Faecal Sludge Treatment and Reuse in Emergencies:
A Case Study from Mahalaxmi Municipality, Nepal

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Overview of the Presentation

- Background
- Flow Diagram with capacity of each component
- Present Status
- Laboratory Analysis Report
- Performance of Treatment Plant
- Lesson Learnt
- Challenges
- Way Forward

Background

Devastating earthquake in April 2015 in Nepal

People residing in campsites

Construction of temporary toilets in campsites

Overflowing toilets in campsites

Construction of treatment plant

Faecal sludge reuse complex

Background

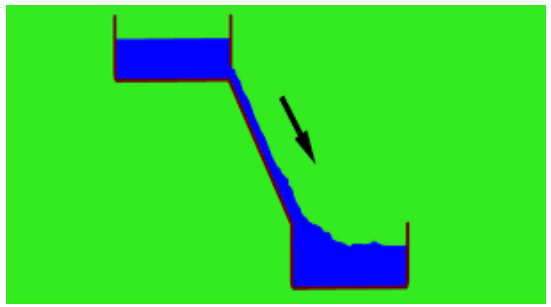
Financial support

Land area (300m^2) provided by: Saligram Orphanage

Technical support: ENPHO and CDD Society

Construction Cost and Prefabricated Component's Cost = USD 70,600

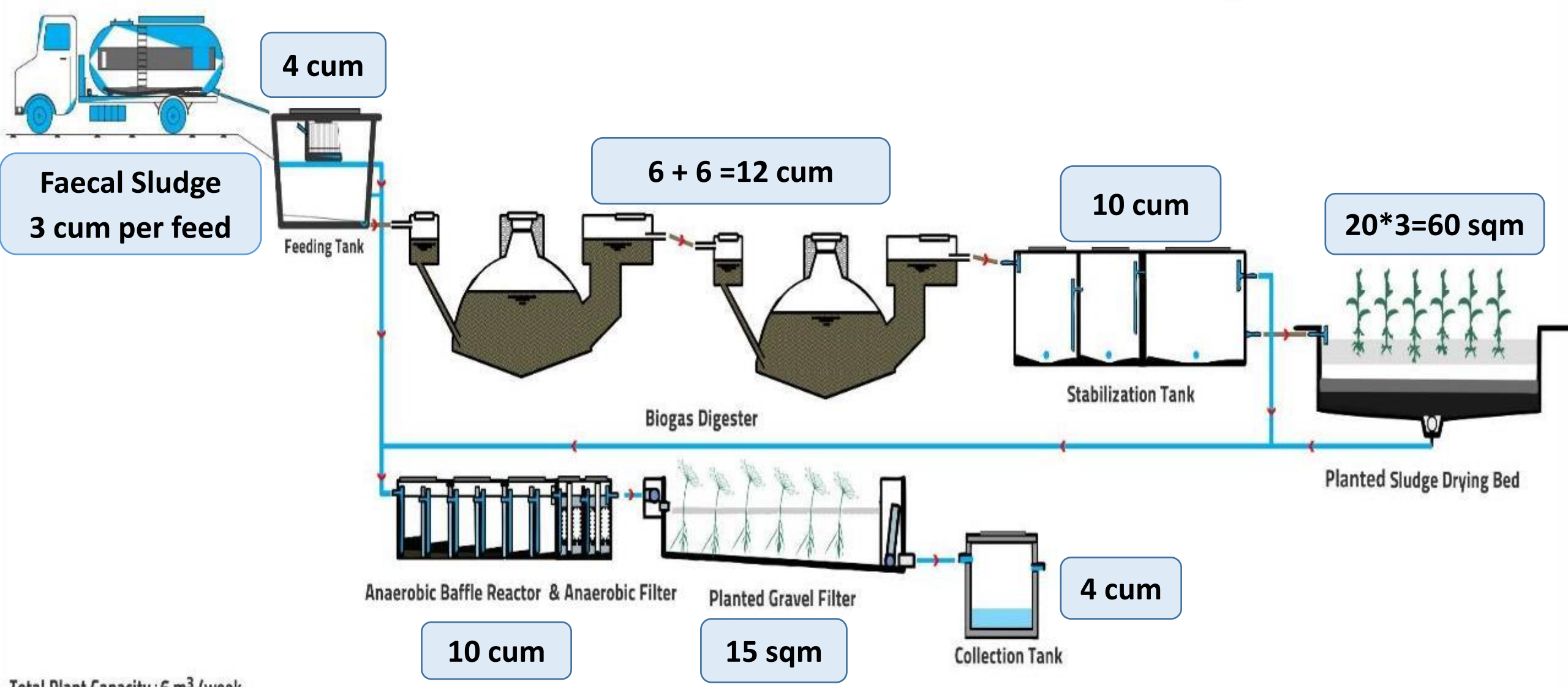
Designed treatment capacity 6 m^3/week



Gravity based system

No skilled labor required for day to day operation

Flow Diagram with Capacity of each Component



Present Status (327 days of operation)

