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Valentin Post is Deputy Director and Senior Finance, Sanitation and Waste Advisor at WASTE, Netherlands. He managed the Waste Venture Facility, and Guarantee Funds. He is the Co-founder of the Financial Inclusion Improves Sanitation and Health (FINISH), a € 100 M public private partnership in India as well as the Co-Founder FINISH in Kenya, a € 12 M public private partnership. He is co-author of the financing sanitation paper series and board member in several organisations (private and public).



# BEYOND DEVELOPMENT AID: SANITATION FINANCING & REVENUE MODELS IN REUSE (HUMAN) WASTE, 15 MAY 2017

## Lessons from microfinancing sanitation

Valentin Post





Imagine....



Photo: AFP



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Public and private financing  
Different cases  
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Loan products India  
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Sanitation loan specifics



- 3.4 billion people w/o (improved) toilet
- Sanitation related illnesses leading cause infant mortality (1000 children / day die)
- Malnutrition and stunting
- Challenge for women -> privacy, security, health
- No toilets -> high school dropouts of girls (23%)
- India 6.4% GDP not realized due to sanitation related loss of work
- Market estimated at min. Euro 120 Billion.

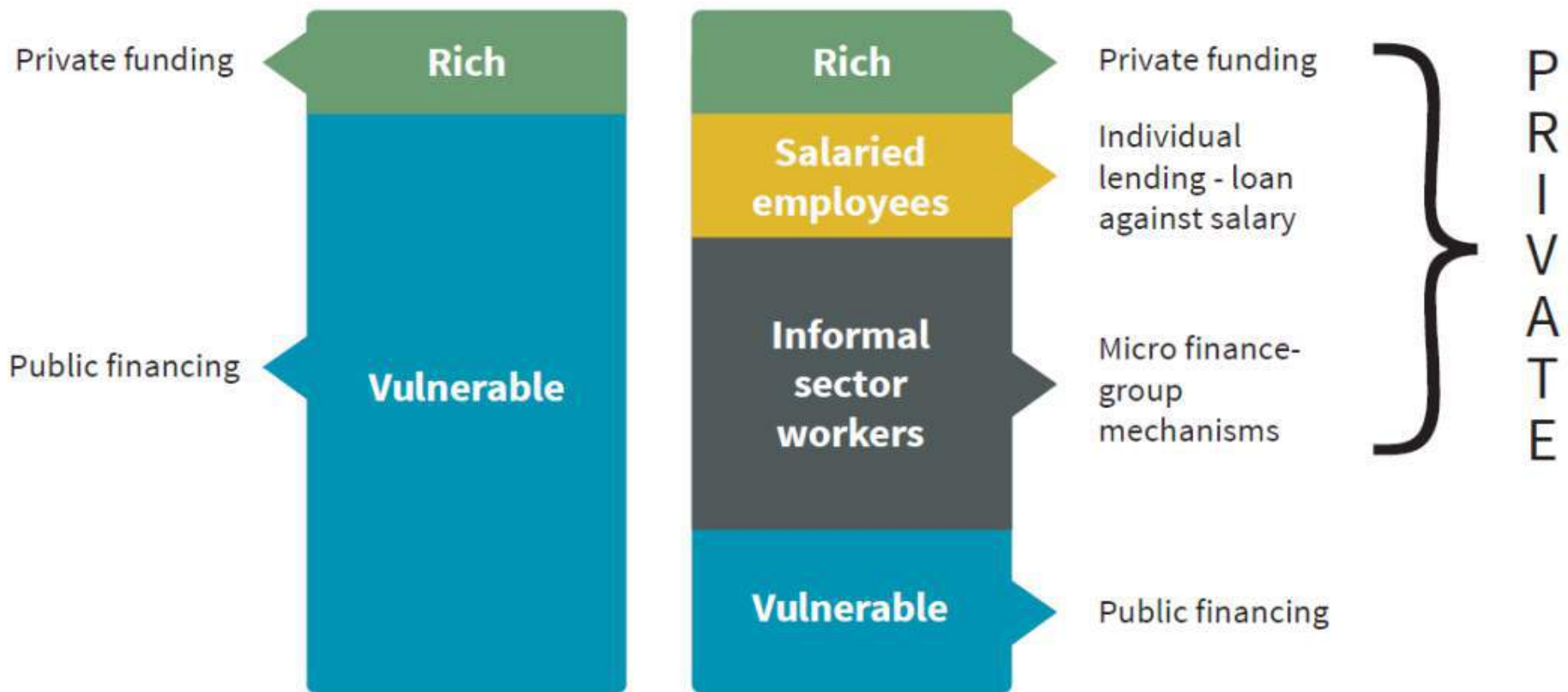
## GLOBAL SCENARIO



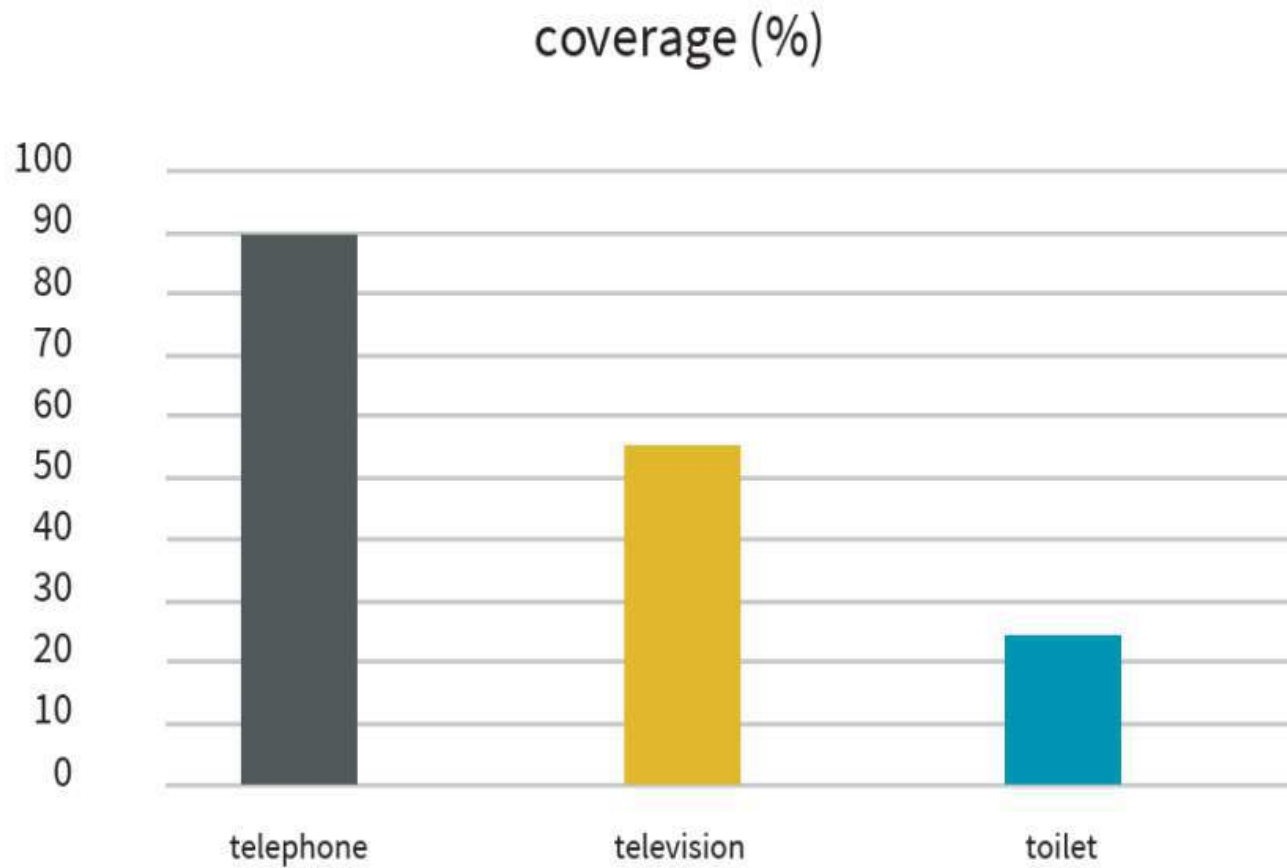
# PUBLIC & PRIVATE FINANCING

Many sanitation programmes operate on two premises:  
1. Sanitation is a public good  
2. People are willing to pay, but not all people have the capacity to pay

YET there are limited public funds

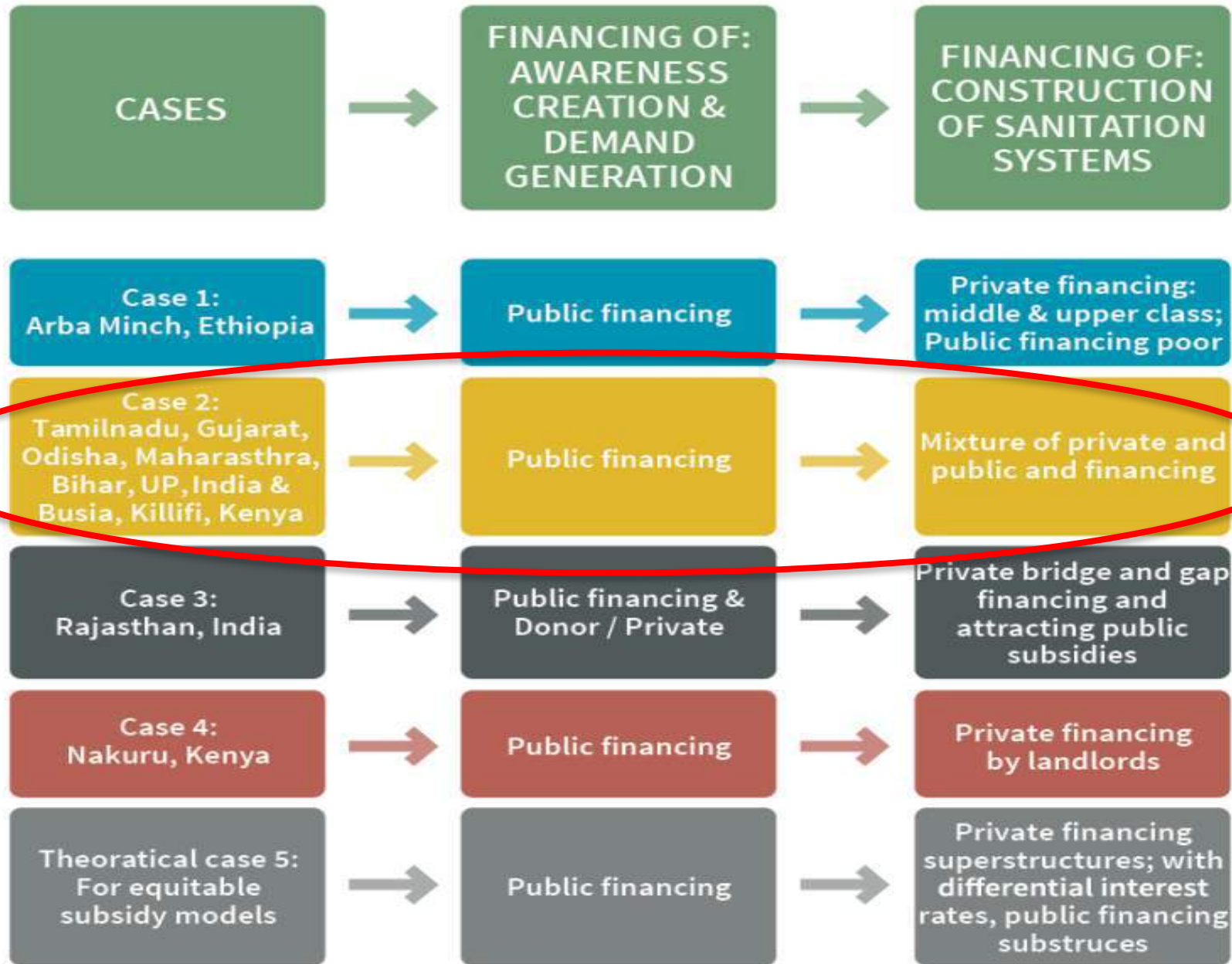


## Capability or willingness to pay ?





# Different cases



## PARTNERS

<b>Organization</b>	<b>Area of operation</b>	<b>Operation Started</b>
<b>BWDC</b>	Tamilnadu (India)	1986
<b>CASHPOR</b>	UP & Bihar (India)	2002
<b>CDOT</b>	Bihar (India)	2007
<b>FB</b>	Most counties (Kenya)	1985
<b>Imarika Sacco</b>	Kilifi (Kenya)	1967
<b>Mahashakti Foundation</b>	Odisha (India)	2004
<b>NCT</b>	MP & Chhattisgarh (India)	2002
<b>PF</b>	Odisha (India)	1989
<b>PRAYAS</b>	Gujarat & MP (India)	1998
<b>RDO Trust</b>	Tamilnadu (India)	1978/2013
<b>Sidian Bank</b>	Most counties (Kenya)	1984
<b>SSK</b>	Maharashtra (India)	2006

# FINISH MF MODEL INDIA

Awareness creation:  
demand generation  
with MFI infrastructure



Sustaining behaviour change  
Monitoring / awareness  
Health incentives  
Safe reuse nutrients / carbon

Access to local finances:  
effective demand

Mason training; supply of  
local material of construction  
→ employment creation



## Supported portfolios several states in India

Categories	2016-17			YTD 2009-2017		
	Euro (M)	INR (M)	% Share	Euro (M)	INR (M)	% Share
<b>Finance (Bank/MFI/Other)</b>	2.1	144	25.2	34.4	2410.1	36.3
<b>Subsidy</b>	1.3	91	47.8	39.5	2767.0	42.9
<b>Self Financing</b>	0.7	50	26.5	18.7	1311.6	20.2
<b>CSR support</b>	0.1	8	0.5	0.6	41.9	0.5
<b>Total</b>	4.2	294	100.1	93.3	6530.6	100.0

**LOAN  
PRODUCTS  
INDIA**

	<b>Number of sanitation loans of surveyed MFIs</b>	<b>Average amount (INR)</b>	<b>Tenure (months)</b>
<b>NCT</b>	<b>10,120</b>	<b>10,000-15,000</b>	<b>24-36</b>
<b>SSK</b>	<b>118</b>	<b>6,000- 15,000</b>	<b>12-24</b>
<b>PF</b>	<b>3,020</b>	<b>10,000-25,000</b>	<b>18-24</b>
<b>PRAYAS</b>	<b>1,579</b>	<b>10,000</b>	<b>12</b>
<b>CASHPOR</b>	<b>10,216</b>	<b>5,000</b>	<b>12</b>
<b>BWDC</b>	<b>20,757</b>	<b>5,000- 20,000</b>	<b>12-24</b>
<b>CDOT</b>	<b>408</b>	<b>12,000-18,000</b>	<b>18</b>
<b>Mahashakti Foundation</b>	<b>215</b>	<b>12,000-25,000</b>	<b>12-24</b>
<b>RDO Trust</b>	<b>34,186</b>	<b>20,000- 25,000</b>	<b>24 – 36</b>
<b>TOTAL</b>	<b>80,619</b>		



