

5. Empirical Cases and Business Models in FSM (II)

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In cooperation with:



RESEARCH
PROGRAM ON
Water, Land and
Ecosystems



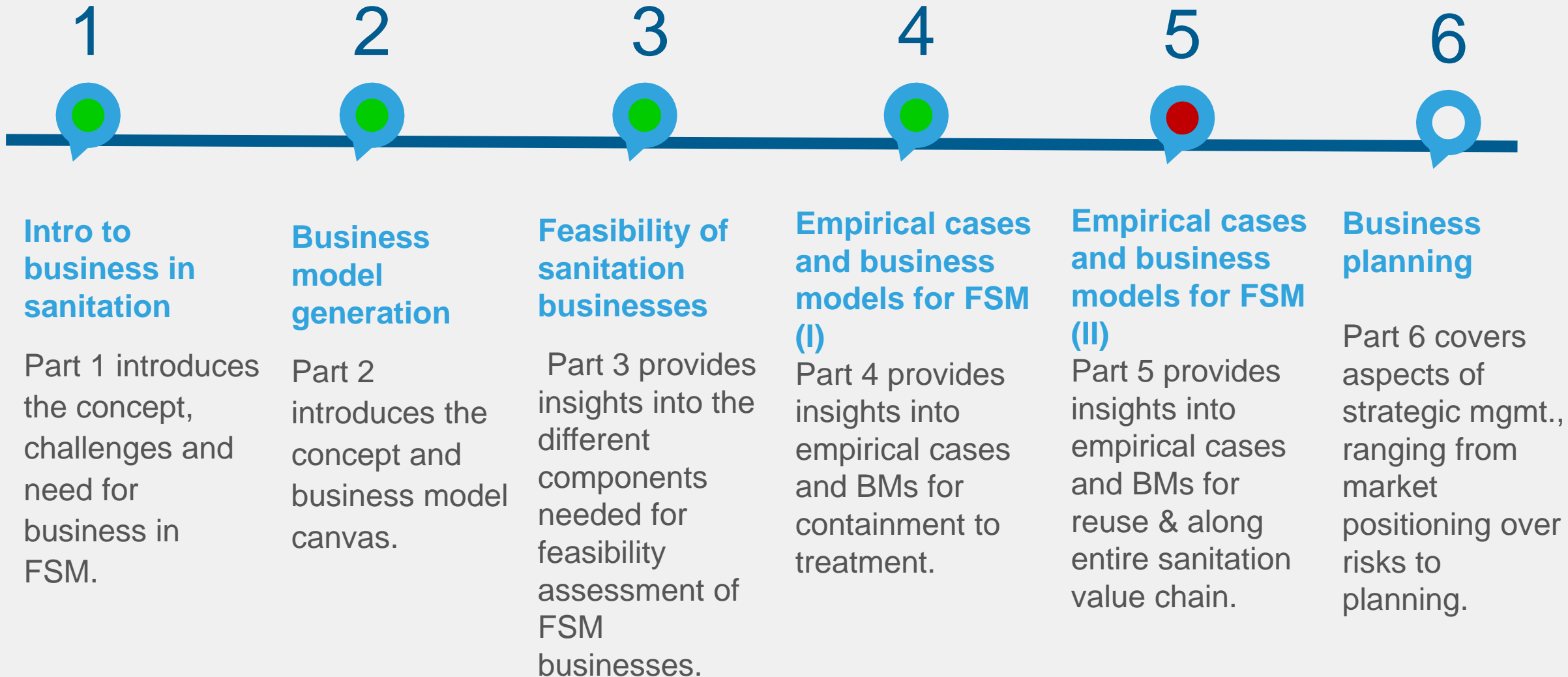


Learning Objectives

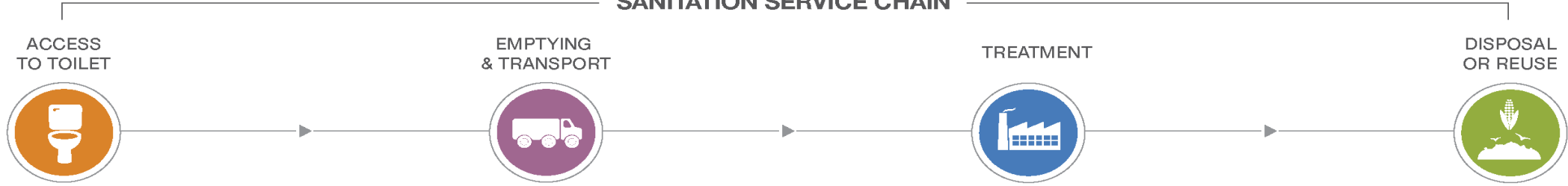
This component will allow you to:

- ♻️ Be conversant with real-life FSM business case examples
- ♻️ Be conversant with FSM business models:
 - Linking emptying, transport and treatment.
 - Emphasizing reuse at end of service chain.
 - Covering entire chain from toilet access to reuse.

