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Title	Implementation of ECOSAN: Challenges & Opportunities in Nepal
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Implementation of ECOSAN: Challenges & Opportunities in Nepal

The concept of ecological sanitation (Ecosan) is not new for Nepal as farmers from the Kathmandu Valley have been applying night soil in crop fields for decades. However, due to lack of awareness and knowledge, this practice has not been hygienic. The present Ecosan system therefore can be taken as a sanitary intervention for better management of human excreta without posing threat to the human health and the environment. This new approach was first discussed in Nepal in 2001. Today several water supply & sanitation implementers are showing interest in this system and are initiating programs on Ecosan system like implementation of dry toilets in periurban areas of the Kathmandu Valley. In addition, it has also been reflected in national sanitation strategy. Environment & Public Health Organization (ENPHO) with financial support from Water-Aid Nepal initiated a pilot program at Khokana, a village 12 km south of the capital city in 2002, with construction of 10 dry toilets. ENPHO envisions setting this village as a model Eco-village. Today 40 dry toilets are in operation in this village and 50 more will be constructed in near future. The toilets are constructed on a demand basis from the community on household scale. The benefiting household contributes 30% of the total cost in cash or in kind. Till date more than 100 dry toilets have been constructed by various organizations in different peri-urban areas of the Valley.

Aside from construction work, research is also a major component of the program in Khokana. Some of the major research topics are the effect of application of human excreta on crop productivity and the fate of microorganisms in the stored faeces. From the experiment conducted on potato crop, it was observed that even though the productivity was low with urine application (12t/ha) than with chemical fertilizers (16t/ha), it was still comparable with the national average potato yield (11t/ha). Although a one-time experiment, this result is an indication that human excreta especially urine could be a substitute for chemical fertilizers with a long-term benefit for farmers of Nepal. Factors like pH, temperature and moisture though to be important for fast reduction of microorganisms in faeces were not in optimal levels in the 4 dry toilets studied over a period of three months. Thus, none of these factors were considered to have contributed as a single important factor for the reduction of the indicator microorganisms in any of the toilets. However, a combined effect of all these factors was assumed to have lead to a decrease of the selected indicator microorganisms (*E.coli*, total coliforms and Enterococcus). However, required log reduction was not achieved in any of the studied toilets and there was no observable reduction of *C. perfringens*. Thus, one of the main challenges for implementation of dry toilets is the

sanitization of faeces. Optimal storage conditions can be achieved with proper trainings and awareness among the users. Even when the users are very positive about this sanitation system, due to lack of adequate training, the system is not functioning well.

It is envisioned that the activities in the Eco-village will facilitate the expansion of the concept of ecological sanitation to other parts of the country. This paper describes the implementation approach, design, cost, recommendation for further improvement and techniques for replication of this technology at national level.