Sustainable value chain linking FSM and agriculture in Vientiane, Lao PDR

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AfricaSan5 FSM5

Context

135° GDP /228 – 7,5% growth – Agriculture = 50% GDP

- Main city of Lao ; 1 M cap.
- 95% access to septic tanks
- No strategic sanitation planning
- 63 private FS operators
- Strong importation of chemical fertilizer
- Strong demand for a local organic fertilizer

Project content

Shaping & developing the FSM sector in the city

- Project under municipal authority
- Regulatory framework
- Involvement of the FS operators
- Capacity building (private & public)
- Communication to households

- Humus production:

  Detailed design, construction, start-up and process adjustment

VCOM

WTA

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Output 1: FSM Framework improved

Facilitating synergy between public, private & households

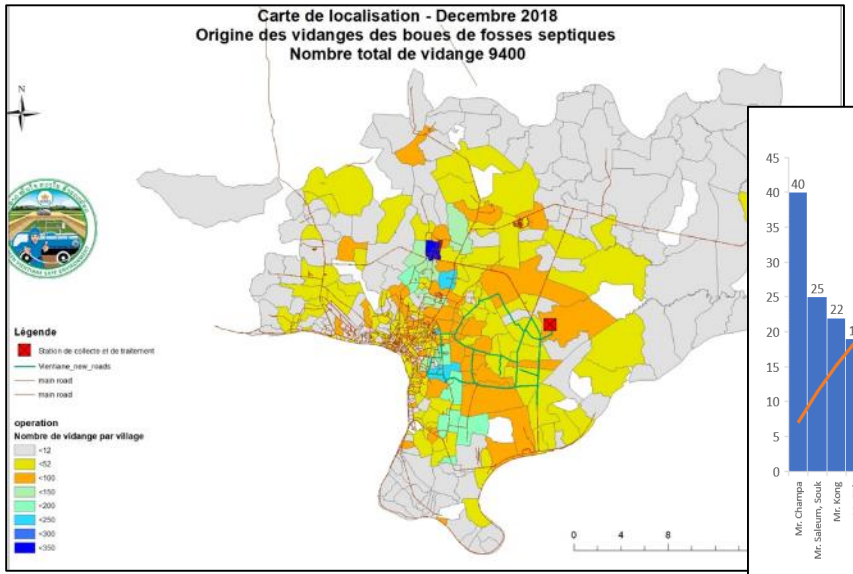
- A new municipal decree on FSM
- Certification of all FS operator
- Label & recognition support
- Procedures are developed at the municipal level
- Household awareness

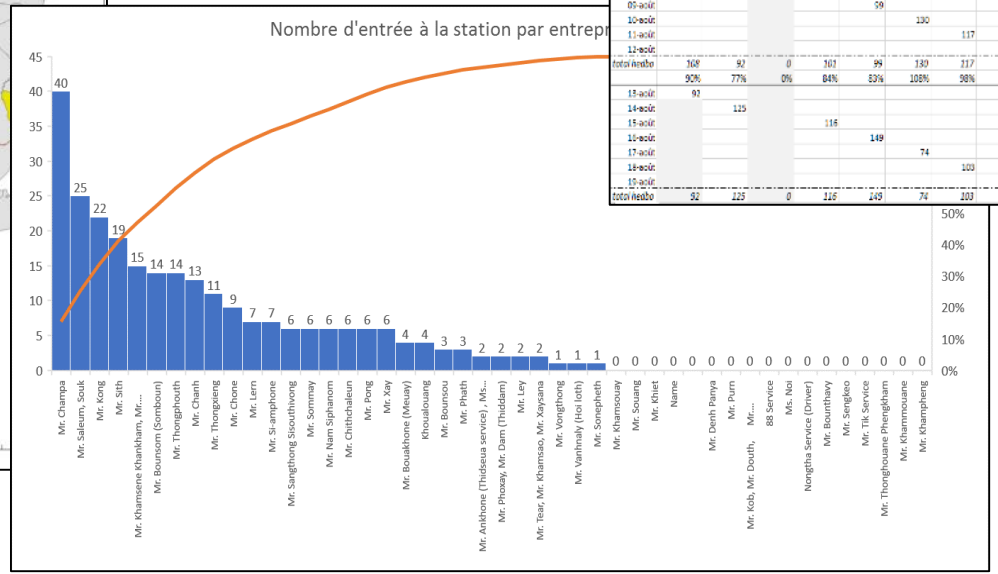
Internal Guidelines for inspection & monitoring VUDAA