**LOAN  
PRODUCTS  
INDIA**

<b>Name of the MFI</b>	<b>Interest rate (pa)</b>	<b>Cost to borrower</b>	<b>Selection of borrower</b>
<b>NCT</b>	12	13,680 (EMI 570)	SHG members
<b>Sakhi Samudaya Kosh</b>	7	2000	NA
<b>Peoples Forum</b>	22	ROI + LPF + Insurance	NA
<b>PRAYAS</b>	21	21% interest + 1% LPF	Loan Track record / also to individuals
<b>CASHPOR</b>	21	NA	JLGs/ 1 loan cycle without default
<b>Bharathi Women Development Centre</b>	26	NA	SHGs & JLGs Capacity to pay
<b>CDOT</b>	26	NA	NA
<b>Mahashakti Foundation</b>	18	NA	Capacity to pay, sanitation need, space
<b>RDO Trust</b>	10 - 18	NA	SHG / JLG

**INTEREST  
RATE  
DIFFEREN-  
TIALS**

Name of the MFI	Rate of interest	
	Sanitation Loan	Regular Loan
<b>NCT</b>	12%	18%
<b>SSK</b>	7%	22%
<b>PF</b>	22%	26%
<b>PRAYAS</b>	21%	26%
<b>CASHPOR</b>	21%	21%
<b>BWDC</b>	26%	26%
<b>CDOT</b>	26%	NA
<b>MF</b>	18%	26%

PROCESS  
TO AVOID  
LOAN  
DIVERSION

<b>MFIs</b>	<b>Process to check Loan Diversion</b>
<b>NCT</b>	Disbursing 1 <sup>st</sup> installment after digging the pit
<b>SSK</b>	Prefabricated toilet unit installed by vendor. Direct payment to vendor.
<b>PF</b>	Start demand generation, check space availability. Cross questioning to check need. Post loan sanctioning, 5 days to dig pit, start construction from own funds. Loan released after completion foundation.
<b>PRAYAS</b>	Vigorous survey & meeting with group members to identify the need of sanitation and family willingness to construct the unit
<b>CASHPOR</b>	Hygiene & sanitation; introduce CHF; credit; product utilization. 1119 CHF in 12 regions. Each CHF facilitate 12-15 Health education (HE) session on each branch / m, promote healthy practices as daily routine.
<b>BWDC</b>	Not applicable
<b>CDOT</b>	Most toilets constructed through sanitation mart, confirms that loan is for toilet construction. Clients constructing on their own are regularly visited by field officers verifying progress construction. If for 3 months no progress is seen to be made the client have to repay the amount.
<b>Mahashakti Foundation</b>	NA

# DEFAULTS

<b>MFIs</b>	<b>Default rate</b>
<b>NCT</b>	< 1%
<b>SSK</b>	NA
<b>PF</b>	NA
<b>PRAYAS</b>	< 1%
<b>CASHPOR</b>	< 1%
<b>BWDC</b>	PAR 90 < 1%
<b>CDOT</b>	NA
<b>MF</b>	< 1%

**Reasons default:**

- 1) Death of the beneficiary or the death of the head of the family**
- 2) Migration**
- 3) Over in-debttness and received more than one loan.**

**SANITATION  
LOAN  
SPECIFICS**

MFI	Model designed/developed for sanitation credit	
	Technical Model	Operational Model
<b>NCT</b>	Septic tank and soak pit	Amount 10,000-15,000, balance by client IR 12%. Tenure 24-36 m.
<b>SSK</b>	Prefabricated structure of individual toilet	Group (3-7 women). IR ≤ 14%. Tenure 12-24m s per loan amount.
<b>Peoples Forum</b>	Single pit with 'Y' , double pit, septic tank + soak pit	Monthly INR 900-1200. Tenure 12-24. IR 22%, grace 30d
<b>PRAYAS</b>	Single Pit with 'Y' junction & Double Pit	Assess space, requirement & interest
<b>CASHPOR</b>	Single Pit with 'Y' junction & Double Pit	Amount INR 3000-5000. IR 21.17-21.65%. Grace 14d No LPF
<b>BWDC</b>	Double Pit, Septic Tank with soak pit, & Single pit with 'Y'	Amount 5000-20,000 (Avg18,500). IR 26% with foreclosure system.
<b>CDOT</b>	Low cost double pit	IR 26%. Tenure 18m
<b>Mahashakti Foundation</b>	No specific model	Lower IR (18%) for the sanitation credit to individuals.



WHY  
DEVELOP  
SANITATION  
LOAN  
PRODUCT?

MFIs	Reasons for development of sanitation loan product
<b>NCT</b>	Works with SHG groups, demand group members, basic requirement and for safety and dignity.
<b>SSK</b>	For the benefit of women and to reduce their stress.
<b>Peoples Forum</b>	Opportunity, government support/subsidy big help to serve local society. Funders offer term loan at reduced IR. FINISH for mason, animator Training and IEC material.
<b>PRAYAS</b>	Due to demand of members for sanitation loan support.
<b>CASHPOR</b>	Hygiene, health, poverty, social & economic development. Sanitation products for livelihood improved hygiene & health.
<b>BWDC</b>	Community health & hygiene issues; credit systems. Develop ownership of community on the sanitation units.
<b>CDOT</b>	Opportunity for sustainable sanitation system in the society. FINISH provided animator and mason training
<b>MF</b>	Health improvements, social-economic development community level

<b>MFIs</b>	<b>Effectiveness of sanitation lending</b>
<b>NCT</b>	Effective because people's own money, community realized importance of toilet in their daily life.
<b>SSK</b>	Yes
<b>Peoples Forum</b>	Effective, 1 year for process & break even. Lot of opportunities. Process simplified & loan product expanded to all branches
<b>PRAYAS</b>	Yes, 99% members who construct are also using it
<b>CASHPOR</b>	Visible; women decisive roles promotion & management at HH; Women & girls feel secure & saves their privacy, prevention of water born diseases & mitigation of health expenditures etc.
<b>BWDC</b>	Yes, demand is fair. 100 % repayment is ensured. Rate of utility is satisfactory.
<b>CDOT</b>	Increase in demand but many clients perceive that provision of toilets & water are responsibility of Government.
<b>Mahashakti Foundation</b>	Reduces inequalities in health through focus on improving health and environmental conditions of poor people; community awareness and health standard increased through health education and promotion.

<b>MFIs</b>	<b>Responses on profit from sanitation lending</b>
<b>NCT</b>	Sanitation lending for social cause.
<b>SSK</b>	Cost of funds very high – not profitable
<b>Peoples Forum</b>	Profitable business but requires continuous technical and promotional support. Big potential
<b>PRAYAS</b>	Sanitation loan as social cause, cost recovery.
<b>CASHPOR</b>	None of the services are provided for business profit.
<b>BWDC</b>	Yes, good repayment, adequate demand, good IR
<b>CDOT</b>	NA
<b>Mahashakti Foundation</b>	Sanitation loan as social cause

**SBM**

<b>MFIs</b>	<b>Involvement of SBM in Sanitation lending scheme</b>
<b>NCT</b>	No
<b>SSK</b>	NA
<b>Peoples Forum</b>	Through NABARD etc., ready to support local MFIs and NGOs.
<b>PRAYAS</b>	Hasn't reached interior areas. Some city members receiving benefits from SBM.
<b>CASHPOR</b>	No
<b>BWDC</b>	Yes
<b>CDOT</b>	NA
<b>Mahashakti Foundation</b>	No convergence





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MFIs	Recommendations to improve sanitation lending
NCT	Prepare guideline to improve sanitation lending & to ensure proper physical monitoring.
SSSK	Need more focussed and specialized human resources
Peoples Forum	Reduction in TAT & operational efficiency keys to sanitation lending
PRAYAS	People's contribution required for success and usage
CASHPOR	Amount increase to INR 8000 - 10,000.
BWDC	Timeliness; technical details during loan distribution. IR lower; <b>High priority for subsidy linked loan;</b> Simplified refurbishments loan product.
CDOT	NA
Mahashakti Foundation	<b>Sanitation market development; Avoid monopoly and encourage competition for sanitation suppliers;</b> Sharing of different case studies on sanitation at Community level.

R E C O M M E N D A T I O N S	<b>MFIs</b>	<b>Suggestions for FINISH</b>
	<b>NCT</b>	Technical & financial support sanitation loan
	<b>SSK</b>	Government linkages & refinancing assistance
	<b>Peoples Forum</b>	Blended finance; assist in documentation and process flow development; make entire model should be transparent and understandable.
	<b>PRAYAS</b>	Refinancing assistance
	<b>CASHPOR</b>	Introducing new low cost toilet structures; organize events/ programs to promote demand & create sanitation awareness
	<b>BWDC</b>	Refinancing assistance; IEC material support; establish RSM projects; continue grant support for further three years.
	<b>CDOT</b>	NA
	<b>Mahashakti Foundation</b>	Proper design sanitation loan product. Orientation and CB to community people on need of sanitation loan. Guidance in proper selection of client before loan disbursement.

# PARTNERS KENYA

Organization	Area of operation	Started
Family Bank	Most counties (Kenya)	1985
Imarika Sacco	Kilifi (Kenya)	1967
Sidian Bank	Most counties (Kenya)	1984
CEDEF	Busia (Kenya) umbrella of 12 SACCOs	2015



Demand generation CLTS

Basic sanitation systems constructed  
about 17,000

Financial partners developed micro loan  
products

Capacity development masons /artisans  
→ cost reduction 50% or more

Loan portfolio € 40,000

Hence from March 2016 refocus:

1. Sanitation marketing
2. Supply side interventions
3. Institutional sanitation

# FINISH MODEL KENYA

Awareness creation  
(CLTS- Amref / MoH):  
Sanitation marketing  
(Amref / MoH/INK)

Sustaining behaviour change  
Monitoring / awareness  
Health incentives  
Safe reuse nutrients / carbon  
Institutional MF

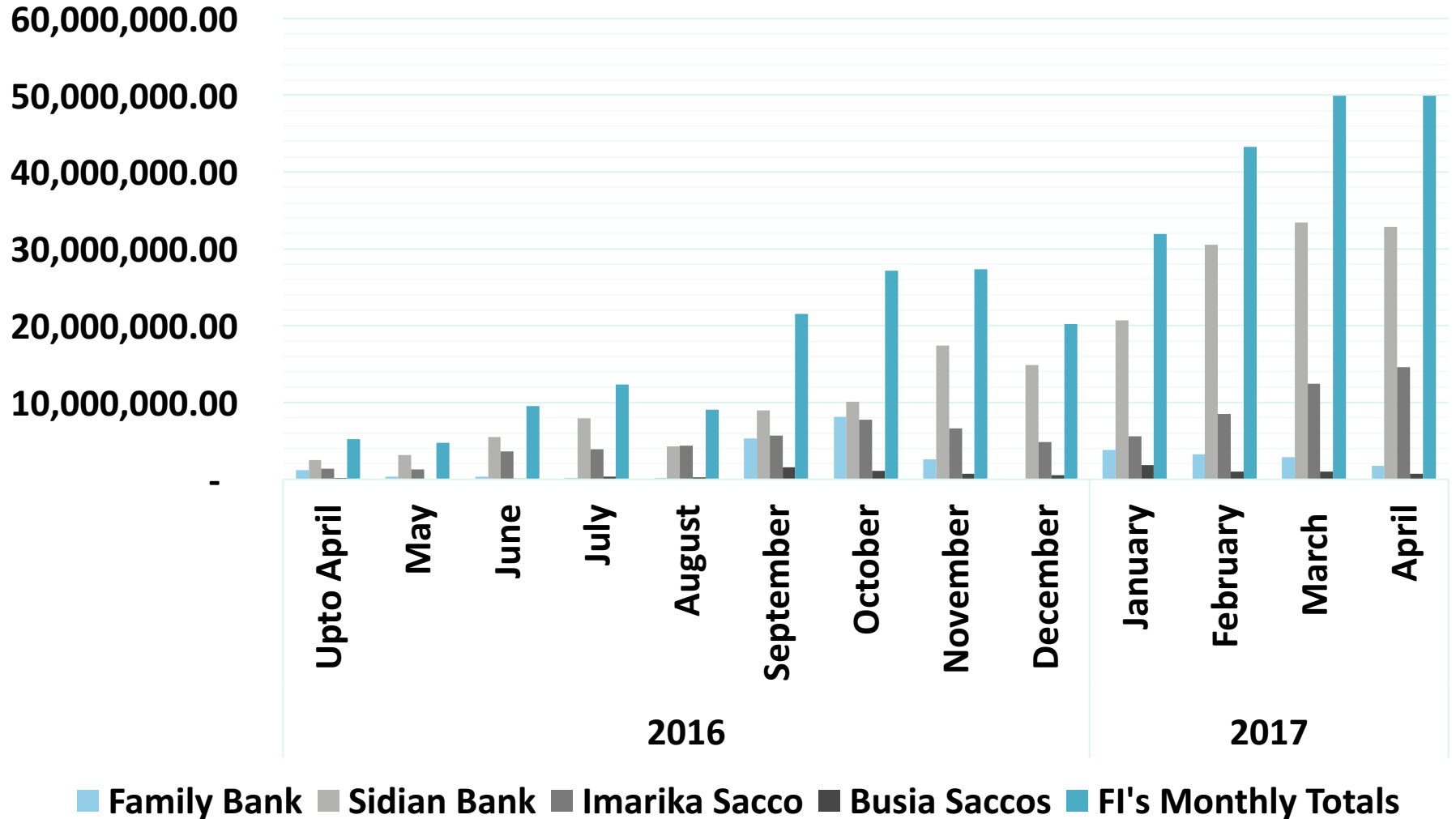
Access to local finances:  
effective demand

Mason training; supply of  
local material of construction  
→ employment creation  
→ MF clients



# Supported portfolios two counties in Kenya in KSh

## Monthly Cummulative Loan Portfolio by Partner Financial institutions



**LOAN  
PRODUCTS  
KENYA**

	<b>Family Bank</b>	<b>Imarika SACCO</b>	<b>Sidian Bank</b>
<b>Amount KSh</b>	<b>29,943,000</b>	<b>80,678,415</b>	<b>192,192,499</b>
<b>Number of loans</b>	<b>95</b>	<b>1158</b>	<b>1774</b>
<b>Range in KSHs</b>	<b>45,000- 1,000,000</b>	<b>45,000- 750,000</b>	<b>40,000- 2,084,000</b>
<b>Tenure (months)</b>	<b>24</b>	<b>Maximum 24</b>	<b>3-24; exceptional 36</b>
<b>Interest rate</b>	<b>15% (flat)</b>	<b>18%</b>	<b>14.5%</b>
<b>Cost to the borrower</b>	<b>LPF 3%; insurance fee 0.5%; credit life 0.5%</b>		<b>Application fee 1.5%; insurance fee 1%; SME only disbursement fee 1.5%</b>



**LOAN  
PRODUCTS  
KENYA**

	<b>Family Bank</b>	<b>Imarika SACCO</b>	<b>Sidian Bank</b>
<b>Client selection</b>	Open an account; collateral 20%; normal appraisal processes; Chattels or group guarantee, log book, school assets;	Active members only; savings account balance $\geq$ KSh1,000 repayment ability Loan secured $\geq$ 4 Guarantors Local Area Chief Endorsement Not a defaulter in any other loan	Open an account; for group model – group guarantee; cash collateral 20%; affidavits for loans $\leq$ KSh 150,000; tangible security loans $\geq$ KSh 300,000
<b>Process</b>	Application form with toilet work quotation. Work with artisan (FINISH-INK trained and/ or approved)	The SACCO pays the materials supplier/trained masons via cheque.	Individuals & groups; entrepreneurs in sanitation and related activities

WHY DEVELOP SANITATION LOAN PRODUCT?

