

ABSTRACT

OPTIMIZATION OF NUTRIENT RECOVERY PROCESS FROM HUMAN URINE- AN ECOSAN APPROACH

Md Azizur Rahman
(Awarded, 2016)

The liquid fraction of anthropogenic human waste- human urine-has for some time now been recognized as a potential nutrient source. Various methods have been developed for recovering and reusing nutrients present in human urine. Processes such as direct urine application to recovering nutrients in the form of struvite have been reported and practiced around the world. The concept of using urine in agriculture or for recovering nutrients India is still to gain wide acceptability. Except for few research reports on direct application of urine in agriculture and some studies on a continuous flow reactor for struvite precipitation from urine, these are limited reports on end users' precipitation, acceptability of urine in liquid form or in salt precipitate etc.

Any idea for implementation of Technology which is to be adopted by the society, it is important to analyze and take into consideration the societal, the technological and the scientific aspects of the Technology. At present there is no guideline to help local governments, be they are rural or urban- to choose which nutrient recovery technology is most suitable for particular context. Recovery of nutrients from human urine is an important aspect of environmental sanitation systems which will result in better health of water bodies as well as reduced energy consumption on wastewater treatment. This thesis aims in the connecting the dots between societal, Technological and scientific approach in developing and addressing the nutrient recovery process from human urine. A survey conducted among farmers' countrywide throws some light on which options may be preferred by potential end users of human urine or nutrients recovered from human urine. The study on comparison and evaluation of various nutrient recovery technologies based on net scoring method carried out by researchers recommend options for various scenarios helps in looking onto the options for nutrient recovery technology is governed by economic factors such as fixed costs, operational cost and value of the end product and by technological fit with the setting. Following the evaluation different processes of nutrient recovery, a process for maximal nutrient recovery (namely N, P and K) from human urine has been explored. It was concluded that desorption or ammonia from hydrolyzed urine followed by struvite precipitation can offer an encouraging option for nutrient recovery. This research opens up some new possibilities – Social, Scientific, and Technological- in visualizing urine not as waste but as a potential resource.