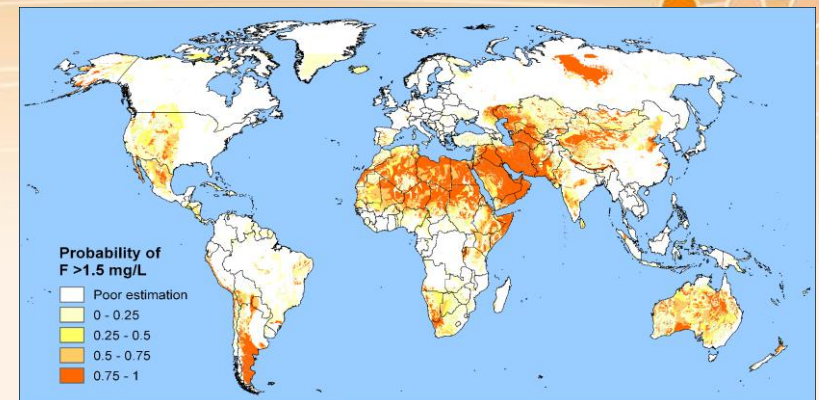
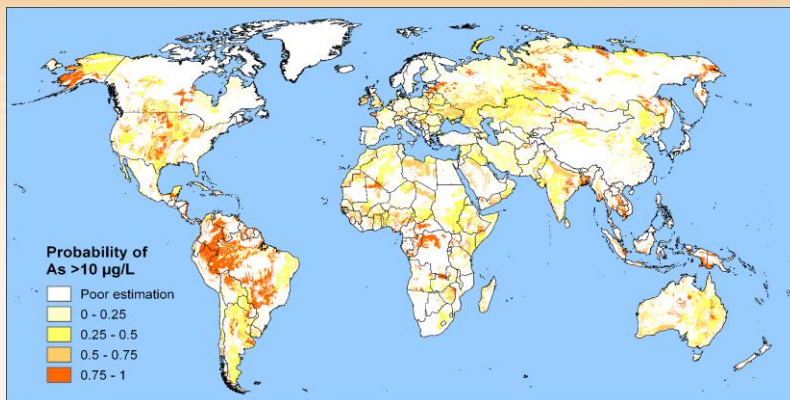
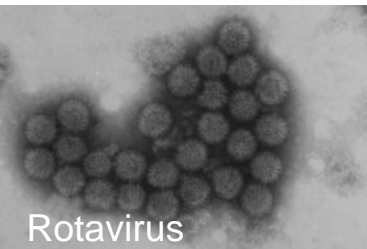


Towards sustainable safe drinking water supply in developing countries:

The challenges of geogenic contaminants and mitigation measures



Priorities for drinking water quality



Rotavirus



Trachoma



Hookworm



Fluorosis

1. Priority : WASH-related diseases

- 1.3 million deaths per year due to unsafe water, inadequate sanitation, and poor hygiene.
- 2 billion people are infected by worm parasites
- 200 million people are infected with Schistosomiasis
- 6–9 million people are blind because of trachoma.

2. Priority : Chemical contaminants

Geogenic contamination affects up to 10% of wells globally

- **~140 million exposed to arsenic**
- **~200 million exposed to fluoride**

Arsenic

An estimated 140 million people are exposed to arsenic

⇒ **Via drinking water**

- Soluble under chemically reducing conditions
- Geothermal waters, volcanic ashes

