

031
Improved traditional Ladakhi composting toilet

Leh, India

ECOSAN SYSTEM	SOLID BIOWASTE	FAECES	URINE	GREYWATER	RAINWATER
APPLIED COMPONENTS					
COLLECTION		Traditional composting toilets			
TREATMENT		Storage, dehydration, composting with earth			
UTILISATION		Compost for fertilization on crops			

1 General Data

Type of Project:
 new constructed demonstration facility (1986)

Project Period:
 Start of planning: 1985
 Start of operation: 1986

Project Scale:
 1 demonstration toilet in the Ecology Centre guest house used by appr.100 persons/day

Address:
 LEDEG
 Ladakh Ecological Development Group
 Ecology Center, Leh, India

Planning Institution:
 LEDEG

Executing Institution:
 LEDEG

Supporting Agency:
 none



figure 1: Project region of LEDEG

3 Location and general conditions

Ladakh or "Little Tibet" is one of the last remaining traditional cultures on earth. It is located in a mountainous desert 3.500 m above sea level with long cold winters and severe water scarcity with rainfall below 100 ml per year. In the seventies of the last century tourism came to Ladakh undermining traditional agrarian lifestyle and values.

In the case of sanitation, especially in the capital of Ladakh, Leh, people try to replace traditional sanitation systems by waterborne toilet systems. This development increases water supply problems and pollution of surface and groundwater due to leakages and disposal of untreated wastewater etc. The waterborne systems often simply drain into the irrigation systems of the urban and peri-urban agriculture of Leh leading to smell and hygienic concerns. An additional problem for waterborne systems in this region is freezing of pipes etc. during winters with temperatures reaching minus 30 °C.

In 1978 the ecological Ladakh project was founded with participation of the International Society for Ecology and Culture ISEC (GB) in order to preserve and develop ways of living adapted to the local conditions and values. As a continuation in the meanwhile the influential



figure 2: Agricultural field in Ladakh

indigenous NGO LEDEG has been actively promoting e.g. adapted ecological technologies for renewable energy generation, locally manufactured household and agricultural devices etc. which can now be found all over Ladakh. LEDEG is also running a visitors' centre in Leh establishing a soft tourism and facilitating close contact of tourists to the nature-based life of the Ladakhi society. The traditional toilet system is run in this centre.



figure 3: Ecological farm house in Ladakh (source: ISEC)

2 Objective of the project

- This project represents rather the revitalization of the traditional ecological sanitation practise that is threatened to fall into oblivion than the introduction of innovative technologies. Therefore it serves educational purposes by:
- presentation of the improved traditional Ladakhi sanitation and reuse concept to local, national and international visitors.
- information about the advantages of the traditional system and research and development on possible improvements to optimize the utilization.
- awareness raising that waterborne systems are no viable option for the region.

4 Technologies applied

The toilet at LEDEG is used by the workers and visitors of the LEDEG centre. It is based on the traditional local toilet system, improved by a black-painted vent-pipe (like in VIP latrines) to ventilate the collection chamber and reduce annoyance by flies. The traditional Ladakhi toilet system is well described

in the book "Ecological Sanitation", published 2004 at SEI :

"Most traditional houses have an indoor toilet on the upper floor (see Figure 3.16). Due to an extremely dry climate it is possible to process human excreta indoors without prior diversion of urine, by using a combination of soil composting and dehydration.

On the floor of a small room typically in some distance to the kitchen/living room there is a thick layer of soil from the garden. In the floor a drop hole leads to a small ground-floor room. This room can only be reached from the outside. People excrete on the soil which is on the floor. Then they push soil and excreta together down the drop hole. Urine goes the same way. Ashes from the kitchen are added from time to time. The household members bring loads of soil into the room when necessary.

For the long winter (September–May) a supply of soil is piled into one corner of the toilet room upstairs. A spade or shovel is also kept in the room. Normally there is no anal cleaning. The decomposed excreta are removed in spring and again at the end of summer and spread on the fields.