Session structure



SANITATION SERVICE CHAIN



BUSINESS MODELS FOR TOILET ACCESS AND *IN-SITU* ENERGY RECOVERY

- Public toilet with energy recovery

BUSINESS MODELS FOR TOILET ACCESS AND *IN-SITU* ENERGY RECOVERY (CONT.)

- Residential-institutional biogas

MODELS FOR EMPTYING AND TRANSPORT OF FECAL SLUDGE

- Commonly occurring private emptying and transportation
- Franchise
- Nonprofit
- Transfer station

MODELS LINKING EMPTYING, TRANSPORT AND TREATMENT

- Commonly occurring public FSM
- Licensing
- Call center
- Scheduled desludging sanitation tax
- Incentivized disposal
- Full private

MODELS EMPHASIZING REUSE AT THE END OF THE SERVICE CHAIN

- Farmer-truck operator partnership
- Co-composting
 - Town cluster approach
 - Pull-push

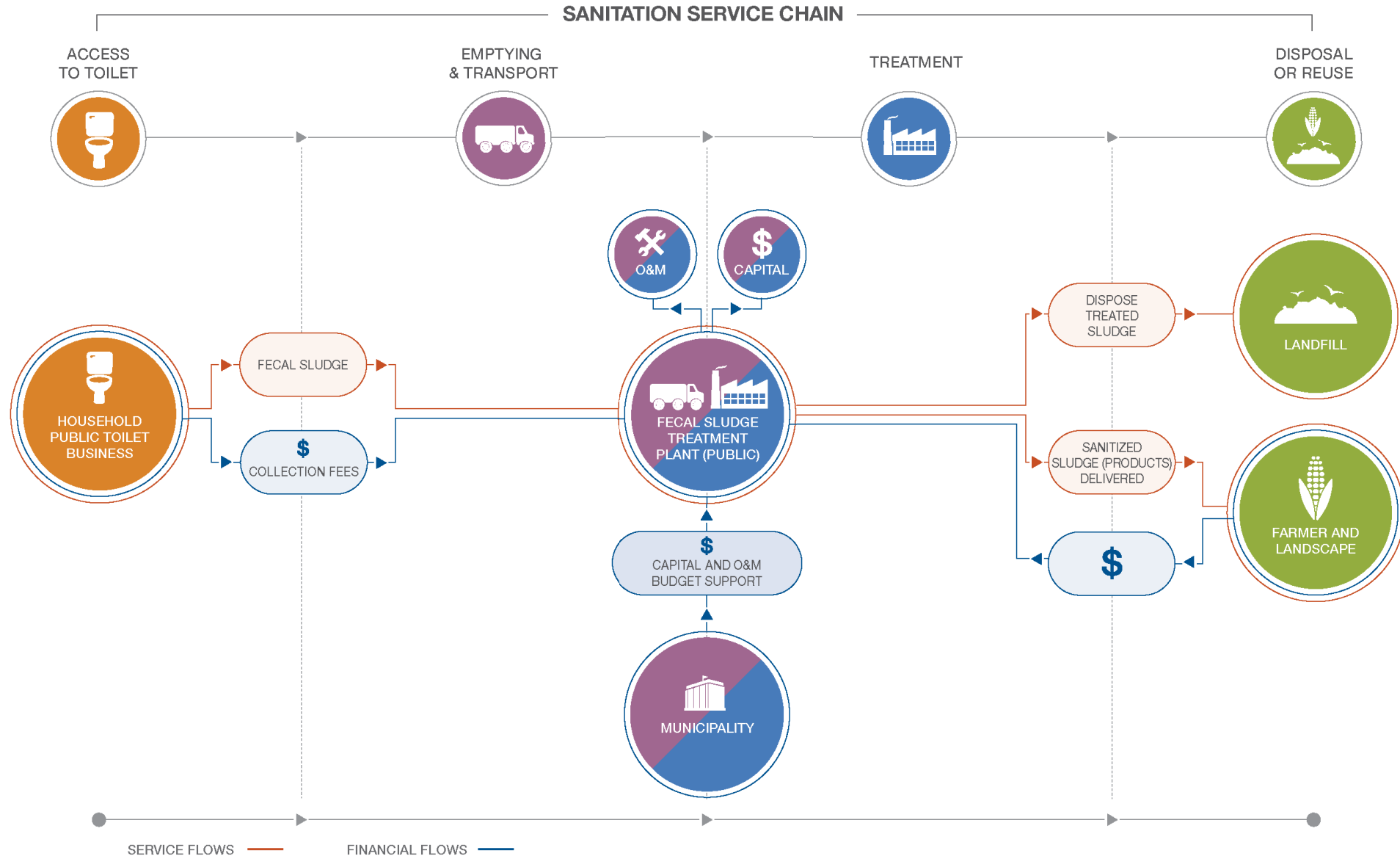
MODELS COVERING THE ENTIRE SANITATION SERVICE CHAIN FROM TOILET ACCESS TO REUSE

- Non-movable UDDT installation
- Container-based sanitation (CBS)