⇒ **Via food and food preparation**

- Paddy field rice
- Contaminated water for cooking

⇒ **Highly toxic**

- Dermal lesions
- peripheral neuropathy
- diabetes mellitus
- cancers

⇒ **WHO recommended guideline**

- 10 µg/L for drinking water



Fluoride

An estimated 200 million people are exposed to fluoride

⇒ **Via drinking water**

- Ultramafic rocks, granites, volcanic ashes
- Arid conditions

⇒ **Via food and food preparation**

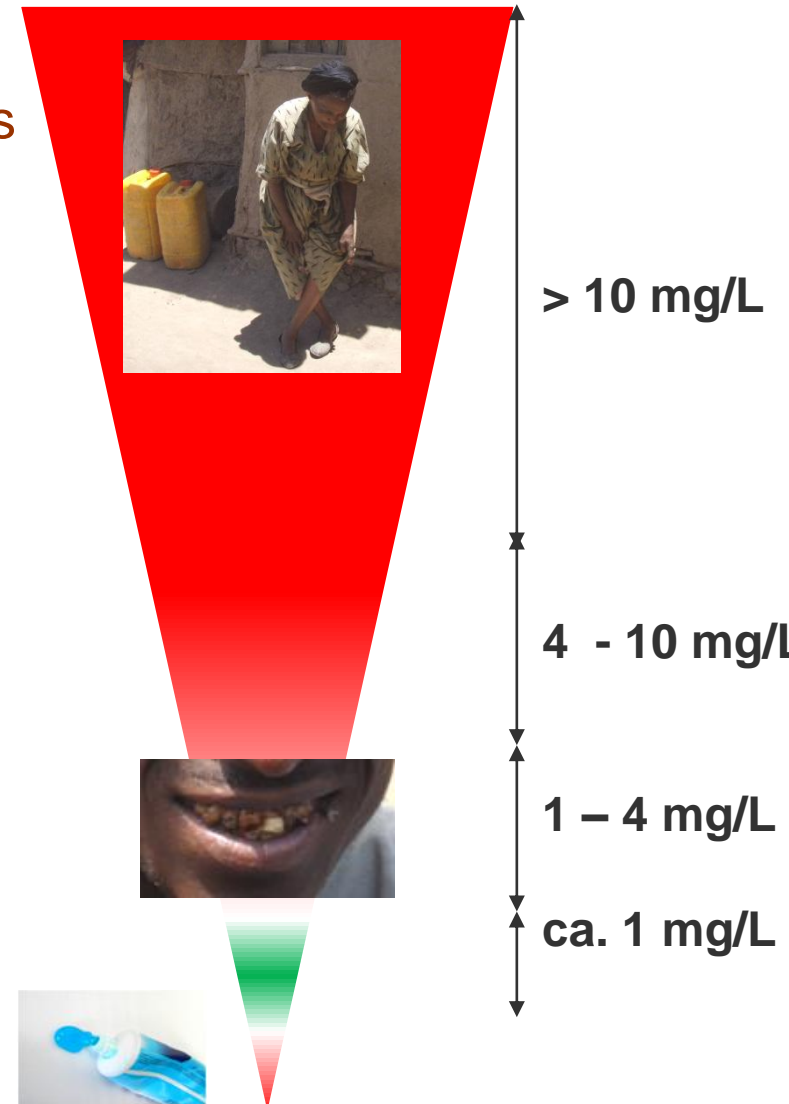
- Beverages, specialty salts
- Local produce from contaminated soil

