

Containment, Desludging and Transport

Training on Introduction of Faecal Sludge Management (FSM)/CWIS

Rajendra Shrestha, Program Director

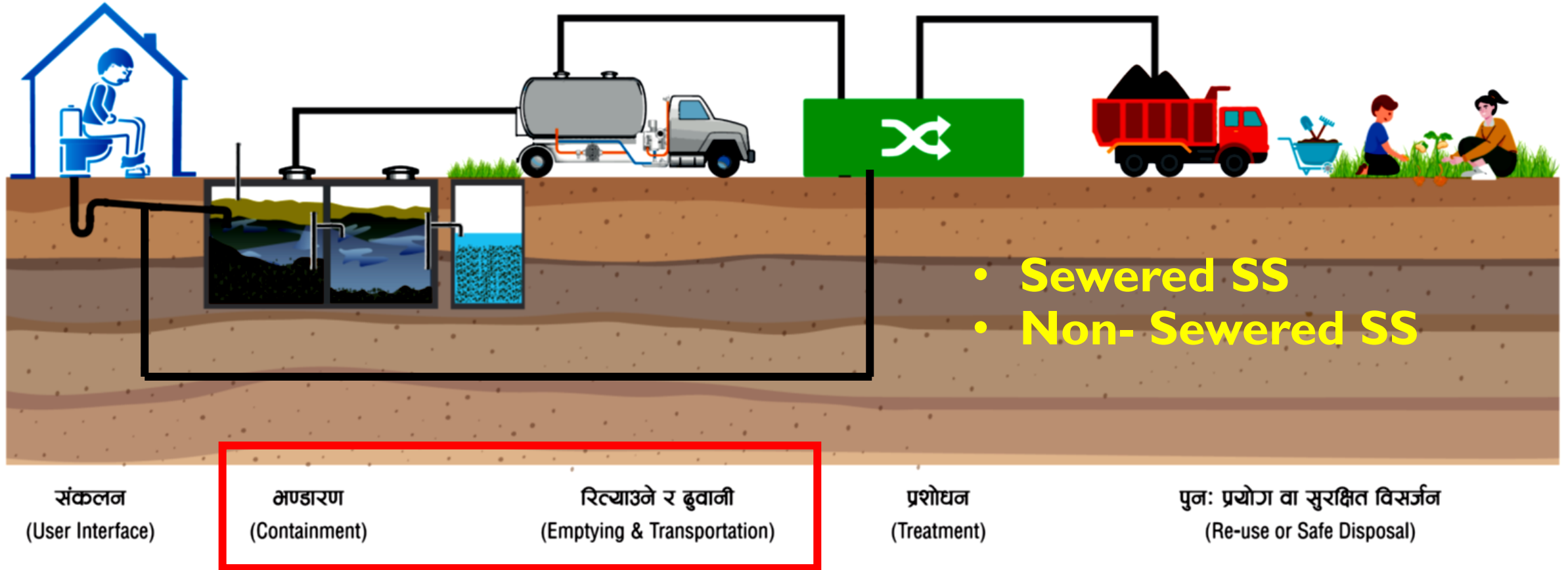
Learning Outcomes

- Interpret various technologies throughout sanitation service chain
- Discuss the different types of containment technologies used in Nepal
- Discuss about different types of desludging and transportation methods

Presentation Outline

- Sanitation Service Chain
- Sewered Sanitation
- Onsite sanitation: Hygienic latrines and Containments
- Desludging and conveyance in Nepal
- Challenges of desludging and transportation service

Sanitation Service Chain



Is your Latrine “Hygienic” ?

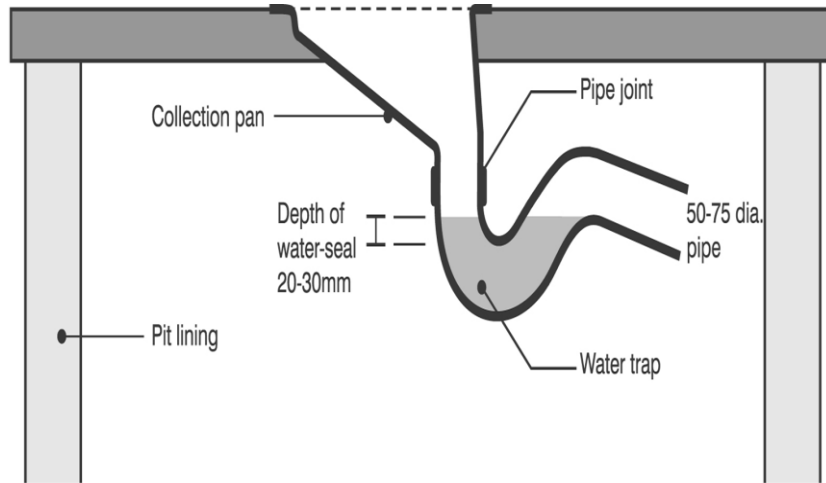
A “hygienic latrine” is defined as a sanitation facility, which effectively breaks the cycle of disease transmission.

Criteria for a “hygienic latrine”:

1. Clean with no faecal traces
2. Seal the passage between the squat hole and the containment
3. Venting out of foul gases

Sealing the passage....

SaTo Pan: “Seal” with Counterweight Mechanism

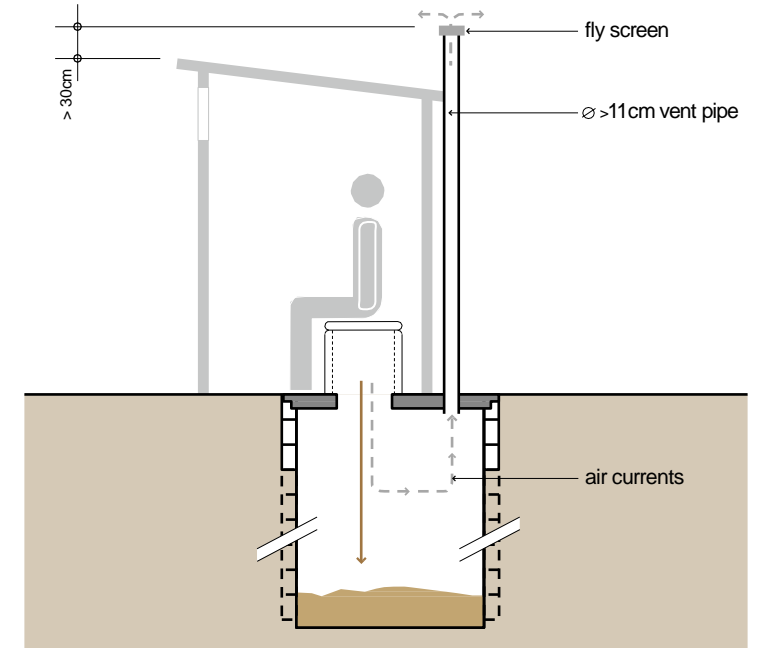
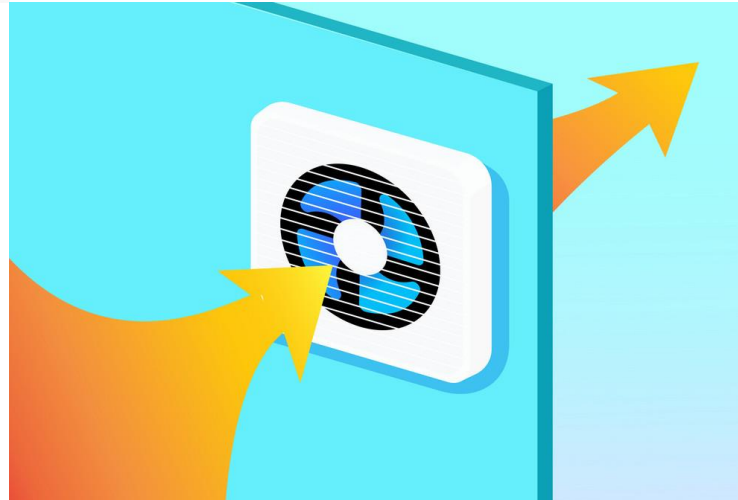
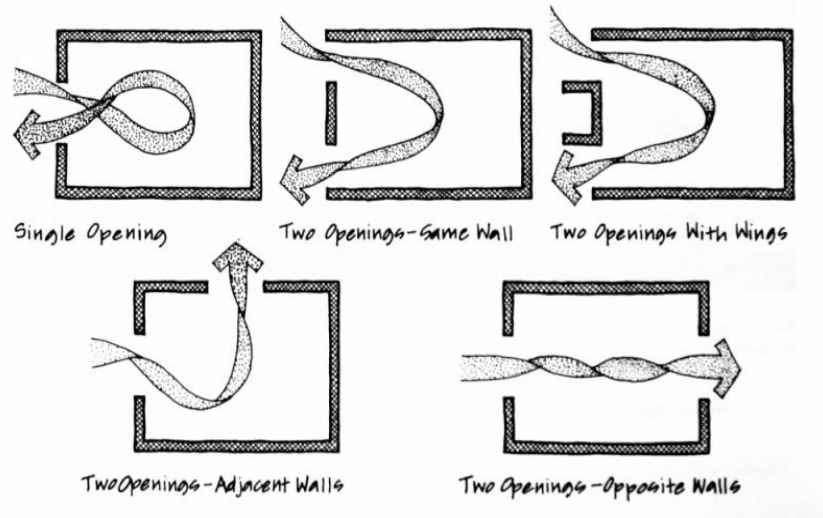


