Integrated water supply, sanitation & sewerage systems in urban planning for human health risk reduction

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Water and health challenge in urban areas

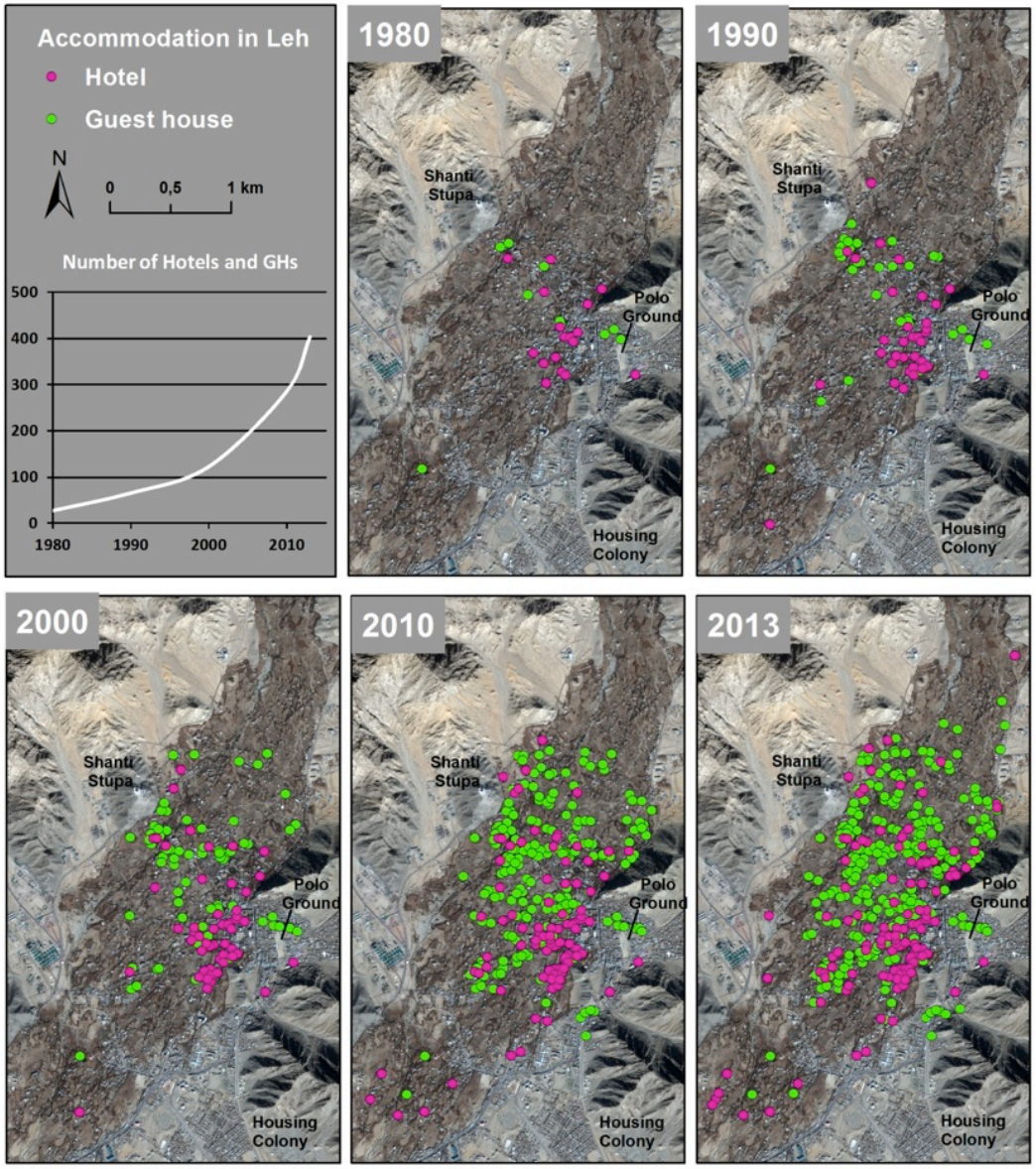
- In rapidly transforming towns and cities in China and India, **water infrastructure development is often unable to keep up** with the rapid increase in freshwater demand and wastewater management, leading to health risk.
- Especially in regions where water is already scarce and that are affected by climate change, **integrated or trans-sectoral urban planning** is urgently needed to address this challenges more effectively.