MFIs	Reason for development of sanitation loan product
<b>Family Bank</b>	Targets low income households ; both new and existing clients; all types of toilet construction and improvement; biogas; exhauster trucks; waste incinerators (girls schools): SMEs
<b>Imarika</b>	Strong demand from clients (households, <b>schools</b> and entrepreneurs); good potential (based on partnership arrangements)
<b>Sidian</b>	Increased health status and social-economic development clients; cheap source of deposits; increase number of clients; cross-selling; goodwill & loyalty clients; loan portfolio growth; deposits growth Households, institutions, SMEs. Bank allocated KSh 500M; institutionalise sanitation loan product

- Micro Financing sanitation is feasible
- MFIs see it as market opportunity, for some based on client demand
- Wide variations in models applied by MFIs
- Most need some sort of ODA / subsidy to create awareness and generate demand, sometimes lower IR & cost of monitoring (diversion) higher
- Repayment rates are at least on par with regular MF
- High impact investment → blended finance / ODA
- Additional differences India & Kenya MF model



- India demand generation through infrastructure MFIs – community level with attention for construction
- India household financial inclusion through infrastructure MFIs
- India supply side construction – capacity development masons – attached to MFIs / some linked to vendors
- India sustained behaviour change; reuse & incentives
- Kenya demand generation through partnership (Amref / MoH) in two stages: CLTS + sanitation marketing/ sales
- Kenya supply side development; CD artisans / entrepreneurs / aggregators initial financial support, market for MF / SME finance and SGB (SEF)
- Kenya sustained behaviour change; schools & health volunteers turned entrepreneurs

- Kenya: Stronger focus on supply side development:
- CD masons → lower costs, this increases market size  
→ new financing market for MFIs (entrepreneurs, aggregators)
- Reuse markets at HHs not mature yet;  
→ institutional exists (biogas schools)
- Commercial and soft commercial leverage on ODA 10 – 20 x







**Jacqueline Barendse**  
Managing Director,  
WASTE

Jacqueline has over 30 years working experience in business development, finance and development aid. In the early years she was product and business development manager for Philips Electronics. Intrigued by the role of financing 'to make things happen' she moved to the financial sector (ING Bank, Triodos Bank, an own investment company and a consultancy organisation) in various roles (investment manager, board member, consultant), and in various countries in Europe, Africa, Asia. Over the years the focus shifted from corporate finance to development financing. At the moment Jacqueline is among others Managing Director of WASTE, board member of the Netherlands Water Partnership (NWP), member steering group ViaWater (innovation in water / sanitation), member of expert team on Output Based Aid of the World Bank (GPOBA).





...@SCALE

Basic needs, (local) entrepreneurship,  
sustainable solutions

## SDG AMBITIONS: RULES OF THE GAME HAVE CHANGED



Eco-Systems

Water Resources Management

Hygiene

Water Quality

**UNIVERSAL**

**SAFELY MANAGED**

WASTEWATER

*On premises*

*Use Efficiency*

# ...@SCALE

What	Need Basic Service	Need Safely managed service
Water	2.3 billion people	4.5 billion people
Sanitation	3.4 billion people	5.3 billion people

Financing (nil to safely managed service):

\$ 100 billion infrastructure

\$ 100 billion operations & maintenance

\$ .....

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**\$ .... billion p.y. till 2030**

# ...@SCALE

What	Need Basic Service	Need Safely managed service
Water	2.3 billion people	4.5 billion people
Sanitation	3.4 billion people	5.3 billion people

Financing (towards safely managed service):

\$ 100 billion infrastructure

\$ 100 billion operations & maintenance

**\$ 21 billion enabling environment**

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**\$ 221 billion p.y. till 2030**

## On earth:

Who	What
Samirah (Ethiopia)	Public toilets
Joseph (Haiti)	Water kiosks
Pradeep (India)	Toilets

# ...@SCALE

Who	Business	Bottlenecks	...@scale
Samirah - Public toilets	'Very busy, great revenues'	'Scaling subsidies'?	Revenue model for scale

# ...@SCALE

Who	Business	Bottlenecks	...@scale
Samirah - Public toilets	'Very busy, great revenues'	'Scaling subsidies'?	Revenue model for scale
Joseph - Water kiosks	'Ok, around break-even'	<ul style="list-style-type: none"><li>• People → trust quality</li><li>• Investors → trust government</li></ul>	<ul style="list-style-type: none"><li>• Marketing / behavioral change</li><li>• Government as partner, guarantors / guarantees</li></ul>



# ...@SCALE

Who	Business	Bottlenecks	...@scale
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<b>Pradeep - Toilets</b>	<b>'Scale: 1/4/24/365'</b>	<b>New area: Need € 25 mio</b>	<b>Blended finance:</b> <ul style="list-style-type: none"><li>• Pipeline € 100 mio investors</li><li>• Business eco system € 5-8 mio</li></ul>

# ...@SCALE

- ...@scale = facilitator
  - Revenue models
  - Link with financing (blending)
    - ➔ Transactions
- **Inclusive !!! (100%)**
- ...@scale is **not** a fund
- Aqua4all and WASTE

...@SCALE



THANK YOU





**Sjef Ernes**  
Managing Director,  
Aqua for All

**Sjef Ernes** is managing director of Aqua for All since 2004. His career has been water-dominated: water technology-consultant, managing director of a drinking water utility, entrepreneur in industrial water services and now enabling the integrating of business & finance on interventions providing access to safe drinking water & sanitation to the BoP via Aqua for All. Since 2005 Aqua for All has successfully contracted DGIS grant support to provide leverage on private and civil interventions, totaling up to € 74 million by 2017, matching with over € 80 million from private sector and philanthropy participation. Aqua for all recently completed an acceleration-assessment on 24 business propositions in the sanitation finance & business working field. They provide gate funding to promising gamechangers in sanitation as businesses like FINISH and Safi Sana. Together with WaterNet-Amsterdam Aqua for All organizes the bi-annual Sarphati Sanitation Award.



**Aqua for All**

## **Sanitation Financing & revenue models**



**Value for money. Money for value.**

**15th may 2017**

# What can we learn from Kiosk business funding?



**The Untapped Potential of  
Decentralized Solutions to Provide Safe,  
Sustainable Drinking Water at Large Scale**



SWE-report: the untapped  
potential of SWE's at large scale  
*march 2017 (see [www.aquaforall.org](http://www.aquaforall.org))*

## Questions:

1. Is there also an untapped business potential for toilets?
2. Why is WASH-BoP funding always blended finance?
3. Is PPP approach helping ?
4. Are kiosk funding structures applicable for sanitation ?





## *PPP business opportunities in Safe Water services*





## *PPP business opportunities in sanitation services?*



# The findings of the SWE study

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## Market is there

Huge untapped market potential for SWE's, as one of the 3 broader access models, providing safe & sustainable services, ready to scale

1,7 billion people underserved, using water that is unsafe and poorly treated

2 billion , underserved, using a source of decentralised improved water, but this is not treated or safe

While it is estimated that as many as 4,4 billion people lack reliable access to clean, SAFE drinking water

## In line with gvt, social impact

SWE's add value, support the safe water policy, with high quality, cost effective services, provides benefits to all 4 stakeholders (end consumer, government, investors and private sector)

Safe Water Enterprises can play a key role in the service delivery spectrum, for governments achieving SDG6 with sustainable services

SWE's provide pathways to increased market penetration, cost effectiveness, efficiency and scale and create clearer articulation of social impact.

# The findings in other words

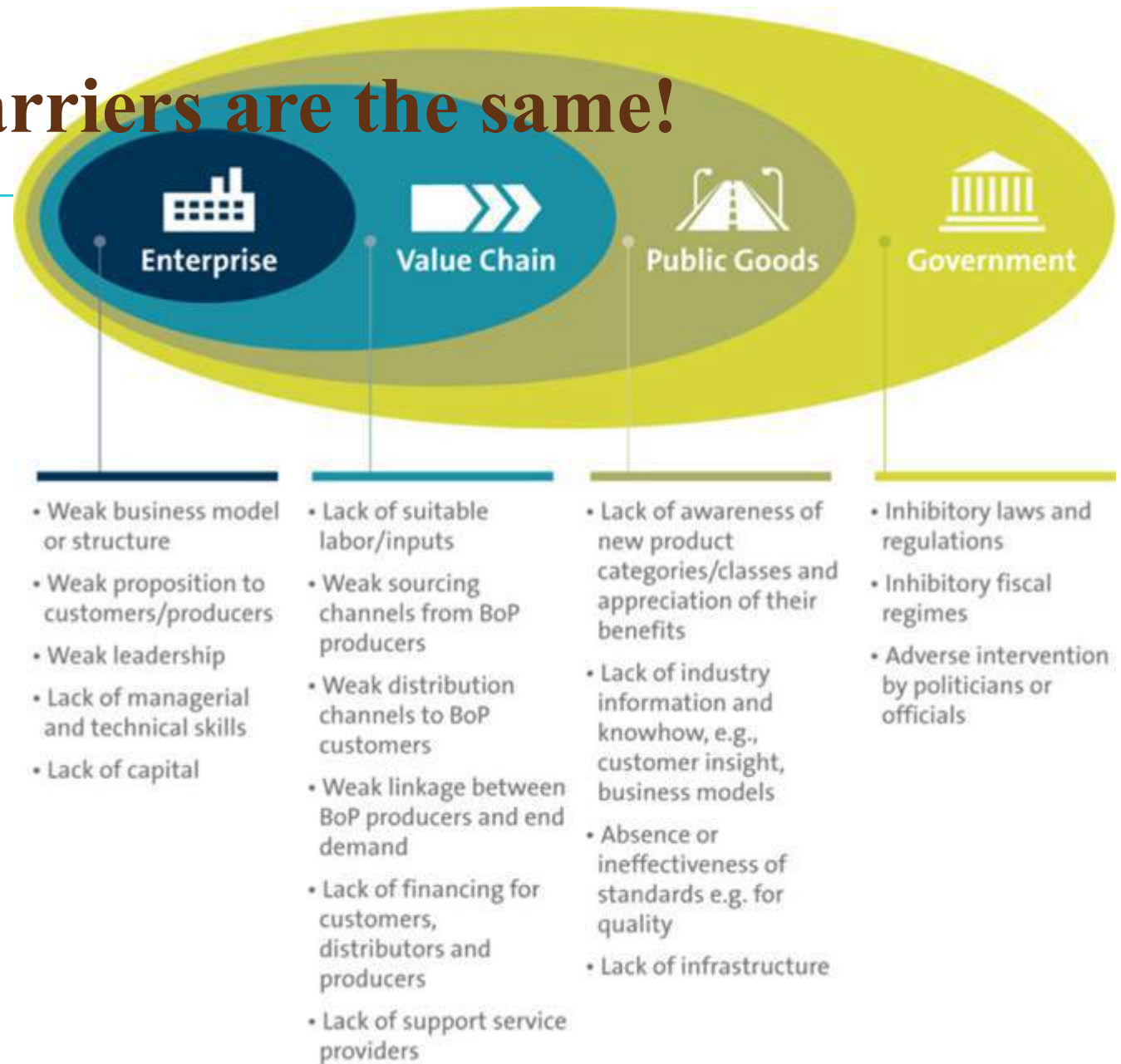
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- There is a business opportunity
- There is a PPP opportunity for gvt
- There is a (sleeping) demand
- There is a willingness to pay for service
- Revenue drivers are cash flow proven
- Investments are much more cost effective , in CAPEX and in OPEX, compared to piped solutions
- There is an impact that unlocks outcome payers
- Scale, technology, proven concepts, SME's: all there



