Tools for faecal sludge management planning in small towns:
case study of Bignona, Senegal

Elhadji Mamadou Sonko
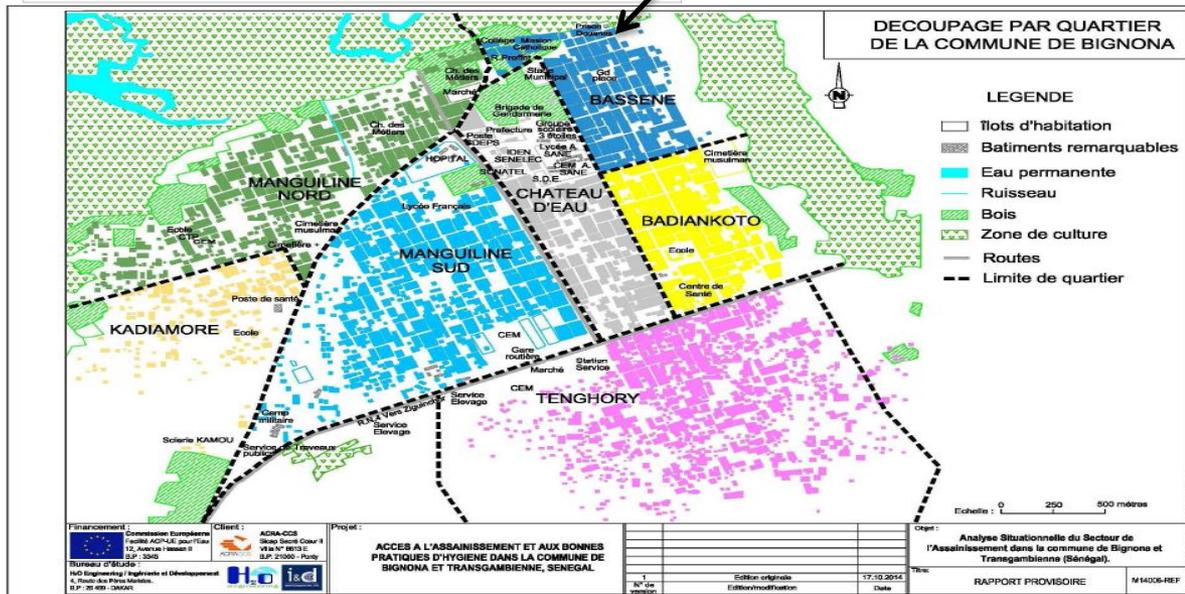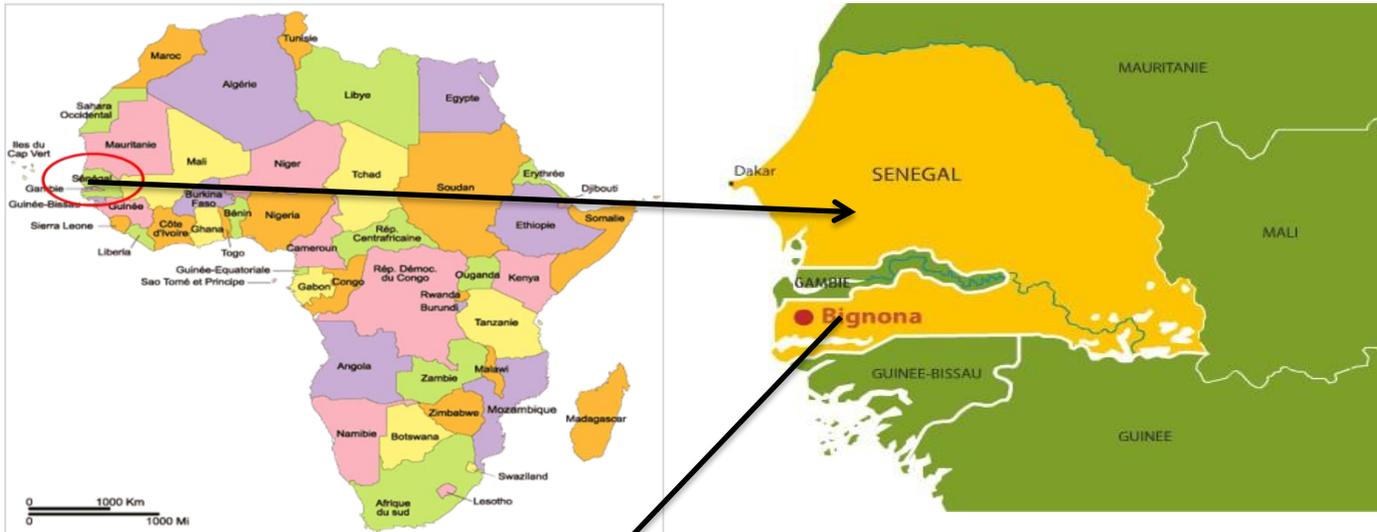Linda Strande, Lars Schoebitz, Juliette Ndounla, Seydou Guinko

Institute of Environmental Sciences, University of Dakar, Senegal

Background context

❖ In Senegal, the rate of access to improved sanitation systems is low in rural areas.

