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### Advancement of Ecological Sanitation (Ecotoilet) in Nepalese Context

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It seems that Ecosan had been practiced in Nepal since ancient times. Collection of human excreta (particularly in the Jyapu, an ethnic, community in the Kathmandu Valley) and use of it in agricultural purposes still exists in some places of Kathmandu, the capital of Nepal. But current practice is liable to risk human health as the personal and community hygiene is not taken in to account while collecting and using the toilet content in the farms.

In ancient times people of Kathmandu used to live in a dense cluster (community/groups) and used to have series of pits in the vicinity for collecting different kinds of wastes. "Mala" is the name given to a pit for community toilet. Mala consists of a long pit (surface drain like structure of about 40-60 cm deep and 30 cm wide without partition) for defecation purposes. It can accommodate 10 to 15 people at a time. There exist separate Mala for Male and Female. The purpose of "Mala" was only to collect faeces but when the nutrition value of the pit content was known they started using it for agriculture purposes. "Saga" is a name given to a pit for collecting garbage, vegetable peelings etc. Similarly "Nauga" is the pit situated below the staircase of almost every (old) house in Bhaktapur where nighttime urine is collected along with ash. Mala and Saga are emptied when they become full and Nauga is emptied either when it is full or when there is a necessity of fertilizer. It is said that the fertilizer value of Urine was not known at that time but people were thinking that Ash is a good fertilizer. Ash production was very high such that they need a place to store it to use it later on as a fertilizer because fuel wood was the only source of energy for cooking, heating etc. The concept of mixing ash with urine was therefore solely for aesthetic purposes.

Nepal is a one among the poorest countries in the world. It is estimated that about 70% of the people of Nepal have access to piped water supply (not necessarily treated water) whereas only 25% have access to sanitation (toilet) system. It implies that huge amount of money and effort is needed to cover all population by potable water supply and sanitation

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system. It is estimated that there are about 700,000 Tubewells (shallow ground source) presently in use in Terai region of Nepal serving drinking water for about 90% of the Terai population of 11 million. A survey conducted by the Department of Water Supply and Sewerage has revealed that more than 55% of these Tubewells are microbiologically contaminated.

More than 80% of the people of Nepal are farmers and 90% of the farmers do farming for subsistence. Agricultural productions contribute about 50% of country's GDP. Agricultural sector has been categorized as the top priority sector since 1960 (from the first 5-year plan when planned development in Nepal was initiated). But, Nepal once one among the food exporting countries has turned into a food importing country. The environment of the country has also deteriorated substantially by the unplanned and unscientific use of natural resources such as air, soil, water, air and forest. Fertility of the soil has also been declining and studies show that productions in mountains is decreasing at a rate of 40 Kg per ha per Yr. Country has to spent huge amount of money every year to import chemical fertilizer from neighbouring countries. As the condition of the rural people is even worse they can not afford buying chemical fertilizer to increase the agricultural growth.

Because of its poverty, Nepal can not afford for high tech, centrally controlled sewer systems. Instead it should go for cheap and sustainable solution to sanitation systems, which at the same time conserves water and fertility of the soil as well. It is therefore urgent to integrate sanitation system with agricultural practices.

Since people had been using urine/ash mixture as fertilizer, the Ecosan concept adopted by DWSS in a pilot project in Siddhipur village (in Kathmandu valley) is a good example of sustainable sanitation systems integrated with agriculture practices appropriate in rural parts of Nepal. Most of the people, who own a piece of land for agricultural purposes, seem to be quite happy with Ecotoilet whereas people without their own land are not satisfied to the scale intended. This paper describes past and present Ecosan practices in Nepal and necessary developments to be made keeping In view the health and hygienic concern of the people and possibility of integration of water and sanitation facilities with agriculture.

This paper also explores the possibility of extending Ecological Sanitation (Ecotoilet) to other parts of Nepal and to other communities who think that faeces should not be touched or applied in the agricultural fields. It is also intended to improve the existing design of Ecotoilet (drawing included in the full text) based on the user's perception and socioeconomic condition to make it more users friendly considering local conditions and cultural values.