„Use water once“ paradigm persists

- 19th century Europe when centralized sewage systems were first developed brought the concept of using water only once and then disposing of it so as to reduce health risk.
- This concept is persisting as a “vision of modernity” even in areas where water is scarce.
- Urban localities in China and India are facing **huge pressure** to address water supply and wastewater management.
- **International experts** may add to pressure e.g. by pointing at hygiene but do not offer integrated solutions.
- In such a situation, localities with little capacity and funding easily fall prey to international consultants’ recommendations for **“business as usual”** options, i.e. centralized sewage systems, although these are expensive and energy-intensive.
- These may however not be the best solutions for a given context.
- Nonetheless, as a result, alternatives have rarely been implemented on a larger scale.
- Is crisis needed in order to implement “alternative water futures”?

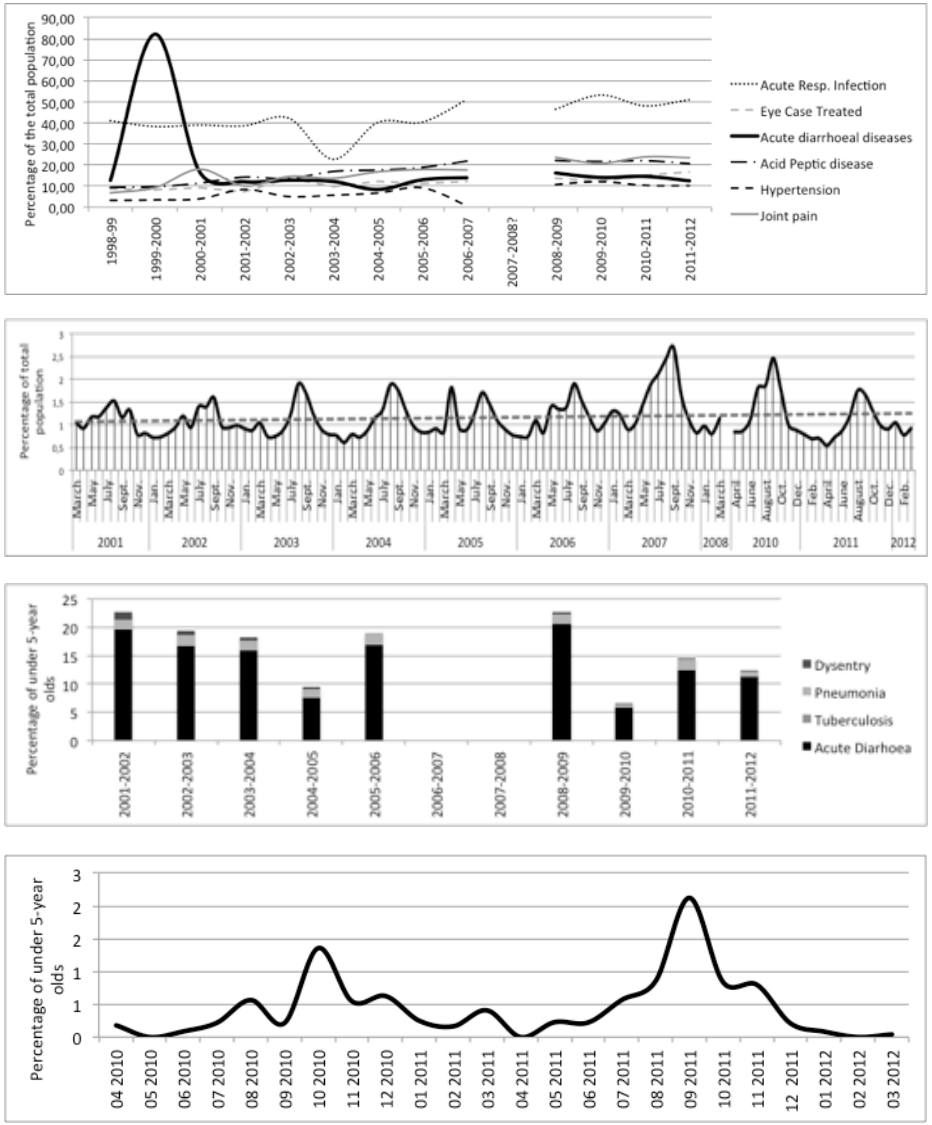
Case study Leh Town, Ladakh, NE India

- A semi-arid high-altitude region of the Himalayas.
- Population 25,000, tourists 200,000 in 2013.
- Number of hotels has increased from 24 in 1980 to ca. 360 in business and 60 under construction in 2013.
- Huge increase in water demand and wastewater production (flush toilets, showers).
- Groundwater is the main source of drinking water.
- Wastewater is not properly managed, therefore groundwater pollution is assumed.



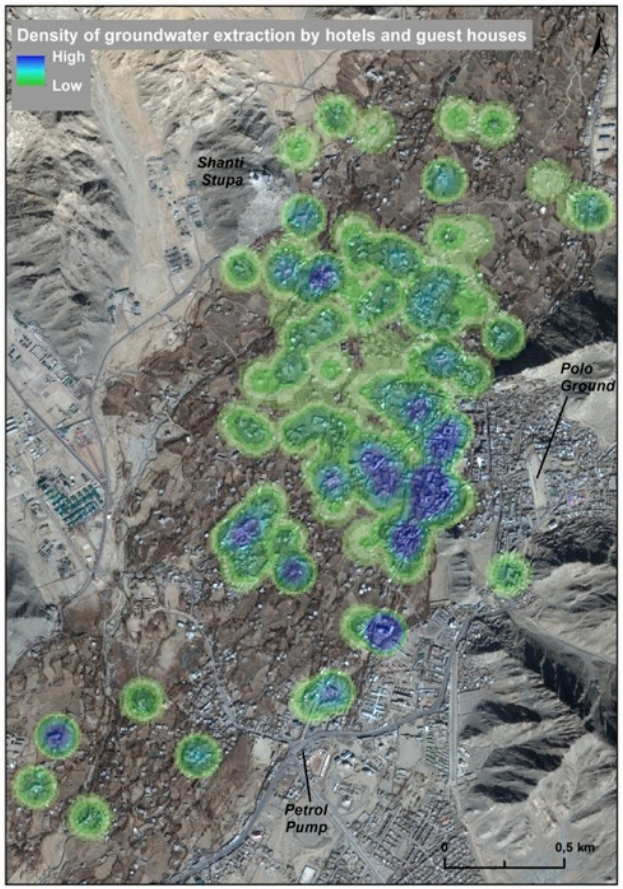
Water-related health risk

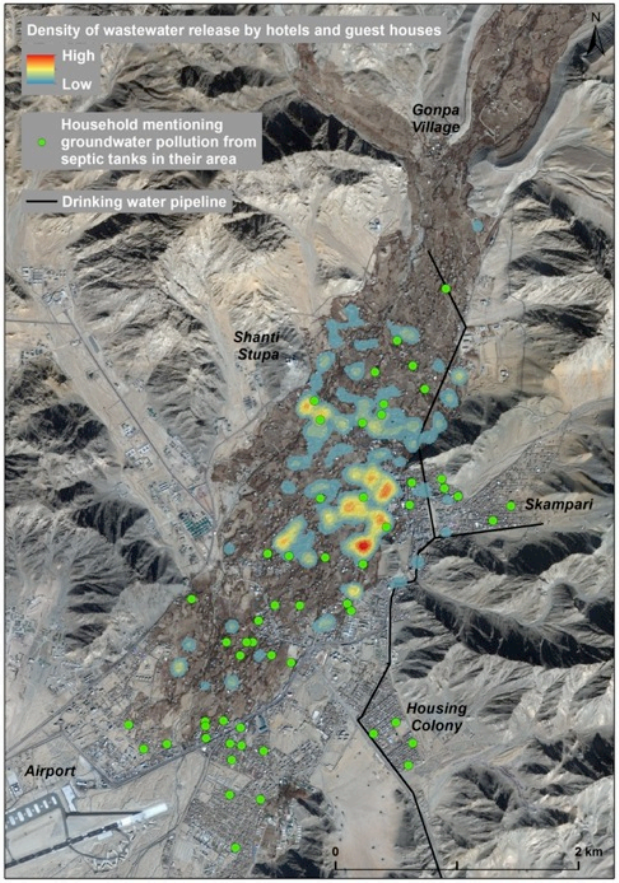
- Cases of acute diarrhoea seem to be increasing.
- However this can not be causally linked to groundwater pollution.