❖ 36.6% against 62.4% in urban areas, in 2013 (PEPAM, 2015).

❖ In order to address this situation the Government is implementing a new program for Rural Sanitation.

❖ Program is based on market approach than assistance approach.

❖ This approach is facilitating the intervention of NGO as ACRACCS in Bignona.

❖ But this requires a good knowledge of the sanitation situation.

❖ That's the purpose of these studies carried out by EAWAG / Sandec.

Site of the study

**44,783 hbts
1040.7 ha**

Method/approach/principles
Market Driven Approach

Market Driven Approach for Selection of Faecal Sludge Treatment Products

Schoebitz, L., Andriessen, N., Bollier, S., Bassan, M., Strande, L.

Sandec
Sanitation, Water and
Solid Waste for Development

eawag...
aquatic research

www.sandec.ch/fsm_tools

8 steps
1. Preparation of the study
2. Market analysis
3. Market players analysis
4. Market sizing
5. Adjustment factor
6. Market growth
8. Market attractiveness
9. Market strategies (Schoebitz et al. 2016)

Method/approach/principles
Shit Flow Diagram


```
Field work          Office work
   |                    |
   v                    v
Existing data (secondary)
        |
        v
Interviews with key informants
        |
        v
Data verification  -->  Field observations
and data
triangulation      -->  Group discussions
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http://www.susana.org/en/resources/library/details/2211

Results

MDA:
Market Driven Approach
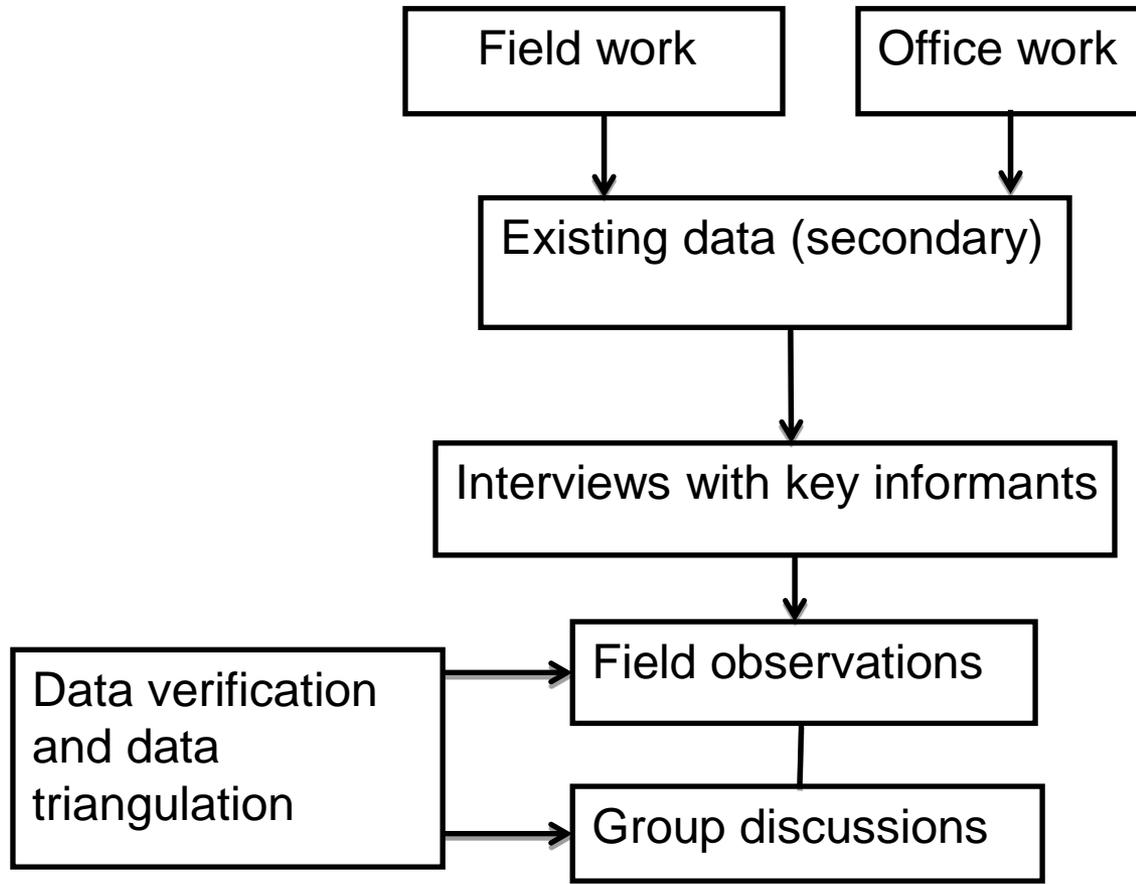
SFD:
Shit Flow Diagram

By-products and their substituted products

Sub-products	Substituted products	Application marketing / industrial
Soil amendments (compost, digestat)	Manure, peanut shells	Agriculture
Fertilizers	Chemical fertilizers (urea, NPK)	Agriculture
Forage plants (plants from planted beds)	Peanut leaves	Livestock
