Groundwater in Asia under Threats

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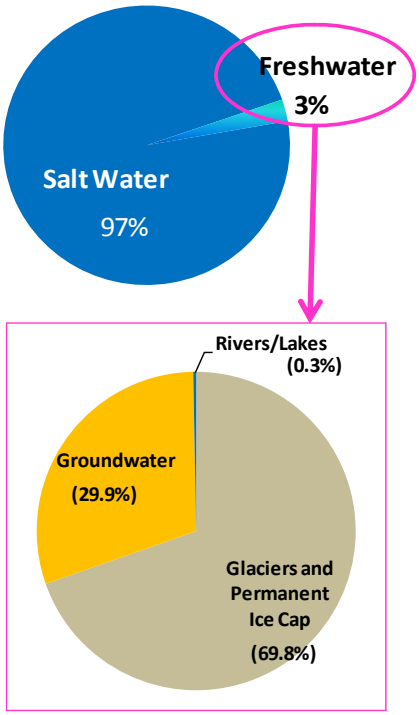
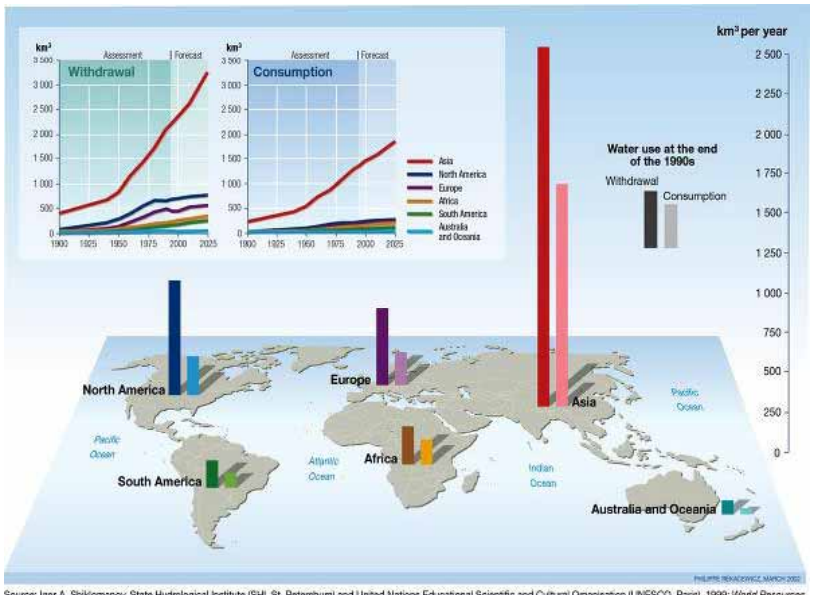
Water is Finite Resources
(水資源は有限である)



- We depend on less than 3 % of global freshwater.
- Water demand has been rapidly increased since mid-1950s in the world, especially in Asia.



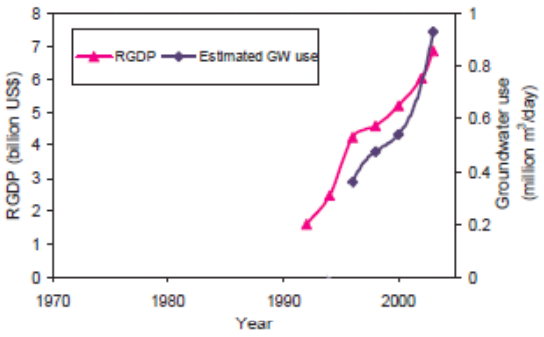
Source: Igor A. Shiklomanov, State Hydrological Institute (SHI, St. Petersburg) and United Nations Educational,Scientific and Cultural Organisation (UNESCO, Paris), 1999; *World Resources 2000-2001, People and Ecosystems: The Fraying Web of Life*, World Resources Institute (WRI), Washington DC, 2000; Paul Harrison and Fred Pearce, *AAAS Atlas of Population 2001*, American Association for the Advancement of Science, University of California Press, Berkeley.

UNEP Vital Water Graphics (http://www.unep.org/dewa/vitalwater/article42.html)

General characteristics of groundwater
(地下水の特徴)

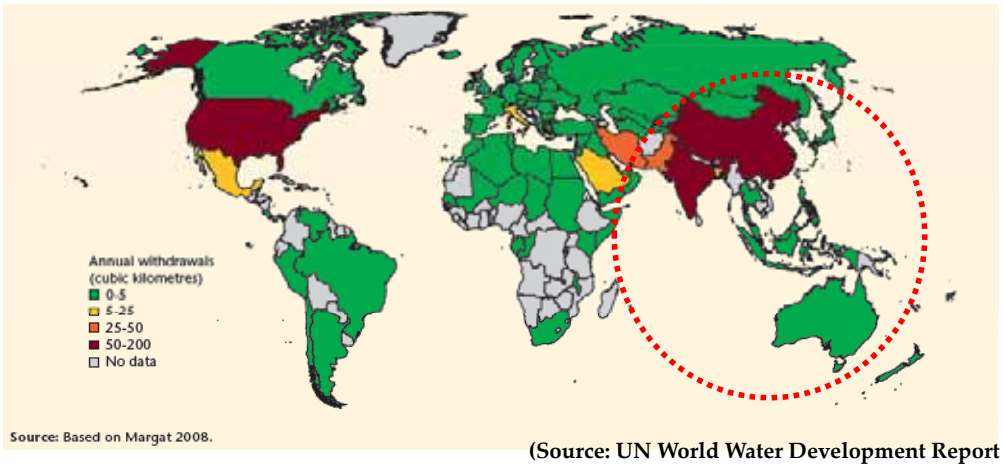
- **Convenient to use**
  - high accessibility
  - good and stable quality
  - slow speed of recharge (more reliable resource in drought)
  - lower cost of development
  - stability of temperature
- **The share of groundwater in world water use is about 20%. <u>The share is increasing especially in dry areas</u>.** (World Development Report 3)
- **Groundwater in urban context**

