Managing the groundwater threat to urban resilience

Urban groundwater management and governance

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GEOZENTRUM HANNOVER

Urban groundwater –

functions and *threats*

Water supply

Buffer function

Structural stability

Photo: M. Eichholz

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Pollution

Over-exploitation

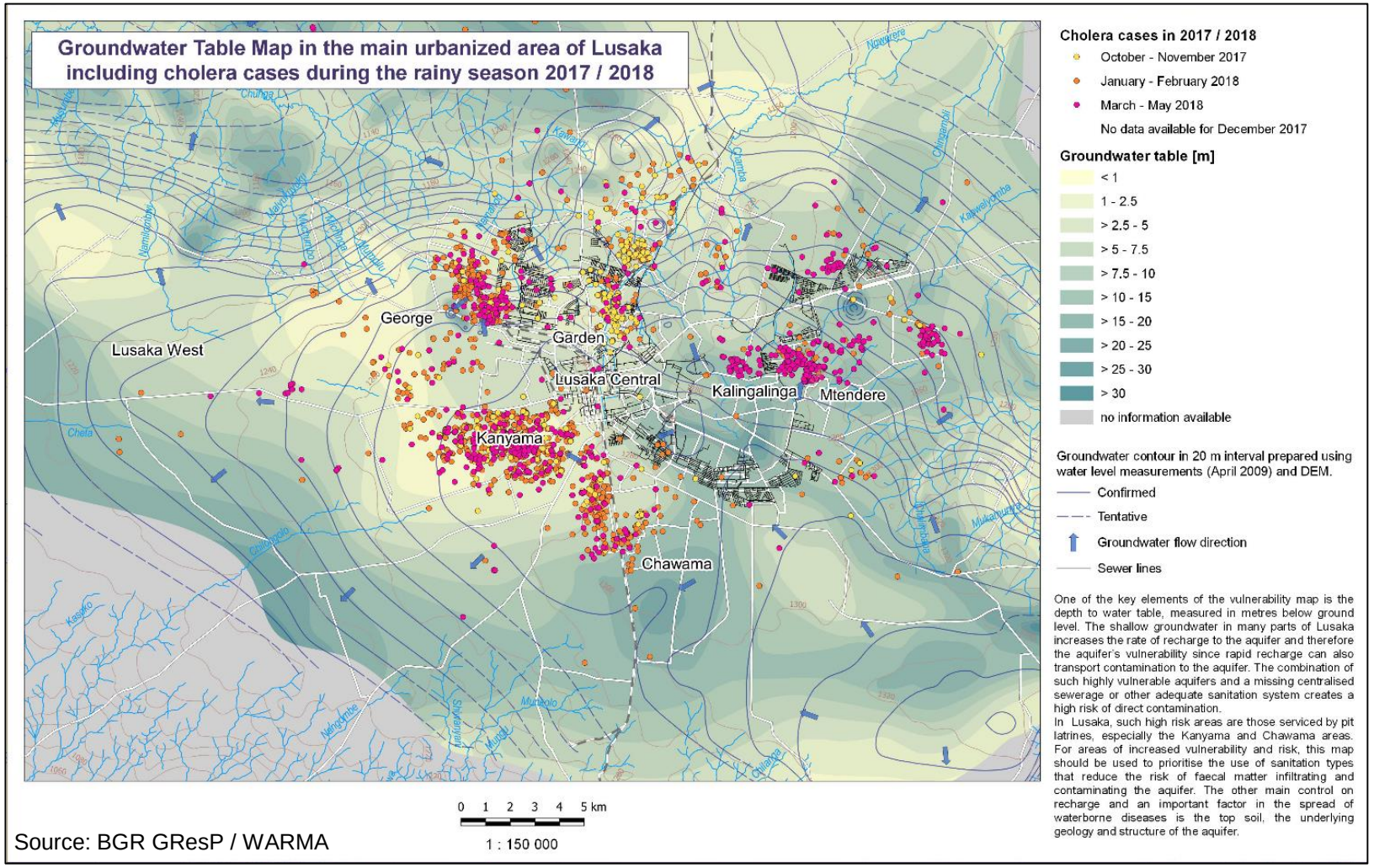
Land subsidence

Groundwater pollution threatens water supply

- Lusaka (Zambia):
  - Nearly 3 Million inhabitants by 2021, 70% live in peri-urban areas
  - Groundwater covers Lusaka's water supply (60%)
  - Karstic dolomite aquifers with good yields but high vulnerability
  - Sanitation often absent: only 17% of the faecal matter safely managed

