Emptying & Transportation of Septage

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Faecal Sludge and Septage Management
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Septage in Septic Tanks

Pumped from septic tank

Manually collected from septic tank

FS Quantification

- Accurate estimates of volume of FS produced is essential for the proper sizing of infrastructure required for:
  - Collection and transport networks;
  - Discharge sites;
  - Treatment plants;
  - Enduse or disposal options
- Two theoretical approaches to quantify volume of FS generation:
  - Sludge production method;
  - Sludge collection method.

Transportation

Tractor-Trolley

Truck

Auto-
Tank

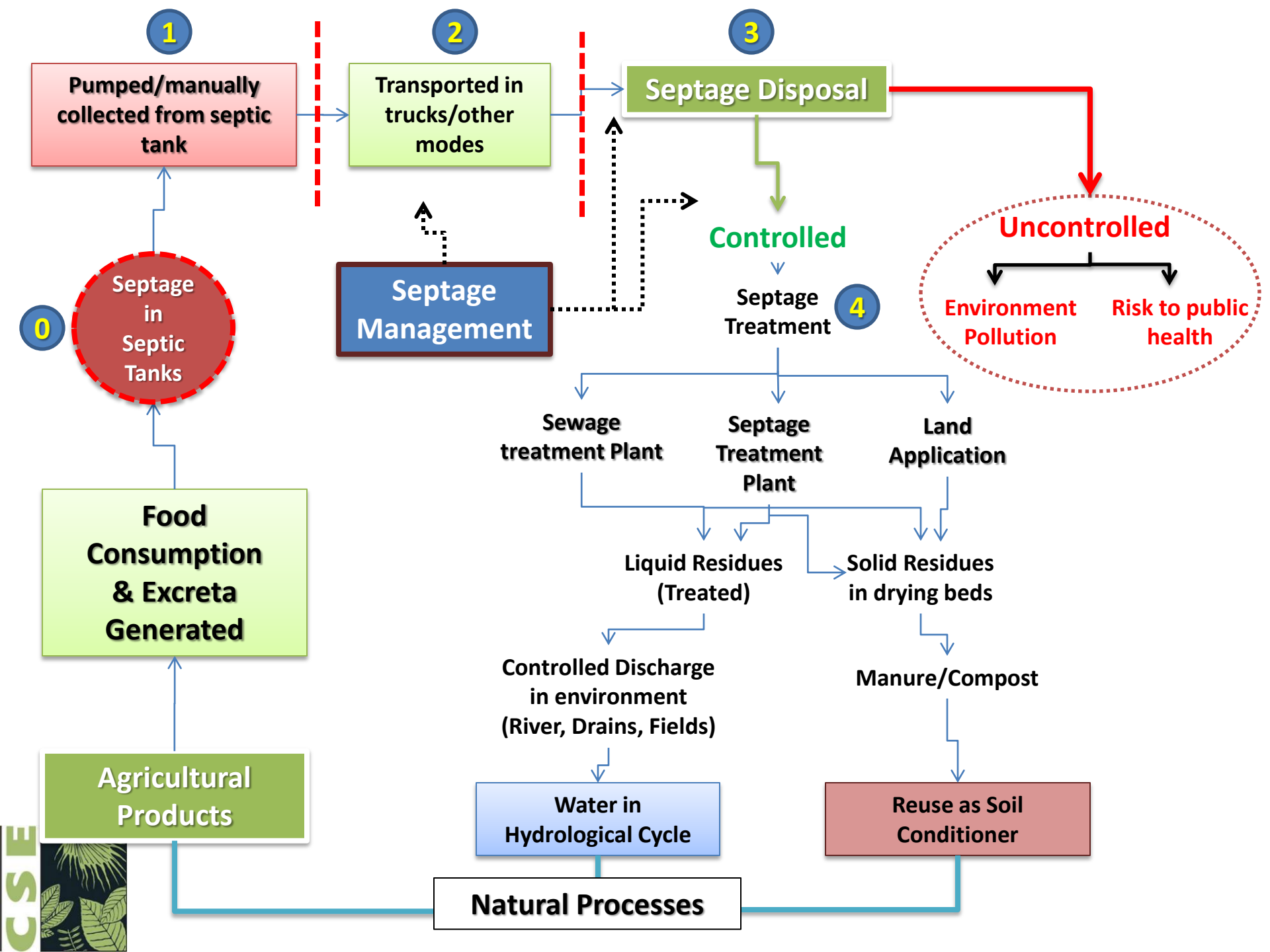
Septage Disposal

Open areas away from city

Municipal sewer line/storm water drain

Nearby water body (talab, kua, johad, nadi)