⇒ **Toxic**

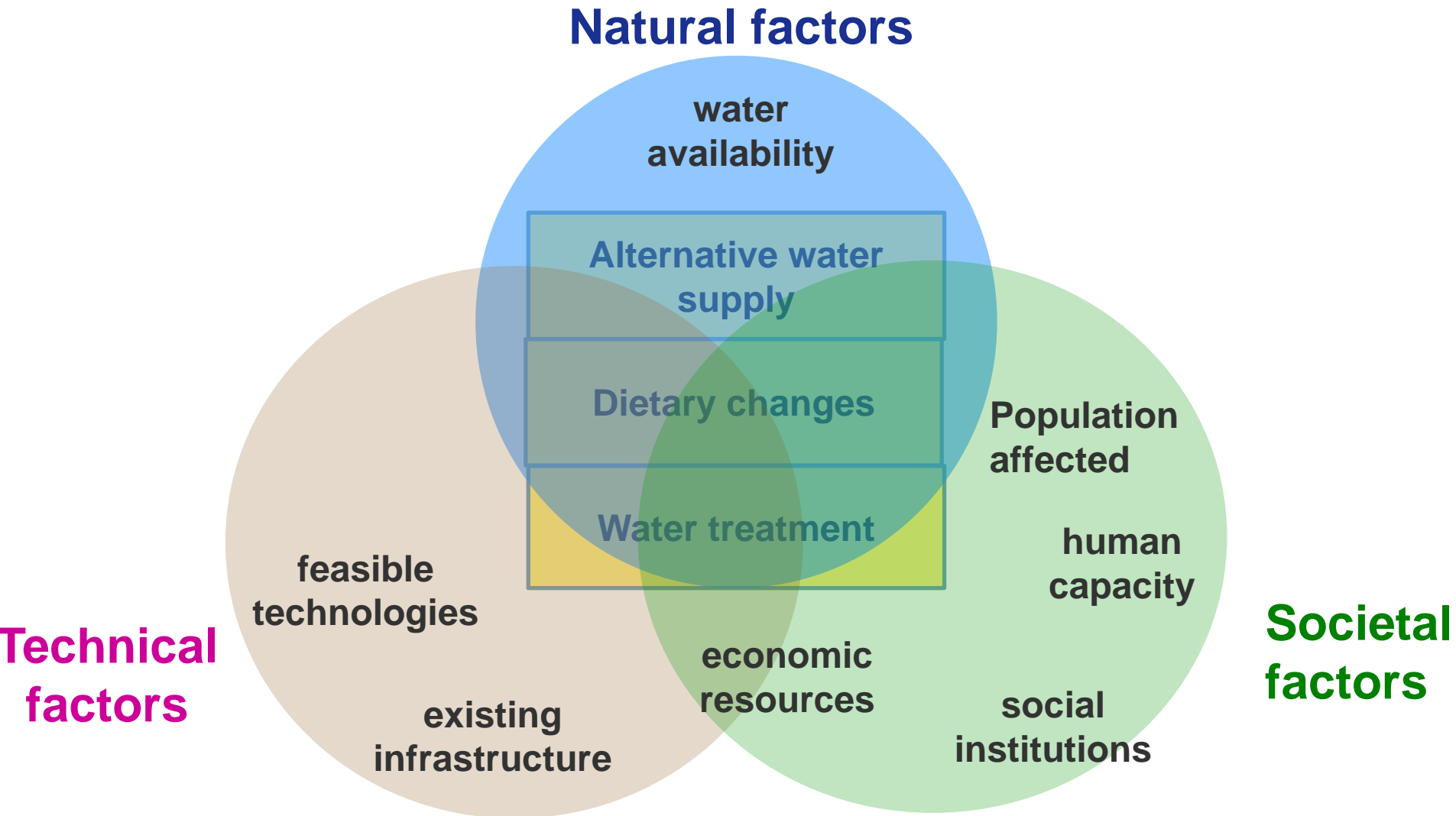
- Dental fluorosis
- Skeletal fluorosis
- Multiple non-skeletal symptoms

