

The Solar Loo on Top of The World

Special Event on Sanitation Technologies

International conference on

Water-Harvesting Storage and Conservation

IIT Kanpur



November 2009

**Asit Nema, Fdn. Green-Ensys, New
Delhi**

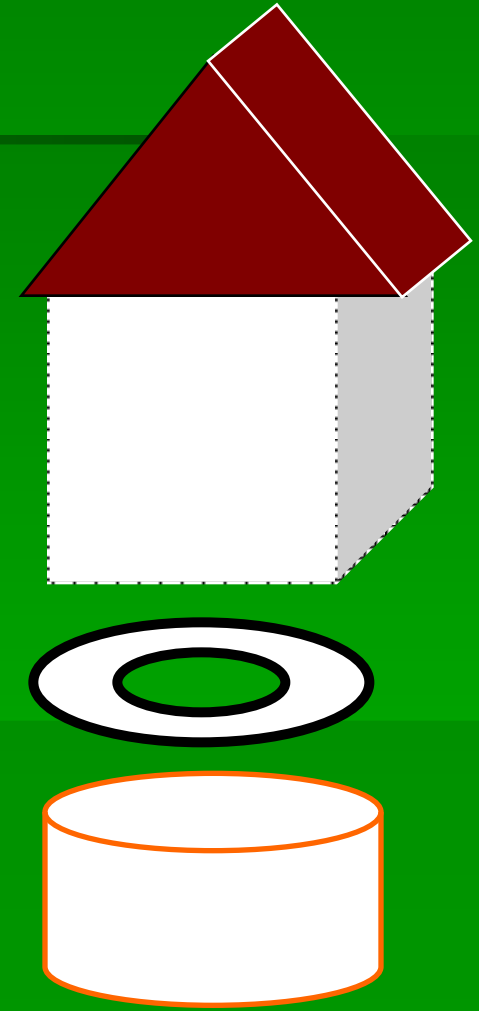
On-site sanitation and need for options

- On-site sanitation :
excreta retained and
treated at the site of
defecation

Superstructure

Platform

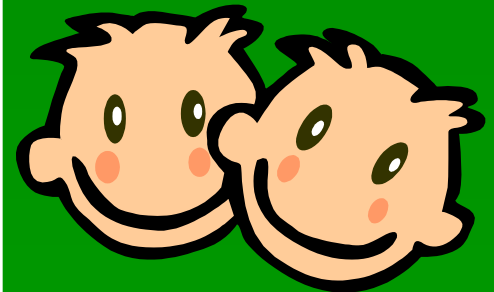
Sub-structure



Criteria for satisfactory on-site sanitation

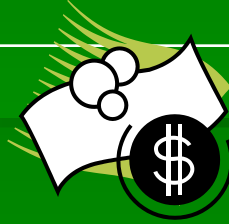
- On-site sanitation facility should :
 - Not lead to contamination of surface soil
 - Not contaminate springs or wells
 - Not contaminate surface waters
 - Not give access to flies or animals
 - Involve minimum handling of fresh excreta
 - Offer freedom from smells and unsightly conditions
 - Be simple and inexpensive in construction and operation, and