# Scaling barriers are the same!

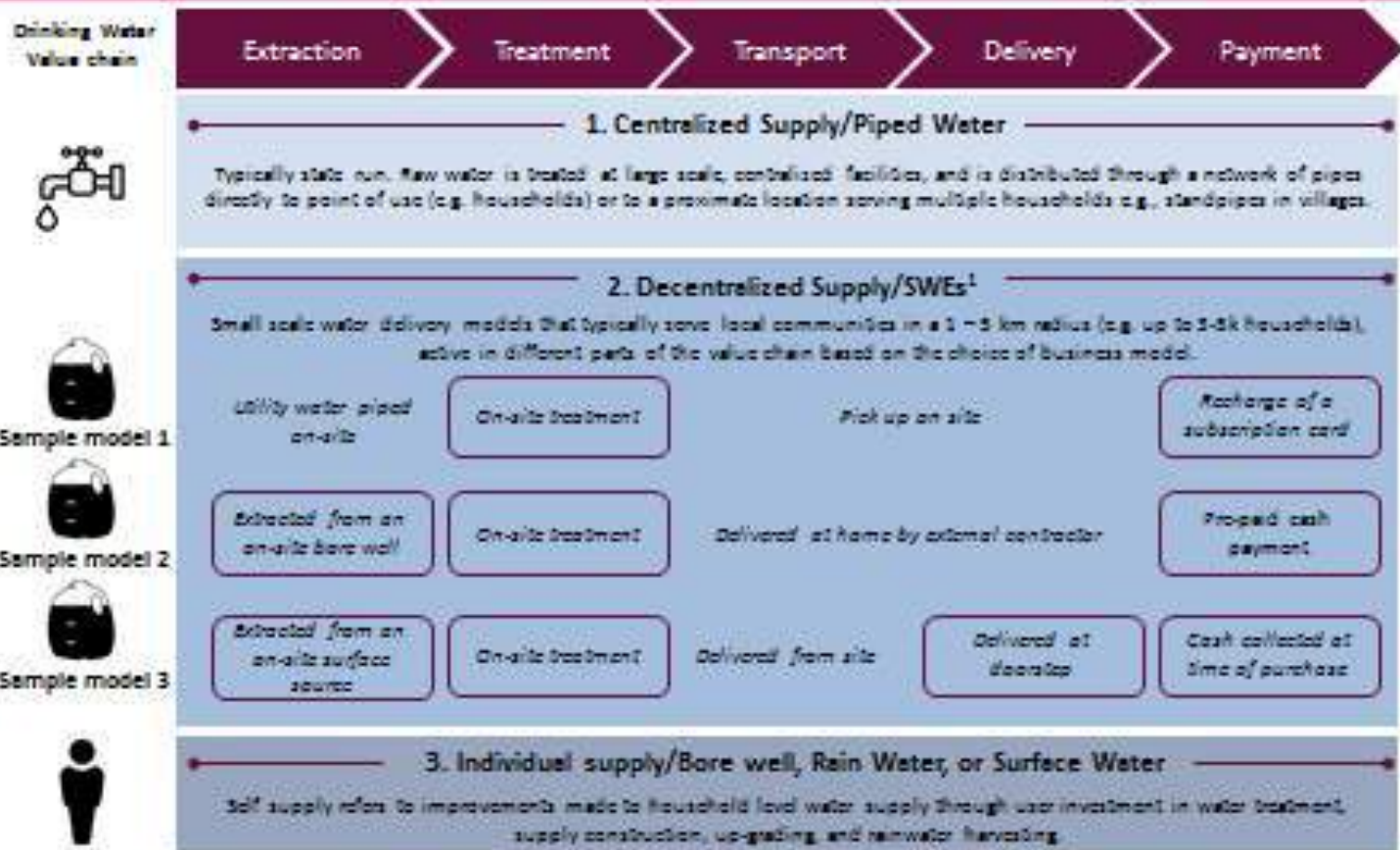


# Like SWE's: diversity in chain activities



## THE SAFE WATER CHALLENGE: ROLE OF SWEs

SWEs are one of the three dominant models of how people get drinking water



Note: (1) Safe Water Enterprises: There are multiple variations of the decentralized model across the world. Models presented here are for illustrative purposes only; Source: Field Interviews, Water and Sanitation Program, World Bank (An Introduction to Self-Supply); Colberg analysis

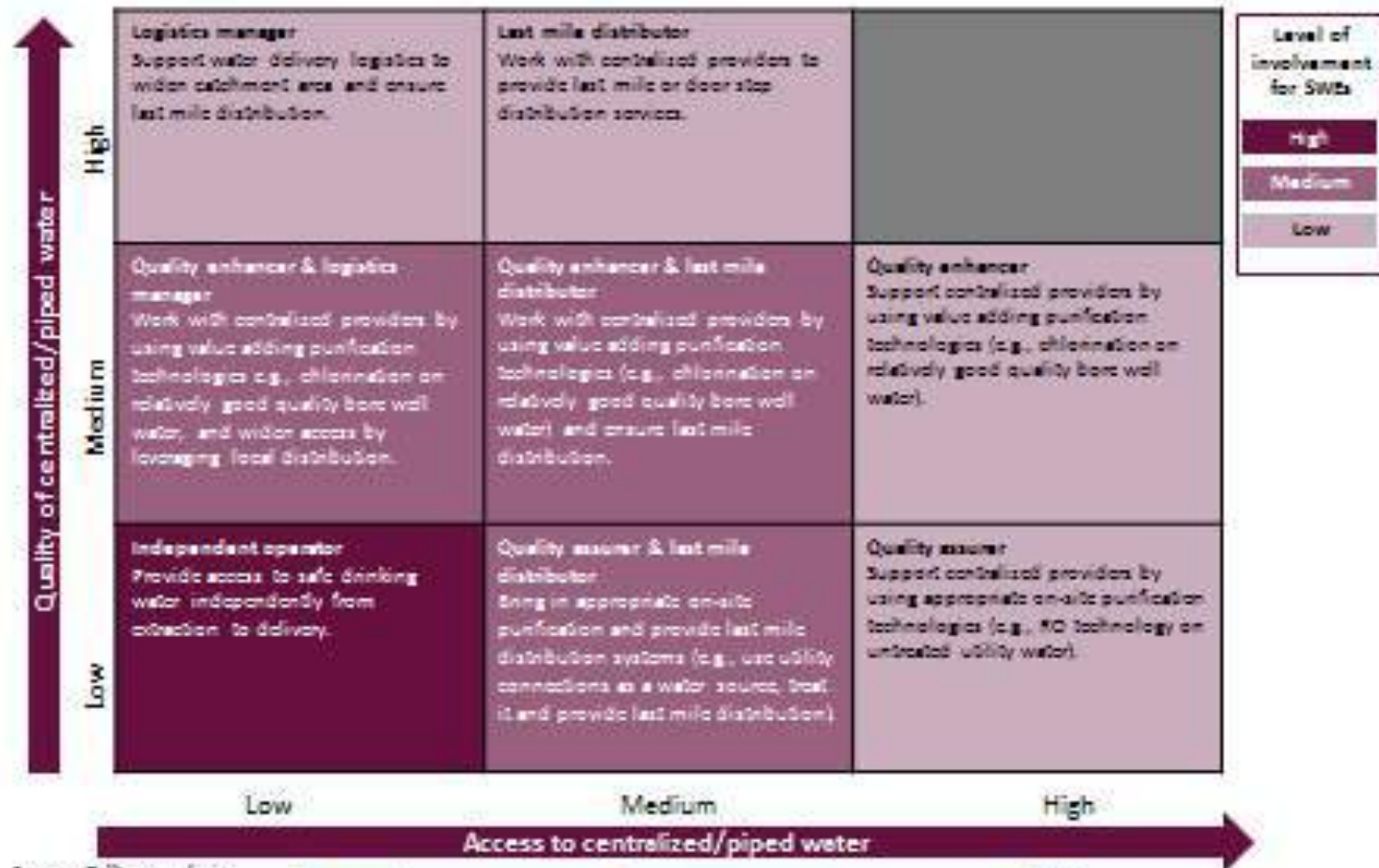
SWE performed activity

# Like SWE's: add value to Utility-infra



## THE SAFE WATER CHALLENGE: ROLE OF SWEs

SWEs can play different roles depending on the presence and quality of piped water supply



Source: Deloitte analysis



# Analogies between SWE's and toilets !!

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Decentral sanitation services fit in the gvt policy, add value to existing sanitation policy, but require protection in legislation& regulation.

People are willing to pay for service, not for bricks

Make sanitation visible as value, comfort, money saver, ..(demand creation, just like in safe water)

Create the value drivers (circular economy, value chain activities) that stimulate the wish for sanitation

Finance structures are the same: PPP finance, blending, include outcome payments (credits, impact, bonds, SROI)







**Sarbani Bhattachary**  
Partner, KPMG

Sarbani Bhattachary is a client partner in financial services for KPMG. Sarbani ensures the effective positioning of KPMG's services, seamless implementation, focussed and coherent relationship management. Sarbani also represents KPMG at the Dutch Trade and Investment Board, India werkgroep and as a Board member with Finish Society, an NGO which is active in sustainable ventures in the sanitation and health space in India and other parts of the world.

# Financing through an impact bond

- Status of sanitation:** As per Swachh Bharat Mission (Clean India Mission) Government management information system at the beginning of FY2016-17, the All-India sanitation density was 51.74%. In Dec 2016 it stands at 58.55%. Leaving a gap of nearly of 75 Million toilets to be completed by 2019 if India is to be ODF – GOI goal! It requires INR 899 Billion!

Swachh Bharat Mission (SBM) Rural					
Achievement BLS Report					
Sr. No.	State Name	No of HH as per BLS	Toilet Coverage as of Dec 2016	% Coverage	Toilet GAP
1	MADHYA PRADESH	12,079,133	6,074,194	50.29	6,004,939
2	MAHARASHTRA	12,114,064	8,550,078	70.58	3,563,986
3	ODISHA	9,020,107	3,371,103	37.37	5,649,004
4	RAJASTHAN	11,486,956	8,094,757	70.47	3,392,199
5	TAMIL NADU	9,540,299	6,301,787	66.05	3,238,512
6	UTTAR PRADESH	28,720,844	13,145,316	45.77	15,575,528
<b>All India</b>		180,755,688	105,825,833	58.55	74,929,855

# Financing through an impact bond

- **Commercialisation of social development**
- **Demand for investment for social impact/ CSR requirement in India**
- **Complex chain of financing dependent on Government grant of 12,000 INR per individual household**
- **Banks and micro finance institutions play a key role in providing Financial support needed for:**
  - Pre-financing Government grant
  - Creation of demand and eligibility of finance
    - Understanding the region and the issue
    - Development of audio-visual / IEC aids
    - Skill Training of Masons
    - Vendor aggregation
  - Support financing
- **Line of credit to be established**
  - Pre-financing/ working capital and balance financing

# Financing through an impact bond

## 400,000 toilets at € 250 each = € 100 million in 24 months

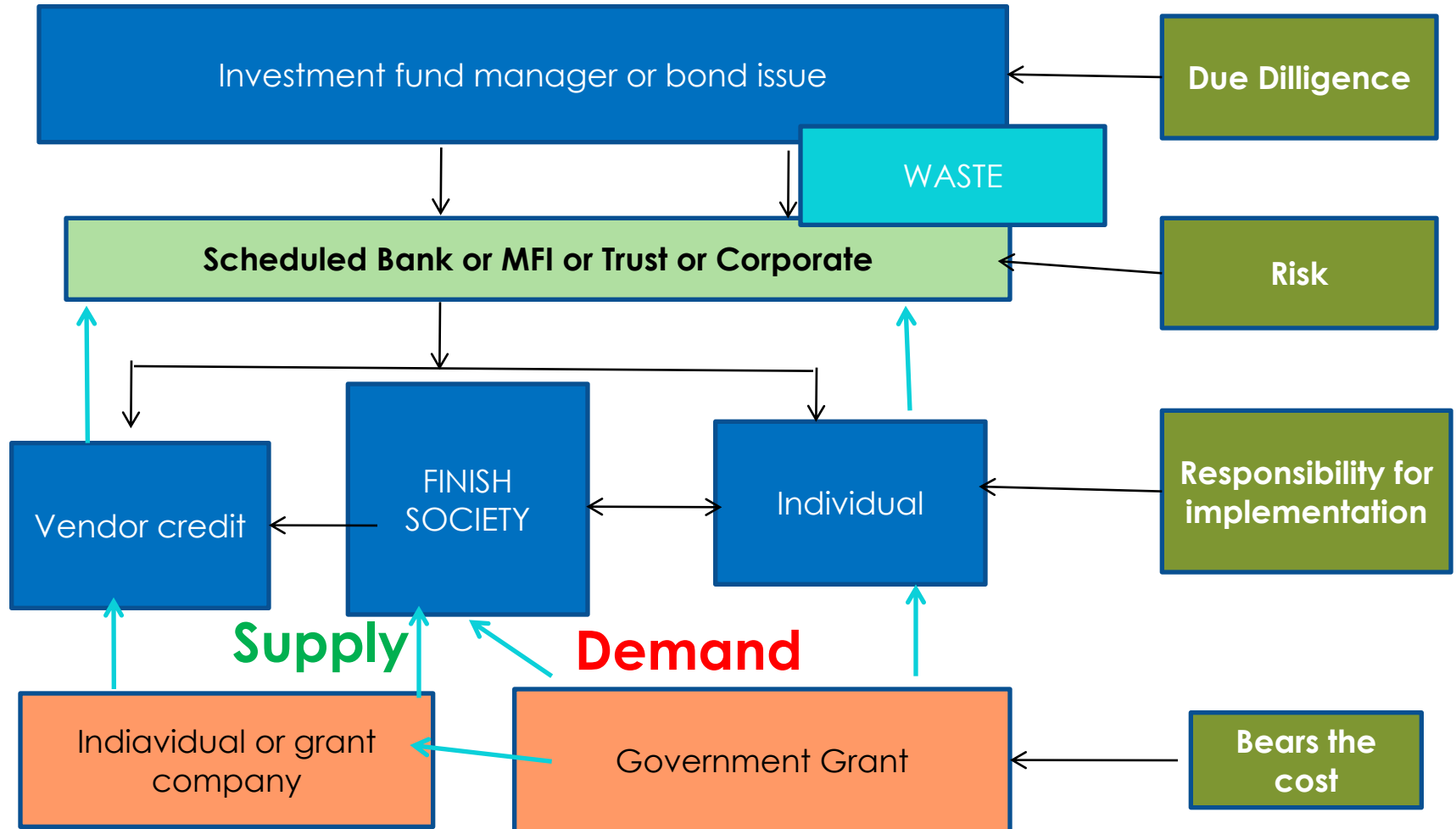
▣ Euro 250 = 20000 INR per toilet	
▣ Central/State Government grant:	12,000
▣ <u>Grant or self finance or loan :</u>	<u>8,000</u>
▣ <b>TOTAL finance requirement:</b>	<b>20,000</b>
▣ <b><u>Expenditure:</u></b>	
▣ Toilet hardware and making:	16,000
▣ Demand creation:	1,000
▣ <u>Interest and other costs:</u>	<u>3,000</u>
▣ <b>TOTAL:</b>	<b>20,000</b>

In some States, the State Government has increased its share. This does not change the fundamentals, as the share of grant or self finance will correspondingly reduce.

# Financing through an impact bond

- **Fund to float bonds for investment in India guaranteeing social impact to be visible.** Such bonds would typically be attractive at 12% to 15% per annum in Europe without considerations of foreign exchange impacts.
- **The fund would LOAN the money collected to one or more scheduled banks in India** under a legal undertaking that the money will be loaned to parties for the exclusive purpose of building individual toilets to be re-imbursed (partly) by the central Government scheme.
- **MFIs Corporates or Trusts** maybe included to complement or add to the role of banks
- The arrangement would include **five types of parties:**
  - Scheduled banks (interest on financing more than the interest to be paid to the bond)
  - Vendors (profit on making the toilet)
  - State Governments (fund for development/ need to show performance)
  - FINISH Society (demand creation, vendor aggregation, technical assistance and managing the process)
  - 3R WASTE (Ensuring the “going concern” between the money suppliers (investment fund and bond parties) and on the other the money spenders (FINISH Society, vendors and individuals).