⇒ **WHO guideline**

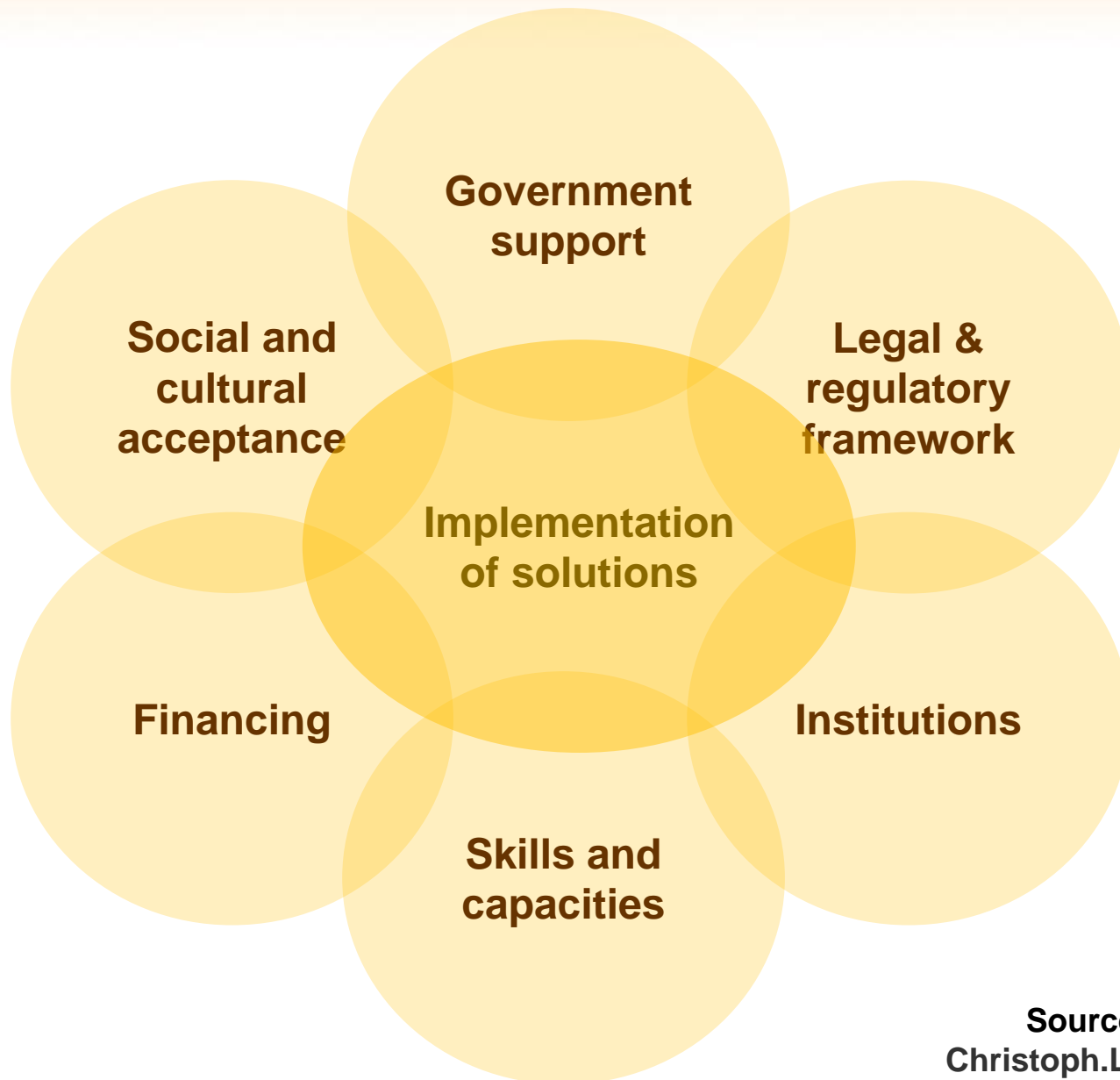
- 1.5 mg/L for drinking water