FINALLY A
LATRINE
SHOULD
BE LIKED
BY THE
PEOPLE



Need for options

- Affordability



- Desired level of aesthetics



- Social customs and practices
- Personal hygiene practices

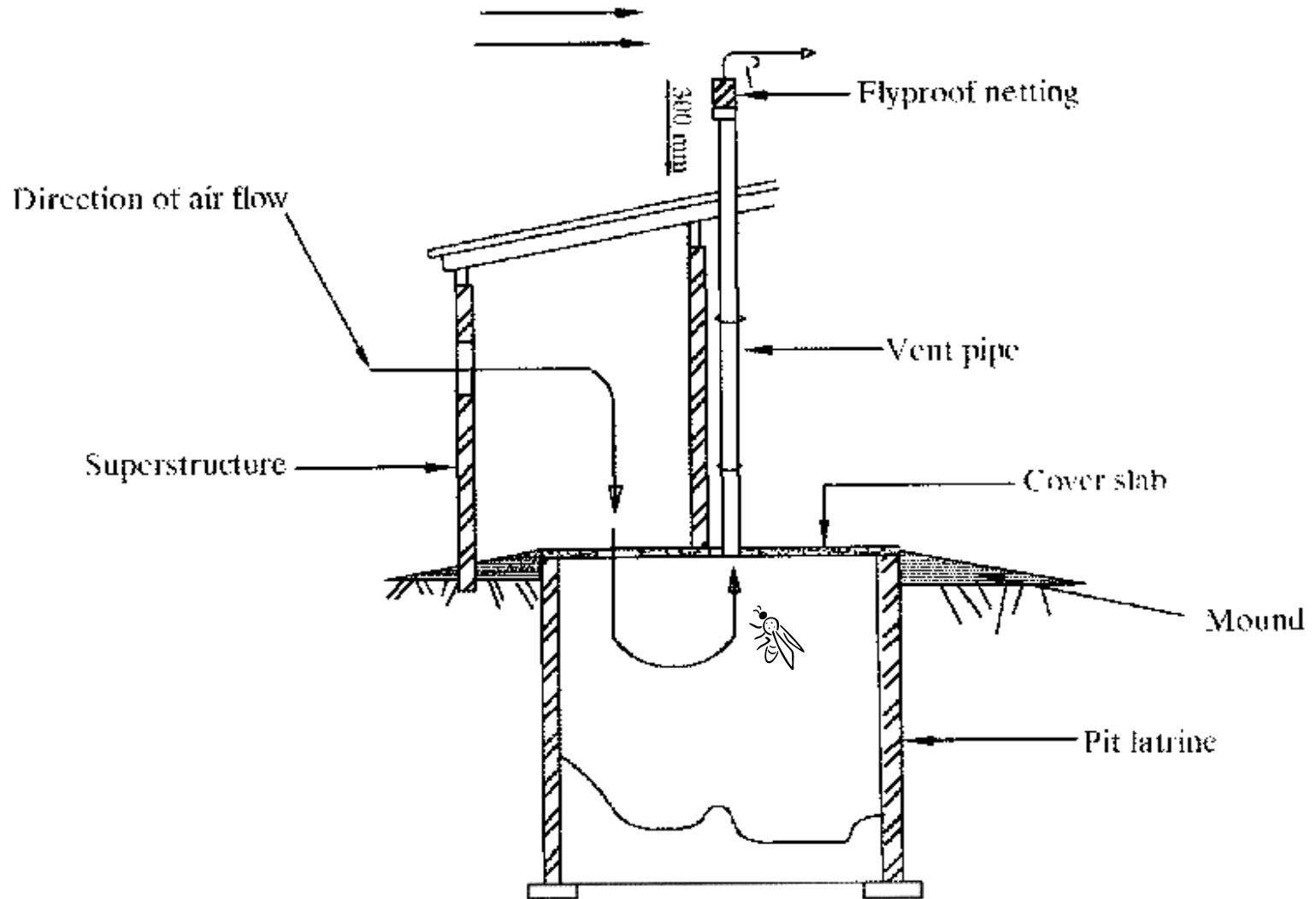


- Preparedness for emptying
- Preparedness for constructing additional pit
- Preference for recovery of compost