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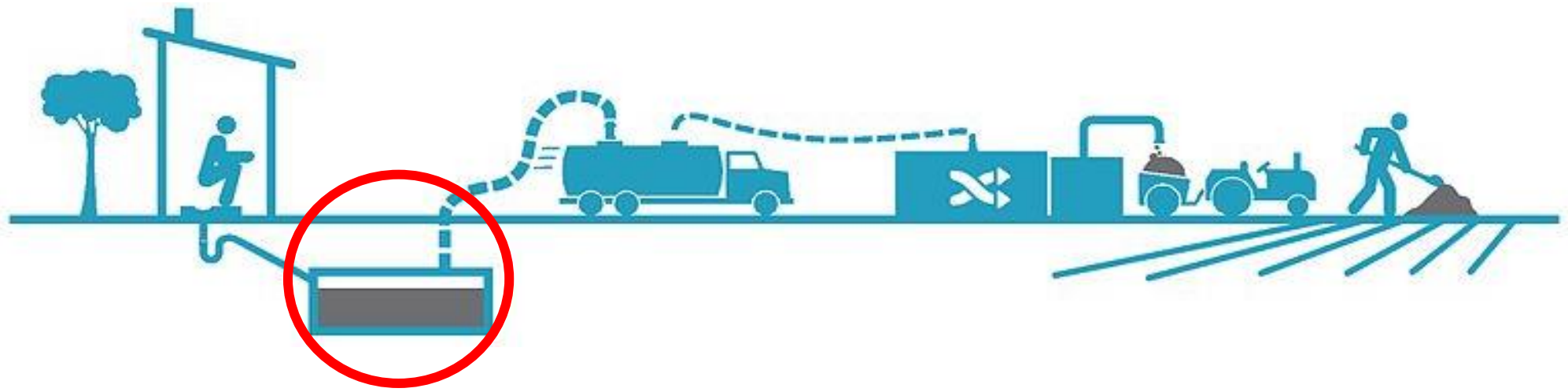
Water Seal



Venting out the odour



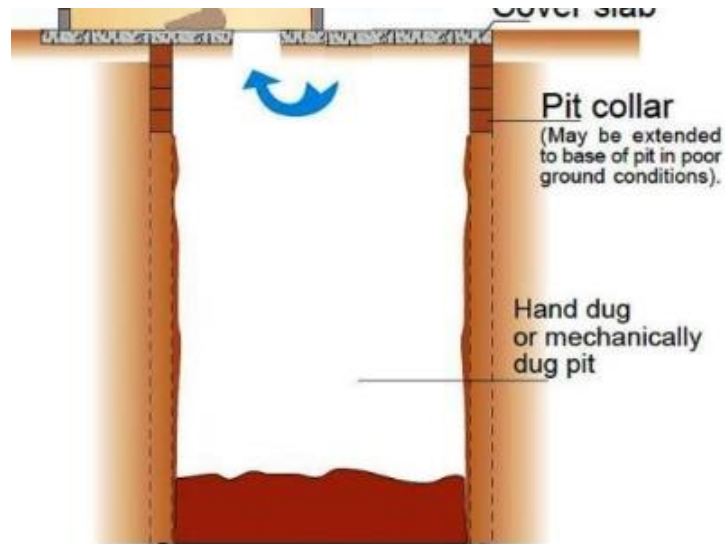
Confinement of Waste (In Containments)



Types of Containment

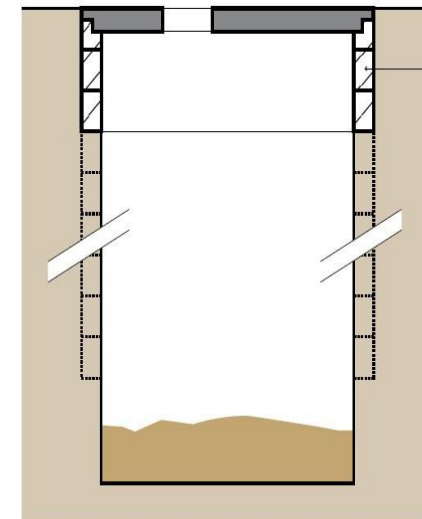
- Pit containment
 - Simple pit/Dry pit
 - Improved/Simple lined pit
 - Ventilated Improved pit
 - Single offset pit
 - Twin pits/Double offset pit
 - Holding tank
- Septic Tank
- Biogas Digester
- Ecosan Vault

Pit Containment : Simple and Improved pit



Simple Pit

- Earthen pit with no lining
- Sitting arrangement over pit
- Pit collar at top



Improved Pit

- Lined pit (Stone, Brick, Conc. Ring)
- Lining support earth falling and superstructure
- Sitting arrangement over pit

