in extracting water
- **Land Subsidence**
 - Damage to infrastructure
 - Flooding
 - Disturb/deteriorate drainage systems

Total Land Subsidence (1992-2000)



(by courtesy of Dr. Babel, AIT)

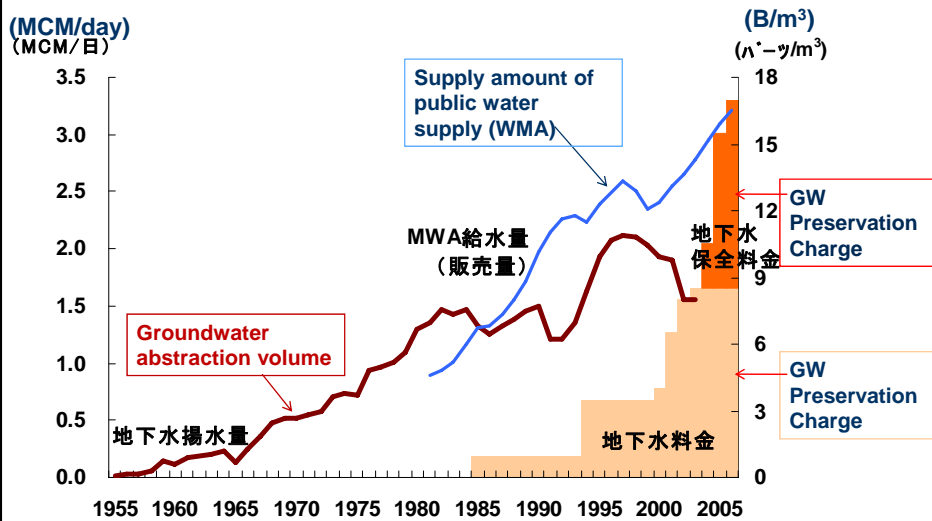
How Bangkok tackled with excessive abstraction of groundwater? (バンコクはどのように地下水の過剰揚水に対処したか?)

- Setting rules (by Groundwater Act)
- Groundwater abstraction and use licenses
- Change the source of municipal water supply to surface water (by development of new water sources)
- Designation of groundwater protection zones

+

- **Groundwater charge system (use charge + protection charge)**
- **Expansion of coverage area of municipal water supply**

Is groundwater abstraction controlled by groundwater charges? (地下水料金によって揚水は抑制されたか?)



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Groundwater Charging System in Bangkok (バンコクの地下水料金制度)

supply service user type	Area with public water supply service	Area without public water supply service
1. Domestic consumption	8.50 Baht/m ³ + preservation charge	Exempt
2. Business		
Business not using agricultural products (proclaimed by minister) as raw material		25 % discount
Business using agricultural products (proclaimed by Minister) as raw material	8.50 Baht/m ³ + preservation charge	70 % discount
3. Agriculture		17 Baht/m ³ > 10 Baht/m ³ public water supply
Crop cultivation		Exempt
Animal farm with groundwater use license not more than 50m ³ /d		Exempt
Animal farm with groundwater use license greater than 50m ³ /d	8.50 Baht/m ³ + preservation charge	70 % discount for users of less than 50 m ³ /day

Y. Kataoka (source) Babel and IGES Database (2005). or.jp International Forum for Sustainable Asia and the Pacific (ISAP) : 27 June 2009 9

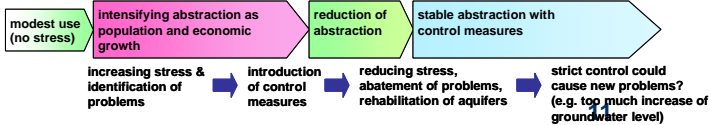
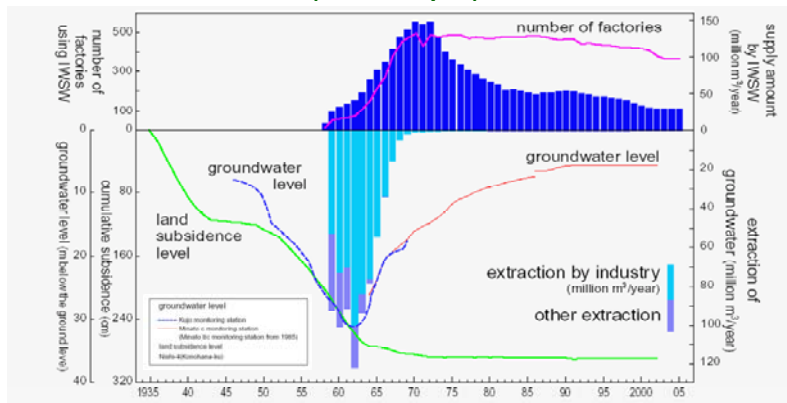
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Lessons from Bangkok's case (バンコクの経験)

- Groundwater charges can be an incentive for users to refrain groundwater use.
- Alternative water sources need to promote control of groundwater with charging system.
- Groundwater preservation charge is useful to promote groundwater management further.
- Groundwater use by individual households is not fully addressed yet.
- A next challenge: from "groundwater control for mitigation of land subsidence" to "sustainable groundwater use".

Y. Kataoka IGES | http://www.iges.or.jp International Forum for Sustainable Asia and the Pacific (ISAP) : 27 June 2009 10

Industrial Water Supply Works as an alternative water supplier of groundwater (Osaka, Japan)



Thank you very much for your attention!