Photo: M. Eichholz

Groundwater pollution threatens water supply



Source: BGR GResP / WARMA

Groundwater and structural stability

- Bangkok: coastal metropolitan region with about 15 Mio. inhabitants
- Heavy groundwater abstraction since the 1950ies, boom of private wells
- Consequences: land subsidence and seawater intrusion
  - City flooding
  - Structural damages in infrastructures

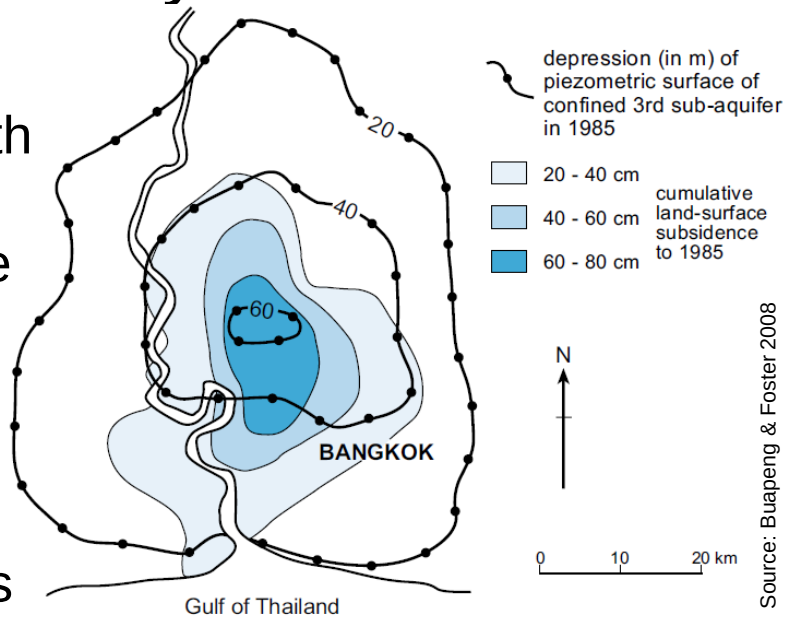
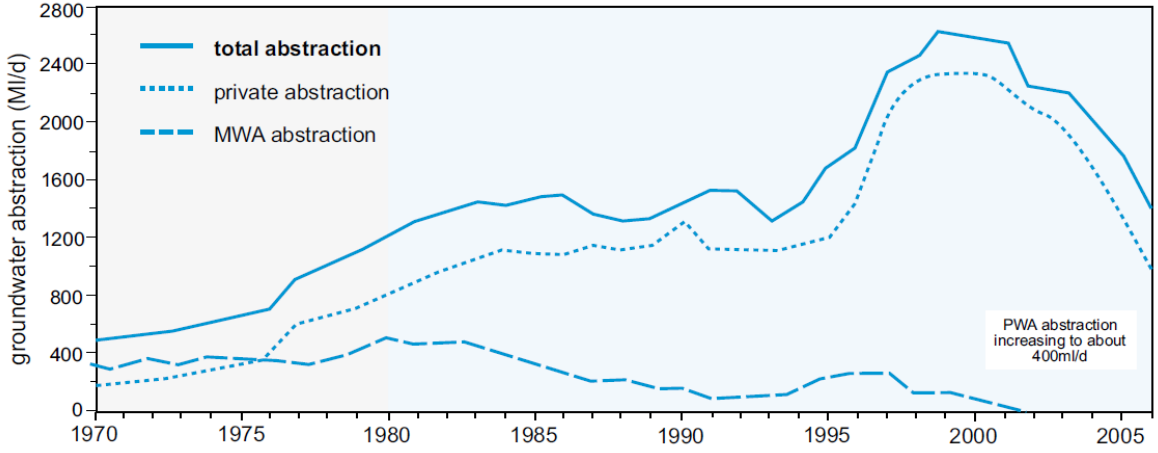
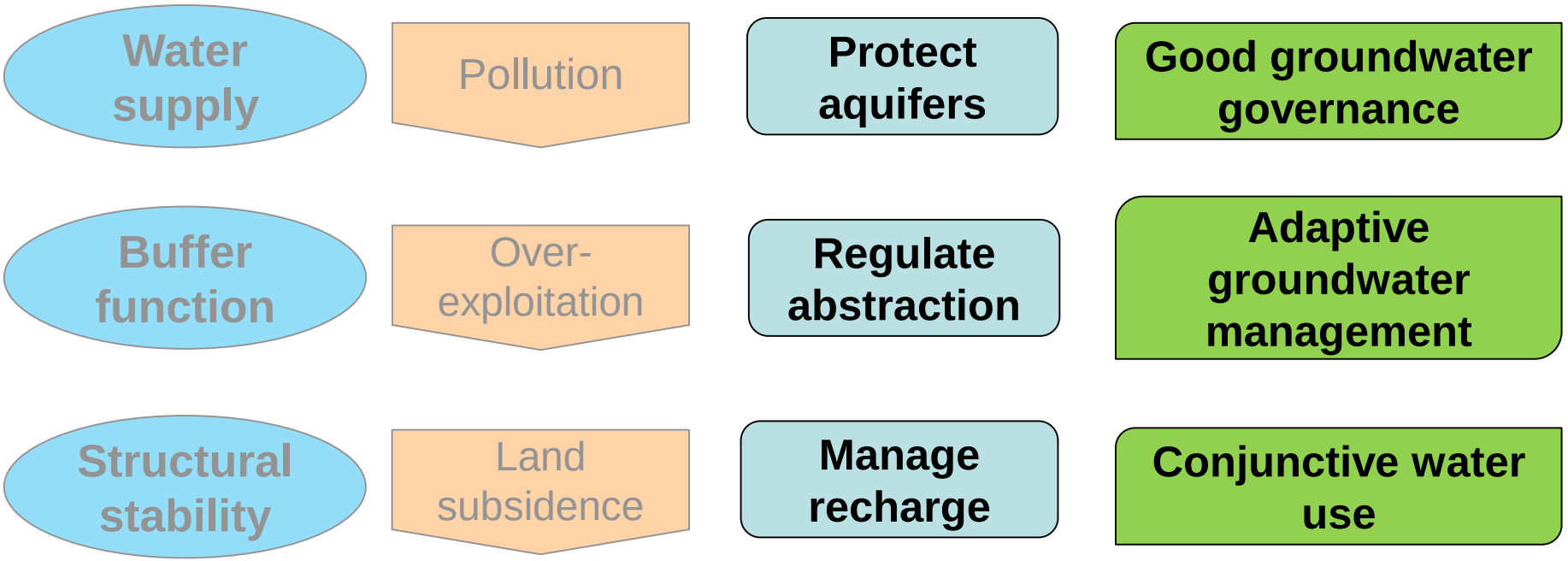