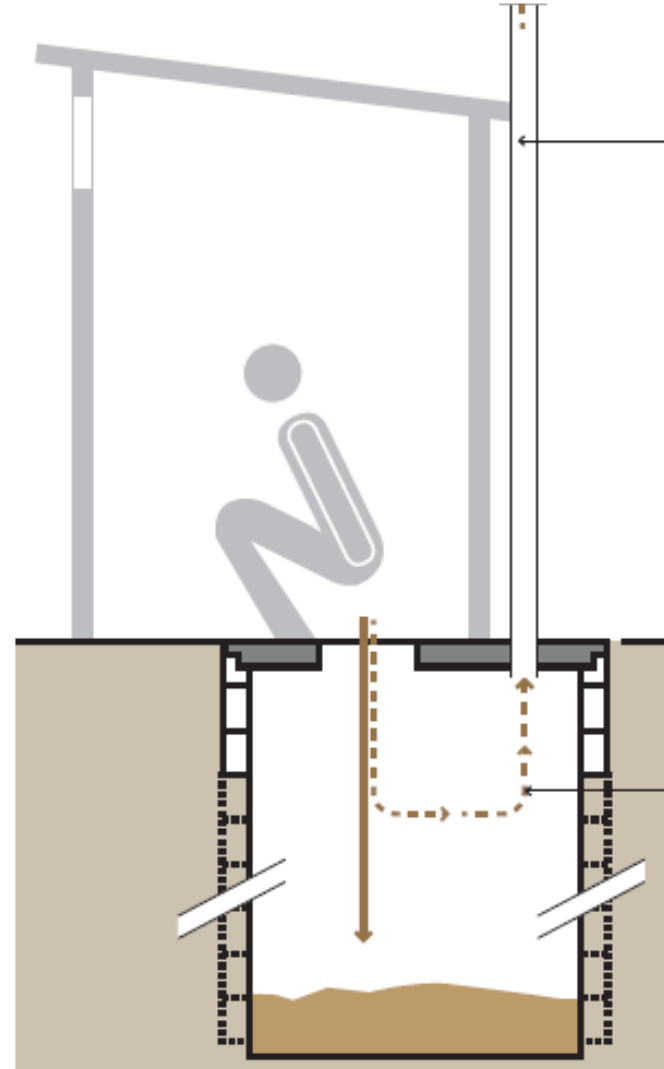
Type of Improved pit



Made of different
types materials

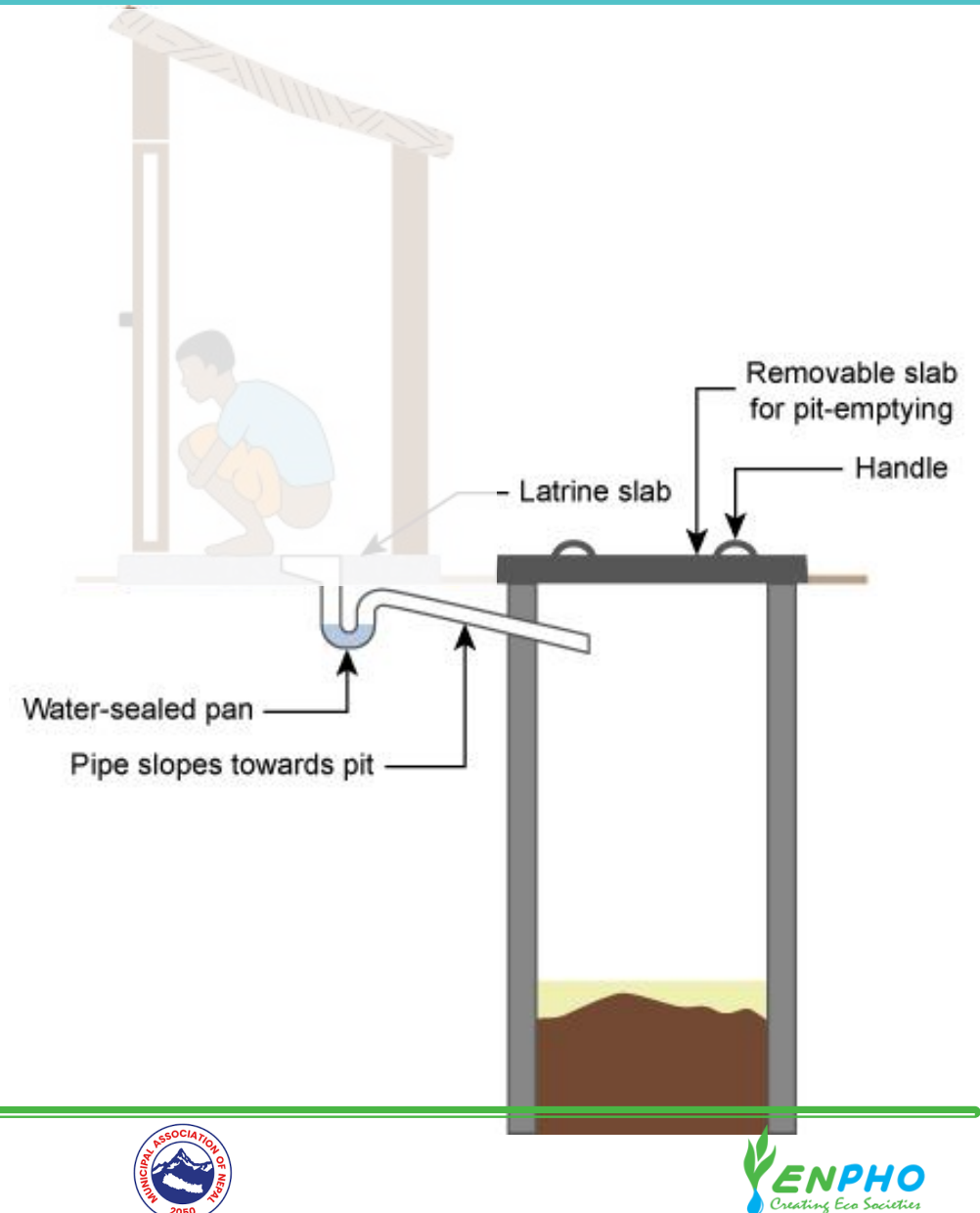
Pit Containment : VIP

- Lined pit
- With vent pipe to scape gas out
- Vent pit – Black and above eye level
- Sitting arrangement over pit



Pit Containment : Offset Pit

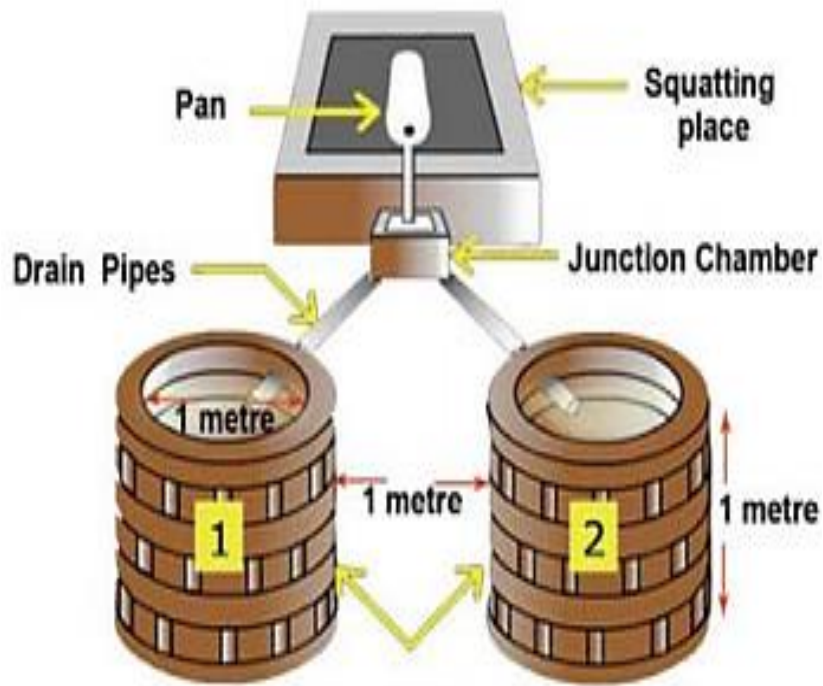
- Lined pit
- (With) vent pipe to scape gas out
- Sitting arrangement aside the pit
- Easy to desludge
- Most popularly used in Nepal



Ventilated Improved Pit (VIP)



Pit Containment : Twin pits



- Two alternatively used
- Manhole is provided to divert flow
- Generally know as Sulav Toilet
- Sludge is taken out after dried
- 2-3 m space between two pit