  GW is used from the beginning of urban development.



Correlation between regional GDP (RGDP) and Estimated Groundwater use in Ho Chi Minh City, Vietnam (source: IGES 2007)

Groundwater - for irrigation
(灌漑用水としての地下水)

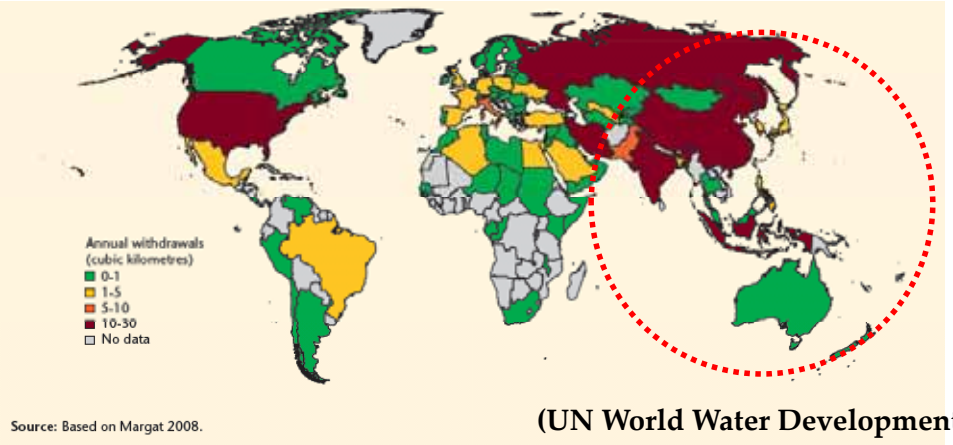


(Source: UN World Water Development Report 3)

Globally, groundwater provides about 17 % of water use in irrigation (World Water Development Report 3).

In Asia and the Pacific, groundwater also serves as a major source of irrigation water:
- 60% of the total agricultural water use in India
- 70% of total agriculture water supply Hebei provinces, China

Groundwater - for drinking water
(飲料水としての地下水)



(UN World Water Development Report 3)

- According to an estimation, globally groundwater provides 50% of current potable water supplies. (IWMI 2007. Water for Food, Water for Life: A Comprehensive Assessment of Water Management is available)
- In Asia and the Pacific, groundwater provides drinking water to nearly 32% of population.
- 53% of Cambodian households drink from groundwater sources in the dry season (Presentation of Dr. Mao Saray, Ministry of Rural Development, Cambodia)

Groundwater Issues
(地下水問題)

- Because of excessive groundwater abstraction (more than recharging capacity), groundwater has been depleted.
- As a result of overexploitation, land subsidence became serious.
- Arsenic and fluoride pollution became a very serious problem which affects people's health.
- Salinization became serious especially in coastal areas of the region.
- Groundwater pollution in shallow aquifer by coliform is a common problem in many areas of the region.
- Inadequate toxic substance (including hazardous solid wastes) contaminated groundwater.

Land subsidence in HCMC

Climate Change Impacts on Groundwater
(気候変動の地下水への影響)

- Shift in precipitation ultimately shift in water balance of aquifer by increase or decrease of recharge.
- Shift in precipitation also make surface water more unreliable which may force to development of groundwater resources.
- Rise in sea level would increase sea water intrusion.

(photo: IGES)

Groundwater Management Challenges
(地下水管理の課題)

- Groundwater is a very important resource especially for human health and food security, but pressure to groundwater has been growing.
- However, groundwater is not well managed in many areas of the region.
- Groundwater should not be a "neglected resource" anymore.

◆ **In this session…**
- ✓ **What's going on groundwater?**
- ✓ **What are the challenges of current groundwater management?**
- ✓ **How we can solve groundwater problems?**

Lesson Sharing of Groundwater Management
(地下水管理の経験共有)

- We need to know what happens in groundwater.
- Compared with surface water, experiences of groundwater management are not accumulated and shared among relevant stakeholders in the region.
- Solution of groundwater problems must be different in different areas because there are “Local characteristics of groundwater” and “local needs”.
- Lessons of groundwater management help those who are working on groundwater management to find better solutions.

(photo: IGES)

IGES as the Regional KnowledgeHub on Groundwater Management
(地下水管理地域ハブとしてのIGESの役割)

(photo: IGES)