Solid fuels (pellets, briquettes)	Coal, wood, peanut shells	Combustion Energy, cooking
Liquid fuel (biogas)	Gas cylinder (Butane gas)	Cooking, Home lighting
Protein	Food for livestock , fish and poultry	Livestock, aquaculture
Treatment effluent	Water	Gardening
Electricity	Electricity	Home lighting
Fish	Fish	Human consumption

Some examples of substitute products

Manure

Peanut shells

Charcoal

Peanut leaves

Gas cylinder

Market size and volume

Substituted products	Market size /year	Market volume (CFA) /year
Peanut leaves	127 tonnes	18.193 millions
Peanut shells	55 tonnes	137 500
Chemical fertilizers	230.25 tonnes	49.31 millions
Charcoal	80 tonnes	2.56 millions
Food for livestock and poultry	250 tonnes	340 millions
Gas cylinder	42.000 cylinder	145.6 millions
Manure	85 tonnes	280 000
Electricity	20 megawatt	1.608 billion
Fish	1,750 tonnes	360 millions
Water	-------------	0

Sonko and Strande, FSM4

What by-product is adapted to the context of Bignona? (1/2)

Sub-products	Forces	Weaknesses	Opportunities	Threat
Biogas	✓Strong demand ✓No local producers ✓Social acceptance	✓Technical parameters ✓Composition	✓Replaces coal and wood ✓Collaborate with the supplier from Ziguinchor	✓Quantity of sludge collected ✓Cost
Electricity	✓Social acceptance ✓May interest Tenghory	✓Investment and operating cost	✓Could be sold to Senelec	✓ Quantity of sludge available
Compost	✓Strong demand	✓Cost	✓Co-composting ✓Cost of chemical fertilizer	✓Low cost of manure ✓Quantity of sludge collected

What by-product is adapted to the context of Bignona? (2/2)

Sub-products	Forces	Weaknesses	Opportunities	Threat
Fodder plants	✓Livestock area ✓Tropical climate	✓Sludge characteristics ✓Sanitary standards	✓Increasing number of animals	✓Production capacity
Treatment effluent	✓Gardening in the locality	✓ Quantity and characteristic	✓Strong vegetable consumption	✓ Social acceptance