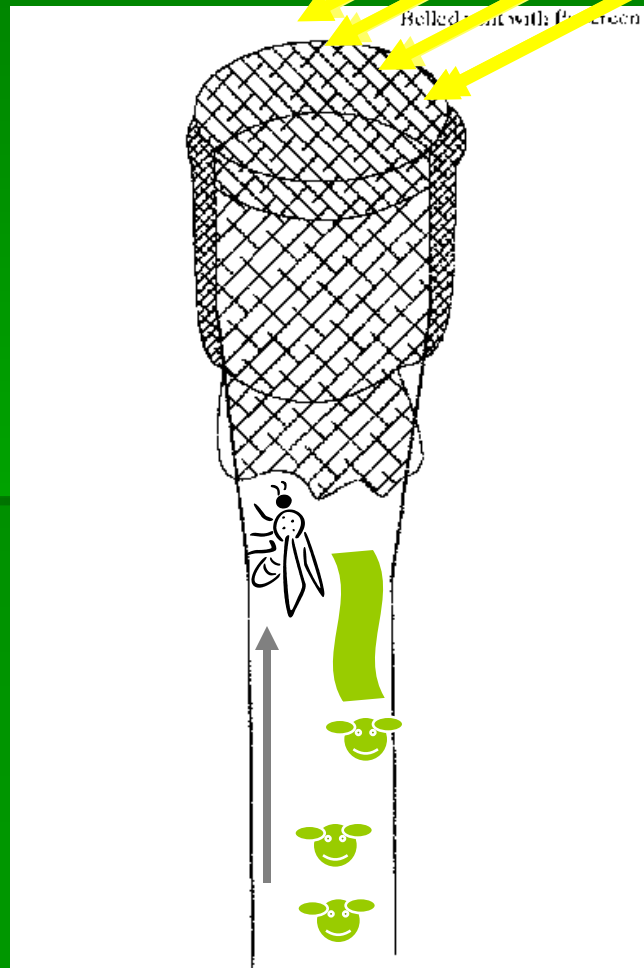
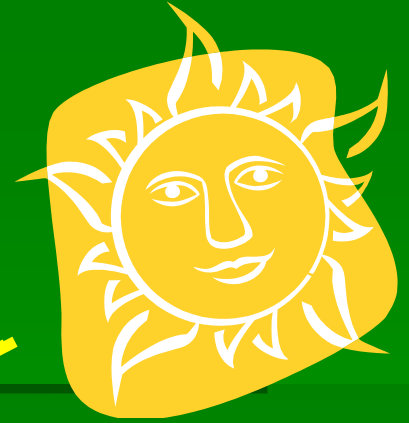
Need to account for boundary conditions

- Availability of water - Village Watefal
- Density of population
- Land availability
- Proximity to drinking water source
- Rainfall and flooding pattern
- Soil conditions
- Groundwater conditions

The VIP latrine



Screen on the vent pipe



The VIP latrine

- **Kea features**
 - A low end, entry level option
 - Easy to construct
 - Needs no water for operation
 - An optional lid on the hole also reduces smell and fly nuisance
 - Shelter is kept dark to prevent flies
 - A raised platform prevents entry of surface water

The VIP latrine

■ Advantages

- Easy construction and maintenance
- Absence of odours and minimal flies and mosquito nuisance
- Less water consumption thus no concerns for infiltration of wastewater
- Minimum risk to health

The VIP latrine

■ Disadvantages

- Unclean floors may lead to spread of hookworm infestation
- Damaged screen or larger mesh size – fly breeding
- Breeding of mosquitoes in wet pits