Internal Guidelines for delivering operating permit VUDAA

Output 2: Useful monitoring tools

Monitoring for strategic actions





	A	B	C	D	E	F	G (expé)	H	Total
26-juil					67				67
27-juil						46			46
28-juil							63		63
29-juil								55	55
total/nombr	64	53	0	67	67	46	63	55	415
	53%	44%	0%	56%	56%	38%	53%	46%	40%
30-juil	81								81
31-juil		96							96
01-août				83					83
02-août					107				107
03-août						111			111
04-août							95,5		95,5
05-août								67	67
total/nombr	81	96	0	83	107	111	95,5	67	640,5
	68%	80%	0%	69%	89%	93%	80%	56%	76%
06-août	108								108
07-août		92							92
08-août				101					101
09-août					99				99
10-août						130			130
11-août							117		117
12-août								85	85
total/nombr	108	92	0	101	99	130	117	85	732
	90%	77%	0%	84%	83%	108%	98%	71%	87%
13-août	92								92
14-août		125							125
15-août				116					116
16-août					149				149
17-août						74			74
18-août							103		103
19-août								79	79
total/nombr	92	125	0	116	149	74	103	79	738

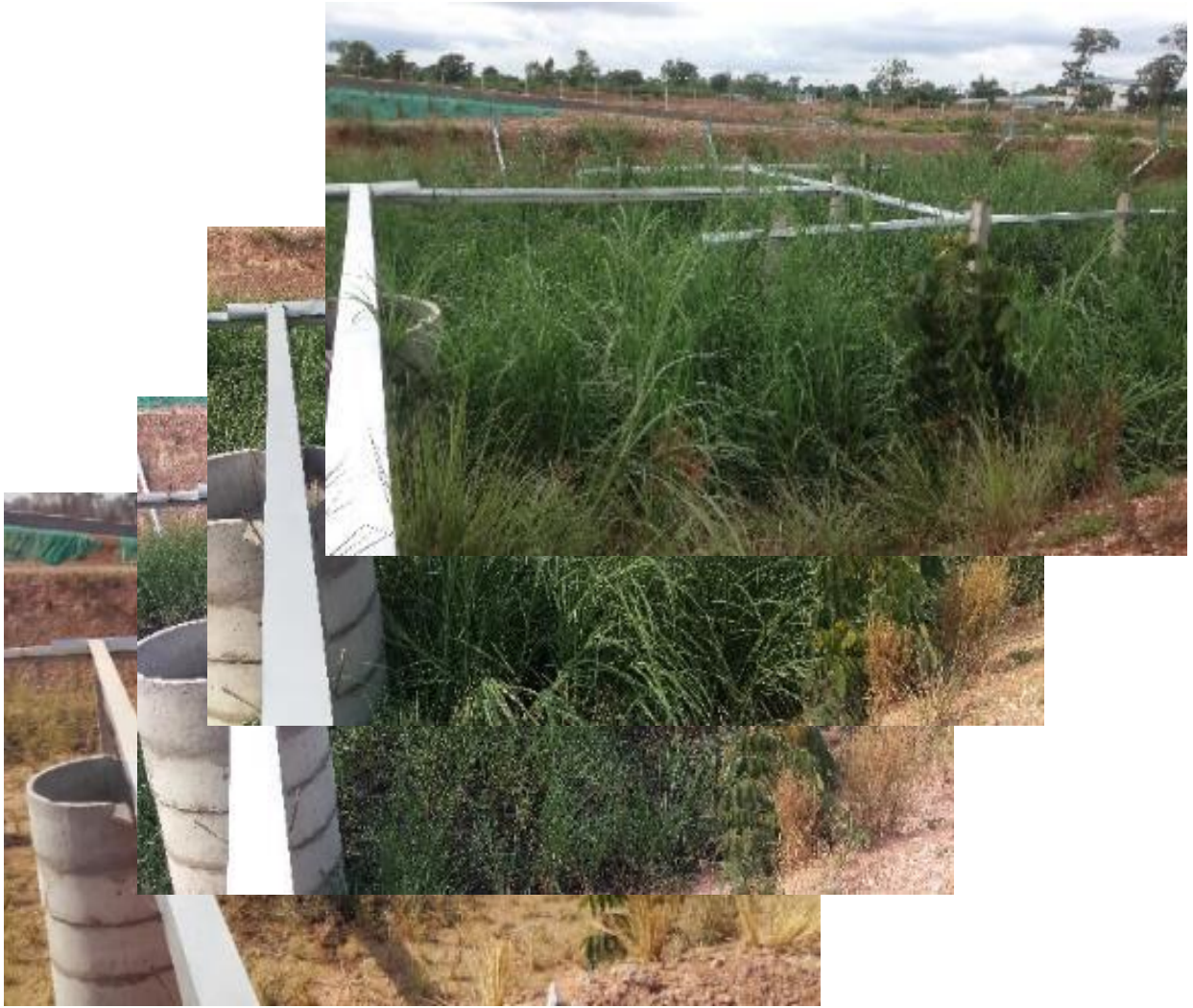
Output 3: Turning FS into Humus is effective