Business Model 3: Emptying, Transport and Treatment



3.1 Typical Public Sector Emptying Model



❖ Indah Water Konsortium Sdn Bhd, Malaysia

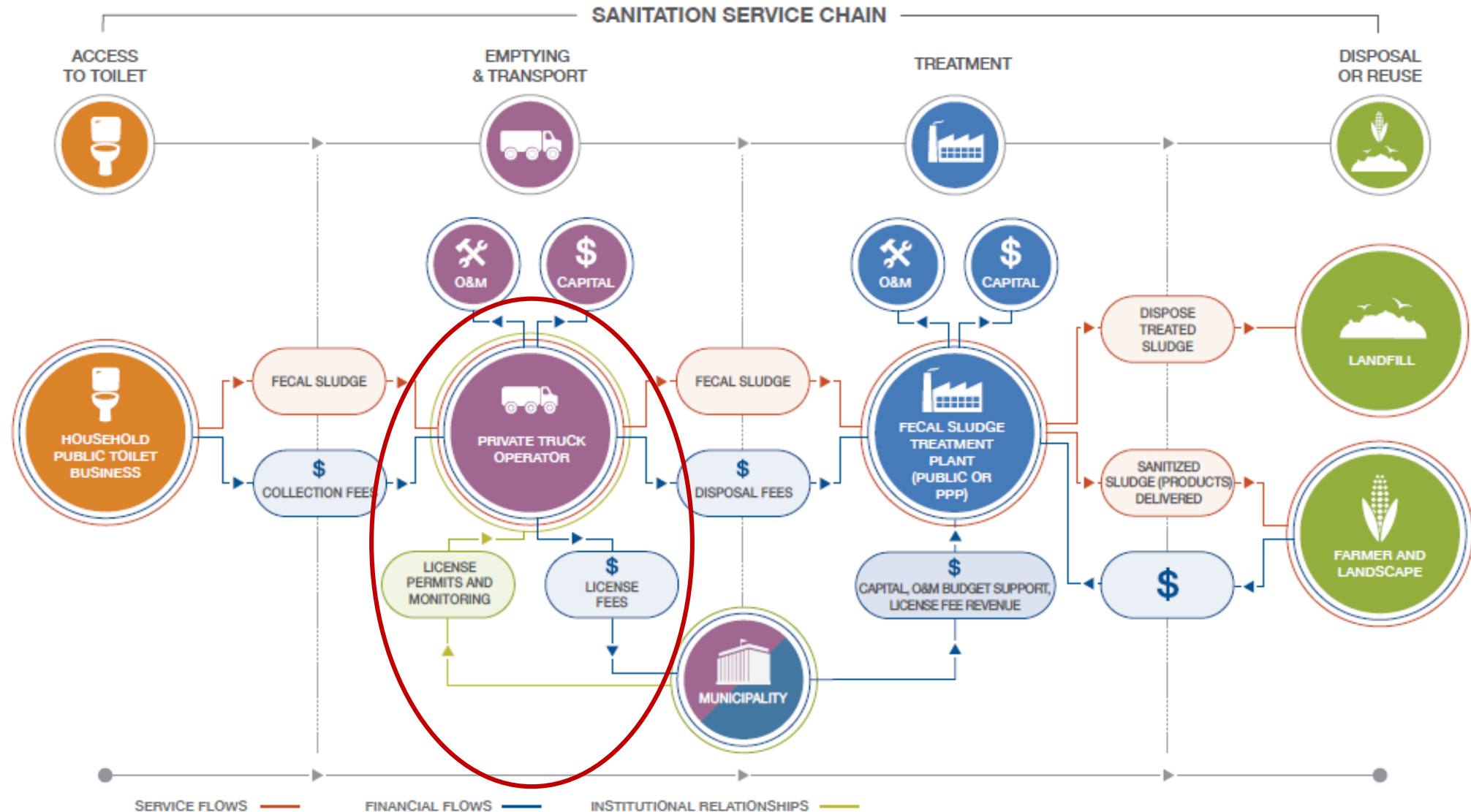


- Concession to Indah Water Konsortium (IWK), **wholly owned by the Ministry of Finance** operating as a private company by GoM.
- IWK responsible for 88 LAs with clientele base of 1.2M users of septic tanks and 800K users of pour flush systems.
- IWK provides **scheduled desludging** of septic tanks, emptying services on demand within and outside its service areas.
- Responsible for **operation of treatment facilities**, equivalent to 90% of its revenue.
- Incentive for increased **private sector participation** via 2016 Water Services Industry Act, given IWK's perceived monopoly.