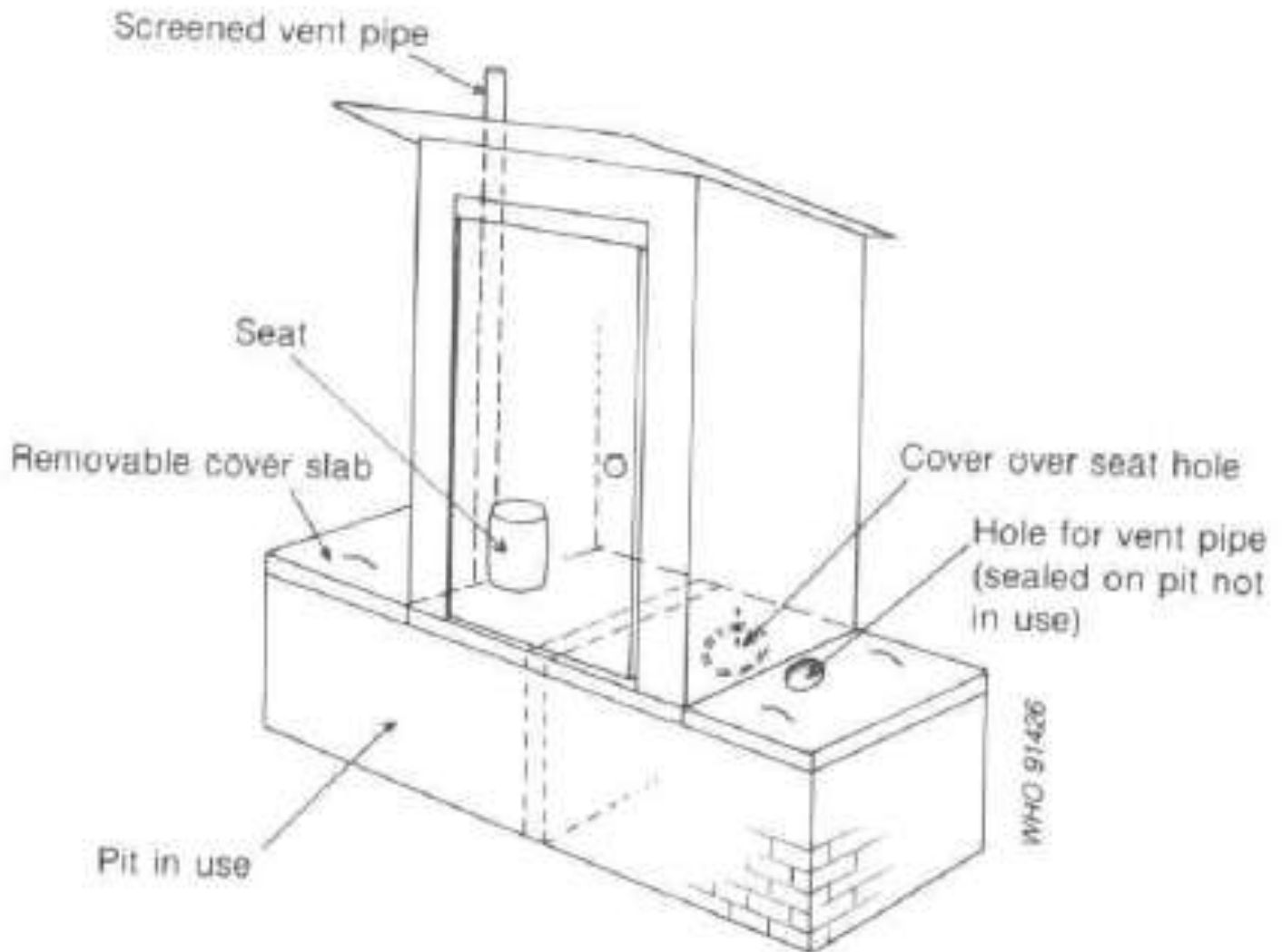
The VIP latrine

■ Applicability

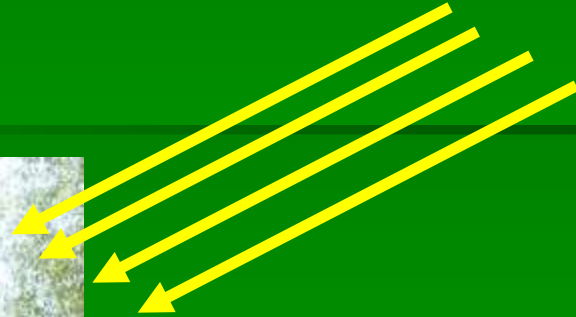
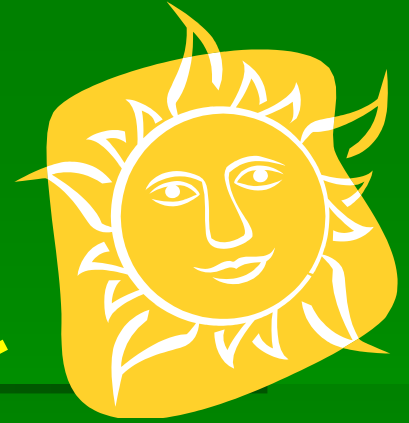
- Particularly suitable in rural areas where there is no on-site water supply
- Suitable in impervious black cotton soil as well as porous soils
- A raised pit latrine is suitable in soft rock and hard impervious rock strata
- Suitable in shallow groundwater table area after corrections

Most appropriate solution for entire Maharashtra

Double pit VIP latrine



The VIP with solar dimension



Welcome to the Top of the World



It's a cold desert !



