

Urban infrastructure, part 2

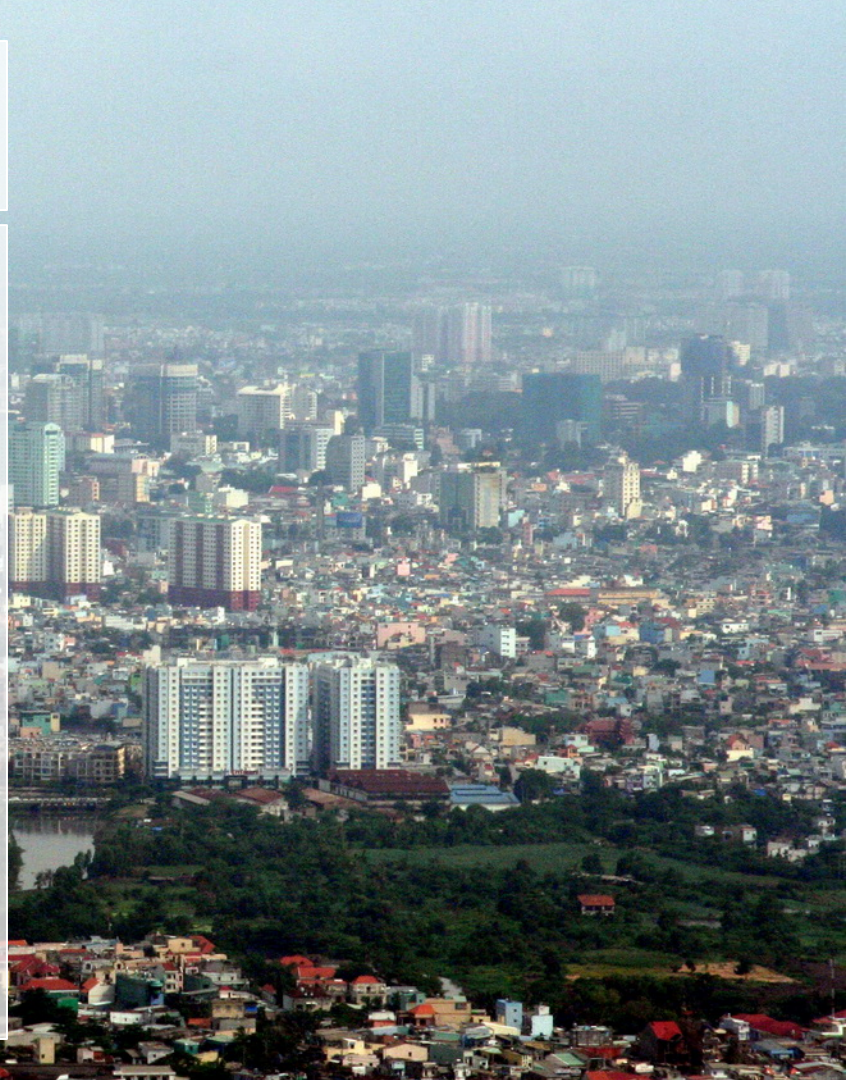


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Megacities

- Can do a lot more towards:
 - Energy efficiency in transport
 - Quality of building
 - Supply of safe drinking water
 - Treatment of waste (water)
 - Public health
 - Local environment
 - Sources of secondary raw materials