<https://www.iwk.com.my/customer/responsive-desludging-services>

3.2 Licensing Model



❖ Kumasi Metropolitan Assembly, Ghana

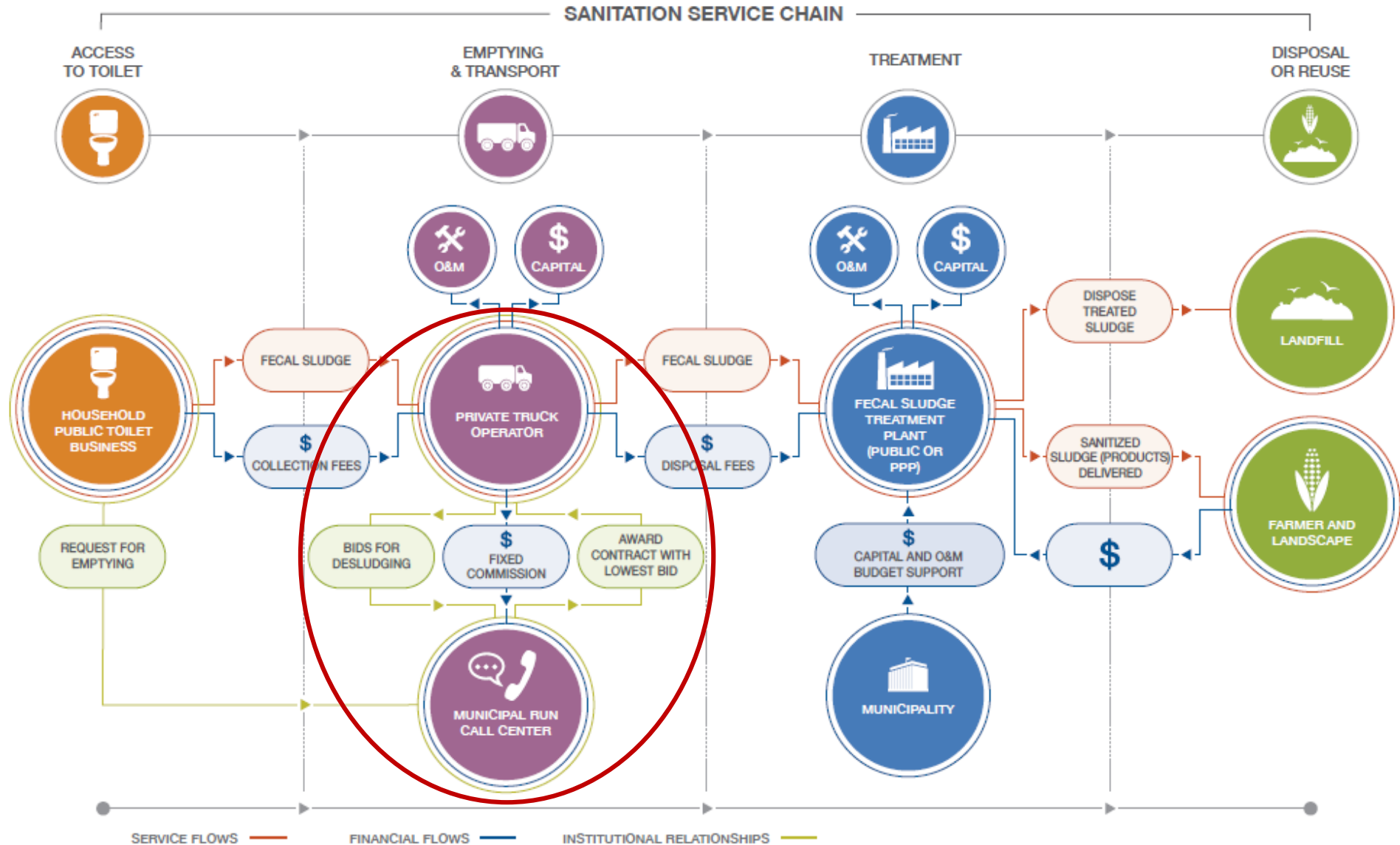


- City authority facilitates **participation of private sector** in provision of desludging services.
- Private truck operators obtain **licenses** from the Waste Management Department (WMD) at KMA.
- WMD in KMA sets rules for private sector participation and vets the operator before issuing a license.
- **Non-compliance with KMA regulations** can result in revoking of license.
- **Strict monitoring** combined with risk of license being revoked has drastically reduced illegal dumping of FS.
- Private truck operators have to pay disposal fees to KMA for disposing the sludge at the treatment plant managed by KMA.