Twin pits



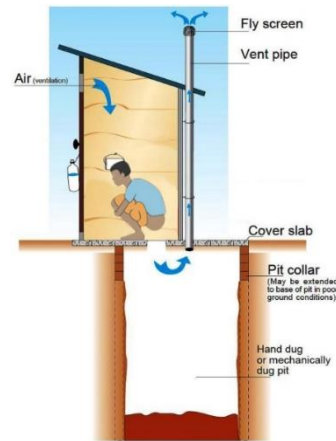
Improvements to pit containment



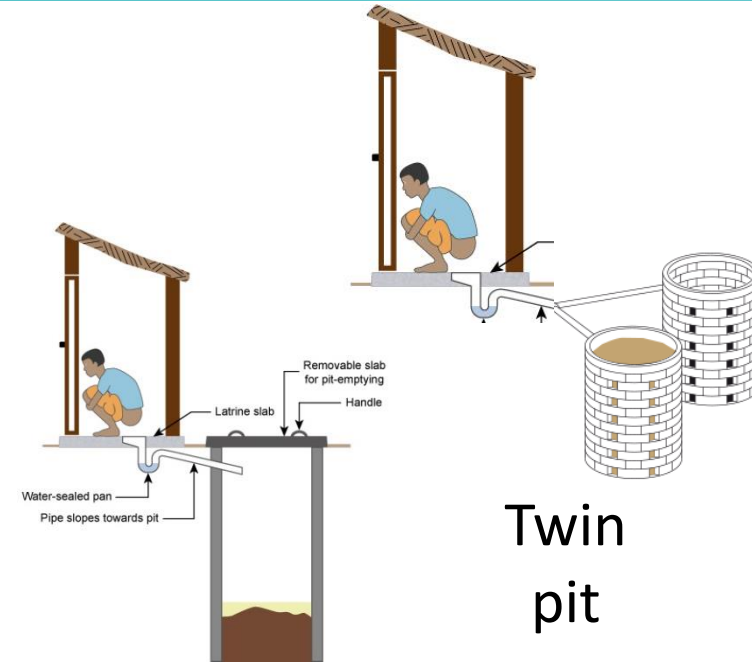
Simple Pit



Improved Pit



Ventilated Improved Pit

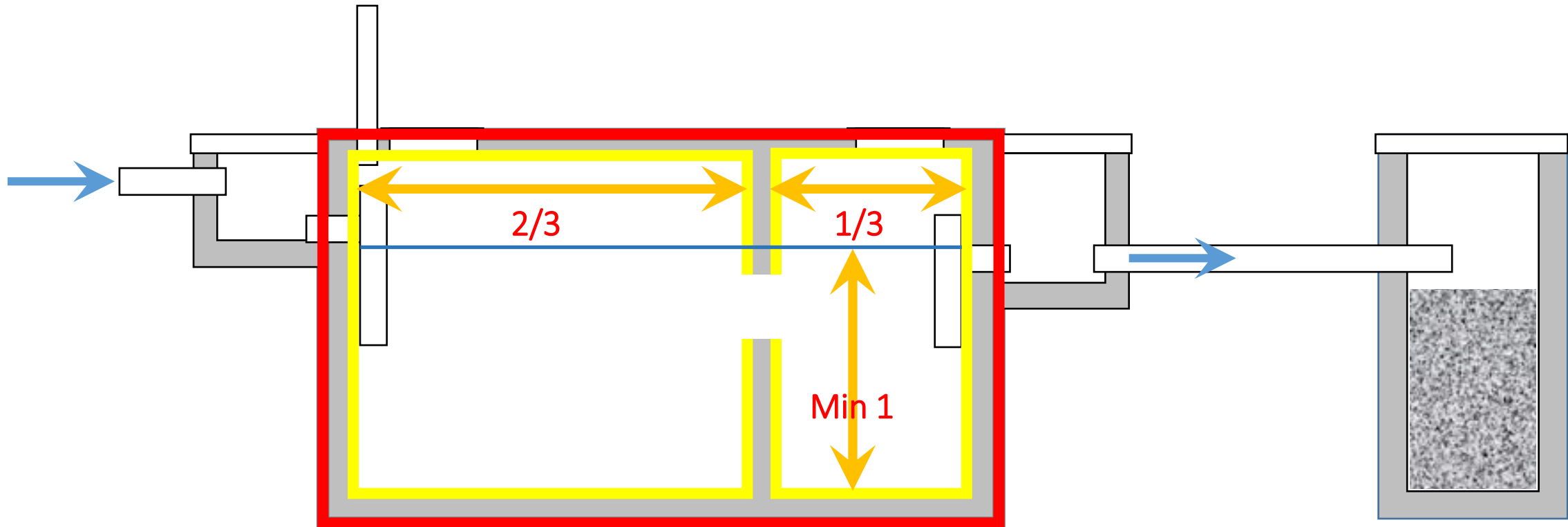


Offset Pit

Twin pit

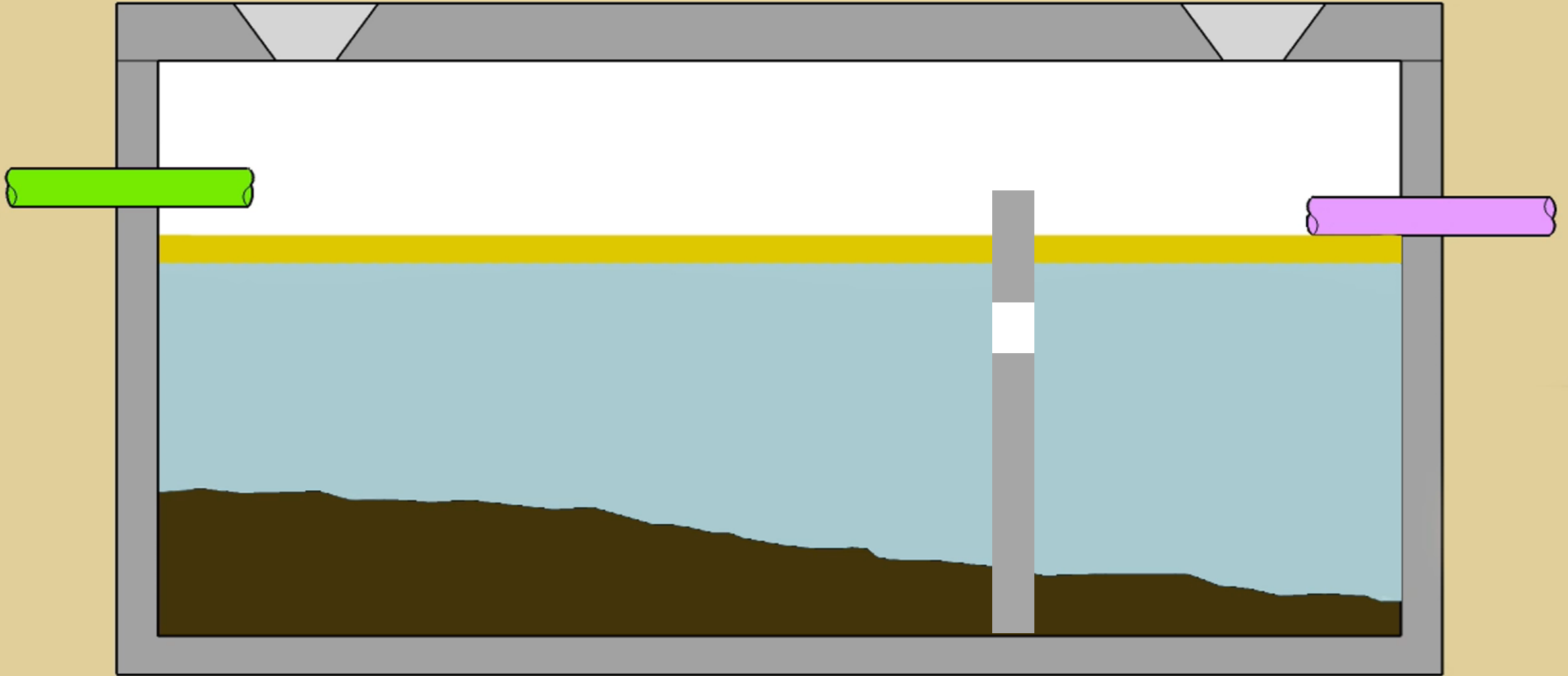
Septic Tank

Septic Tank + System for Disposal of Effluent (Soak Pit)

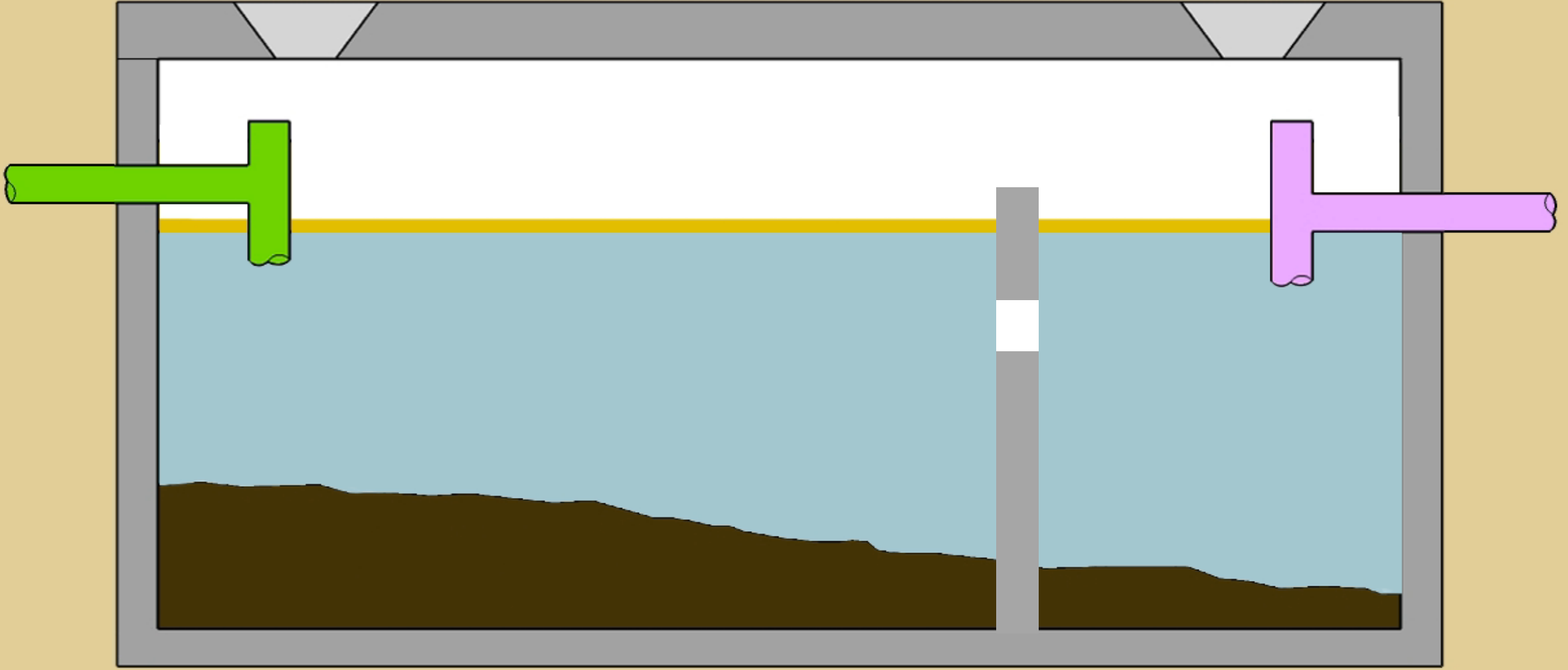


Major Option in All Urban Areas (including some slums)

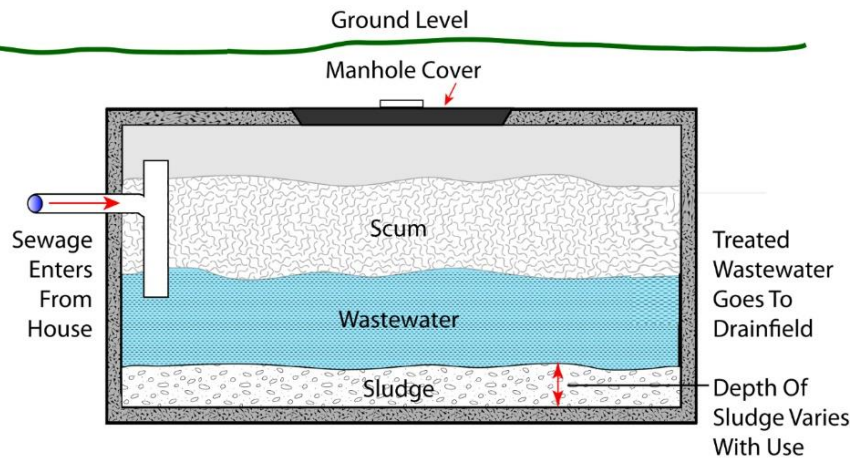
Importance of proper inlet and outlet in ST