# Concept...



# Open for discussion

- **Fund to float bonds for investment in India guaranteeing social impact to be visible.**
  - **What** is a reasonable expectation in terms of volume, return and cycle time
  - What kind of guarantees would be required at each stage
  - What are the concerns
- **MFIs Corporates or Trusts** maybe included to complement or add to the role of banks
  - Profile
  - Due diligence
  - Legal commitments
- State Governments and local bodies
  - Commitments
- **Other Commitments**
  - Scheduled banks
  - Vendors
  - FINISH
  - WASTE/ 3R WASTE
  - Individuals







**Kajetan Hetzer**  
Advisor, WASTE  
Executive Director,  
Social Equity Fund

Kajetan Hetzer has worked for more than 10 years in the financial sector as an analyst on Environmental, Social, Governance (ESG) aspects of investments. During this period, he initiated the innovative SNS REAAL Water Fund (2006) and was appointed as its Fund Manager. After his career in the financial sector, Kajetan worked as sustainability consultant for various international organizations, NGOs and development agencies. In 2014, he joined WASTE where he works to date with specialization on business development, finance, strategy, acquisition and partnership development. In 2015, he was appointed Executive Director of the Social Equity Fund. Next to his job Kajetan is adviser to think-tanks and several advisory boards related to sustainable development, including for young enterprises and for the business platform of CEWAS (International Centre for Water Management Services) in Switzerland. He is the Chairman of “Good Foundation” that aims to accelerate the transition to sustainable communities by initiating and supporting circular design principles.

# Targeting the Missing Middle – Investing in Small & Growing Business which provide Basic Needs

## Social Equity Fund

The missing model for the missing middle



Conference

*Beyond development aid:*

*Sanitation financing & revenue models in reuse (human) waste*

15 May 2017, The Hague





**Prof. Barbara Evans**  
Chair in Public Health  
and Engineering,  
School of Civil  
Engineering Leeds  
University

Professor Barbara Evans holds the chair in Public Health Engineering in the School of Civil Engineering at the University of Leeds. Her research activities centre on sanitation, hygiene and water services in the global south with a particular focus on urban sanitation in cities and towns. Within these areas, particular emphasis is placed on the development of effective strategies for management and disposal of faecal sludge, alternatives to conventional water borne sewerage in dense urban areas, effectiveness of rural sanitation programmes, sustainability and equity in community-wide approaches which eliminate open defecation, health impacts of sanitation and water services, technologies and institutions to link community sanitation and water investments with city networks. Professor Evans' career spans 30 years; she worked as a consultant and at the World Bank for over twenty years before joining the University in 2009 and has lived and worked in South Asia, Africa and Latin America. Professor Evans now leads a multi-disciplinary team working on global development and public health. She has over forty publications with a direct link to urban WASH services, planning, costing and financing of urban sanitation.



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# Managing a million pits...

towards an understanding of rural faecal  
sludge management in Bangladesh

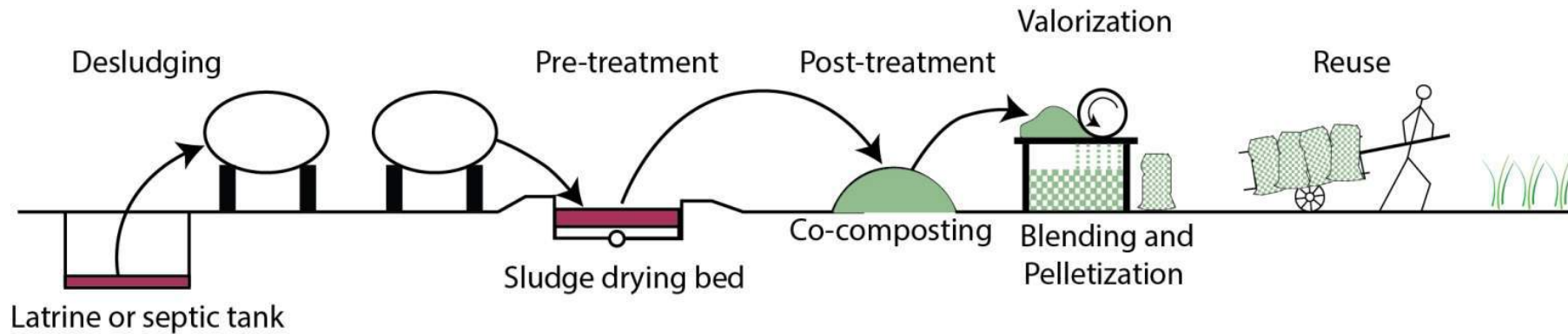
Professor Barbara Evans  
Centre for Global Development  
University of Leeds





# Background

- ▶ Bangladesh – has made strong progress in elimination of open defecation
- ▶ Estimated 8 million single pits have been installed in the past 10 years
- ▶ Only about 20% of these have yet been emptied
- ▶ More than a million cubic meters of faecal sludge needs to be moved every year
- ▶ There is an urgent need for active management of rural faecal sludge
- ▶ Value at the end of the Value Chain project addresses this challenge



Our core hypothesis is that this system would result in effective sustainable management of faecal sludge only if costs are covered by payments from:

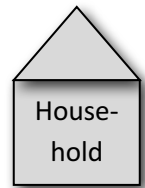
- Households for pit emptying
- Farmers (or others ) for end product
- Government to finance any gap (subsidy (GOB/LGI))