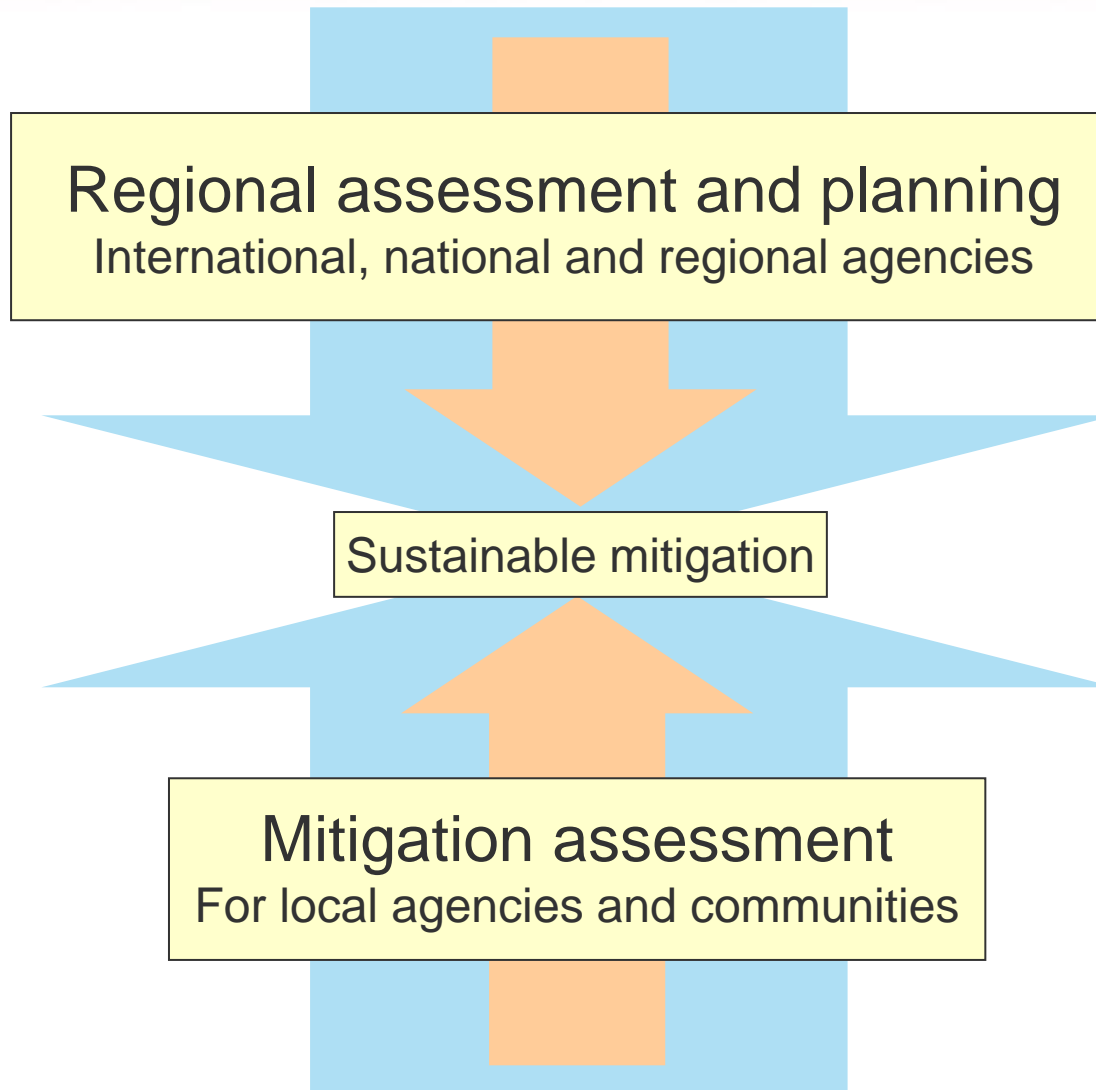
Factors that determine feasibility of mitigation measures