The Dry Latrines of Ladhak





Some more from Ladhak....



The Solar Loo of Ladhak!



Design by:

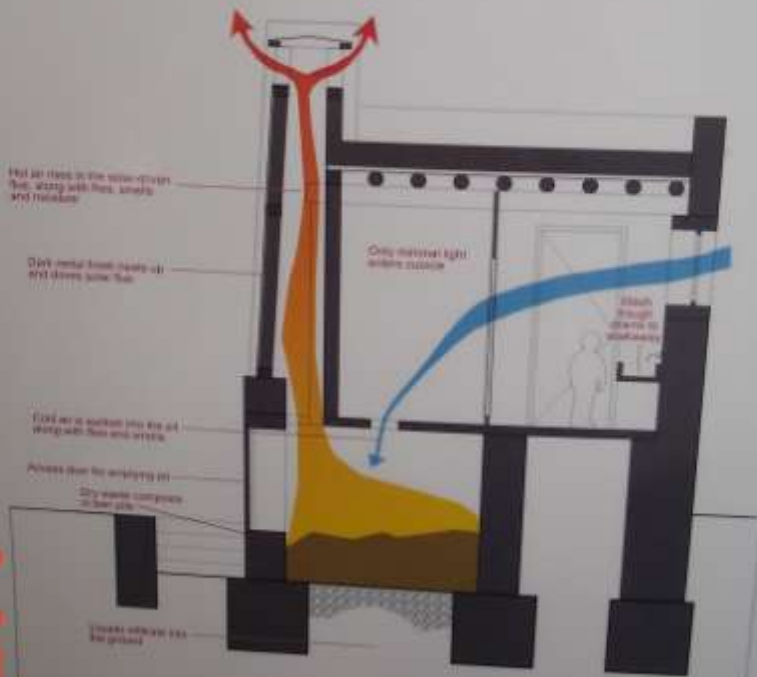
Aroop Associates, UK

The ventilation arrangement

VIP LATRINES

(Ventilated Improved Pit)

The latrines are oriented to face due south, so that the black angled chimney will heat up and draw air and smells from the below ground waste pit to rise up through the fly screens and out to the sky at the top. The cubicles are designed to be dark when not in use, so that flies will be drawn toward the light at the top of the chimney. Ventilation gaps above and below the cubicle door allow the cooler outside air to flow into the cubicle, down the draught hole into the waste pits, and then up through the chimney as described above. Once a year the waste pits are emptied via the access doors and the humus is used as fertilizer.

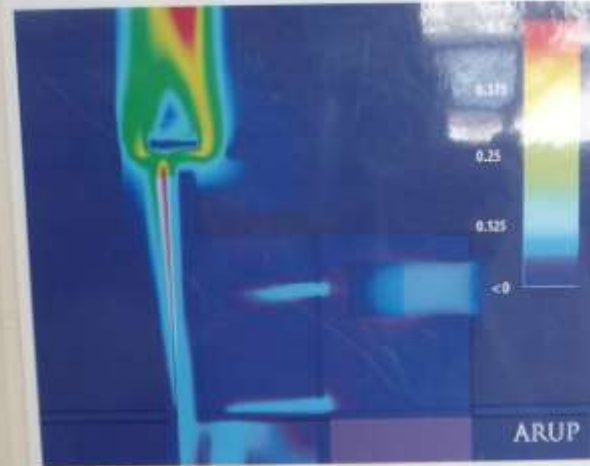


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Computational Analysis of Air Movement Through the Chimney



VIP LATRINES Norman's Improved Pit

Below:
Each of the solar ventilated latrines has been designed to adopt and enhance the traditional dry latrine. The individual buildings are built of stone with a black angled solar chimney.

Left:
The latrines were designed and tested using computational fluid dynamics. The image at left demonstrates how the air gains speed and is sucked up and out as it is heated by the solar flue. The temperature differential created by the solar chimney induces the draft and drives the flue.



27 2009

Thank you very much



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