Photo:
https://www.todayonline.com/world/asia/bangkok-sinking-10mm-every-year

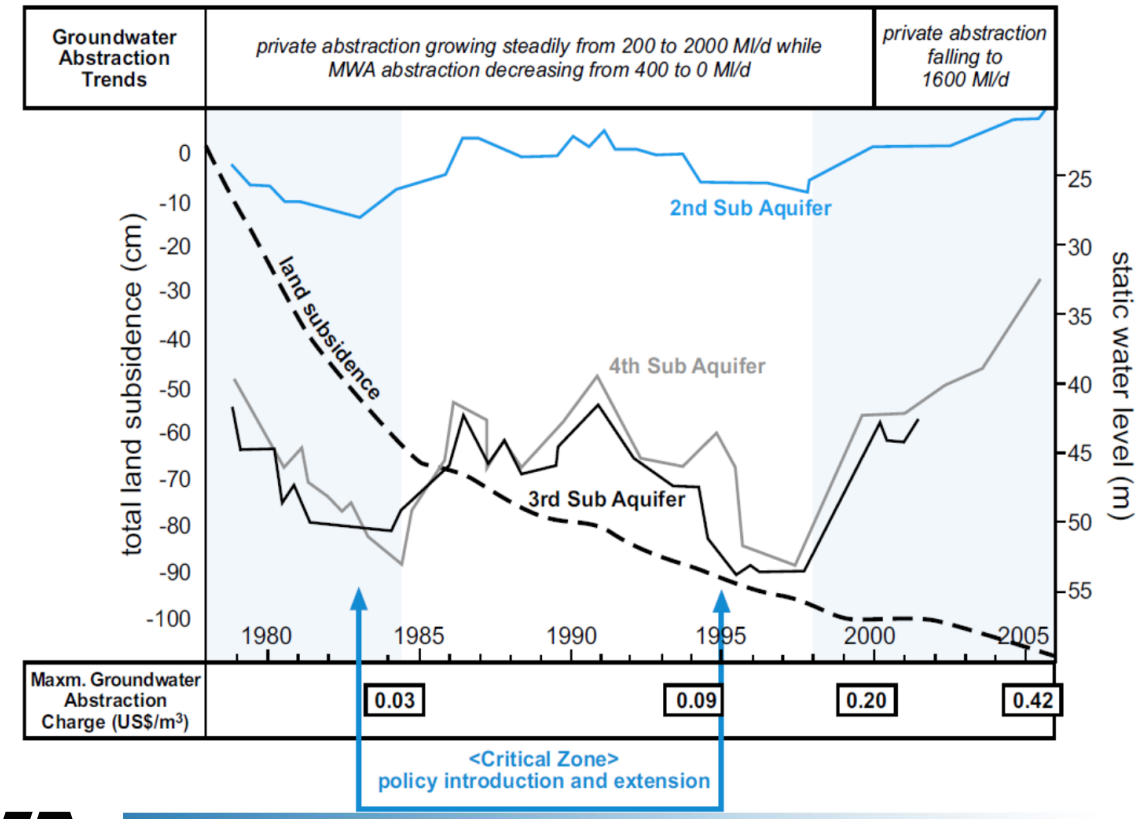


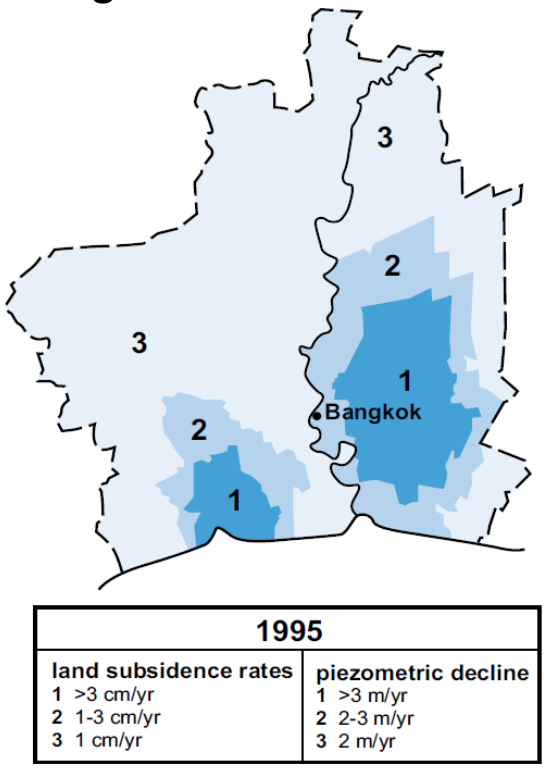
Urban groundwater – measures and ways forward



Groundwater regulation and adaptive management: Case Bangkok

- Implementation of groundwater monitoring and regulation





Source: Buapeng & Foster 2008

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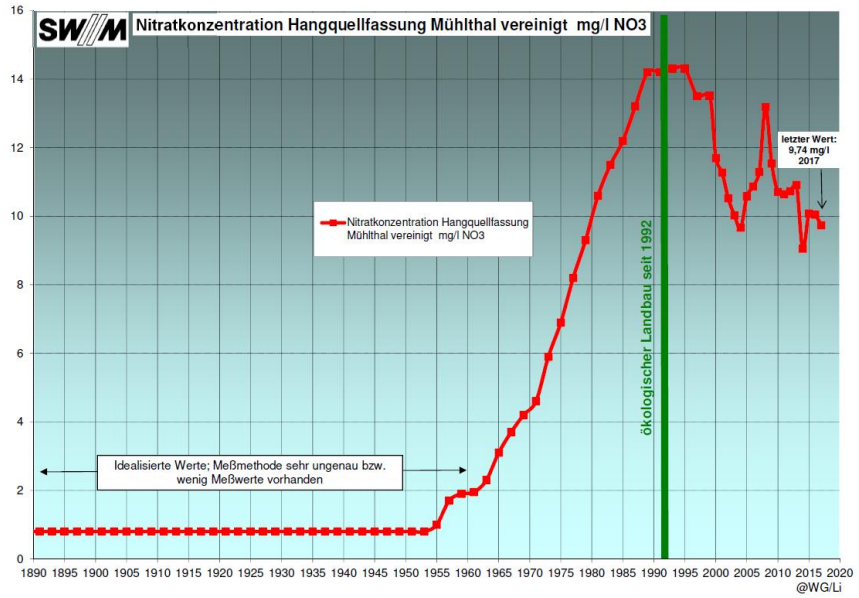
Good governance for groundwater protection Example: Munich

