

# PRACTICA

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## FOUNDATION

### Manual FSM considerations

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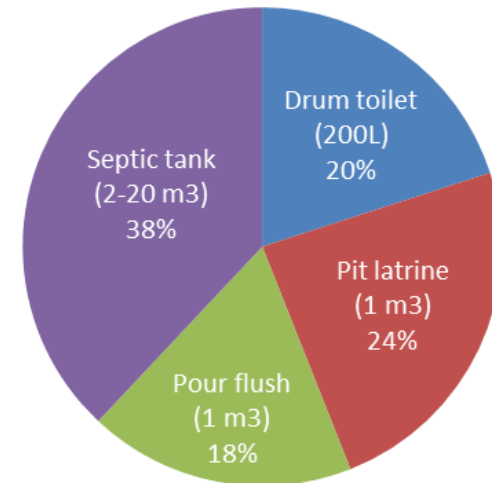
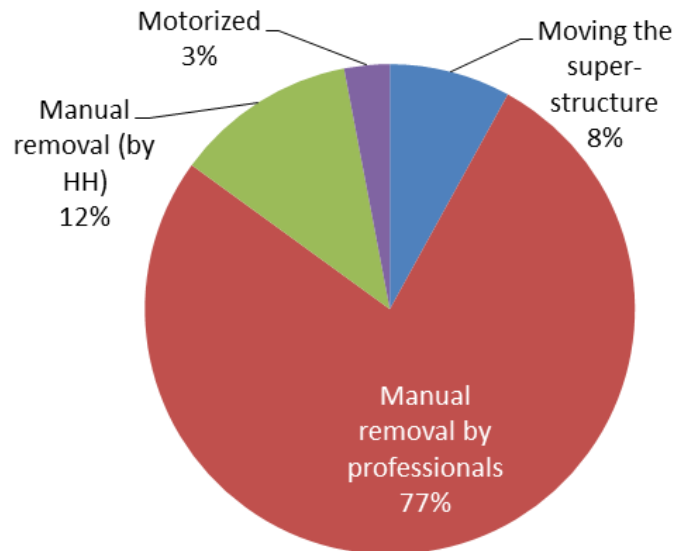


# Manual FSM considerations

## Challenges in Toamasina

(study executed with PROTOS)

- Manual removal (97%) > safer
- Motorized removal (3%) > cheaper



- Badly managed pits (dried sludge)
- Lack of urban planning (limited space)
- Unsolved FS transport (reburying)

# Manual FSM considerations

## PRACTICA's approach (to advance manual emptying and transport)

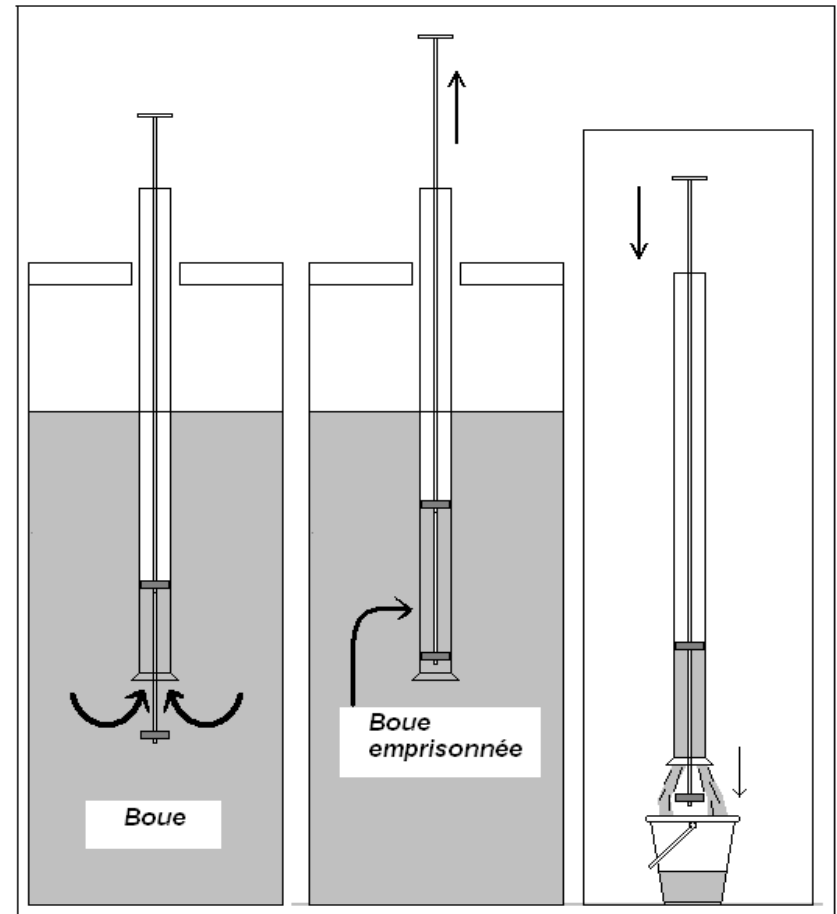
- Smart solutions: locally appropriate technologies with an innovative edge
- Applicability research and targeted innovation
- Multidisciplinary, sector-wide approach: adjustable and upgradable



# Manual FSM considerations

## Development of sampling device 'Syringe'

- Dried fecal sludge is a crucial challenge
- Sludge consistency in pits changes strongly with depth
- 'Syringe': for measuring sludge consistency at given depth range or over full depth



# Manual FSM considerations

## Local testing: Gulper & Hand auger

### Gulper:

- Basic design: easy to build/operate
- Shorter pipe & smaller diameter : Still difficult to transport /handle)
- Limited to low-viscosity sludge
- Requires two operators
- Outlet pressure insufficient for direct loading
- 30L/min in Toamasina, MG
- Time consuming to clean

### Hand auger:

- Excellent for high viscosityFS
- Design adjustment underway
- ...



# Manual FSM considerations

## Transport and the need of transfer stations

	Toilet	Pricing	Operator	Time	Efficiency	Radius (when full)
Cyclo	DT (200L)	EUR3/DT	1	1h/DT	2-3/d	~10 km
Push-cart	PL (<1 m <sup>3</sup> )	EUR7.5/500L	2	1.5h/PL	3/d	< 10 km
Pick-up	PF&ST (≥2 m <sup>3</sup> )	EUR 11/m <sup>3</sup>	2(+pump)	1h/ST	4 /d	> 10 km



# Manual FSM considerations

## Final remarks and recommendations for emergency FSM

- Sludge consistency is key to applicability of manual emptying tool
- An independent comparative analysis on applicability could increase sector efficiency and reduce emptying by hand!
- ***Emergency and relief phases***
  - *Ample storage at toilets*
  - *Motorized designs for pit/tank emptying and transport*
- ***(Early) recovery & reconstruction phases***
  - *Use only locally appropriate and lasting 'development' solutions*
  - *Turn disaster into an opportunity to upgrade WASH infrastructure!*