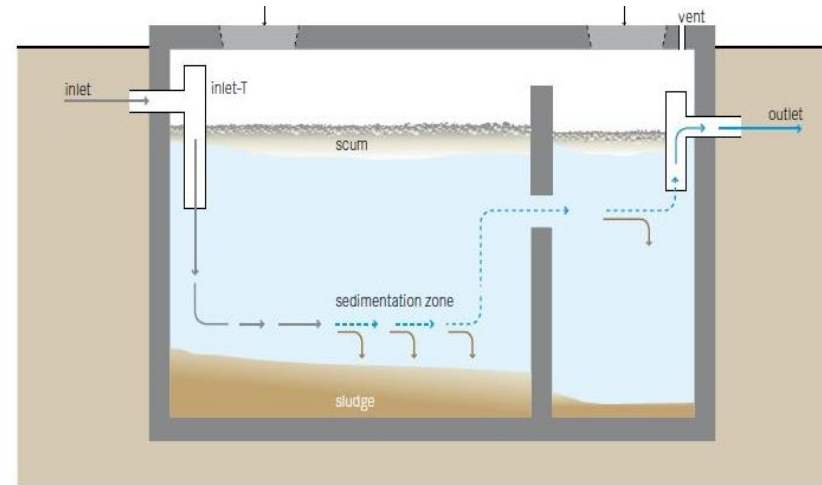
Importance of proper inlet and outlet in ST



Rectangular tank is not septic tank

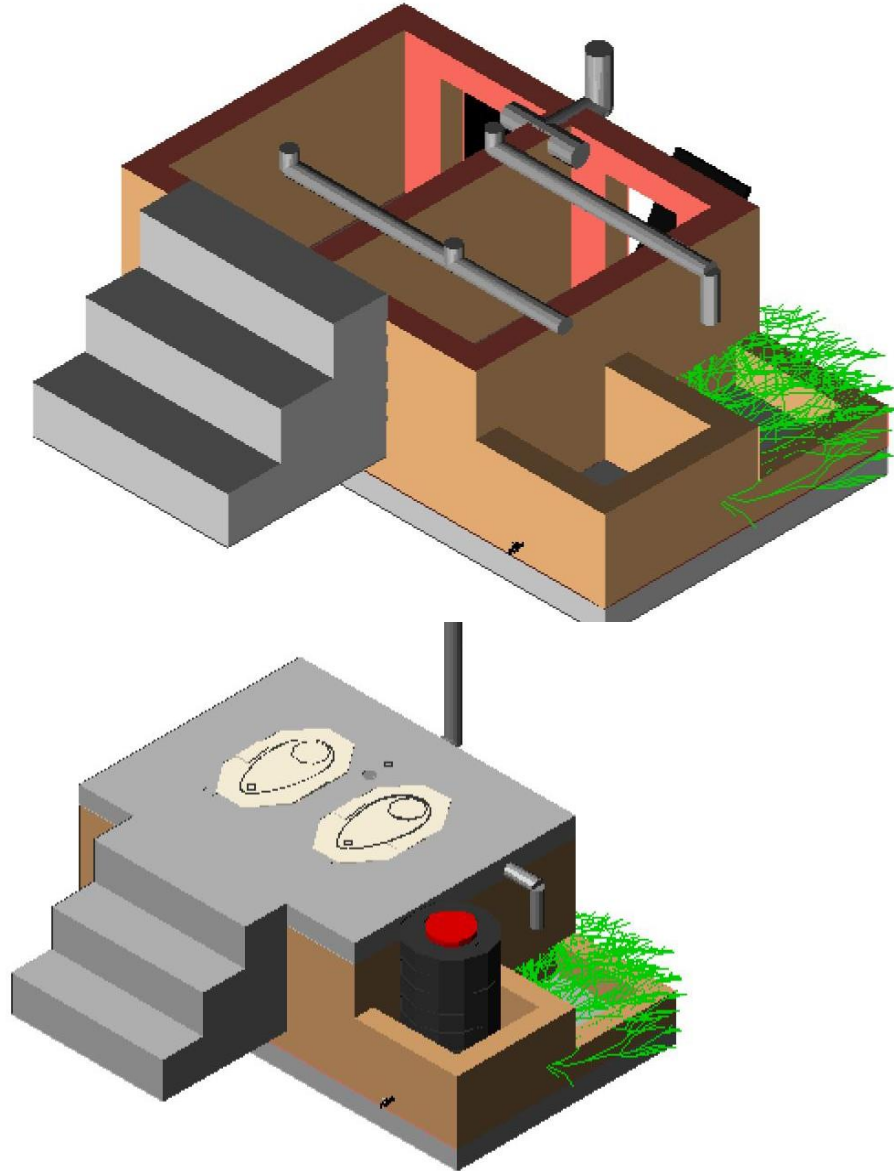


- Only collect and store
- No have outlet
- Need frequent desludging
- Single chambered
- Leaky tank



- Treat wastewater upto 40%
- Outlet connected to Soak pit/sewer
- Need less desludging
- Double chambered
- Water seal

Dry Ecosan Vault



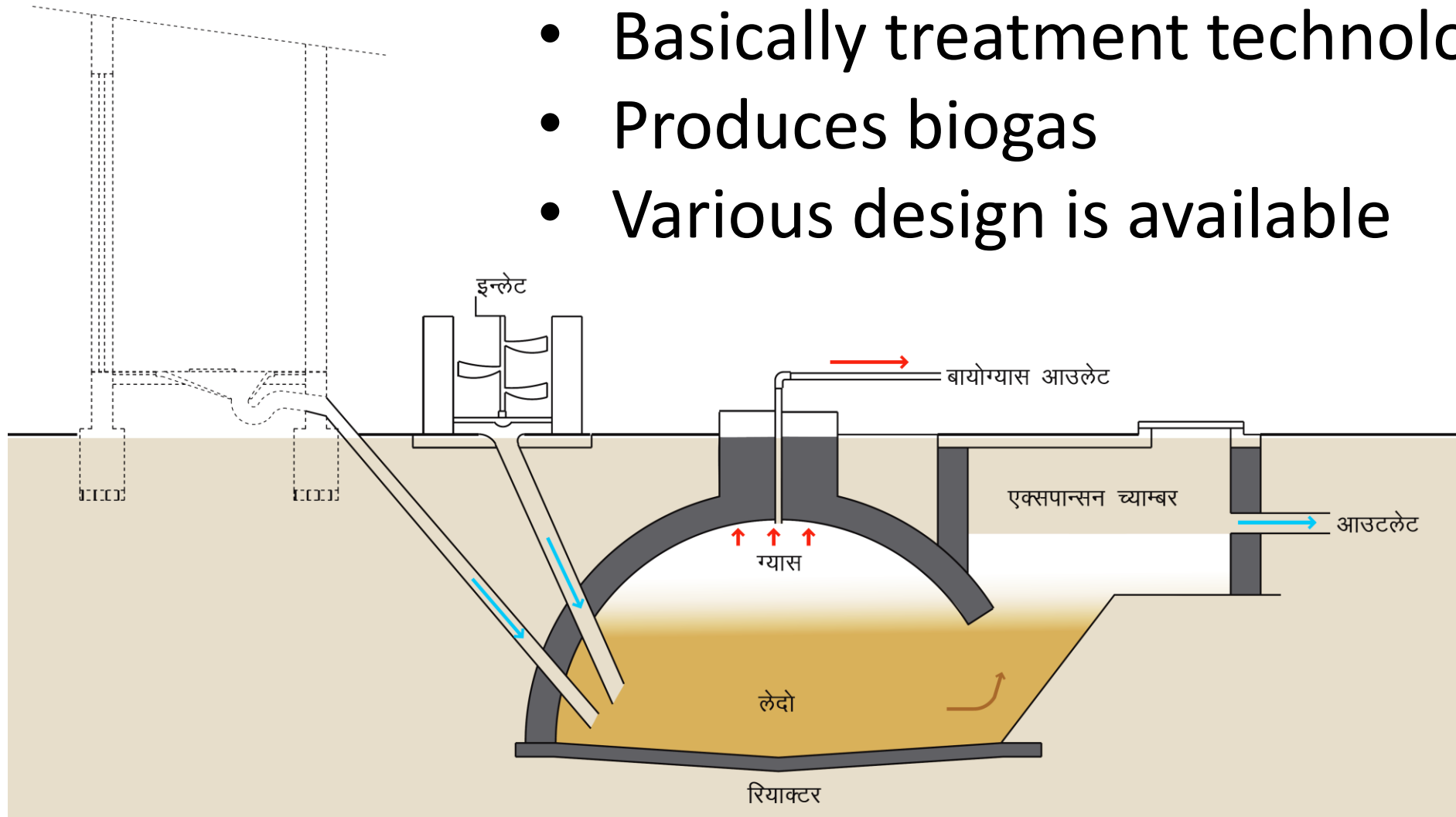
- Also called UDDT
- Collects only feaces and additives
- Constructed above ground
- Two vault is used alternatively for 6 months
- Emptied after 1 year