Number of loads arrived : **80**

Volume of Biogas used: **196 m³**

Volume of treated water generation: **4m³/week**

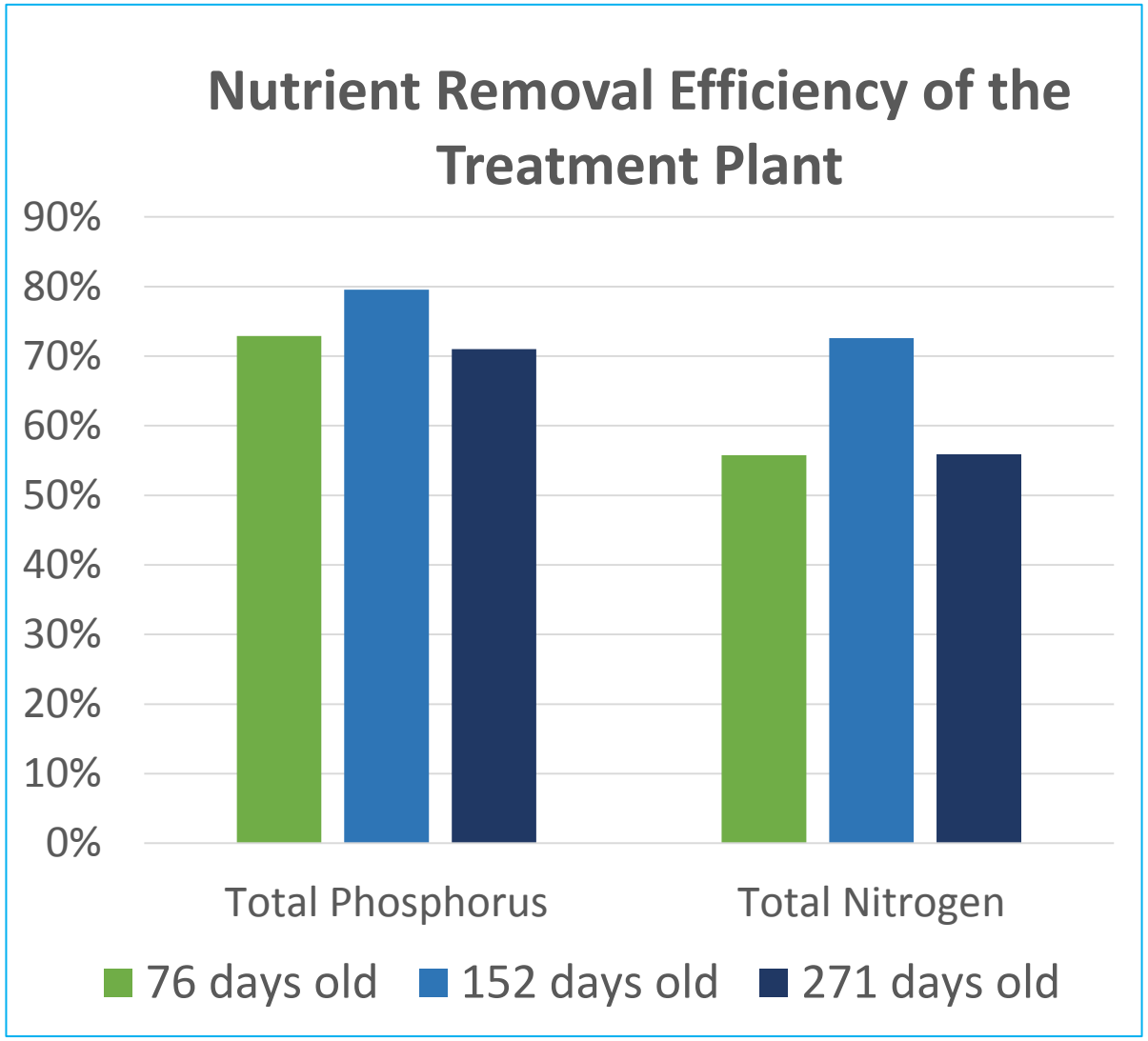
Number of sampling done: **3 times**

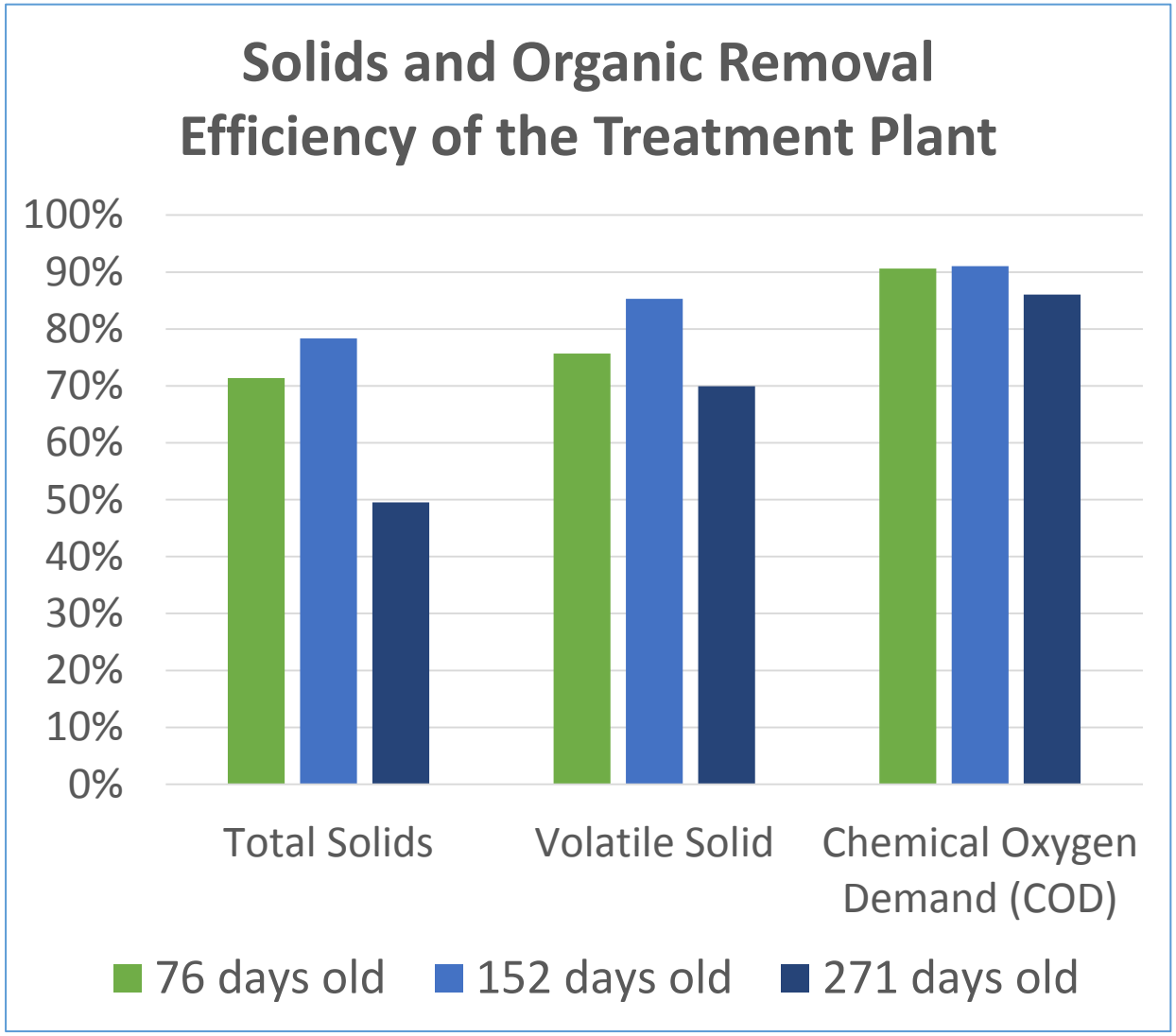
Laboratory Analysis Result

Parameters	Unit	After 76 days of operation			After 152 days of operation			After 271 days of operation		
		Pre- Monsoon			Monsoon			Post-Monsoon		
		FT	PGF outlet	Removal (%)	FT	PGF outlet	Removal (%)	FT	PGF outlet	Removal (%)
pH	-	7.9	8.1	NA	7.3	7.5	NA	7.5	8	NA
Electrical conductivity	µS/cm	11840	5280	55.41%	8370	2590	69.06%	5620	4410	21.53%
Total Solids	mg/L	5554	1590	71.37%	4911	1064	78.33%	4997	2522	49.53%
Volatile Solids	mg/L	2206	536	75.70%	2172	319	85.31%	2154	648	69.92%
Total Alkanity as CaCO3	mg/L	4390	2615	40.43%	3730	319	91.45%	3040	2240	26.32%