Photo Credit: Dana Ward (<https://www.psi.org/2015/09/making-kumasi-a-cleaner-city/>)

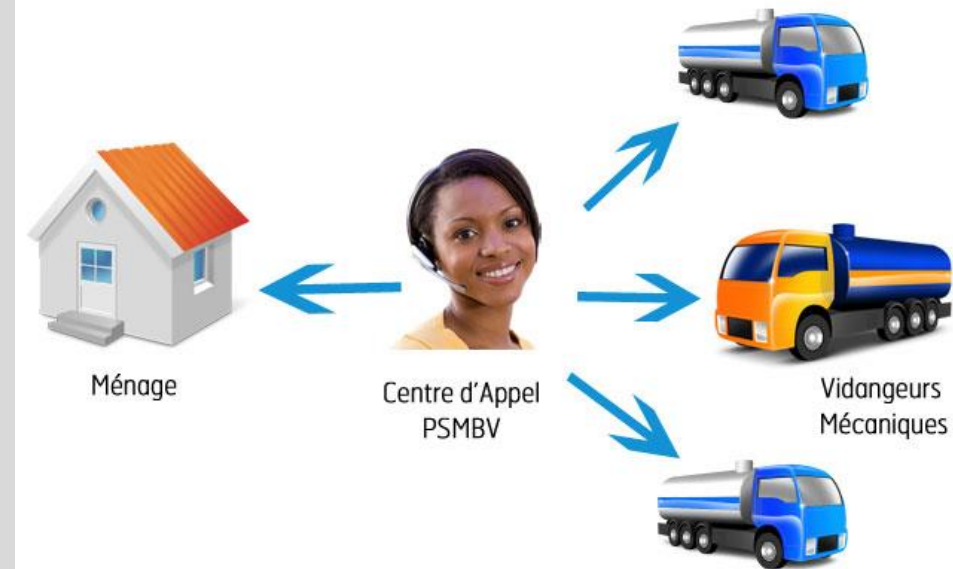
3.3 Call Center Model



❖ ONAS Call Center, Senegal



- **National Office of Sanitation (ONAS):**
 - ❖ Two years to design and develop the call center
 - ❖ Launch done in two phases – beta phase and commercial scale-up
- **Association of truck operators**
 - ❖ 138 trucks registered
 - ❖ Trucks are geo-referenced to monitor emptying and disposal
 - ❖ Individual trucks participate in the auctions
- **Customer feedback**
 - ❖ After every emptying to ensure quality control
 - ❖ Poor service is penalized (USD 3.5) by adding this amount to future bid offer making them less competitive
- **Result:** Emptying fees for households have reduced and volumes of sludge delivered to treatment plants have increased.



<https://www.onasbv.sn/en/psmbv-innovations/call-center/>

3.4 Scheduled Desludging with Sanitation Tax



❖ Cases from Philippines and Vietnam

Dumaguete

- Population: 0.12 million – (about 75% septic tank coverage)
- Service by Municipality
- Tariff: 2 pesos (USD 5 cents) per m³ of water consumed
- Covers O&M and capital costs in 8 years

