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## Urine Separation and Urine Treatment to Produce a Mineral Fertiliser

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### Abstract

In the Mekong-delta waste water from households is not treated. Especially in rural and peri urban areas it could be possible to establish new waste water treatment systems. One option is to divert urine from the other waste water as urine contains more than 80 % of the N, and more than 50 % of P and K that is excreted by . Treated urine can be used as a source of mineral fertiliser in crop plants. Our research purposes are to recycle nutrients in urine instead of eliminating them and to prove that treated urine is environmentally safe to use. We have installed urine diverting systems in a school to collect the urine. The school is visited by female and male 200 pupils. Urine from male and females are collected in separate tanks. In the tanks (500 liters) concentrated sulfuric acid is used to inactivate pathogens and to adjust a low pH to prevent ammonia losses. During the first 3 months 500 liters of urine was collected. The urine was used to fertilise spinach and tomatoes in initial experiments. This collected volume of urine corresponds to a theoretical value of 0.014 liter/pupil\*d only. Thus, the system seems not be completely accepted. In a questionnaire that was performed prior of installing the toilets, students and teachers appreciated the toilet construction as the former toilets were in poor condition. The collected urine had N and P concentrations of 26.81 and 1 g/l, respectively. The urine was free of *Salmonella* and *E. coli*. In laboratory experiments acidified and untreated were dried to increase the nutrient concentration per kg urine. The urine was dried at 50°C for 72 hours. After drying, about 40 % were lost in the untreated and 18 % in the acidified urine.

Acidification seems to be efficient to reduce pathogens and volatilisation losses of ammonia. Other acids such as phosphoric acid could be used to increase the nutrient concentration. The results are the base for the a treatment unit of urine that will be collected at a dormitory in the University of Can Tho.

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