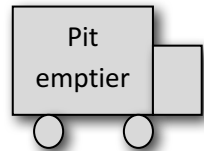


# FS collection and transport

## Current arrangements



Household



Pit emptier

Pourashava/ Municipality

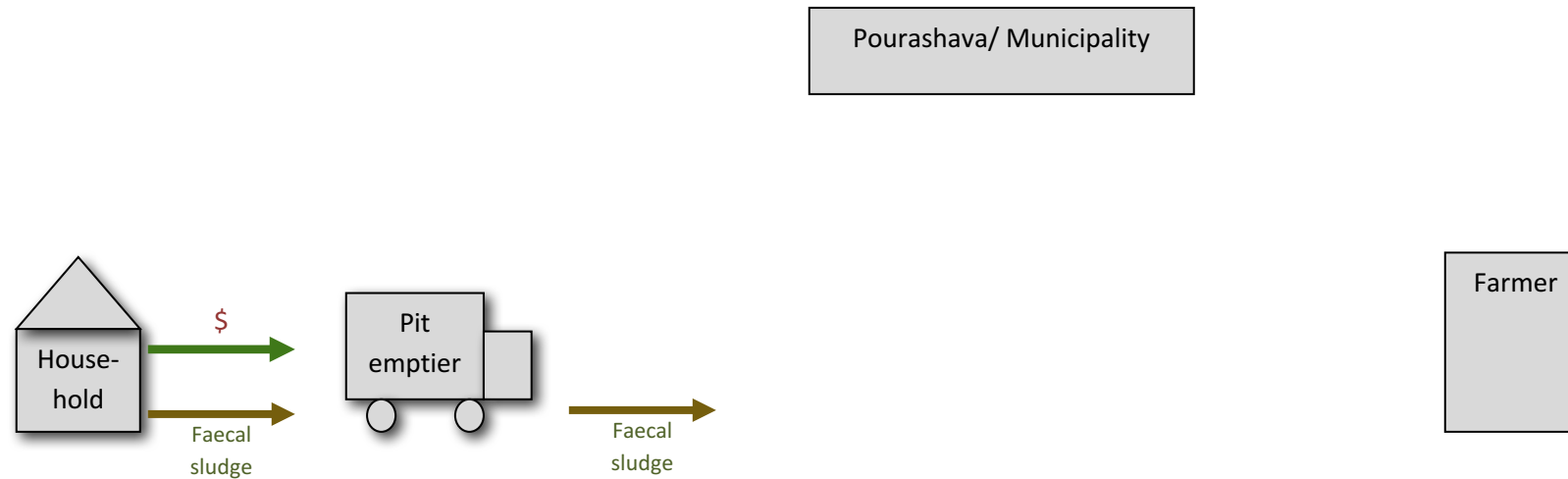


Farmer



# FS collection and transport

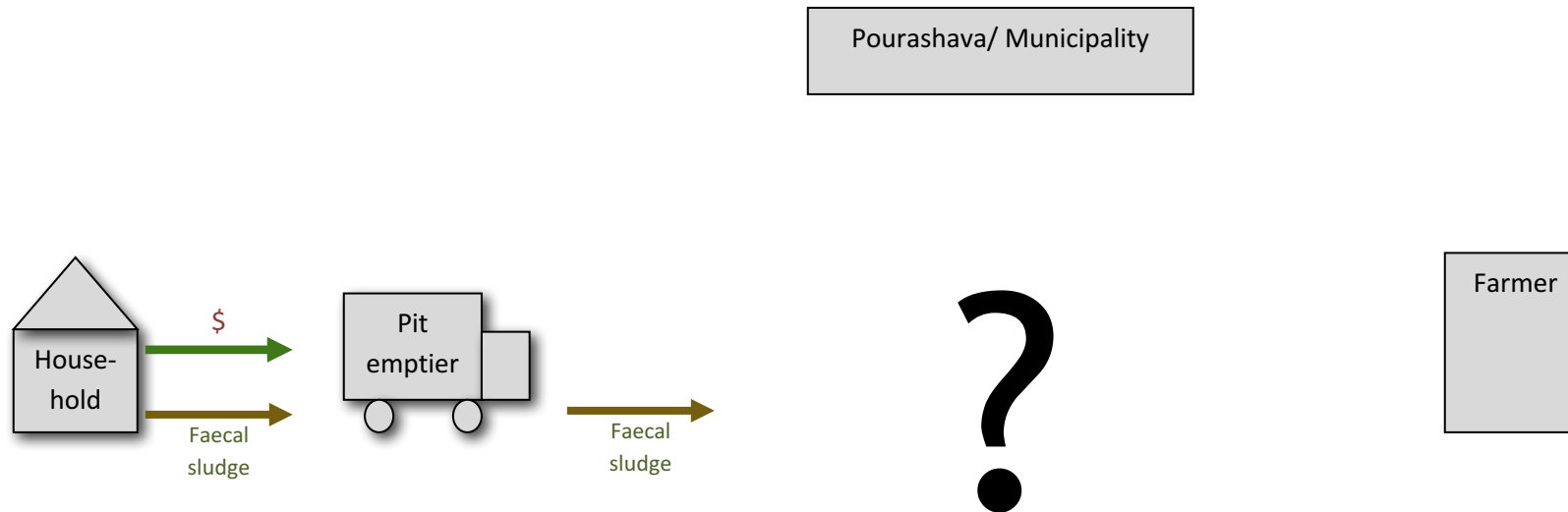
## Current arrangements





# FS collection and transport

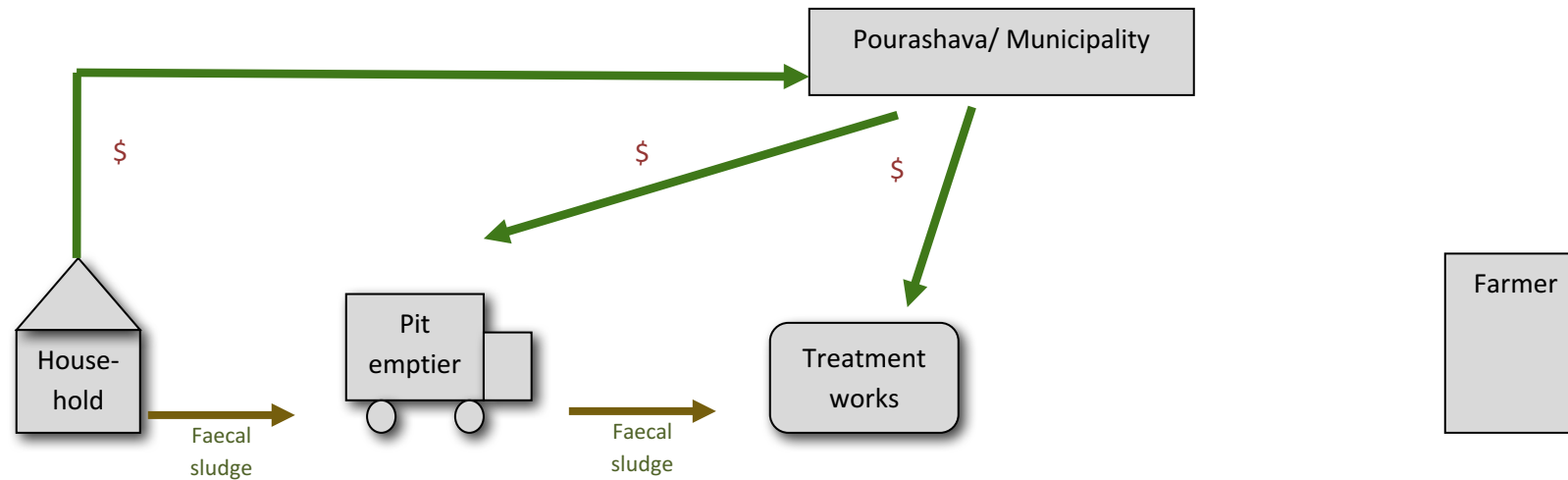
## Current arrangements





# FS collection and transport

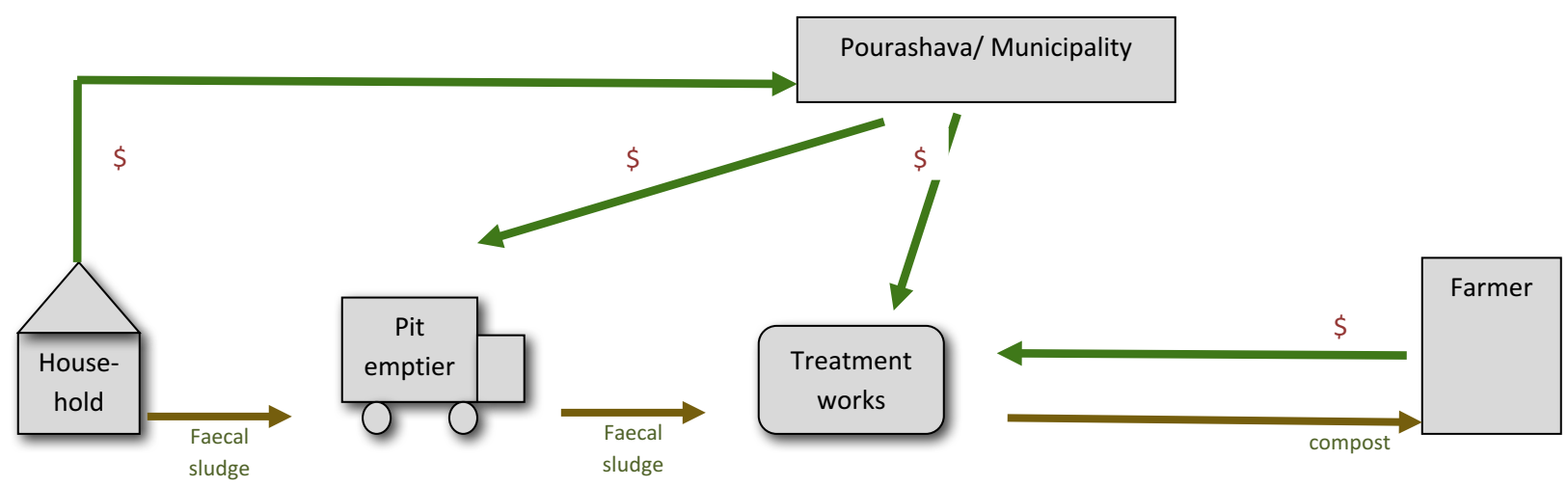
## The public sector model





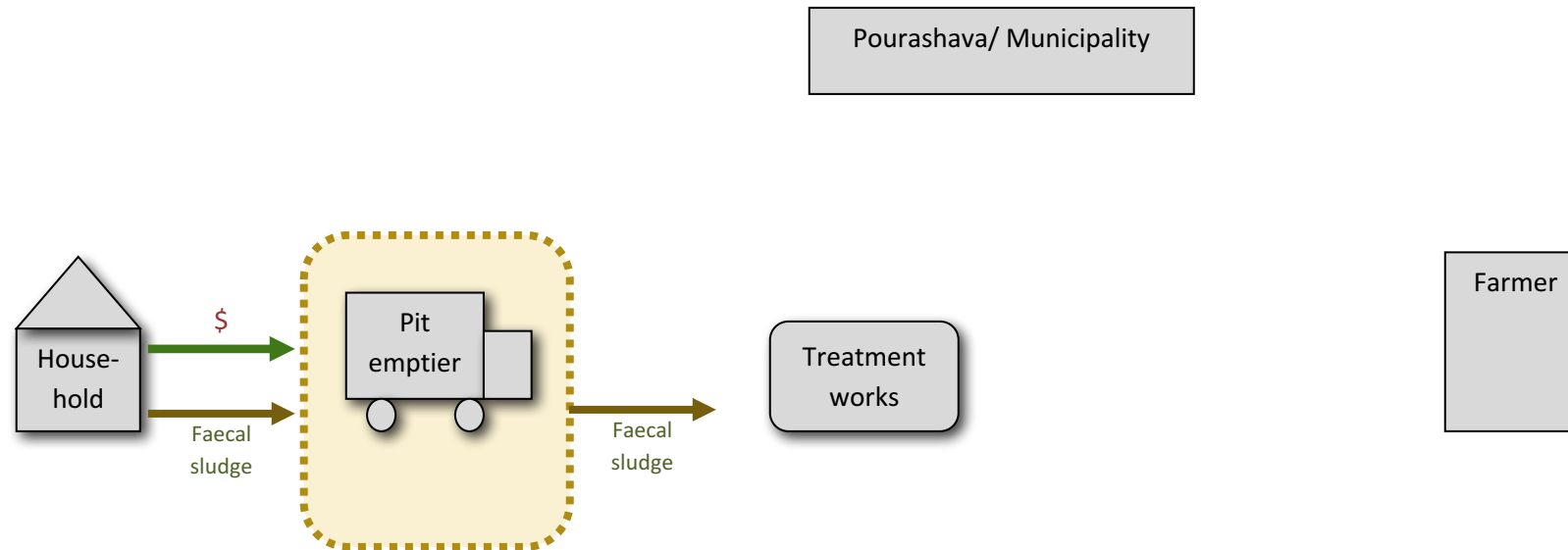
# FS collection and transport

## The public sector model



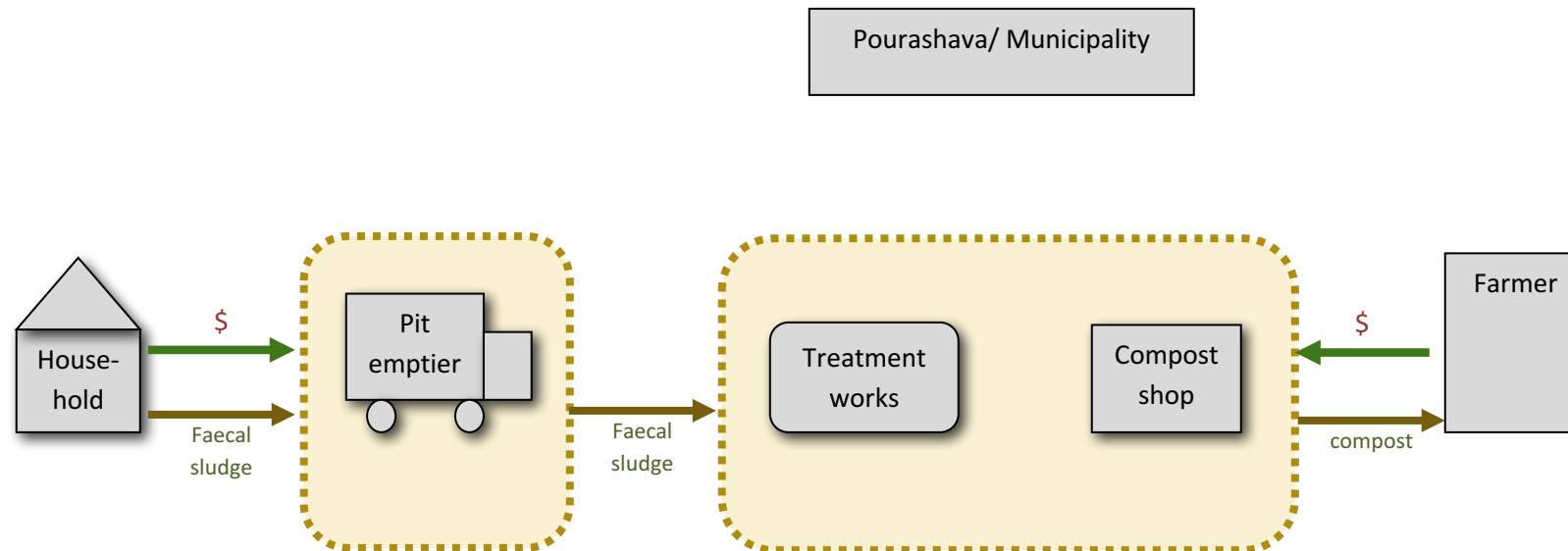
# FS collection and transport

## Can we incentivise good treatment?



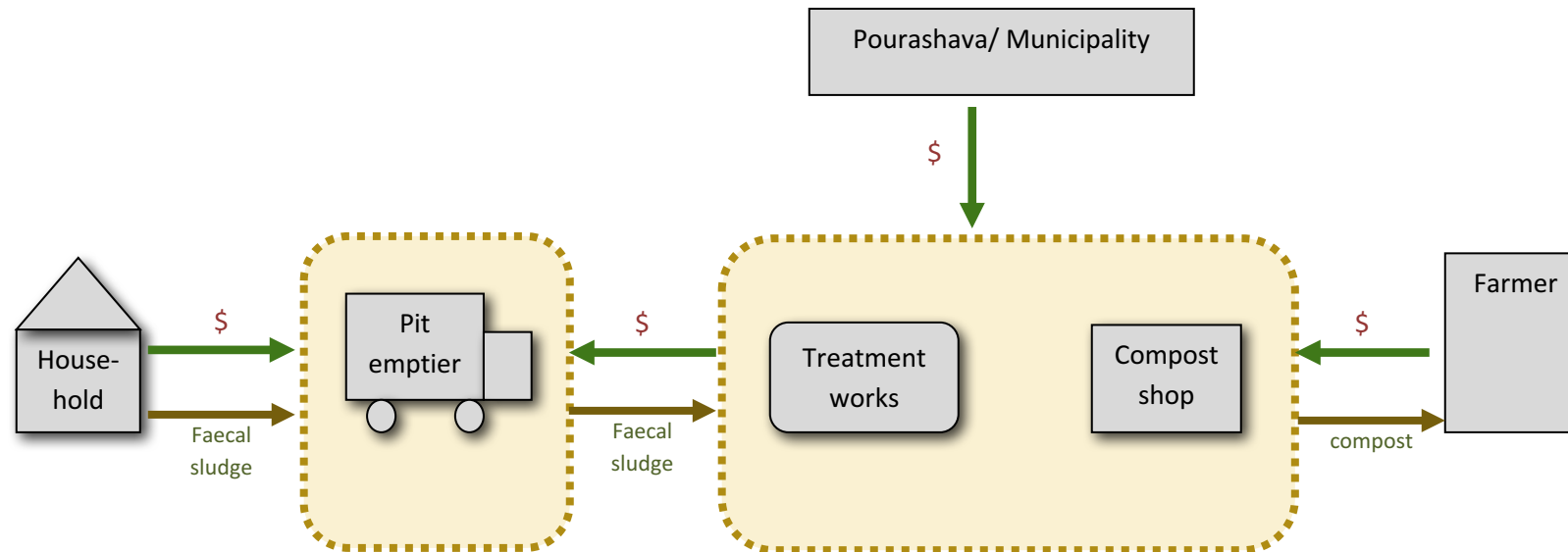
# FS collection and transport

## Can we incentivise good treatment?



# FS collection and transport

## Can we incentivise good treatment?

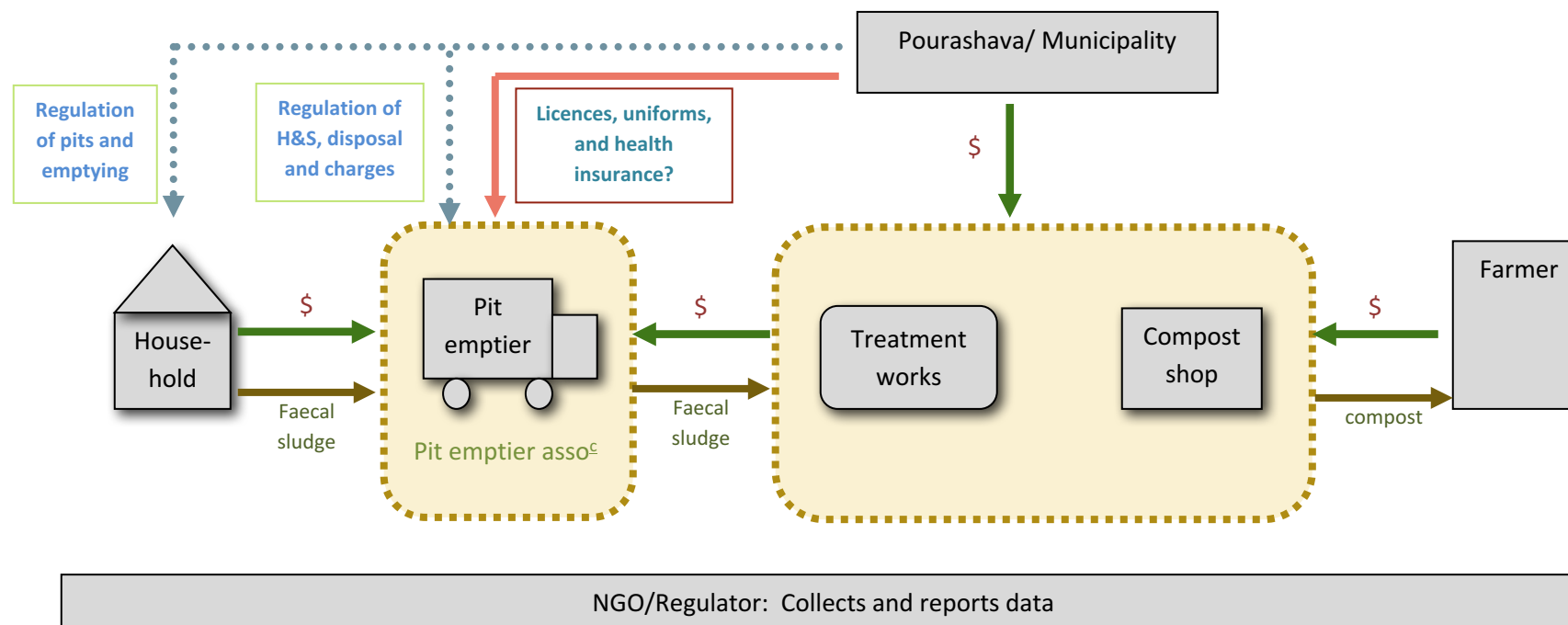






# FS collection and transport

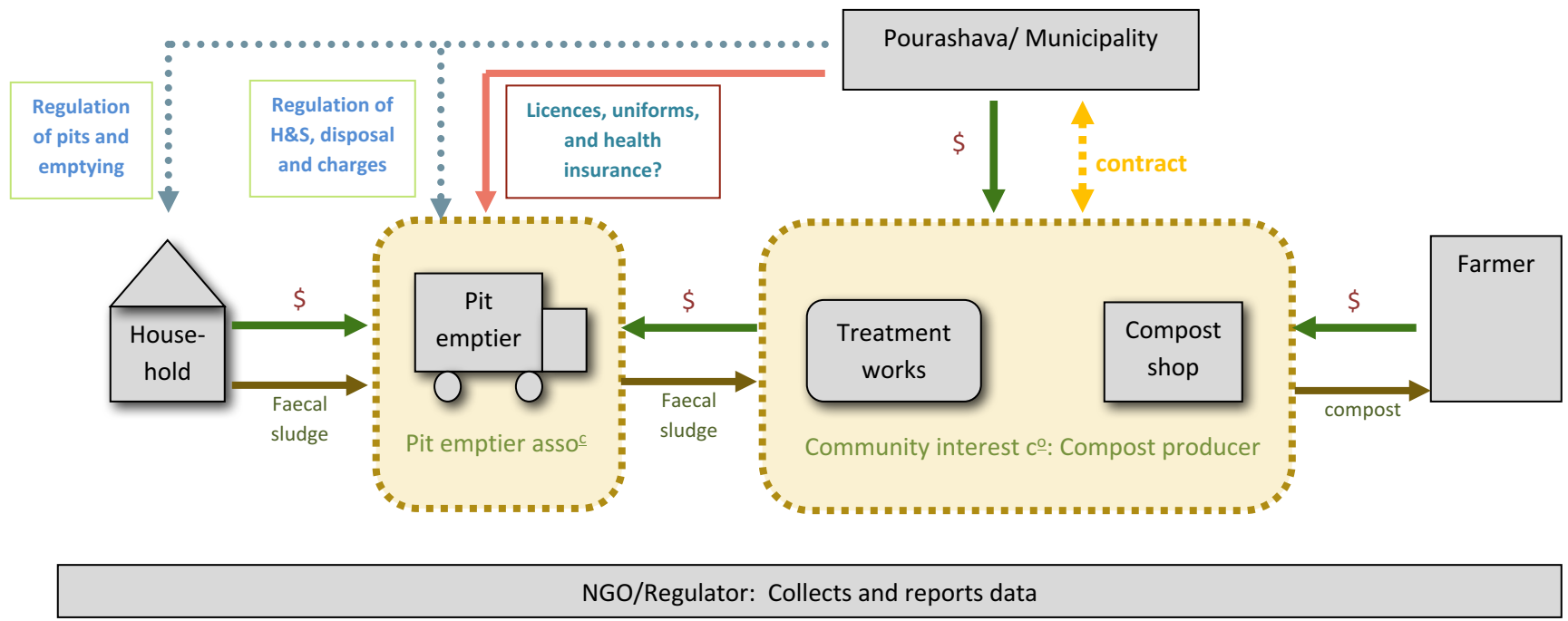
## How might this look in practice?





