

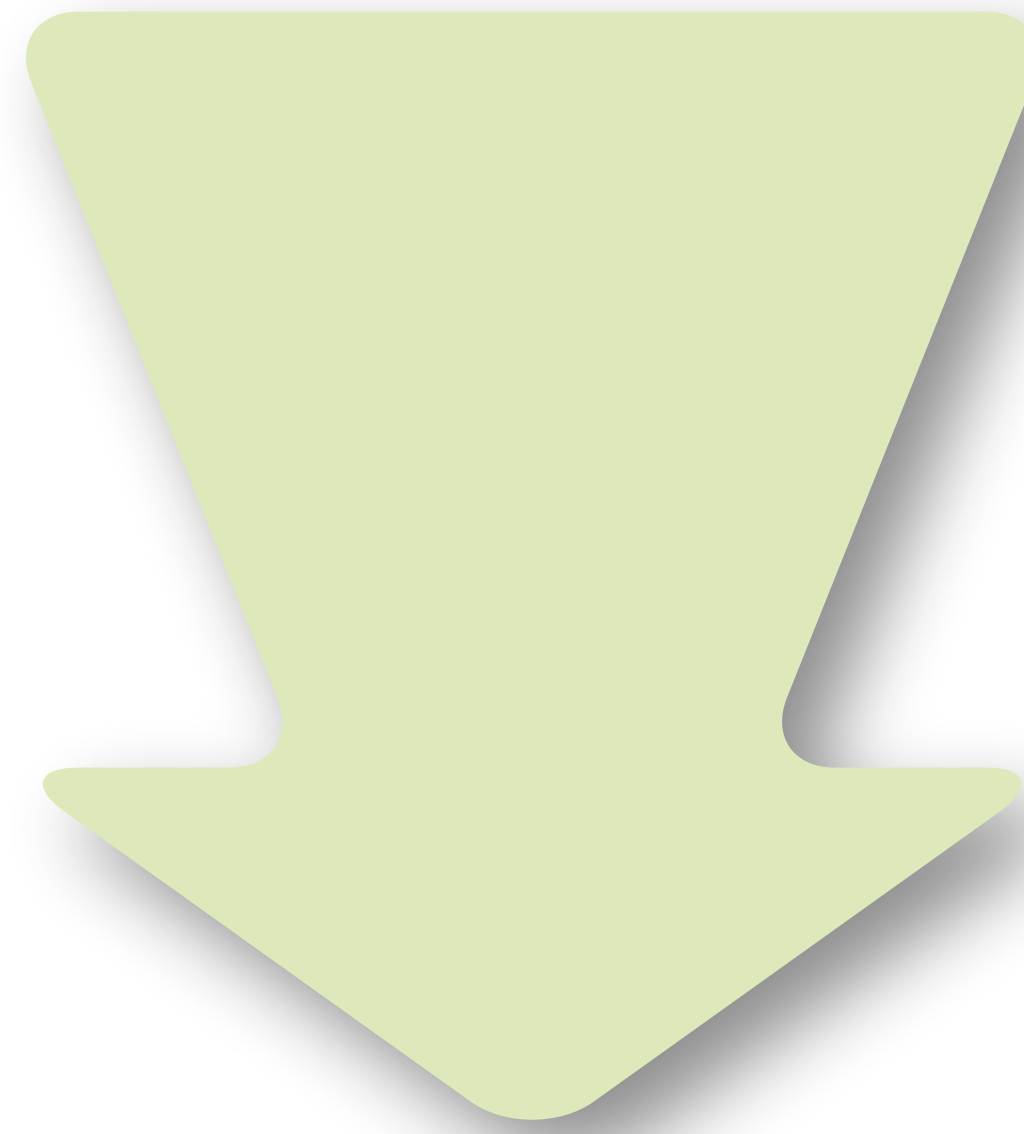
Sanitation

> flush to discharge <

current problems:

- eutrophication
- public health risk
- high water use
- nutrient loss
- lack of sanitary facilities