Using 100% free energy: gravity & solar

Key data

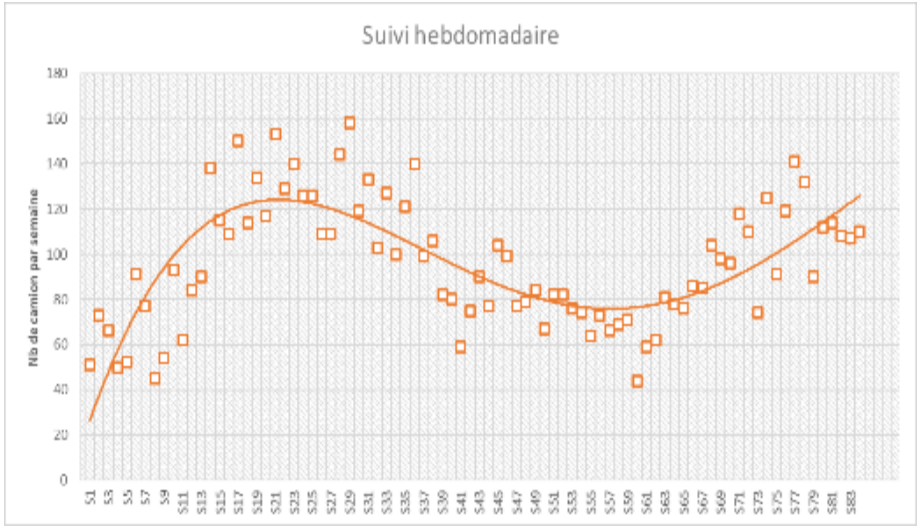
- Design load:
  - 120 m^3/ d
  - 10 g TS/L
  - 1 250 kg TS / d
- 800 k€ (construction + supervision + expert)