Nearby river drain


1
Pumped/manually collected from septic tank
2
Transported in trucks/other modes
3
Septage Disposal
Uncontrolled
Environment Pollution
Risk to public health
Controlled
Septage Treatment
4
Septage Management
0
Septage in Septic Tanks
Sewage treatment Plant
Septage Treatment Plant
Land Application
Liquid Residues (Treated)
Solid Residues in drying beds
Controlled Discharge in environment (River, Drains, Fields)
Manure/Compost
Food Consumption & Excreta Generated
Agricultural Products
Water in Hydrological Cycle
Reuse as Soil Conditioner
Natural Processes

Septage collection

- In India main focus is on centralized STP
- Recently, Septage has been given due attention with NUSP
- However, no local government has paid attention towards services related to Septage (collection/treatment)
- People largely depend on private service providers to clean septic tanks

Transform Urban India into Community Driven, totally sanitized, healthy and livable cities and towns, NUSP-2008

Source: CSE Field visit, 2014

Prevailing practices: 1

Source: Google image, manual scavenging link

Emptying

Dewas, Madhya Pradesh

Solapur, Maharashtra

Emptying (removal) issues

- Considered as an unpleasant and repulsive job
- Poses risk of transmission of diseases of faecal origin during removal
- Noxious gases while opening chambers pose threat
- In-efficient cleaning due to irregular de-sludging
- Reduced anaerobic reaction rates due to complete removal of sludge
- In-adequate safety measures

In efficient cleaning

- The septage removal is not regular/scheduled – unless becomes a compulsion
- The prevailing practices does not ensure efficient cleaning of the septic tanks
- The locations of the septic tanks are at times difficult to reach

Reduced sludge digestion

- The sludge from the tank is completely removed from the septic tanks
- Therefore, the supporting culture (bacteria) for decomposition are reduced in sufficient numbers
- Due to this the anaerobic reaction rates – (decomposition) reduces
- This results in more sludge formation

Labor issues

- Mostly done by private parties – as a business
- This is unpleasant act for labor
- They do not understand the impacts of wrong practices related to septage cleaning
- Inadequate tools available while cleaning
- Do not understand the environmental impacts of wrong practices

Prevailing practices-2

Source: CSE Field visit, 2014

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Source: CSE Field visit, 2014

Source: CSE Field visit, 2014

Source: CSE Field visit, 2014

Source: CSE Field visit, 2014

Transportation

Solapur, Maharashtra

Delhi

Bikaner, Rajasthan

Environmental impacts

- Private parties do not take adequate measures to dispose septage systematically
- It is
  - Dumped far away at open areas
  - Disposed off in sewer chambers in night time
  - Dumped in to land fill sites
  - Sold to farmers as manure

Disposal

Disposal into Solid Waste dump yard
Solapur, Maharashtra

Source: CSE Field visit, 2014

Disposal in to Trunk sewer.
Dewas, Madhya Pradesh

Disposal in Storm Water Drain
Ghitorni, Delhi

Disposal in Canal
Delhi

Africa Example

MAPET

EAWAG SANDEC
2008

South Asian Examples

Source: AECOM International Development, Inc. and the Department of Water and Sanitation in Developing Countries (Sandec) at the Swiss Federal Institute of Aquatic Science and Technology (Eawag), 2010

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Bangladesh Example

	India	Indonesia	Malaysia	Philippines	Sri Lanka	Thailand	Vietnam
Clear Policy Frameworks	◎ (NUSP, state sanitation plans)	○	● (WSIA, developer guidelines)	● (CWA, DOH operations manual)	○	◎ (PHA, MOPH operations manual)	○
Strong Local Programs	○	◎ (Malang)	○	● (Marikina, Dumaguete)	○	● (Non-thaburi)	◎ (Hai Phong)
Effective Promotion Campaigns	◎ (*Nirmal Shahar Puraskar*)	○	● (Indah Water Konsortium)	● (Marikina)	○	○	○
Successful Private Service Provision	○	◎ (Surabaya)	● (Indah Water Konsortium)	● (Manila Water Company)	○	○	◎ (Hoa Binh Company)
Diverse Technologies for Septage Treatment	○	◎ (drying beds, modified activated sludge)	● (trenches, drying beds, mobile dewatering units, activated sludge)	● (mobile dewatering units, activated sludge)	◎ (trenches, coco coir mats)	● (anaerobic digestion tanks)	◎ (dewater-ing units, drying beds, wetlands, compost)

○ = no known good practices ◎ = emerging practice, needs improvement ● = replicable good practice

Source: AECOM International Development, Inc. and the Department of Water and Sanitation in Developing Countries (Sandec) at the Swiss Federal Institute of Aquatic Science and Technology (Eawag), 2010

Conclusions

- FS quantification is important for FSM planning including designing the treatment systems;
- Difficult to quantify production of FS in urban areas;
- More field-based research is needed on FS quantification