San Fernando

- Population: 115,000
- Service by Private sector
- Fees through property tax

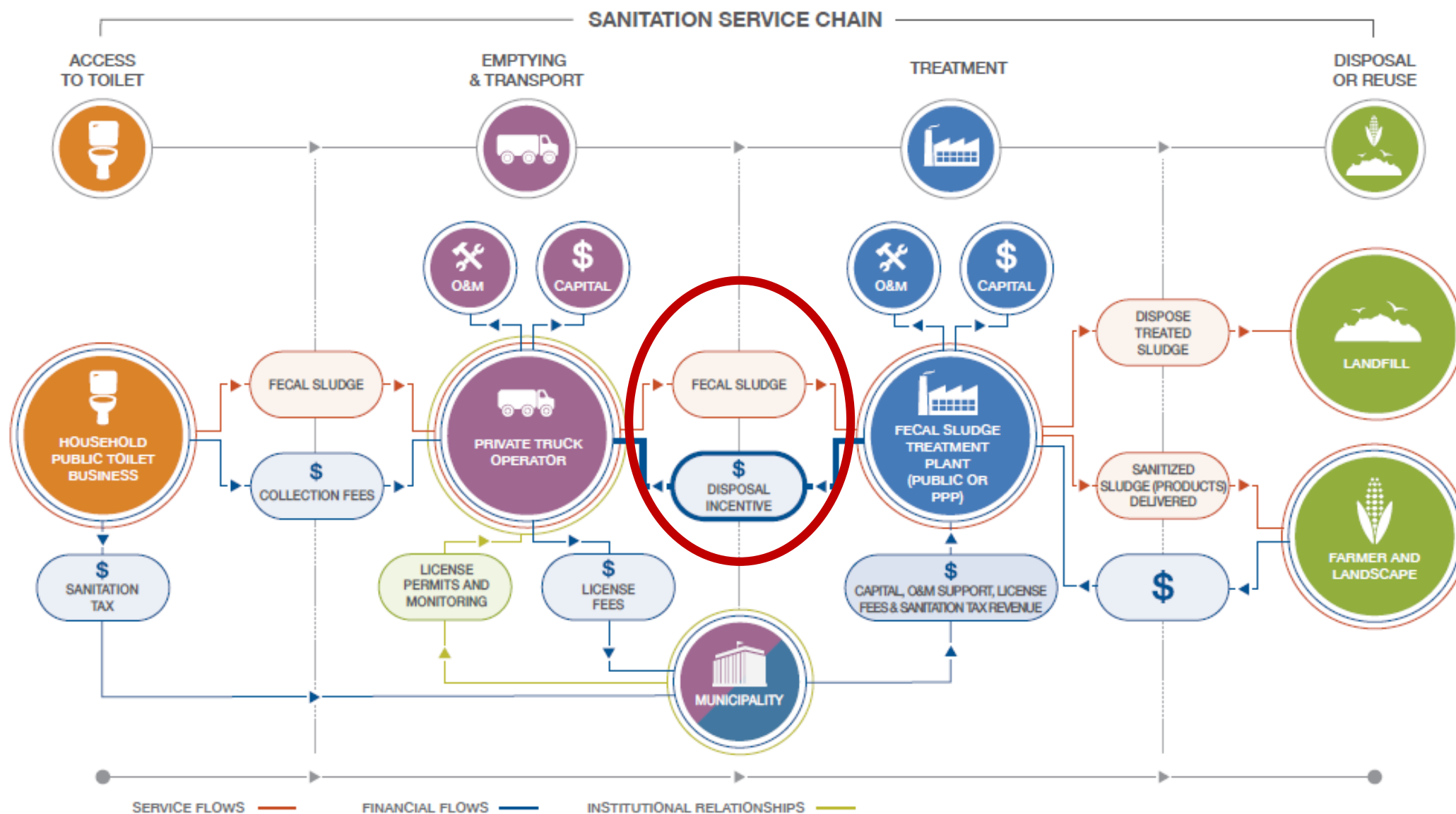
Hai Phong

- Population: 1.8 million
- Service by state run utility company
- Wastewater fee – 15% surcharge added to the water bill
- Water tariff of USD 0.29/m³ and daily consumption of 0.54m³
- Recover O&M costs



https://www.pas.org.in/Portal/document/UrbanSanitation/uploads/Resources%20for%20Scheduled%20emptying_CWAS-CEPT.pdf

