World Toilet Day: Creating Value from Urine

19 November 2009

To commemorate the international World Toilet Day 2009, Eawag is highlighting an innovative research project from Nepal which combines improved sanitation with increased food security. The STUN project, funded through Eawag's discretionary funds in 2008/9, investigated the feasibility of collecting urine to produce a phosphorus-based fertilizer called struvite.

Rising energy prices have led to rising fertilizer costs. As an example, in Nepal 2007 the price of some fertilizers rose over 700%. Eawag's STUN project (with the department Water and Sanitation in Developing Countries) examined the feasibility of converting source-separated urine into a dry fertilizer product called 'struvite'. Struvite – often called MAP for magnesium ammonium phosphate: MgNH4PO4.6H2O – is a powder-like fertilizer which can be precipitated from urine with the addition of magnesium.

Not only the technical aspects

Working in the Kathmandu Valley with the community of Siddhipur, the project has assessed the social, economic, and technical feasibility of producing struvite at the community level. By producing struvite from urine, we hope to promote improved sanitation, local food security, and nutrient independence as Nepal must import all of its fertilizer at prices which are not always affordable for subsistence farmers.

Figure: The STUN reactor showing the 7 steps of struvite production.
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Follow up with higher volumes

This pilot project proved that small-scale struvite production is technically feasible in areas where urine diverting toilets already exist. However, to reach economies of scale, increased urine volume (from sport stadiums, public toilets, etc) and an affordable supply of magnesium is needed (magnesium is currently imported from India). The second project phase in 2010 will therefore attempt to process higher volumes of urine and will examine the hygiene aspects.

This short video presents struvite production in Siddhipur (mp4, with English subtitles).

STUN research partners:

- UN-HABITAT Nepal
- University of Kathmandu
- Community of Siddhipur

For more info visit: www.sandec.ch/stun

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