As long as the toilet is well maintained and enough soil is pushed down the drop hole every day, there are no odours. In some cases there might be a faint smell of ammonia from urine splashed on the soil-covered floor of the toilet room. There is no fly breeding due to the dryness of the soil/excreta pile. The system has worked well in rural areas for hundreds of years but in recent years there have been some problems in the central part of the town of Leh where households have no easy access to soil. <<

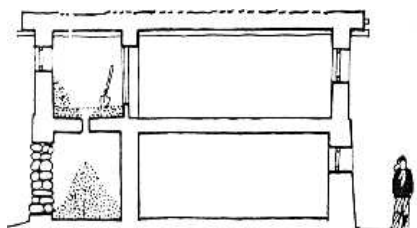


figure 4: Section of Ladakhi toilet (source: EcosanRes)

Other problems occur e.g. in places rented out to people with different toilet behaviour like utilization of water for anal cleansing. This increases the moisture of the material to be disposed and thus odour and fly breeding. Also the removal of humid excreta mixture gets more difficult, so that people sometimes refuse to do it properly.

Open question and interest of LEDEG is to design, improve and promote the sys-

tem in a way that it can be commonly used in guest-houses etc. were currently waterborne systems are introduced and causing problems for Leh. Any suggestion for improvements in this respect by users or resource persons is welcome and will be considered.

In the authors' perception the owners of the guest houses as well as the visitors simply anticipate the necessity of flushing toilets without thinking of the consequences. It is hoped that awareness raising campaigns and information material can help to understand the advantages of an improved traditional system.

It shall be a visible advantage of the guesthouse to have a toilet system which is both based on traditional practice and ecologically sound.

5 Type of reuse

In India faecophobia is prevalent. Not so in the upper Himalayas where traditionally excreta were composted and seen as important resource for nutrients since centuries

The quantity of composted excreta material collected for reuse is about 3 m³ per year. The amount of soil added per year is about 2 m³. The excreta material is traditionally collected for reuse as fertiliser and soil conditioner once a year. Urban agriculture is common in Leh.

Due to the very low temperatures the material has not always finished the composting process until the collection. It is therefore taken out, brought to a nearby field (200 meters) and covered with soil to finalize the composting process. After a period of 20-30 days it is applied to the fields to grow barley or vegetables.



figure 5: Agriculture in Ladakh (source: ISEC)

The excreta material is taken out by labourers (or in villages by the farmers themselves) and brought to the fields. This work does not have problems due to being related to dignity questions in this region. The material is seen as valuable material, usually produced and used by the same farmer family.

6 Further project components

As mentioned in the beginning LEDEG, amongst other activities, also promotes

- wind and solar energy as well as small scale water power for diverse household purposes, crop drying, greenhouses, grain grinding etc.
- ecological farming and food production without pesticides and artificial fertilizers
- adapted ecological building
- a women association supporting female autonomy, amongst others by business activities like handicraft etc.
- tours serving sensibilisation for the local natural, social and political conditions

7 Costs

The construction of the toilet was included in the ordinary construction of the ecological centre. Total investment was 40.000 Indian Rupies (appr. 650 €).

O&M is done as collaborative work.

8 Operation and Maintenance

See chapter 4.

9 Design information and technical specifications

The toilet is designed according to traditional knowledge.



figure 6: Traditional toilet (source: LEDEG)



10 Practical experience and lessons learned, comments

If the toilet is properly used and maintained it is accepted as the traditional solution.

Information material in or near the toilet is presently discussed as it would probably raise the awareness about the advantages of the toilet and explain some of the visitors (mainly tourists) how it works.

11 Available documents and references

ISEC Website, The Ladakh project:
www.isec.org.uk/pages/ladakh.html

12 Institutions, organisations and contact persons:

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data sheets for ecosan projects

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