# FS collection and transport

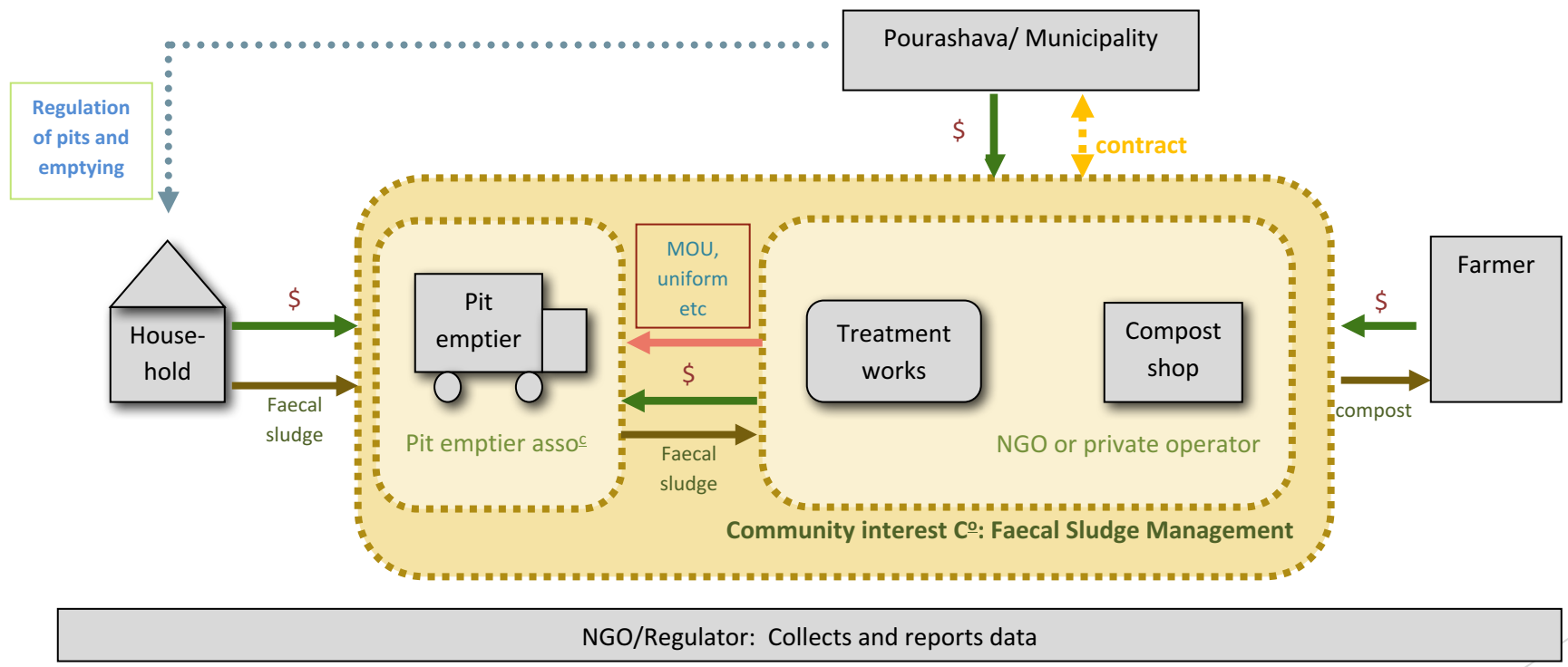
## How might this look in practice?





# FS collection and transport

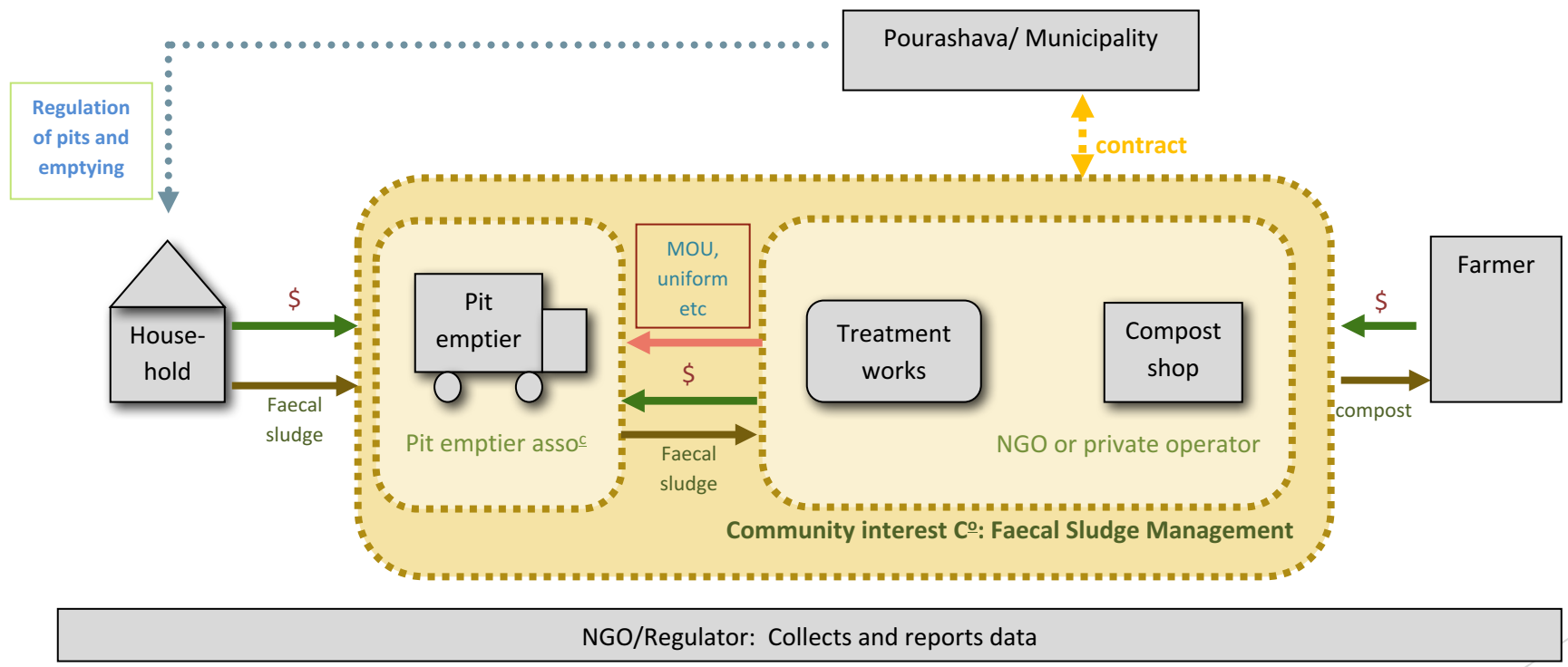
## How might this look in practice?

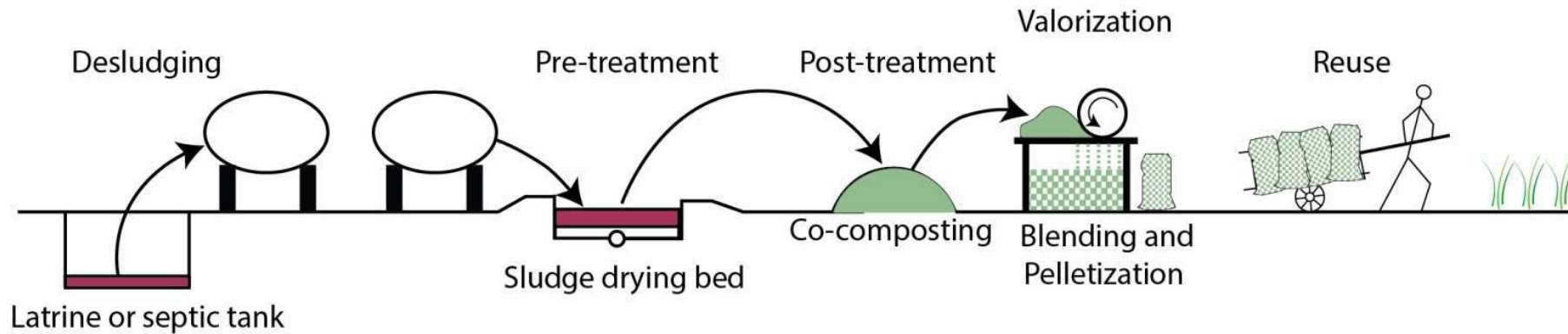




# FS collection and transport

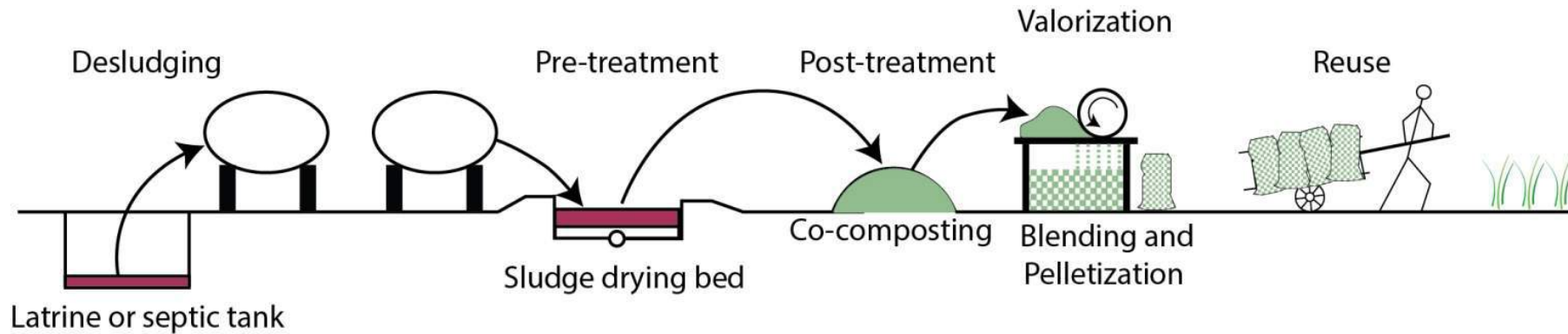
## How might this look in practice?





Our core hypothesis is that this system would result in effective sustainable management of faecal sludge only if costs are covered by payments from:

- Households for pit emptying
- Farmers (or others ) for end product
- Government to finance any gap (subsidy (GOB/LGI))



Our core hypothesis is that this system would result in effective sustainable management of faecal sludge only if costs are covered by payments from:

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# So the big questions are...

- ▶ How much does it cost to empty and transport faecal sludge?
- ▶ How much are households willing to pay for this service?
- ▶ How much would they be willing to pay more for a 'better' service?
- ▶ How much does it cost to treat faecal sludge?
- ▶ Is it possible to sell the product?
- ▶ And therefore what is the extent of the public subsidy required?



## Household and community engagement

To understand the **perceptions** towards faecal sludge compost product and the **pit emptying** constraints and opportunities:

- **BRAC Household Survey** (Total 1440 )
- **Non-BRAC Household Survey** (Total 660)
- **FGD** (8 in total held Bhaluka, Mymensingh)
- **KAP and Willingness to Pay Study**



Household Survey



Focus Group Discussion

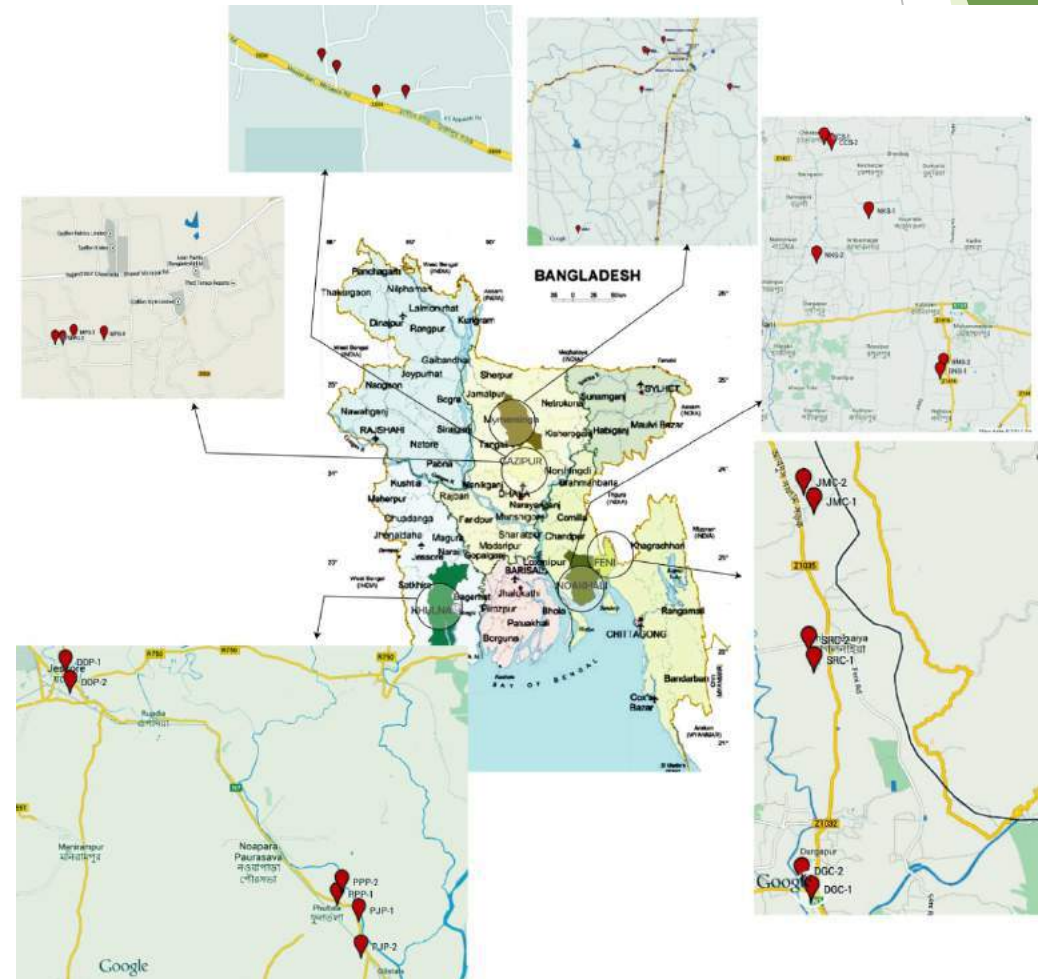


# Feecal Sludge characterisation

5 Upazilas: 38 sampling points

Characterizing parameters: TN, TOC, TVS, MC, pH, Conductivity, PO<sub>4</sub>-P, Total Coliform, E. Coli and Helminth Eggs.