Solid Fuels	✓Replace coal	✓Few industries	✓SONACOS	✓Cost

Sonko and Strande, FSM4

Classification of by-products in ascending order of interest

1. Forage

2. Aquaculture

3. Soil amendment

4. Fertilizers

5. Biogas

6. Electricity

7. Animal proteins

8. Solid Fuel

9. Processed water

10. Building Materials

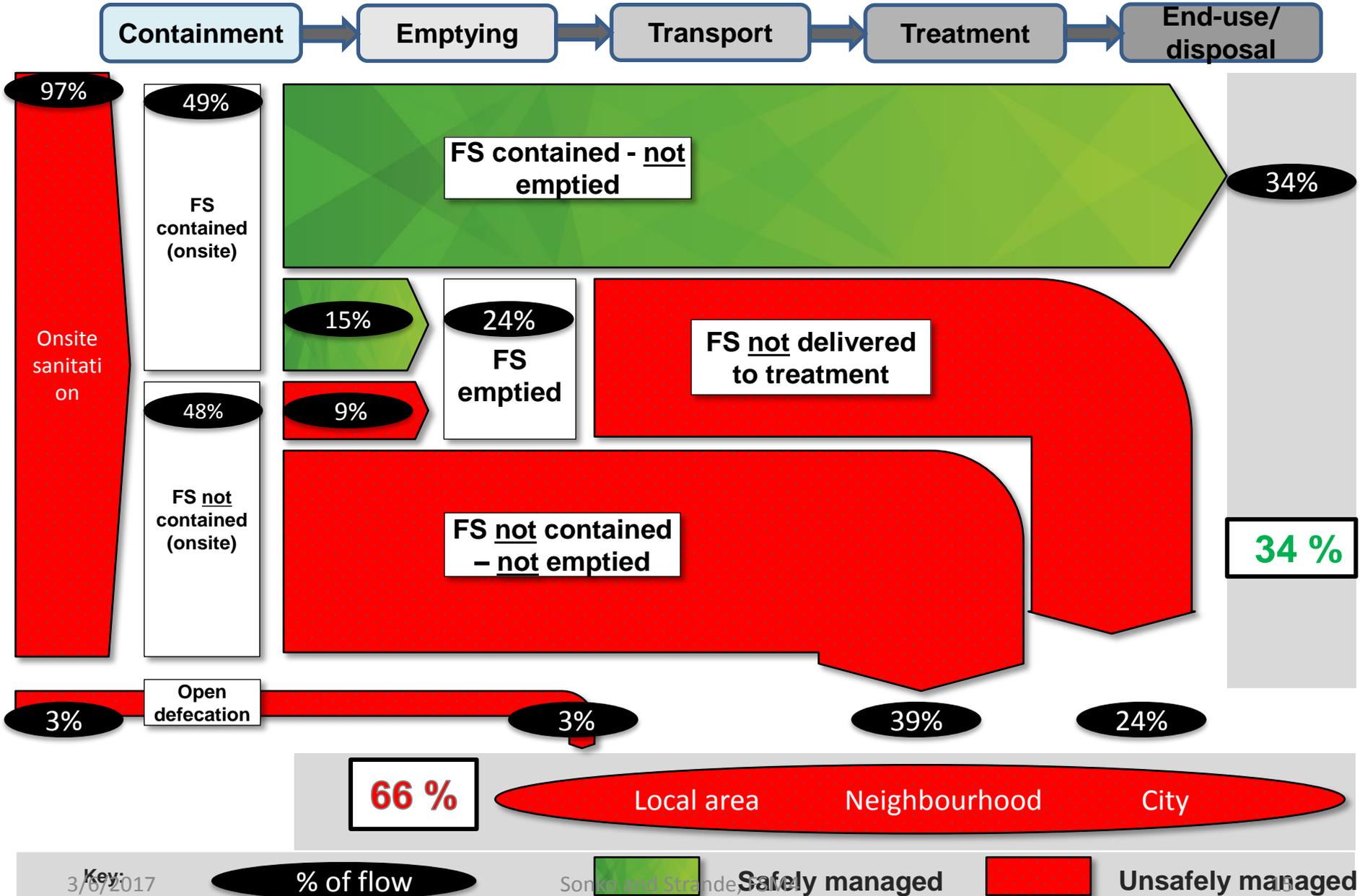11. Soil amendment (untreated raw sludge)

Sonko and Strande, FSM4

What the MDA brought?

❖Facilitated the communication with all stakeholders.

❖ Helped to have the commitment of all the actors.

❖ Facilitated the choice of the most appropriate treatment technology.

❖Shown the business that can be created around the FSM.

Results

MDA:
Market Driven Approach

SFD:
Shit Flow Diagram

Bignona, Senegal, 08.12.2015
Desk based assessment

| Containment | Emptying | Transport | Treatment | End-use/ disposal |

97%

49%

FS contained (onsite)

FS contained - not emptied

34%

Onsite sanitation

15% **24%**

FS emptied

FS not delivered to treatment

48% **9%**

FS not contained (onsite)

FS not contained – not emptied

34 %

Open defecation

3% **3%** **39%** **24%**

66 % Local area   Neighbourhood   City

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Key: % of flow   Safely managed   Unsafely managed

What the SFD brought?

❖A better understanding of sanitation in Bignona.

❖Shows where to act to reverse the trend.

❖Helped in the advocacy to engage local authorities and state services to act.

Difficulties to develop such studies in small towns

❖ Market dominated by informal

❖ No archives

❖ Difficult access to producers

❖ Lack of previous studies in the locality

❖ No laboratory equipped for analysis

❖ Disparity of data according to actors

❖ Mistrust of local populations

Sonko and Strande, FSM4

Thank you for your kind attention!