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| Title | Harvesting Human Urine in the Municipality of Tepoztlán, Mexico |
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Harvesting Human Urine in the Municipality of Tepoztlán, Mexico

The diverse benefits of urine-diverting (UD) toilets have by now been clearly demonstrated, as have the potential of using urine as a fertilizer. Nevertheless, in spite of the clear advantages of closed loop ecological sanitation (ecosan) approaches, the dearth of effective, affordable, and user friendly urine harvesting (UH) methods continues to be a major bottleneck for demonstrating that UD ecosan can be a viable sanitation alternative in urban settings. As anyone with direct UD toilet experience knows, the volumes of dried faeces are relatively small and can be dealt with at intervals of several months at a time, whereas urine is a constant flow -- and, unless it is disposed of non-ecologically in an on-site soak pit, the management of significant volumes of urine represents a major logistical, financial and cultural challenge.

Throughout 2004, the TepozEco Project, with financial support from the Swiss National Centre of Competence in Research-- North/South (NCCR-PAMS), EcoSanRes and UNDP, has given special attention to developing and testing UH strategies for "recovering and recycling valuable nutrients to stimulate local agricultural production and self-reliance."

Urine harvesting activities have included:

- Collection at public events, institutional settings and households,
- Design and testing of odourless urinals for both men and women,
- Construction and management of portable urinals for large scale public gatherings,
- Micro-enterprise development to provide mobile UH services events at public festivals and private celebrations (parties, weddings, etc.),
- Installation of permanent urinals in parking lots, sports facilities and restaurants,
- Hygienic measures and guidelines,
- Legislative framework and constraints,
- Education and promotion, and
- Coordination with public and private sector.

Processing and application strategies have included:

- Direct application on cash crops (nopal cactus, avocado, tomato, corn, etc.),
- Fermented urine for intensive orinoponic gardens,
- Application on compost at household, neighbourhood and municipal levels, and
- Trial applications of urine on the main soccer field.

In addition to reviewing the simple collection, transportation, storage and application techniques, the presentation will discuss the valuable lessons have been generated through the experience. Among the preliminary conclusions:

1. Results are particularly promising for urine harvesting in public and institutional settings, which offer greater volumes per collection point, than do domestic toilets. Nevertheless, a major hurdle has been the lack of public waterless urinals that are odourless, low-cost and offer easy access for emptying. The design and promotion of public and institutional urinals has become a major creative and logistical challenge of the program. TepozEco has been working closely with Mexico's principle supplier of public waterless urinals to design smaller, lower cost units (with an improved odour trap from in South Africa), for public, institutional, as well as household users. .
2. The local context in Tepoztlán does not offer the infrastructure or institutional capacity for establishing and sustaining a large-scale household urine collection system. For the time being, it seems that domestic urine will be best disposed of on-site (e.g. added to household compost, orinoponics, mixed with greywater; and direct application to trees, lawns and gardens.) -- and, possibly, transported short distances to neighbourhood eco-station composting facilities.
3. It is estimated that the medium term UH potential from public facilities within the municipality (including schools, public facilities, festivals, etc.) would be around 100,000 litres per year, sufficient to fertilize approximately 10 hectares with urine alone. Therefore, in order to fertilize large-scale agricultural plantations, it will be advisable to combine urine with other fertilizing techniques (such as application of manure, compost and other organic fertilizers). In other words, promote urine application together with sustainable, organic agricultural practices.
4. The UH strategy goes beyond simply closing the nutrient loop. The water saving potential, particularly in a town such as Tepoztlán with growing volume of tourism, is significant.
5. The UH project has contributed to awareness raising in terms of water conservation, as well as the potential benefits of urine as a fertilizer. By "demystifying" urine, the project has helped to achieve greater cultural awareness and acceptance of ecosan alternatives in general.
6. Long term sustainability of any UH system will depend upon the ability to create favourable conditions for primary stakeholders –i.e. private/social entrepreneurs, public service providers, local government, and/or farmers —to assume responsibility in the functioning of the system.
7. Involvement with public urinals inevitably raises associated issues, which eventually will also have to be addressed. For example, the installation of mobile urinals for men has generated a demand for urinals for women. Finally, it is difficult to focus exclusively on urinals without resolving the other part of the equation, i.e. adequate public toilets that provide efficient, hygienic and ecological disposal of faeces as well. Whereas the TepozEco project has begun to investigate options for eco-public toilets, (such as the Clivus Multrum), for the moment this seems to go beyond both the mandate and capacity of the program.