  -> 1,75 €/kg TS
- Feb 2017: start-up
  - Acclimation period
  - Load increase



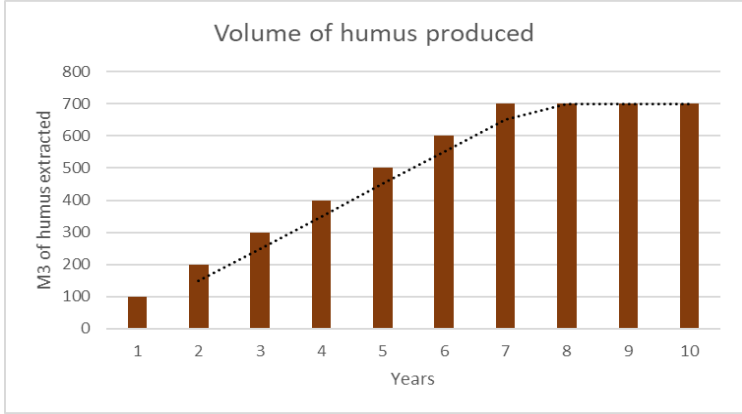
2 years in function

- 10 000 trucks received
- 45 000 m^3 FS treated
- Average loading rate 55%
- From 40 to 80% according to the season



Humus produced

Humus 1 year old



- 70 m^3 extracted mid 2018

- Analysis (01/2019):
  - C/N ~ 10
  - Heavy metals < French regulation
  - DMC = 70%
  - No helminth eggs alive
  - 2/3 samples < WHO guideline (1 HE/g)

SYNDICAT INTERDEPARTEMENTAL POUR L'ASSAINISSEMENT
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Percolate treatment

Strong efficiency of planted beds & tertiary treatment

		CONCENTRATIONS			
		INLET	**PLANTED BEDS**	**POND**	**FILTER**
SS	mg/L	7 000	107	14	14
TSS	mg/L	10 000	917	716	702
COD	mg/L	12 000	244	97	94
BOD	mg/L	1 000	42	19	19
TN	mg/L		130	76	74

	TOTAL
SS	99,80%
TSS	92,98%
COD	99,22%
BOD	98,10%

Sampling of Dec. 2018

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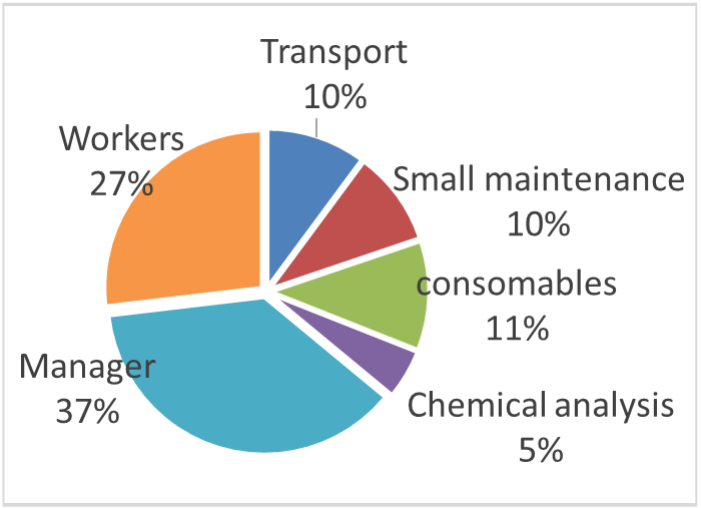
Economical concerns

General data

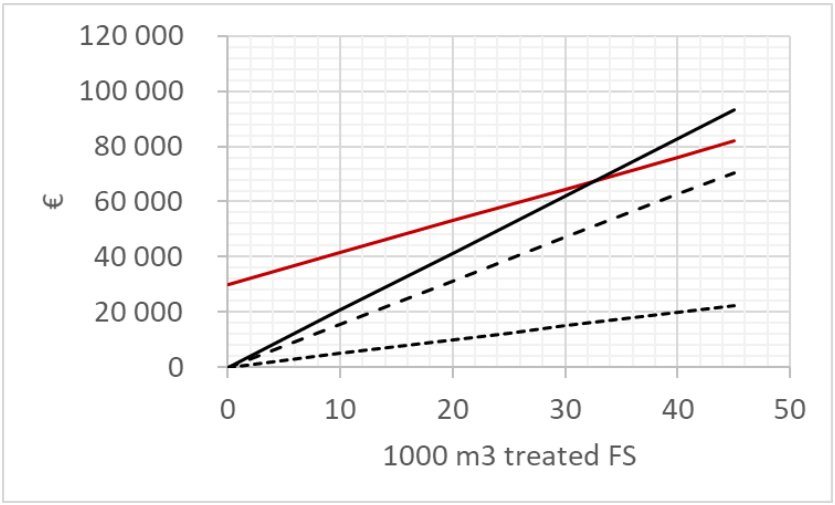
- O&M COSTS
  - Fixed : 30 000 €/y
  - Variable : 0,15 €/kg humus in bag