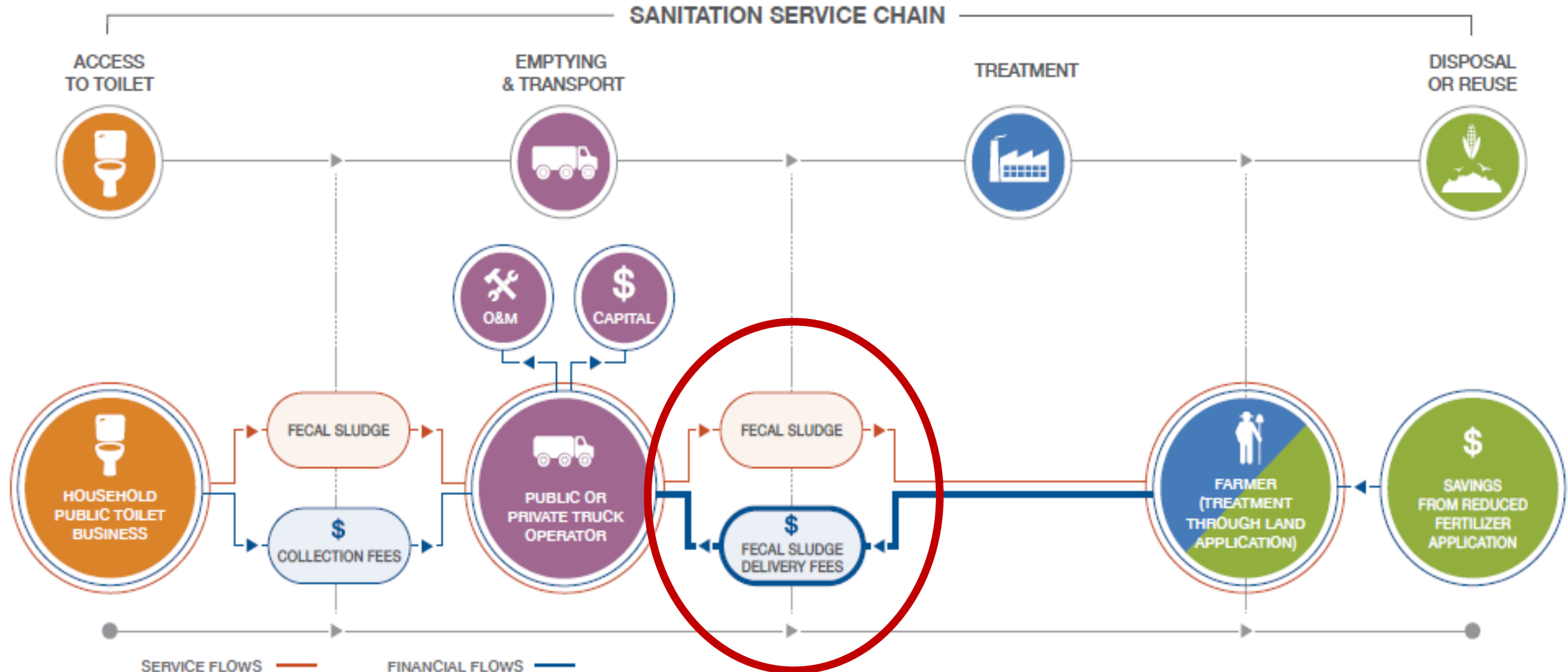
3.5 Incentivized Disposal Model



Business Model 4: Treatment for Reuse Models



4.1 Farmer-truck Operator Partnership Model

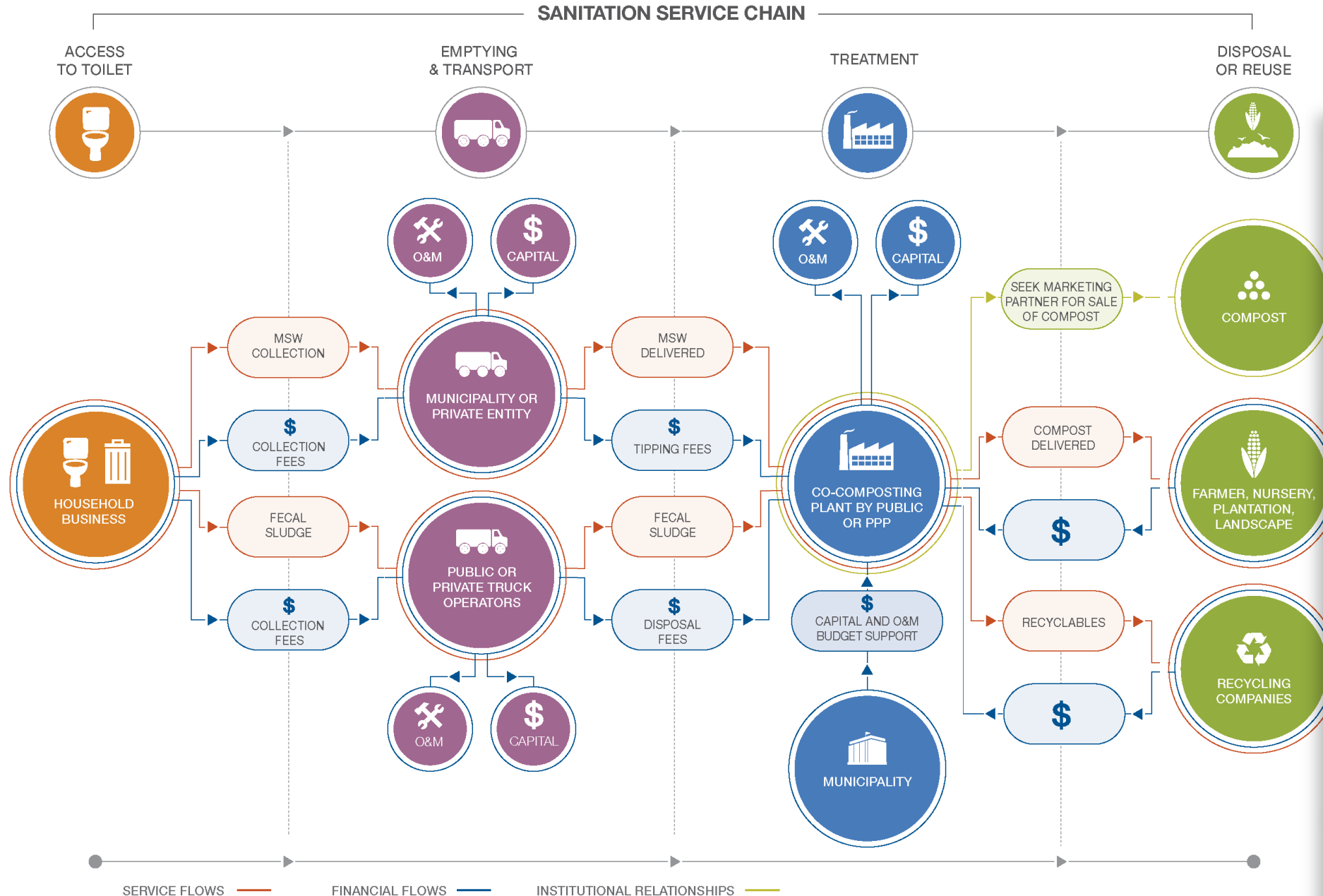


❖ Cases from Ghana and India*

- **Bangalore:** Vacuum truck operators discharge FS collected on farmlands.
 - ❖ Farmers store and dry the sludge prior to use, and others use it directly (e.g. banana plantations).
 - ❖ **FS collected mostly given for free**, but sometimes sold to farmers.
 - ❖ **Farmers' financial savings** btw USD138 –2,998/year.
 - ❖ Some farmers sell dried FS to other farmers at US\$ 27/tractor load.
- **Dharwad:** Farmer-truck operator partnership arrangement for sludge delivery.
 - ❖ **No financial transactions**
 - ❖ After drying, **farmers auction pits** to other farmers who bid for composted material
 - ❖ Compost sold at USD25/tractor load vs. tractor load of cow dung sold btw USD80 – 110.



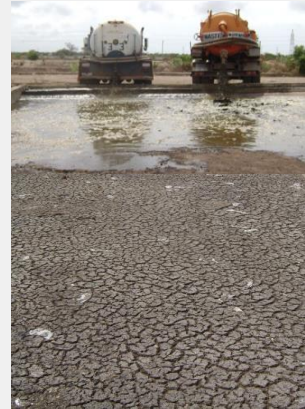
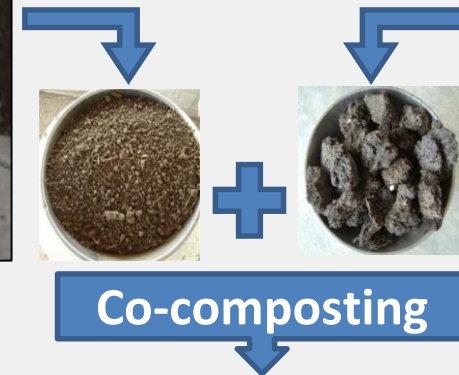
4.2 Co-composting Model



- Scale: 60–100T MSW/day, 50-60 m³ FS/day;
- High profitability due to multiple-revenue stream approach;
- Operational cost breakeven in 3-5 years;
- Success drivers: economies of scale, strategic partnerships, product innovation, potential for market segmentation;
- Employment generation for urban poor, including women.




❖ Balangoda Case from Sri Lanka