Dry Ecosan



Biogas Reactor

- Basically treatment technology
- Produces biogas
- Various design is available

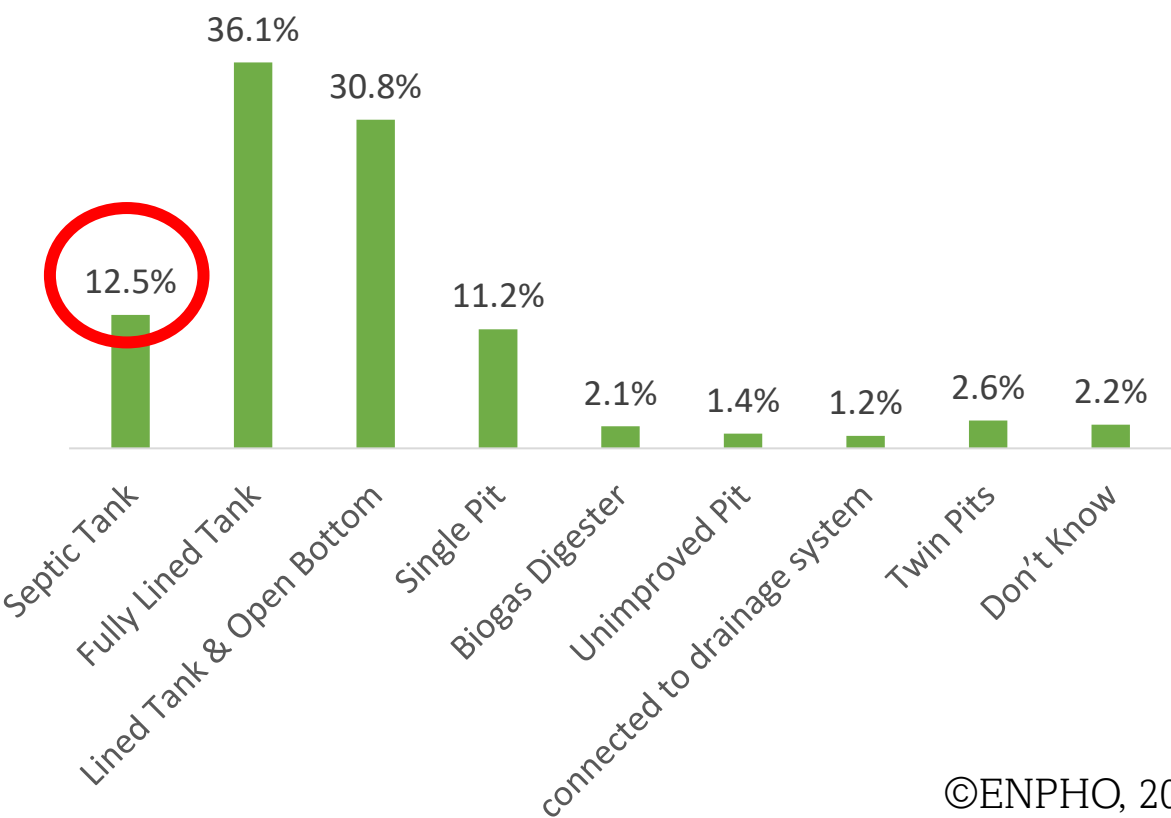
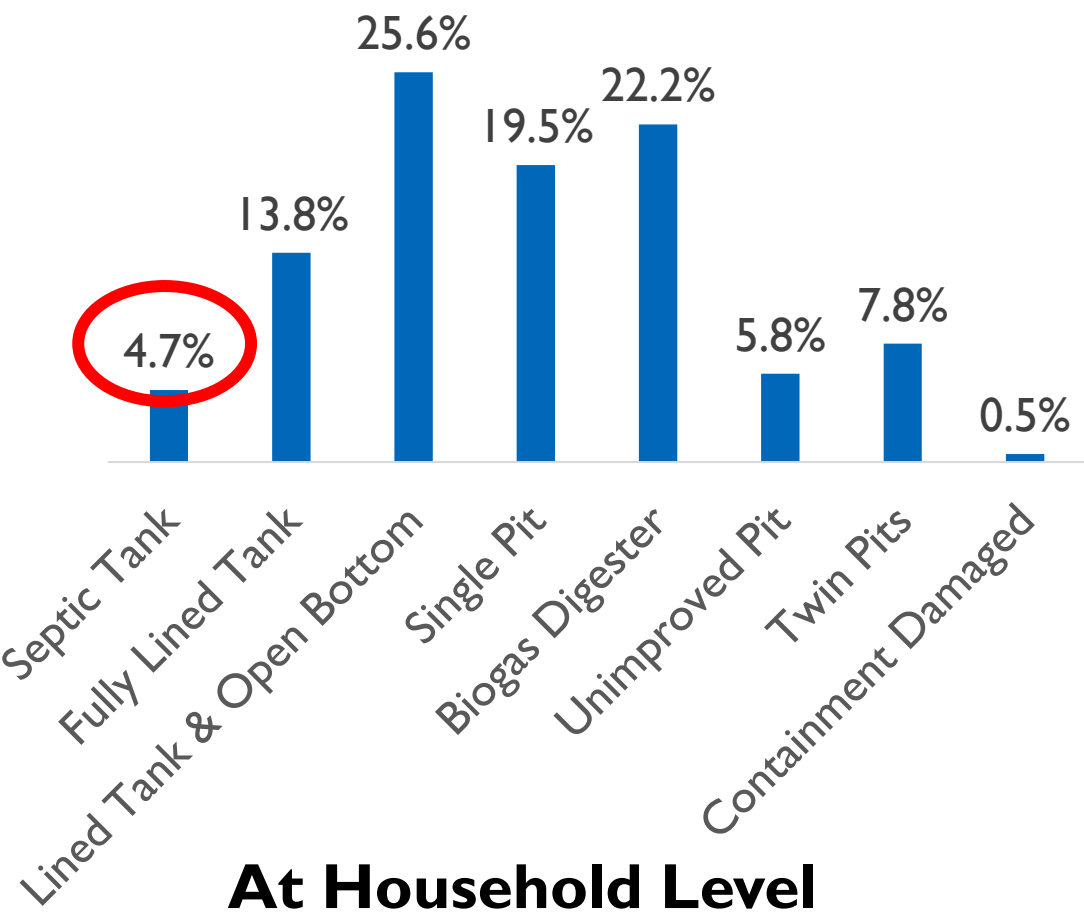


