Development of a low cost desludging pump in Uganda

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Introduction

- Water for People-SaniHub: “manages and drives forward the development of improved sanitation technologies to a point where they are adopted and owned by private sector operators.”
- The extraction/ emptying devices include Gulper I and Gulper II (Rammer)
- Gulper II; outer casing slides up and down, forcing sludge into the cylinders without using suction

Slump Cone Test

- 15% of kaolin clay & 85% of top soil was mix with 2.2 litres of water to form a simulant mix
- Water (100 to 200 ml) was added at intervals
- Slump was measured for respective water added

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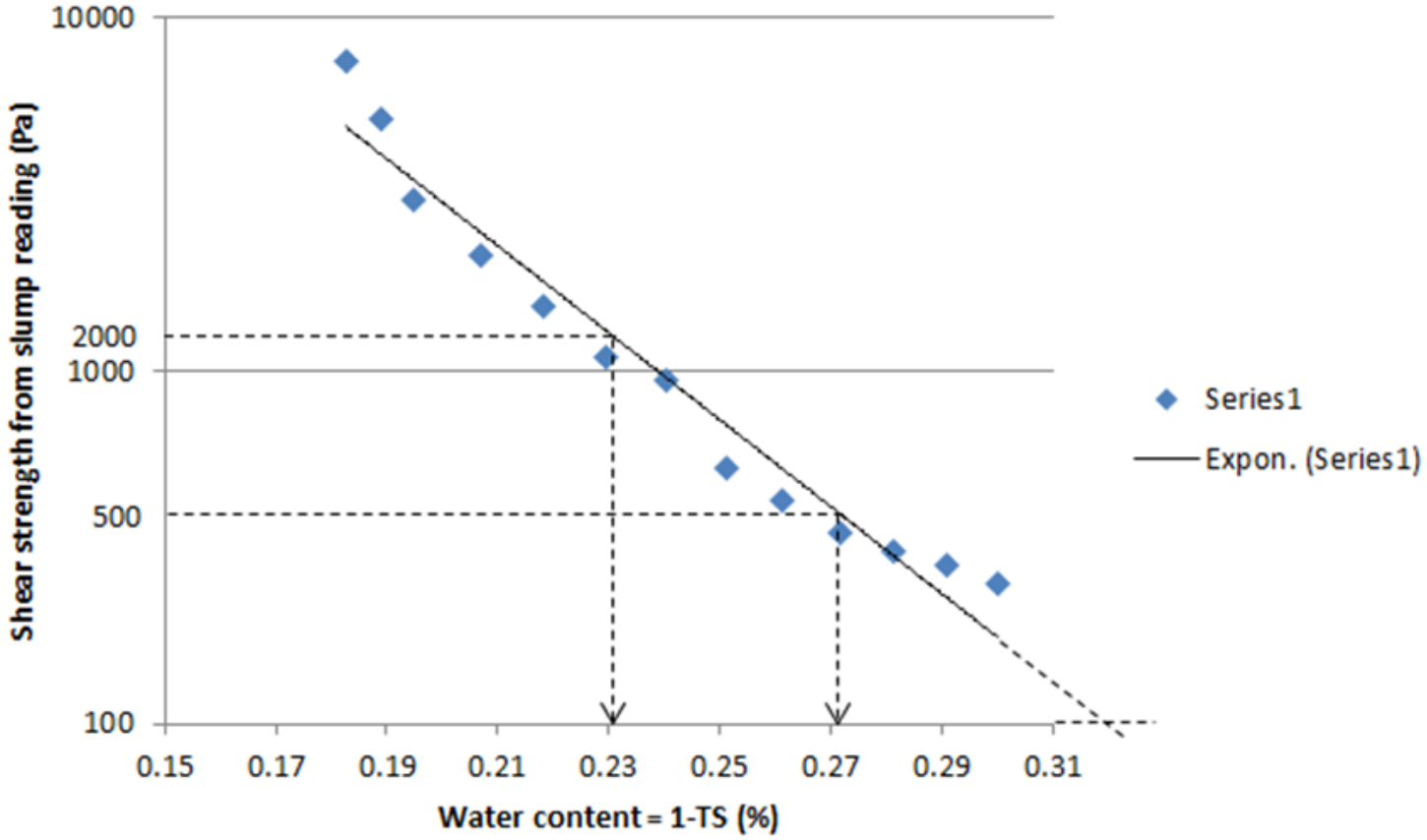
Shear Strength verses Water content



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Pump test of Gulper I and Gulper II

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Pump test of Gulper I and Gulper II

	Gulper I			Gulper II		
	Priming time (s)	Mass pumped in 30s (kg)	Ave. flow rate (l/s)	Priming time (s)	Mass pumped in 30s (kg)	Ave. flow rate (l/s)
100pa						
Person 1 (60kg)	16	17.5	0.53	16	37.3	1.13
Person 2 (80kg)	19	18.6	0.56	15	45.4	1.38
Individual	**18**	**18.1**	**0.55**	**16**	**41.4**	**1.25**
Dual operators	11	27.6	0.84	10	50.7	1.54
500pa						
Person 1 (60kg)	Failed	Failed	Failed	25	22.5	0.63
Person 2 (80kg)	Failed	Failed	Failed	20	29.4	0.82
Individual	**Failed**	**Failed**	**Failed**	**23**	**26.0**	**0.72**
Dual operators	Failed	Failed	Failed	17	33.8	0.93

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Training operators to use Gulper II

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Field test on strong sludge

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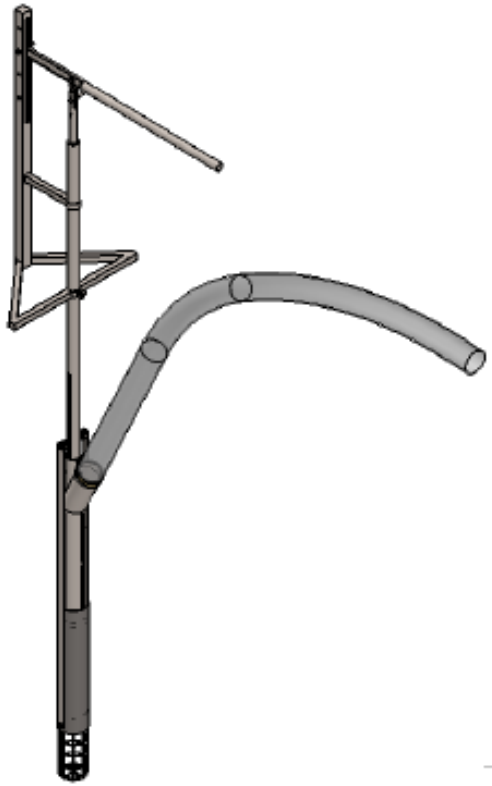
Why Gulper II is superior to Gulper I

- It pumps thick/ strong sludge
- Delivers sludge to receptacle in a sanitary manner
- Extendible to 3 meters
- Less energy to operate since it has a lever arm



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Challenges in pit emptying

- Most pits are filled with detritus materials
- Some pits are substandard; squat hole small, low roof and door height

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Conclusion and recommendations

- 50mm butterfly: all pit sludge with less rubbish
- 50mm gate valves: strong sludge with rubbish
- Marketing and Legalizing use of gulper II for pit emptying
- Ask house holds not to dump detritus material into pits

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Thank you for listening

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