PORTFOLIO COMMITTEE ON WATER AFFAIRS AND FORESTRY

Sanitation Technology Options

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Sanitation Technology Options

- The facility options include:
  - **Dry Systems**
    - Ventilated Improved Pit toilet (VIP)
    - Ventilated Improved Double Pit toilet (VIDP)
    - Compositing/urine diversion toilet (UD)
  - **Wet Systems**
    - Pour-flush toilet
    - Aqua-privy and soak away
    - Conservancy tank
    - Septic tank and soak away or small bore solid free sewer
    - Shallow sewerage/ Condominium system
    - Full borne waterborne sewerage

- As the options move up the sanitation ladder, so they increase in financial, resource and technical requirements and organisational structural needs.
The VIP is designed to reduce two problems encountered with traditional latrine systems:

- Bad odours
- Insect proliferation

The vent pipe is covered with a fly screen. Flies are attracted by light and if the latrine is suitably dark inside, the flies will fly up the vent pipe and die.
VIP Top Structures
Putting the Environment back into the VIP: The Arborloo

- The VIP should make use of human excreta and turn it into something useful.
- An ecological VIP toilet would not just “drop-&-store” excreta in the pit but rather reuse/recycling of excreta products.
- A simple pit latrine called the Arborloo, is one such toilet.
- The Arborloo
  - Is a simple latrine with a portable top structure.
  - Needs additional ingredients such as soil, wood ash to regularly be added to the pit.
- Once the pit is full, the slab and the superstructure are moved to a new pit.
VIP Variation: The Archloo

- The Archloo
  - Uses the same principle of the VIP
  - Superstructure is in the shape of a catenary arch
  - Is made by draping Hessian over catenary-shaped forms
  - Hessian is painted with a cement slurry before plastering the consecutive layers of cement mortar
  - Self-supporting arch and the wooden forms are removed once the mortar is dry
Ventilated Improved Double Pit Latrine (VIDP)

- The key technical requirements are the same as the VIP except for:
  - Having two shallow pits.
  - Each pit has its own drop-hole and vent pipe
  - The pits are used alternately
  - It is more expensive to build
  - It can be emptied
  - It requires greater operation inputs from the user
Putting the Environment back into the VIDP: The Fossa Alternna

The Fossa Alternna toilet:

- Is a simple alternating pit toilet system designed to make humus suitable for agriculture
- Has a slab and superstructure on the one or two permanent shallow pits
- Adds wood ash, soil, organic kitchen scraps, leaves to the pit to encourage composting
- The slab and superstructure are moved to the new pit once the first pit has been filled.
Urine Diversion Toilet (UD)

- Urine is an excellent soil fertiliser that is rich in nitrogen, phosphorus and potassium.
- Through source separation of human urine:
  - The quantities of nutrients that can be recycled to arable land can be significantly increased, and
  - The nutrient load in wastewater can be significantly reduced
- After sanitizing of faecal matter to destroy pathogens, the resulting material may be applied to the soil.
Pour-Flush Toilet

- The Pour Flush:
  - Was adopted to overcome many of the disadvantages of a VIP
  - Is a low cost alternative to the traditional full-flush sanitation facility
  - Only requires about 1-1.5 litres of water for each flush
  - Overcomes the problems of flies, mosquitoes and odours by having a pan or pedestal with a water seal.
  - Still has a pit
Aqua Privy and Soak Away

• The aqua privy facility:
  ❑ Has a water-tight settling tank
  ❑ Helps to separate the solid matter from the liquid
  ❑ Solids sink to the bottom and are broken down by bacterial to form sludge
  ❑ Has liquid effluent flowing out the tank to a soak away or by connecting the tank to a sewer system
  ❑ Needs sludge to be removed regularly, usually once every 1-5 years
Conservancy Tank

- Solid materials settle at the bottom of the tank
- Can use full/low flush
- Tank requires emptying
Septic Tank and Soak Away or Small Bore solid free sewer
Shallow Sewage System

- The system comprises a secondary pipe network of reduced diameter.
Conventional Sewage System

• The toilet connects to the main sewer system.
THANK YOU