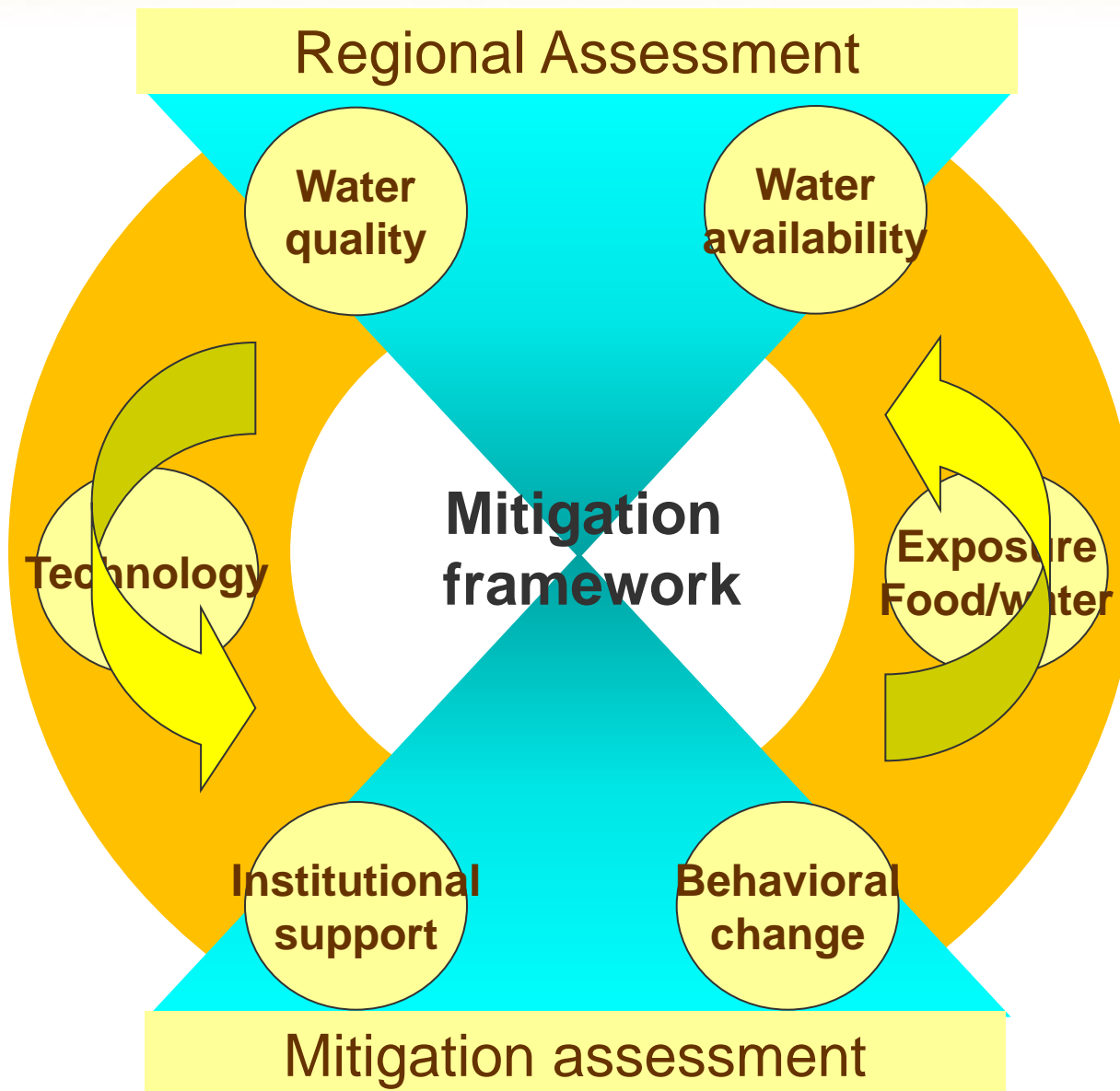
The enabling environment



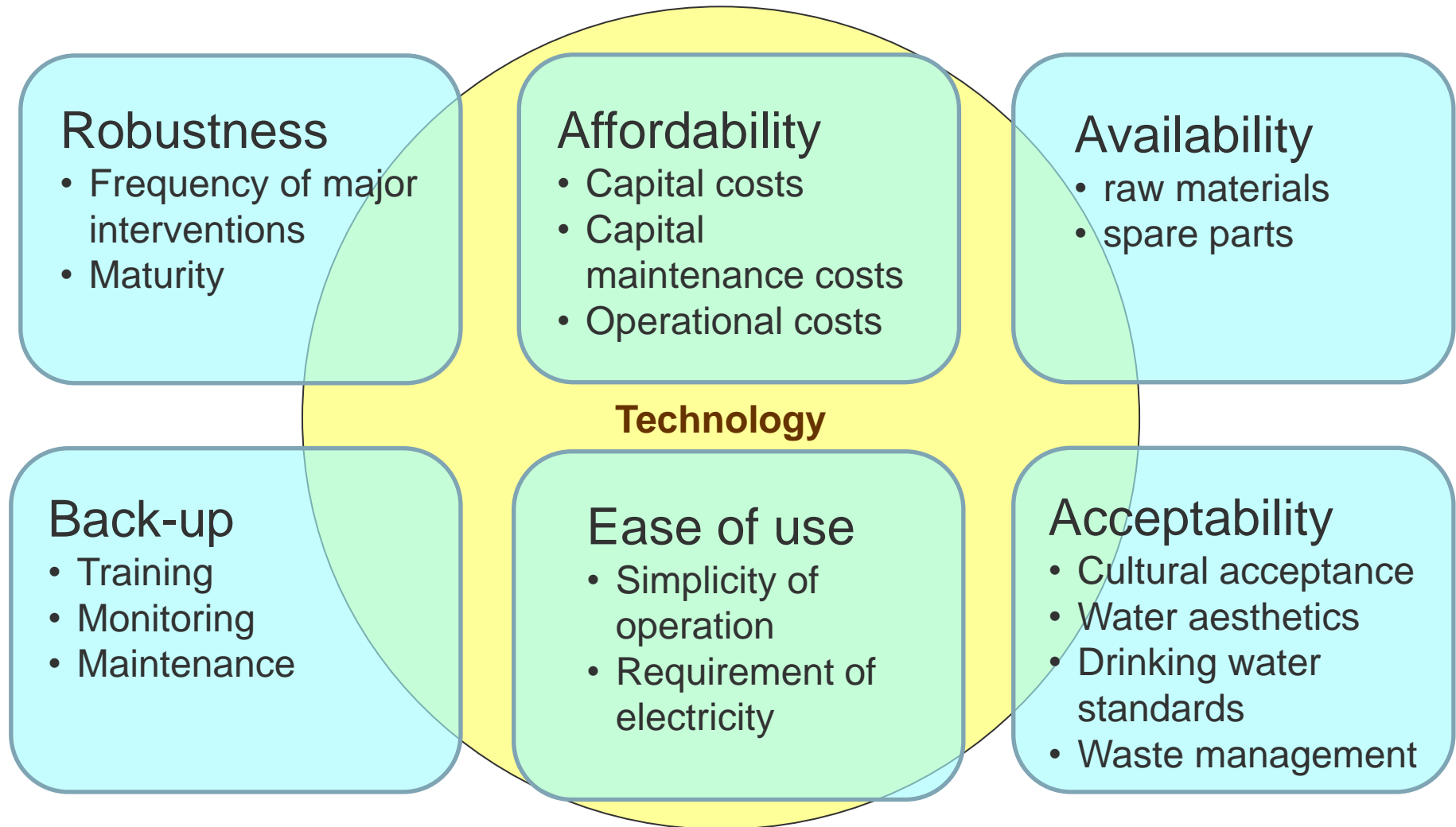
Required information



Eawag's Water Resource Quality project



Technology requirements



AAU / Eawag collaboration

To test the **acceptability** and **technical performance** of fluoride removal filters and to explore ways of **sustainable implementation**

- Technical performance
- Social acceptance
- Cost-efficiency

**Addis
Ababa University**



AAU

**Catholic
Diocese of Nakuru**



CDN

**Oromo
Self-Help
Organisation**



OSHO

Eawag

**Swiss
Interchurch Aid**