- **Balangoda compost plant:** Public-entity owned and managed by local urban council-
 - ❖ Council responsible for collection of MSW and FS.
- Desludging of FS from on-site sanitation on-demand basis at USD30 rate.
- Urban council undertakes door-to-door MSW collection from HH (for free) but unsegregated waste collected at fee of USD 0.75 – 9 (commercial entities).
- GoSL – provided capital investment for treatment & compost plant at USD352K.
- Operation costs = USD1,340 per month.
- Compost production = 420 tons annually, sold at USD 77-120/ton.
- Sale of recyclables main driver of cost recovery







Safe organic fertilizer

■ List of references

-  RAO, K., KVARNSTRÖM, E., DI MARIO, L., DRECHSEL, P. (2016). *Business models for fecal sludge management*. Colombo, Sri Lanka: International Water Management Institute (IWMI). CGIAR Research Program on Water, Land and Ecosystems (WLE). 80p. (Resource Recovery and Reuse Series 6).
-  Unless otherwise noted, all images from IWMI flickr library
www.flickr.com/photos/iwmi/
-  Unless otherwise noted, all graphics and case studies from RAO, K., KVARNSTRÖM, E., DI MARIO, L., DRECHSEL, P. (2016). *Business models for fecal sludge management*. Colombo, Sri Lanka: International Water Management Institute (IWMI). CGIAR Research Program on Water, Land and Ecosystems (WLE). 80p. (Resource Recovery and Reuse Series 6).

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