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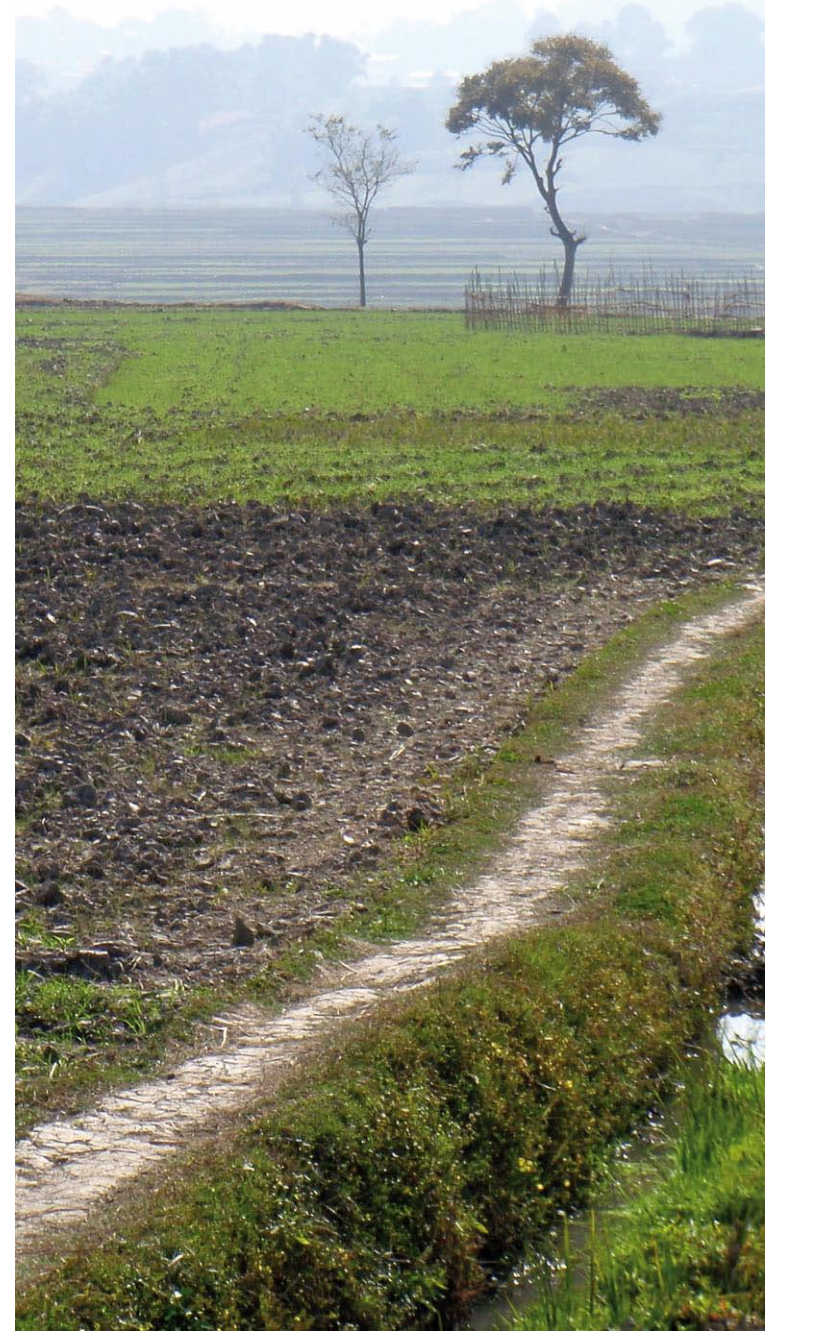


Agriculture

> mineral inputs <

current problems:

- resource depletion
- dependence upon imports
- increasing prices
- strategic interests
- food security



nutrient recycling

Struvite precipitation is one possible way to recycle nutrients from wastewater to agriculture.
The STUN project explored the potential of struvite production in the Kathmandu Valley, Nepal.

