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There is one source of fertilizer that seems virtually recession proof and protective against soaring prices as well – and that is the fertilizer in human urine. The world recession has seen the price of chemical fertilizer fall by almost half in a few months, but this is against a background of soaring increases in prices up to December 2008 in some countries. In Nepal, fertilizer prices rose 300-500% in the months up to December 2008, the Environment and Public Health Organization (ENPHO) reported. ENPHO is using the price increase to argue that urine is one of the best and cheapest organic fertilizers around.

ENPHO has for several years been promoting ecosan toilets which collect urine and faeces separately. However, storing and transporting the product of urine diverting ecosan toilets is often difficult. Efforts are under way to crystallise the urine into a solid form so that it can be stored and used more easily – and the village of Siddhipur in Nepal is in the forefront of research. Siddhipur is a farmers' village about 10 km south-east of Kathmandu with a population of about 6,100, mainly engaged in subsistence farming. The village is also known for the production of Suku straw mats.

The Swiss Federal Institute of Aquatic Science and Technology (EAWAG/SANDEC), together with UN-HABITAT Nepal, is conducting research on the production of struvite from urine in Nepal. Struvite is a phosphate mineral first discovered in medieval sewer systems in Hamburg, Germany, in the nineteenth century. It can be produced by adding a magnesium salt to urine, causing most of the phosphate and some of the nitrogen to precipitate and form white crystals that can be filtered out. The research – known as STUN – seeks to optimise the reactor and assess the economics of Struvite production.

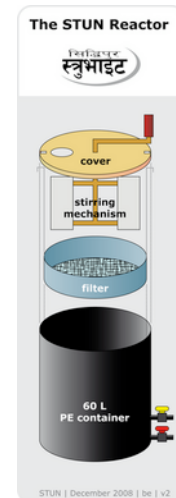


Struvite from urine researched in field laboratory setting (Photo: EAWAG).

Urine collected from households in Siddhipur

Human urine is collected from a dozen households in the village of Siddhipur. Then the "magic machine" (the struvite reactor), produces the powder through using a simple precipitation reaction, by adding magnesium and filtering out the solid with a cloth filter.

The project aims to adapt the pilot scale reactor, to obtain a low-cost, robust and simple method. Besides the precious yellow liquid, struvite production requires a magnesium source. But magnesium salts, such as magnesium sulphate, have to be imported from India. The research is now focusing on potential alternative magnesium sources, such as bittern (the waste product of sea salt production) or treated magnesite, a locally available mineral.



Schematic overview STUN reactor (EAWAG)

EAWAG and the Nepal agencies hope that in the near future powder production from urine will break new ground by being derived from public toilets in densely populated urban areas, where urine is generated in large quantities, and from rural communities, where transport to the field is difficult. Powdered extract of urine will facilitate nutrient recycling, transportation and storage, and will combine sanitation and sustainable soil management. Everybody will be able to make his or her contribution to healthy vegetables from the farm. Pee proudly.

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