Biogas Reactor



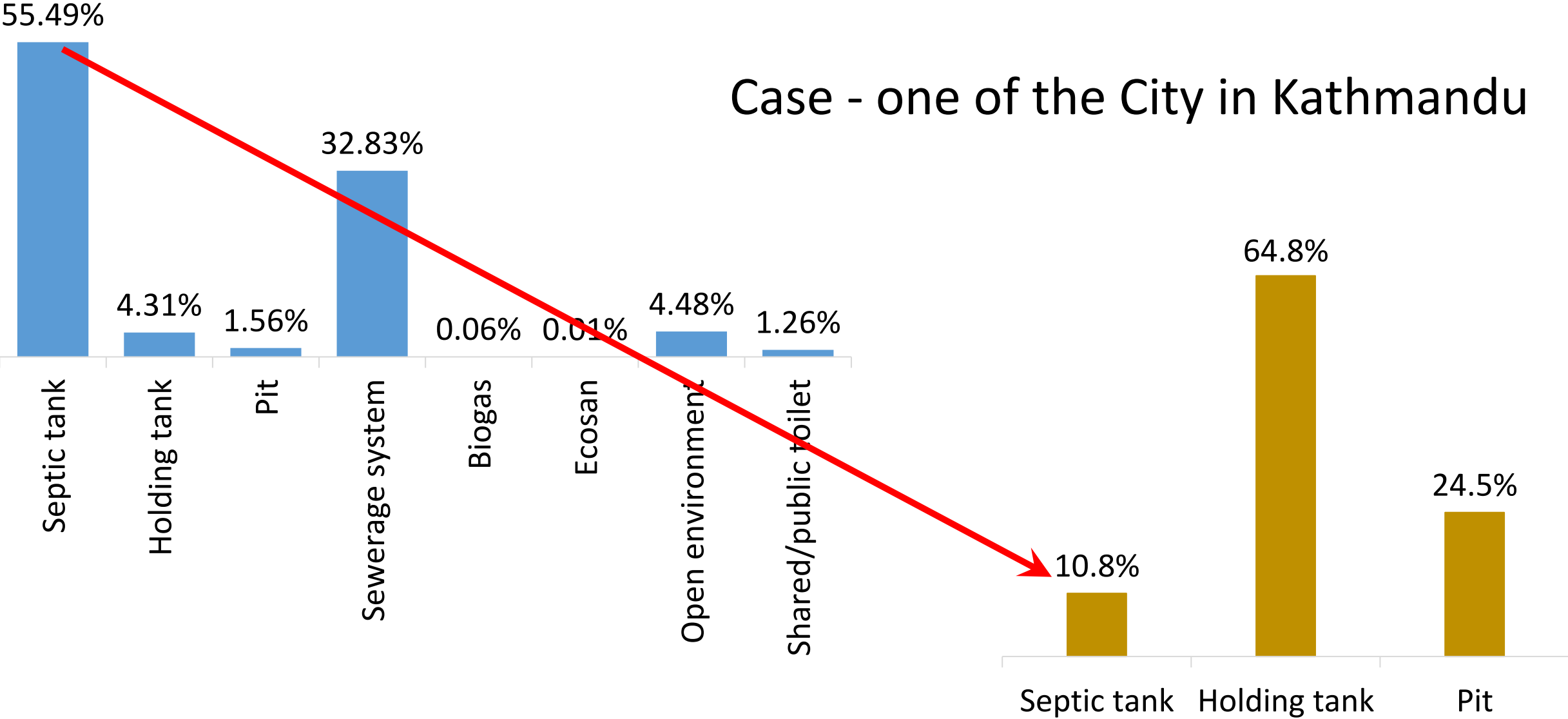
Containment Status in Nepal

Source: Situational Assessment of Fecal Sludge Management in 5 Municipalities of Nepal (ENPHO, 2018)



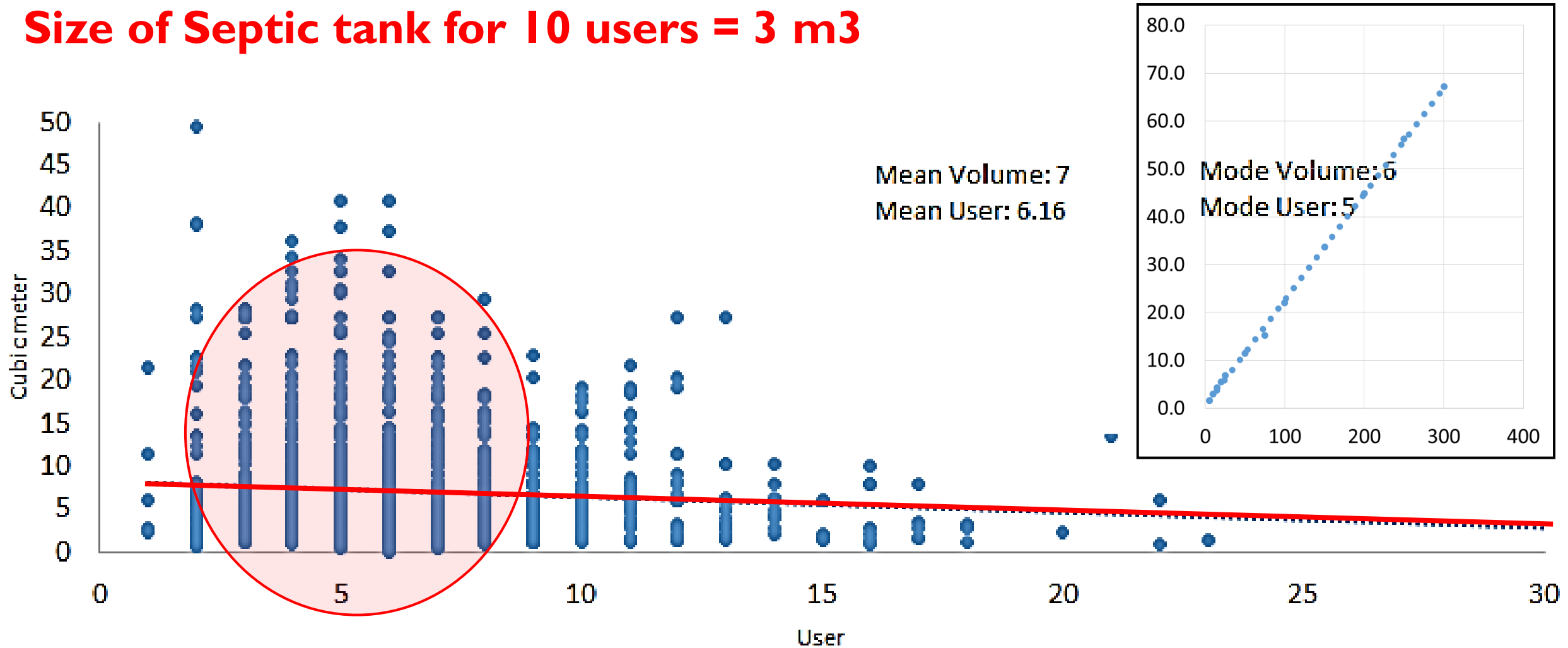
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Public perception towards septic tank