Source: Chief Medical Office Leh

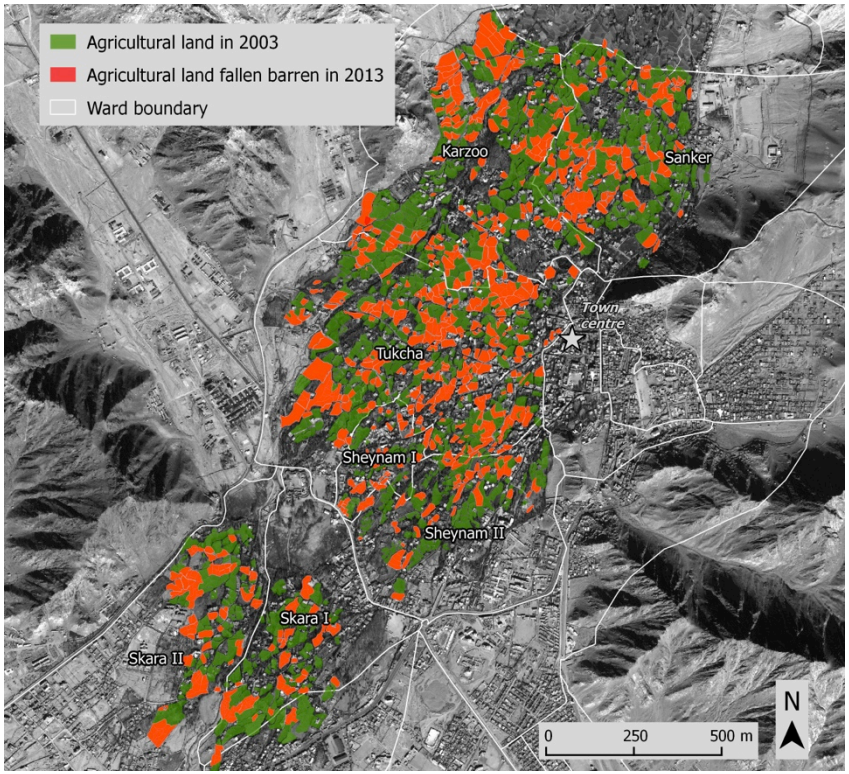
Water consumption

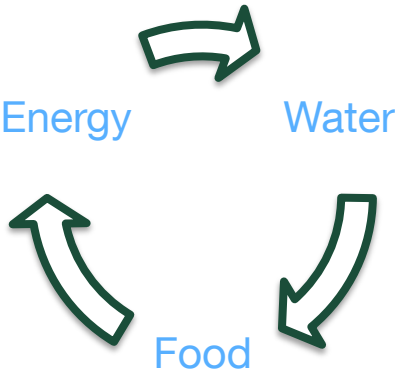




- Ca. 5 million litres daily is pumped up from groundwater aquifers, requiring huge amounts of energy.
- 40 % of water extraction points are too close to wastewater disposal areas.
- Hotels are producing about 1 MLD wastewater: this is an underutilized resource.