Nitrogen-Ammonia	mg/L	1240	572	53.87%	896	264	70.54%	770	450	41.56%
Nitrate	mg/L	0	0	NA	5.2	0.5	90.38%	4.9	ND(<0.2)	96.00%
Total Phosphorus	mg/L	107	29	72.90%	93	19	79.57%	30	8.7	71.00%
Total Nitrogen	mg/L	1384	612	55.78%	1003	275	72.58%	1370	604	55.91%
Total Kjeldahl Nitrogen (TKN)	mg/L	1384	612	55.78%	1002	274	72.65%	1369	604	55.88%
Organic Dry Matter	mg/L	2206	536	75.70%	2172	319	85.31%	2154	648	69.92%
Chemical Oxygen Demand (COD)	mg/L	5244	492	90.62%	3120	280	91.03%	5563	775	86.07%
Potassium (K)	mg/L	299	200	33.11%	407	141	65.36%	113	190	-68.14%
Helminths	Present/Absent	Absent	Absent	-	Absent	Absent	-	Present	Absent	-
E.coli	CFU/mL	TNTC	TNTC	-	TNTC	TNTC	-	TNTC	TNTC	-

*FT= Feeding Tank
*PGF= Planted Gravel Filter
*CFU= Colony Forming Unit
*TNTC=Too Numerous To Count
*NA= Not Applicable
*ND= Not Detected

Performance of Treatment Plant





Challenges

- High septic tank emptying demand
- Limited design capacity of treatment plant
- Social acceptance
- Low awareness in FS workers (desludging service providers) on health safety

Lesson Learnt

- Need-based placement
  - Community support
  - Political support
  - Private operator's support (honey sucker's role)
  - Optimum use of end-products
- Minimize and simplify operational works

Desludging Vehicle

Caretaker of FSTP

Way Forward

- Continue on-job training on O&M
- Business plan for sustainability
- Handover of FSTP to local NGO by March, 2018
- Monitoring and research
- Evidence-based advocacy on FSM
- Explore possible replication of the system

Inauguration by Chief District Officer

Visitors - Government Officials

ENPHO
Creating Eco Societies

Thank you for your attention!