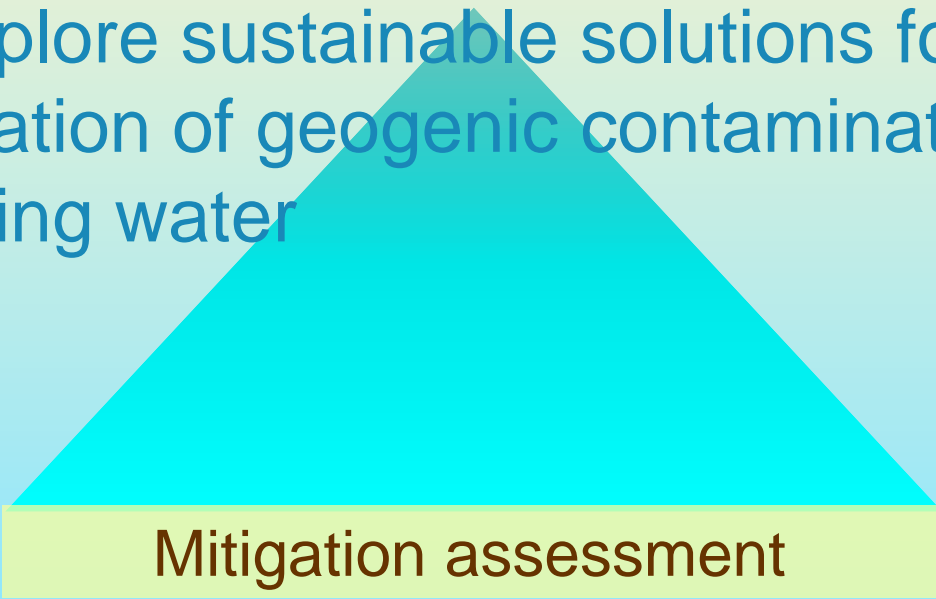
HEKS

Geogen2013

The aim is to bring together:

- Arsenic and fluoride specialists
- Technical and social scientists
- Researchers and implementers

⇒ to explore sustainable solutions for the mitigation of geogenic contamination of drinking water



Mitigation assessment

Programme

5 th February	6 th February	7 th February	8 th February
Welcome	Behaviour change	Drivers	Field trip
Health	Fluoride mitigation	Drivers	
Arsenic mitigation	Fluoride mitigation	Country case studies	
Arsenic mitigation	Country case studies	Panel discussion	
Poster sessions			