Integrated urban planning is needed

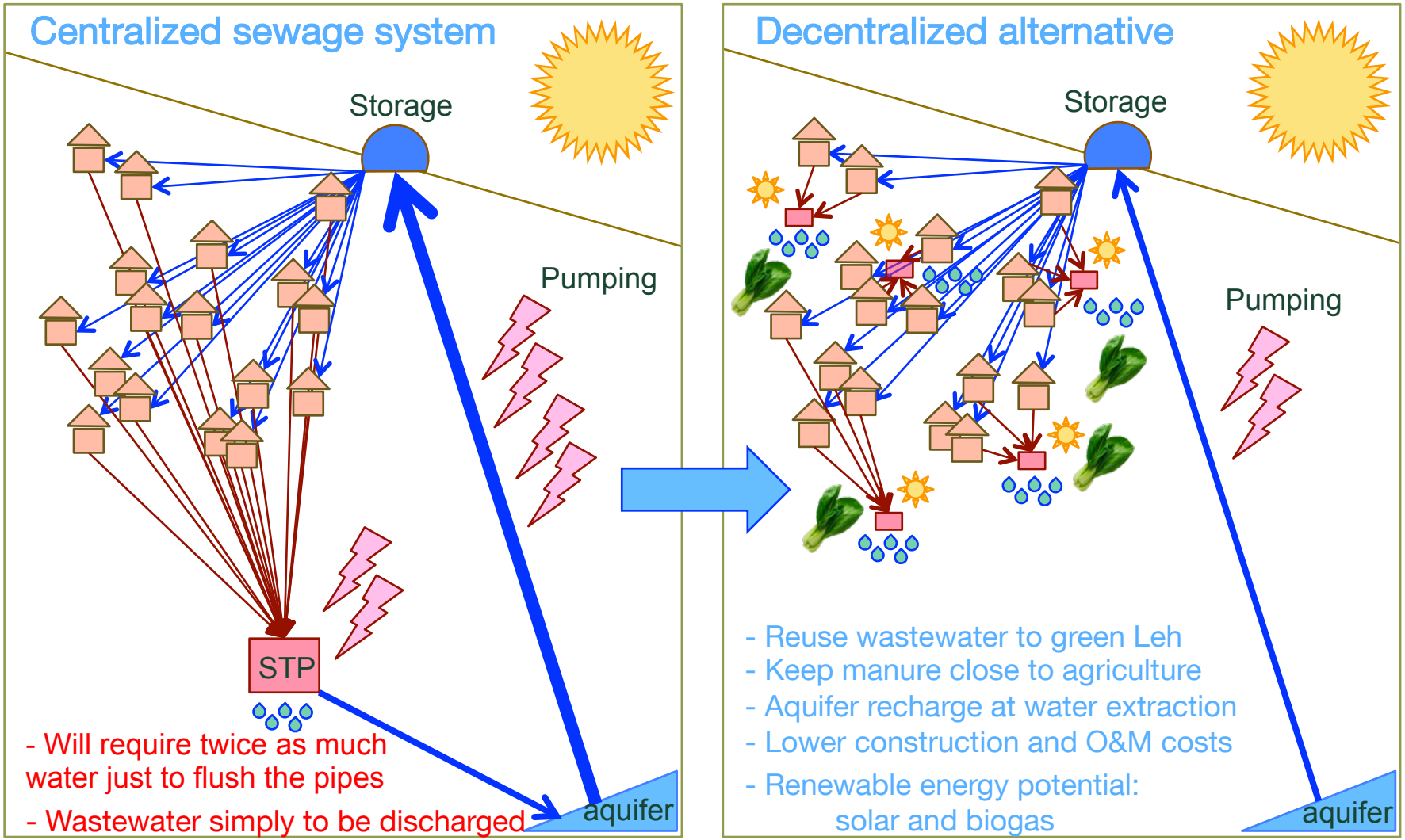




- Over 30 % of agricultural fields have fallen barren in the last 10 years.
- Water, energy and food need to be considered as "three sides of the same coin"

“Alternative water future” visioning

A centralized sewage system is planned to address wastewater management issue, but it may not be the best option for water conservation and health risk reduction.



Conclusion

- The centralized sewage system will not necessarily decrease health risk in Leh because fresh- and wastewater pipes will run in the same trenches in extremely rugged terrain, risking seepage.
- Implementation of “business as usual” seems to have various drivers including international community.
- Building decision-support systems based on geographic information systems (GIS) at local levels is needed for capacity building.
- Local governments and NGOs need to enabled to make innovative decisions and play “politics with principle”.
- “Alternative water futures” are needed before crisis occurs!

Thank you!

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