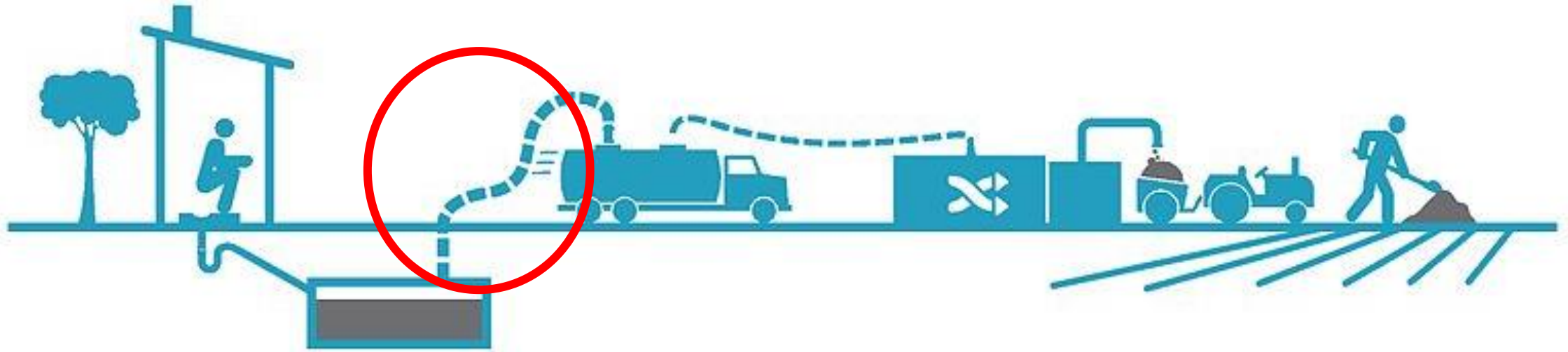
Size of Containments – Case of Nepal

Size of Septic tank for 10 users = 3 m³



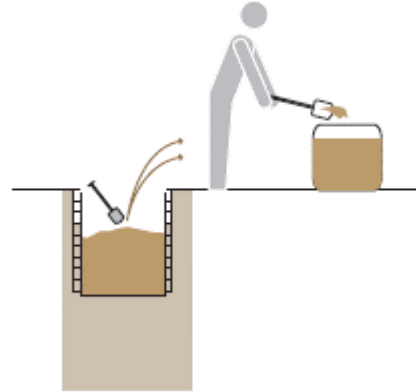


Desludging Service

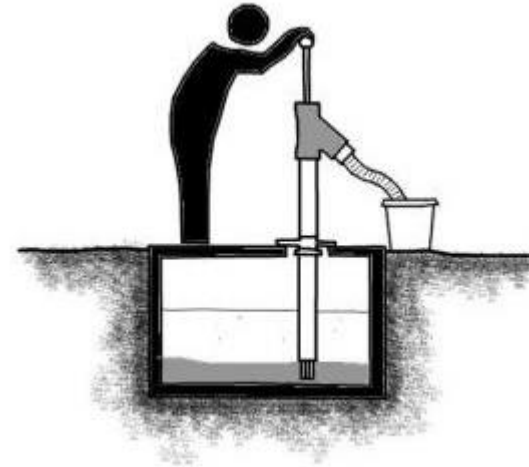


Methods of Desludging

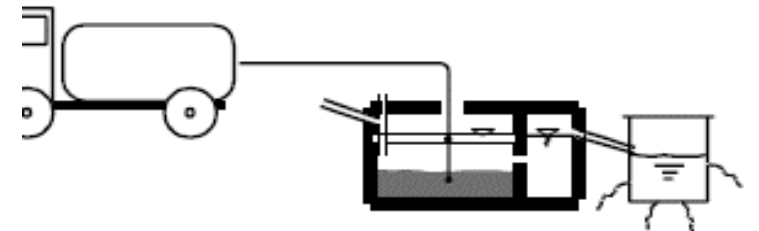
- Manual Desludging



- Semi Mechanized Desludging



- Fully Mechanized Desludging

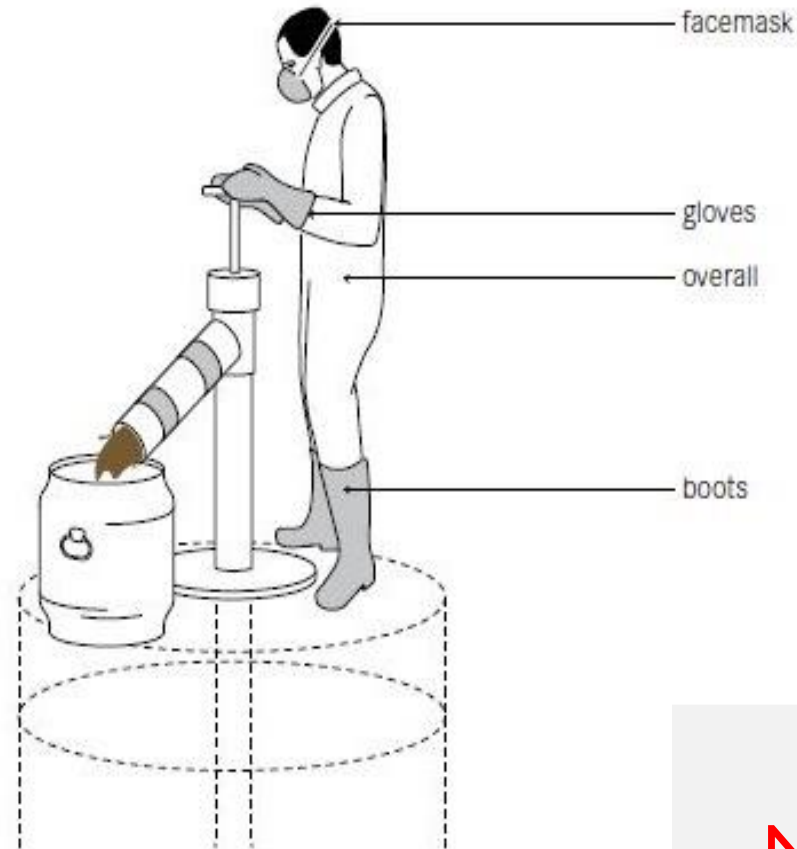


Manual Desludging



Manually Operated Mechanical Desludging

- **Gulper/II**
- Manual diaphragm
- Pump
- Nibbler
- MAPET



Poop pump/Gulper
Not available in Nepal

GULPERS

Mechanized Gulper
Capacity: 60 Liters/min



©Practical Action



Motorized Gulper
Capacity: 90 Liters/min

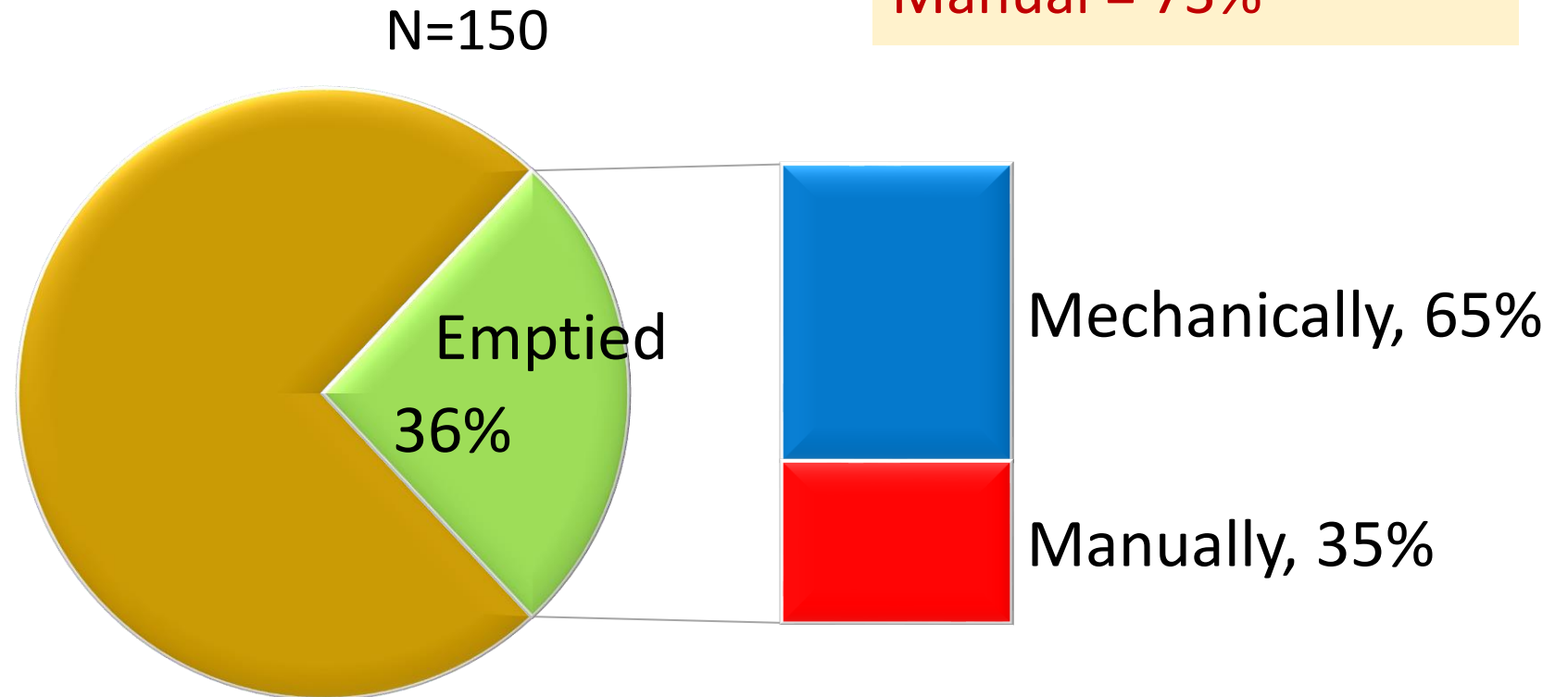


Mechanical Emptying Using a Vacuum Tanker



Desludging Status : Terai

Emptied at least once
= 36% (31% 2018) of
households with puts
or septic tank

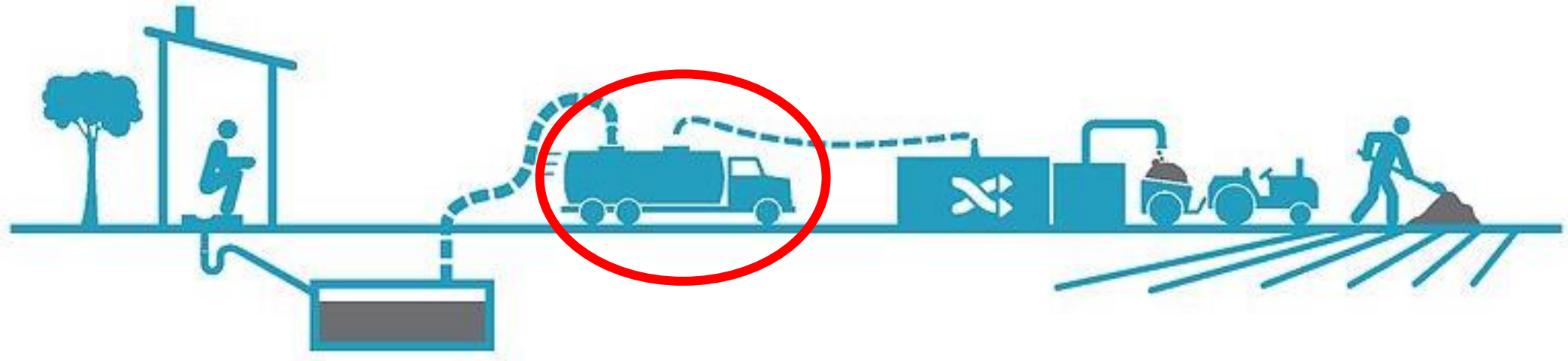


During 2018

Mechanical = 27%

Manual = 73%

Transportation of Fecal Sludge




Non-motorized Transportation



Motorized Transportation



Desludging and Transportation services in Nepal



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Desludging service is growing

Challenges of Desludging and Transportation Service

- Technical Challenges
- Behavioral Challenges
- Social Challenges
- Rules and Regulations



Thank
you