Wash Water: pH, Conductivity and TDS



## Perceptions and use of equipment for emptying

### Gulper

- Heavy and difficult to handle
- Need to remove superstructure (fragile in maximum case) of latrine
- Unhygienic for health and environment in terms of spill over effect
- High possibility to damage slab and ring



Gulper

### Electric Pump

- Low voltage of rural electric supply hampers its operation
- Can empty quickly the liquid sludge
- Trashes hamper its operation frequently and it seems unhygienic for health and environment



Electric Pump



## Perceptions and use of equipment for emptying

### Diesel Pump

- Can empty pits very quickly, but found not suitable to use in rural pits
- Quite weighty



Diesel Machine

### Diaphragm Pump

- Suitable for pit emptying and easy to carry from one place to another
- Hygienic in terms of a health and safety environment for workers, in comparison with the other three technologies



Diaphragm



## Perceptions and use of equipment for emptying

We also looked at options for transport – including light trucks and tankers



Pit emptiers wearing Personal Protective Equipment



# Sludge treatment





# Sludge treatment



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Co-Composting





# Costing emptying and transport in rural Bangladesh

- ▶ 8 million single pit latrines in Bangladesh which need emptying
- ▶ In Bhaluka 77,413 new single pit latrines which need active management
- ▶ The pits have on average 2.4 rings, with a diameter of 0.83m. The typical sludge accumulation rate in Bhaluka is estimated at 0.11 liters/person/day
- ▶ The typical latrine will need to be emptied approximately once every 3.7 years
- ▶ For the whole population, that results in the need for 20,760 emptying events each year, and a total of 15,219 m<sup>3</sup> of sludge to be emptied and transported annually
- ▶ Typical manual transport and driving distances from village to union and from union to upazilla were mapped using a GIS platform





# Options for emptying and transport

Option	Method of Emptying	Transport	
		Village to Union	Union to Upazila
1	Manual	Trucks	Trucks
2	Manual	Trucks	Tanker
3	Diaphragm Pump	Trucks	Trucks
4	Diaphragm Pump	Trucks	Tanker



# Options for emptying and transport

Option	Emptying		Transport				Total staffing (people)
	Method	Nr of Units	Village to Union	Union to upazila	Nr of units		
					Trucks	Tankers	
1	Manual	49	Trucks	Trucks	228	-	603
2	Manual	49	Trucks	Tanker	169	3	491
3	Diaphragm Pump	10	Trucks	Trucks	228	-	466
4	Diaphragm Pump	10	Trucks	Tanker	169	3	354

Source: Authors' calculation



# Total costs of emptying and transport services

Option	Total capital costs	Annual cost <sup>1, 2</sup>					Cost per emptying event	Cost per household with a pit	Monthly cost per household with a pit
		Annualised capital costs	Labour	Operating costs	Total				
BDT									
1	142,321,000	10,523,891	13,595,855	21,654,197	45,773,943	2,205	591	49	
2	110,185,000	8,264,596	11,061,555	6,402,234	25,728,385	1,239	332	28	
3	142,572,000	10,555,314	10,412,666	21,654,197	42,622,178	2,053	551	46	
4	110,436,000	8,296,020	7,878,366	6,402,234	22,576,620	1,088	292	24	
USD <sup>3</sup>									
1	1,824,628	134,922	174,306	277,618	586,845	28	8	0.63	
2	1,412,628	105,956	141,815	82,080	329,851	16	4	0.36	
3	1,827,846	135,325	133,496	277,618	546,438	26	7	0.59	
4	1,415,846	106,359	101,005	82,080	289,444	14	4	0.31	

Source: Authors' calculation

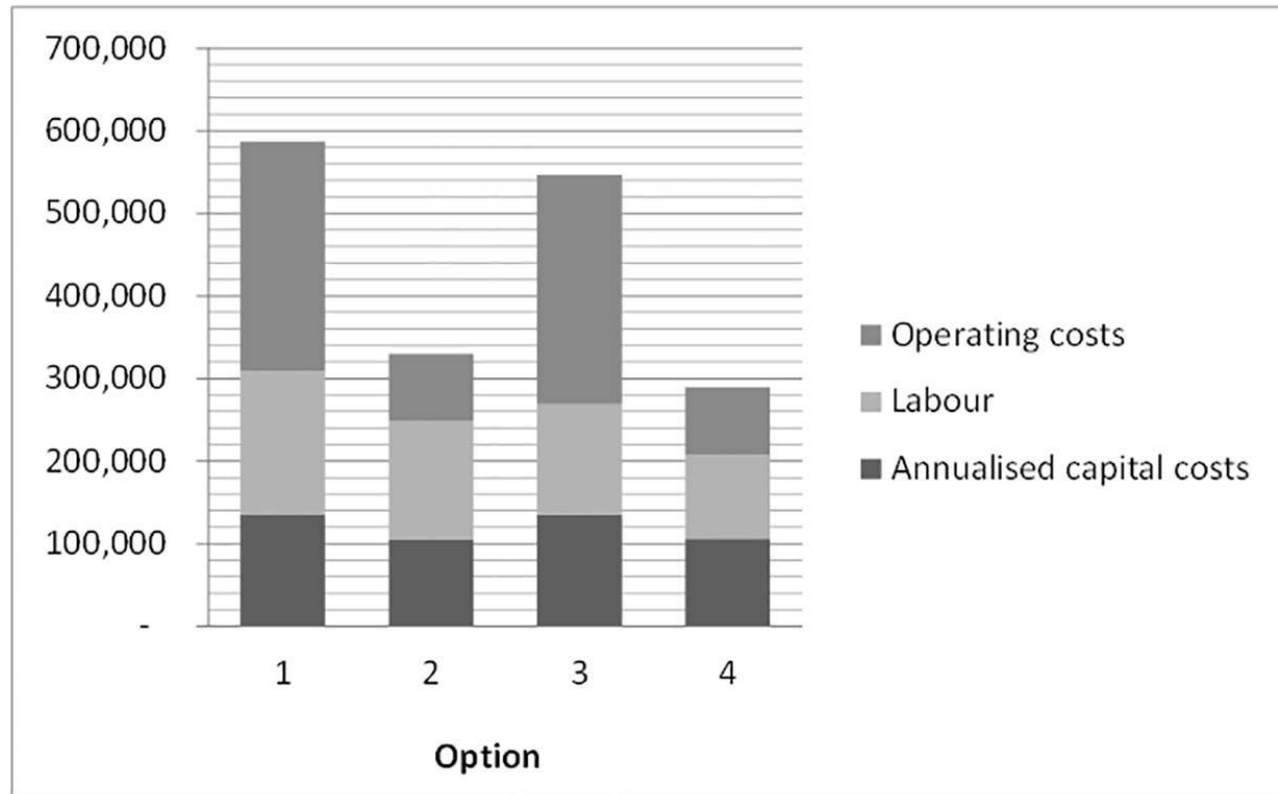
1. Annualised capital costs includes cost of servicing capital, capital maintenance and operational wear and tear, over the operational period which is 25 years

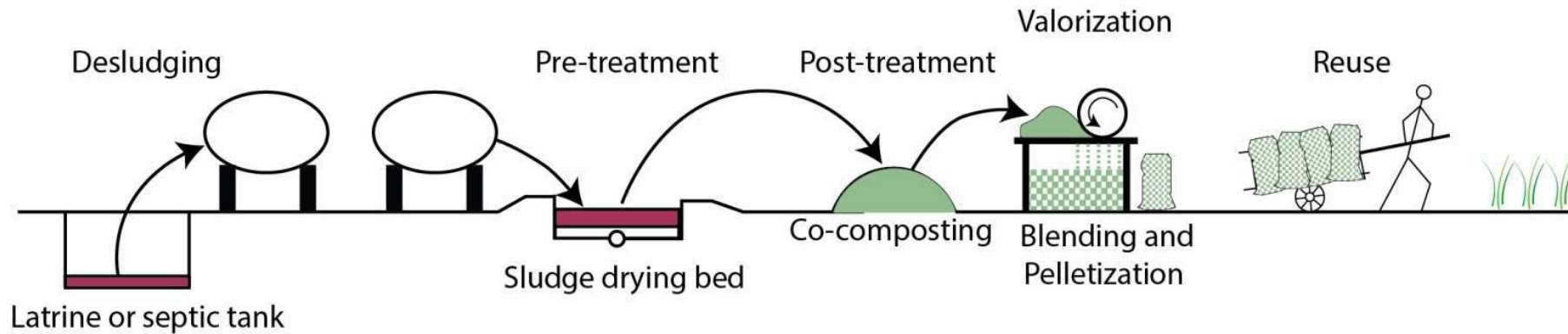
2. Operating costs includes fuel, and other operational supplies

3. 1USD = BDT78



# Cost breakdown (Annual cost - BDT)



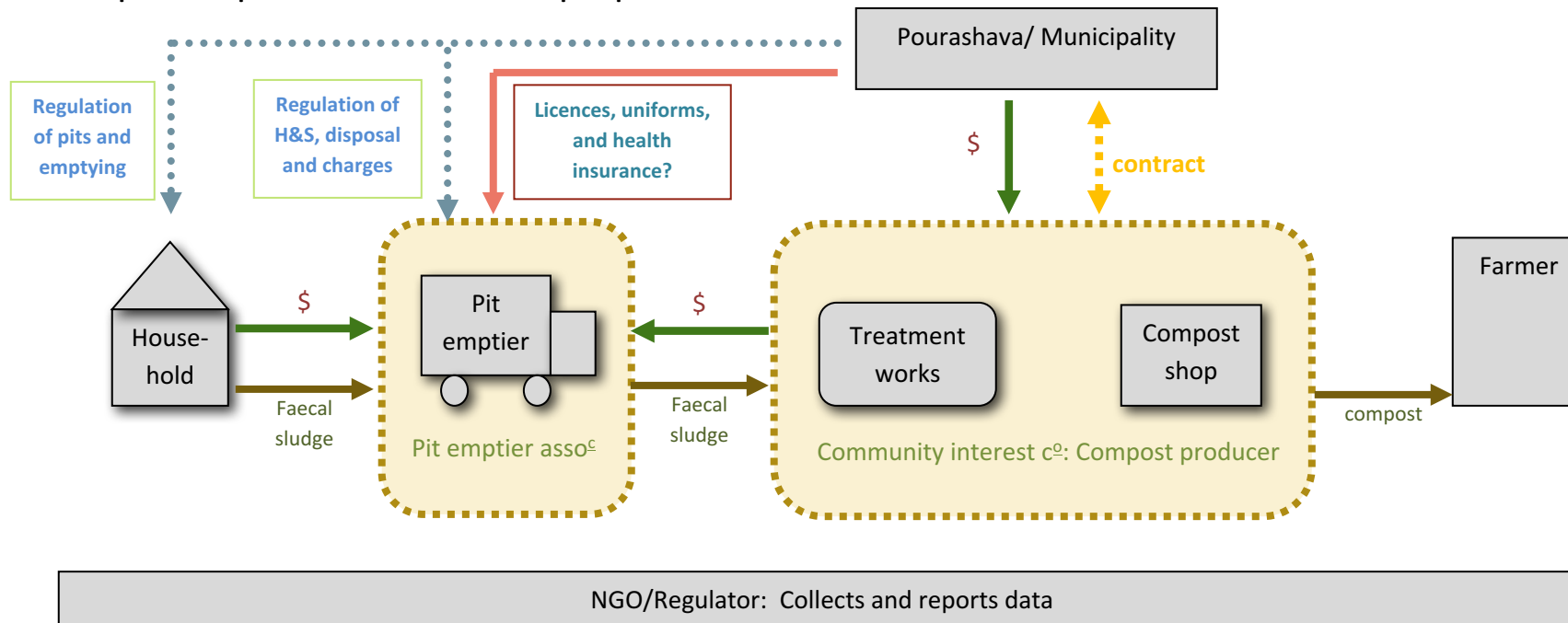


- ▶ Emptying cost \$14 per emptying event, \$4 per household per year, \$0.31 per household per month
- ▶ Current WTP is \$6.50 *per emptying event* (covers 47% of the cost)
- ▶ A deficit of USD 154,500 per year for Bhaluka subdistrict
- ▶ BUT a monthly subscription service at household level would cost \$0.31 per month (considerably less than the average monthly expenditure on phone calls)
- ▶ Willingness to pay for this service would rise - it could potentially cover treatment costs
- ▶ The service would result in the creation of around 350 jobs
- ▶ Smart delivery of a subsidy via the treatment service would optimize public health outcomes

# FS collection and transport

## How might this look in practice?

### Option 1: Separate FS collection and compost production





# References

- ▶ Evans, B. E., Balasubramanya, S., Hardy, R., Ahmed, R., Habib, A., Asad, N. S. M., . . . Camargo-Valero, M. A. (2017). Identifying the financing gap for emptying and transport of fecal sludge in rural Bangladesh: towards sustainable management for improved public and environmental health. *PLoS ONE*. doi:  
<http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0171735>
- ▶ Balasubramanya, S., Evans, B., Ahmed, R., Habib, A., Asad, N. S. M., Rahman, M., . . . Fernando, S. (2017). Take it away: the need for designing fecal sludge disposal services for single-pit latrines. *Journal of Water, Sanitation and Hygiene for Development*. doi:[10.2166/washdev.2017.073](https://doi.org/10.2166/washdev.2017.073)
- ▶ Balasubramanya, S., Evans, B., Ahmed, R., Habib, A., Asad, N. S. M., Vuong, L., . . . Camargo-Valero, M. (2016). Pump it up: making single-pit emptying safer in rural Bangladesh. *Journal of Water, Sanitation and Hygiene for Development*, 6(3), 456-464. doi:[10.2166/washdev.2016.049](https://doi.org/10.2166/washdev.2016.049)



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Thank you