- Munich: 1,5 million inhabitants, dependent on groundwater from southern rural areas
- Water quality affected by nutrient pollution from agriculture
- Since 1992: collaborative approach to groundwater protection, promotion of organic farming by
  - Buy out of strategic recharge areas
  - Contracts with farmers (incl. direct financial transfers)
  - Utility supports farmers in commerzialition of products

→ Currently 165 farms and 3900 ha are under organic farming

→ Nitrates trend decreasing since 1995

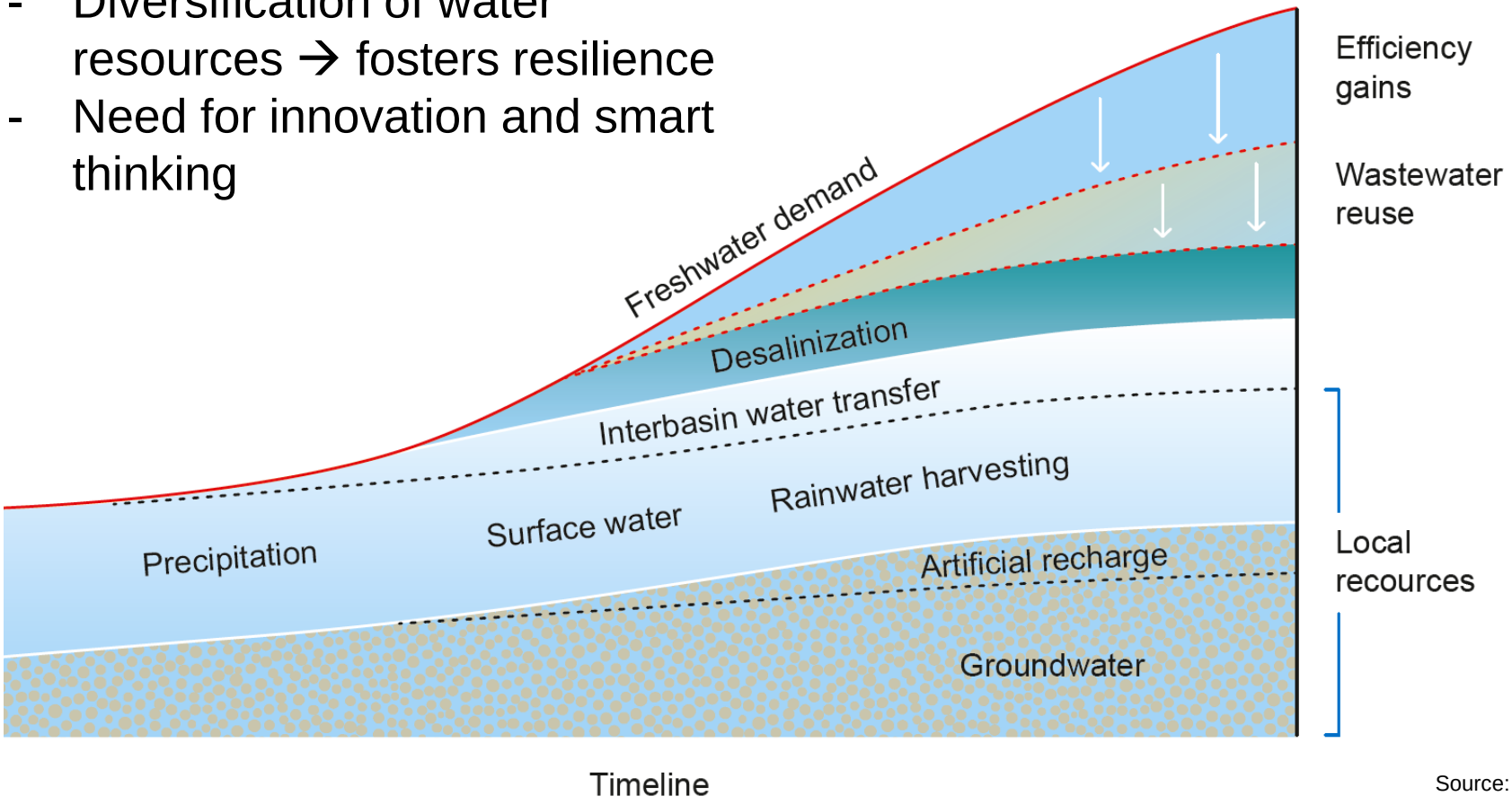


Stand: 03.11.2017

Source: SWM Website

Conjunctive water use and management

- Diversification of water resources → fosters resilience
- Need for innovation and smart thinking



Source: BGR

Thank you for your attention.

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