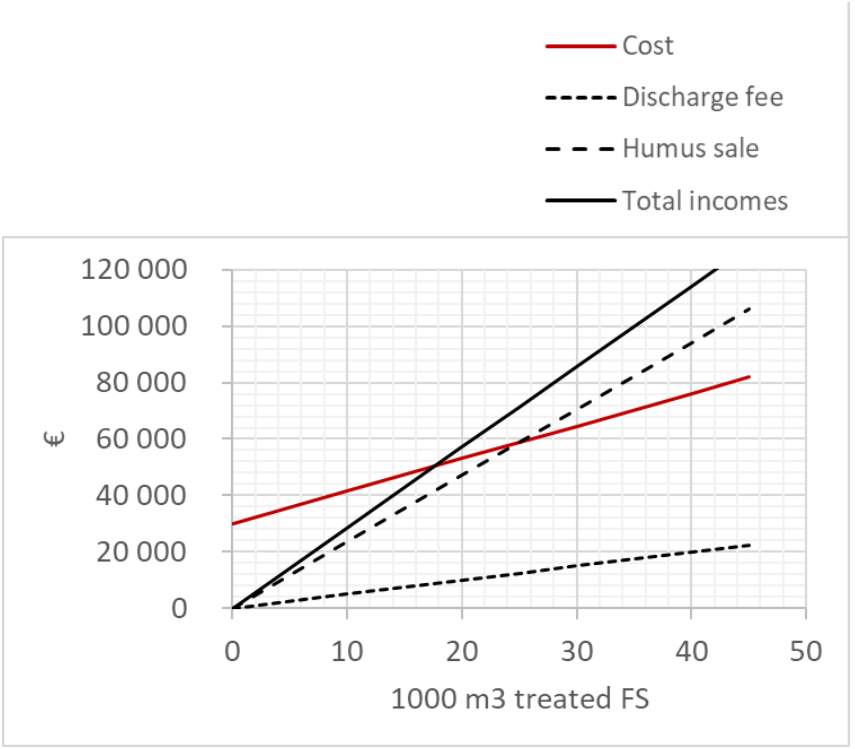
- O&M INCOMES
  - FSTP discharging fee: 0,5 €/m^3 FS
  - Sale of humus: 0,2 -> 0,3 €/kg (market study)

- Septic tank desludging
  - Min. 10 €/m^3 FS

Economical concerns



- 0,5 €/m³ discharge fee
- 10 €/humus bag
- Balance for 75% loading rate
- 10% profit at 100% loading rate



- 1 €/m³ discharge fee
- 15 €/humus bag
- Balance for 40% loading rate
- 35% profit at 100% loading rate

Success factors & lessons learnt

- Political commitment is essential
- O&M adjustment period needs to be planed in the project
- Strong market study at the feasibility stage
- FSTP operator must be adapted
- Specialized consultants (all FSM components)
- Critical phase is FSTP commissioning

Points to Remember

- Producing good Humus from FS at scale is possible
- Treatment efficiency is high
- Many solutions were developed for the Planted Beds technology
- Economical sustainability is realistic, profitability also
- Local authorities involvement is essential
- The model is still in observation/optimization

THANK YOU!

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