Fresh water use



1000 liter

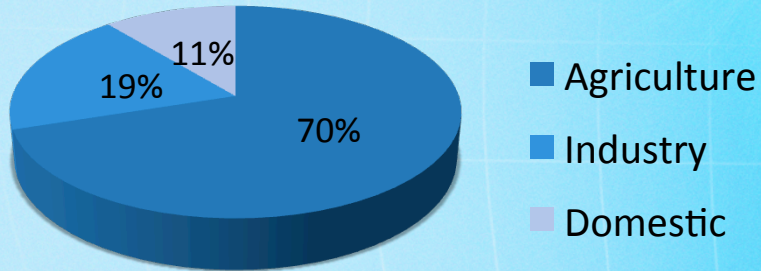


11000 liter



10000 liter

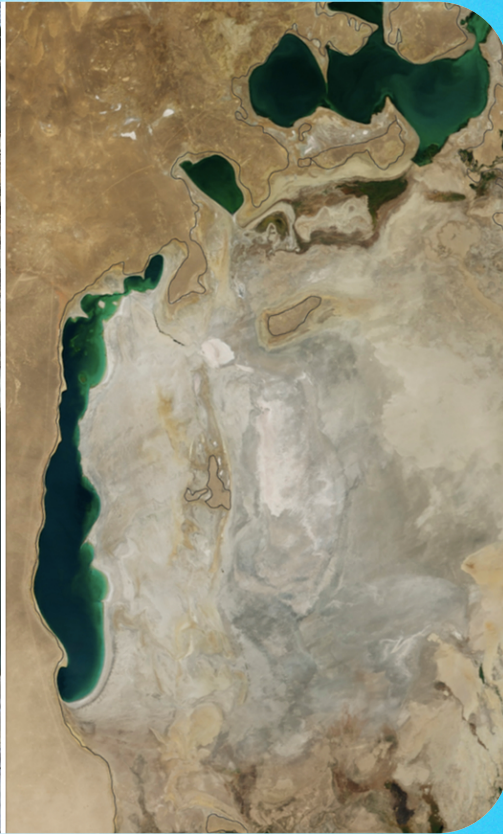
The world's fresh water use



Aral Sea

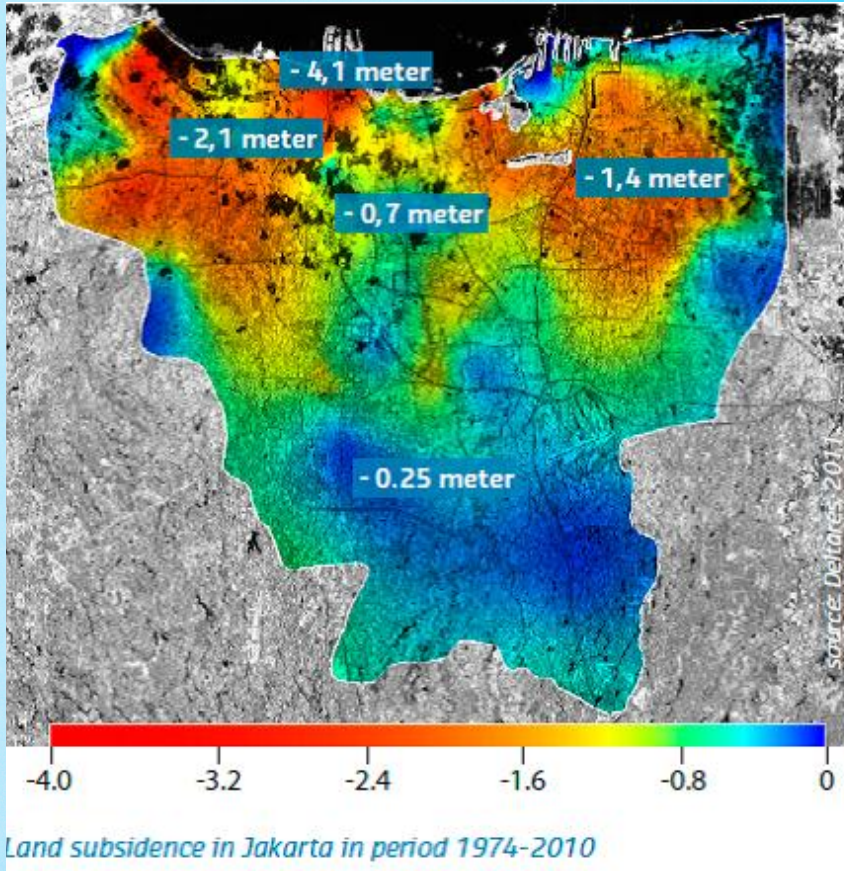


1989

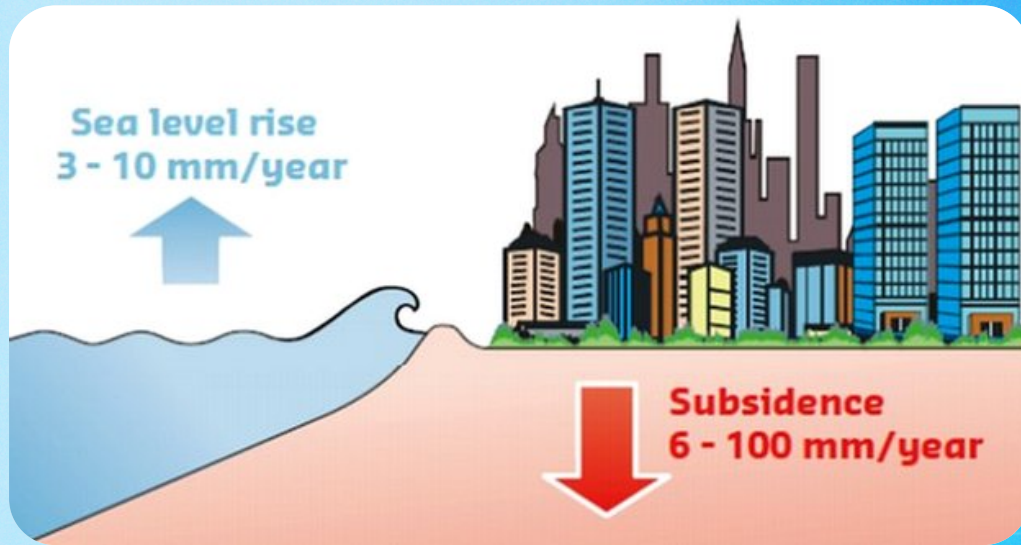


2014

Extraction of groundwater



Land subsidence



↑ 6 - 100 mm/year

Desalination



Azzia desalination plant, Saudi Arabia

Water: a prime condition for life

City's water needs often conflict with the water needs of agriculture and local ecosystems.



Polluted surface water



Water retention

- Let water seep into the soil so that it will replenish groundwater
- Porous pavements
- Green parks and ponds
- Reduce salt water intrusion
- Ensuring eco-systems' fresh water supply

Challenge for cities

Meet the water demand with renewable internal freshwater resources.

- Raise people's awareness of freshwater scarcity
- Advocate frugal water use
- Costs should be covered by all users

Singapore



Hongkong



UN World Water Day 2014

- Focus on the water-energy nexus
- Energy depends on water



Global water use for energy

2010:

- Withdrawals 583 billion cubic metres (bcm), 15% of the world's total water withdrawals.
- Water consumption was 66 bcm.

2035:

- withdrawals increase by about 20%, but consumption rises by 85%!

Dependency on scarce materials

- Used in e.g. wind turbines, batteries, photovoltaic panels and fuel cells
- How to secure the future supply of these materials?
- No effective recycling systems!

The factor 8 question

‘Is it possible to imagine infrastructure systems that can meet the needs of twice today's population with half today's resources while providing twice the liveability?’

Thank you for your attention!

Please post any questions you may have
on our discussion forum.