process inputs

urine

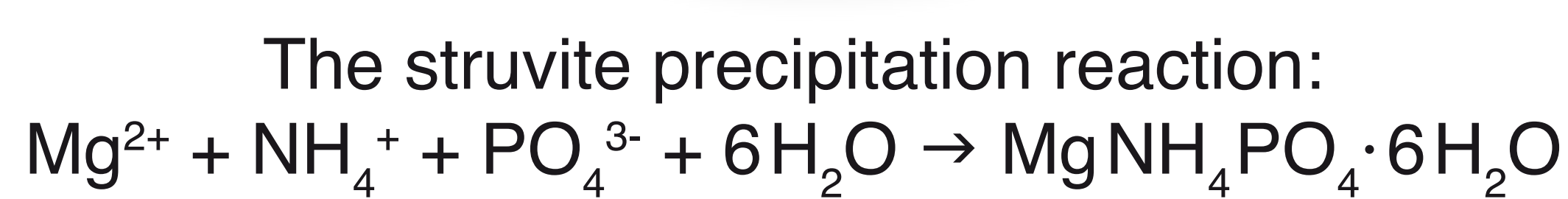
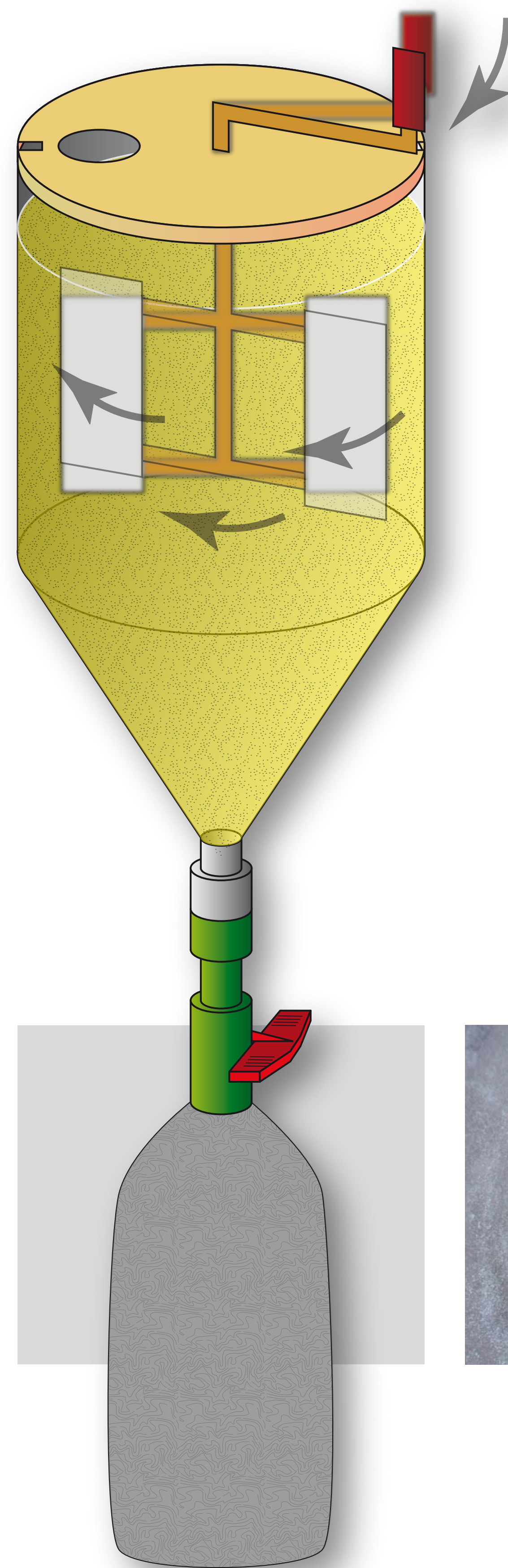
urine harvesting

- urinals
- urine diverting toilets
- any high-density concentration of people
- public buildings
- stadiums
- markets
- etc.

magnesium

magnesium sources

- magnesium sulphate: fertilizer powder magnesium content: 5 - 10 wt%.
- bittern: waste product of salt production magnesium content: 3 - 10 wt%.



development of the struvite process in Nepal:

- comparison of magnesium sources
- optimization of liquid-solid separation
- maximization of overall phosphorus recovery
- using exclusively locally available material
- granules production for user-friendly fertilizer

process outputs

struvite as a fertilizer

fertilizer comparison

urea	N		
DAP	N	P	
struvite	N	P	Mg

struvite in practice – a valuable fertilizer

- slow-release – continuous nutrient flow
- bio-available – easy uptake by plants

effluent reuse potential

effluent characteristics – additional nutrients

- high nitrogen (N) content
- high potassium (K) content

reuse potential – fertigation

- fertigation: fertilization by irrigation
- reduced clogging in drip irrigation