Closing the Loop in WASH Discourse - Towards Policy & strategy

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Household Human Wastes and Wastewaters
Excreta and Graywater—Definitions and Properties

**Excreta:** Human feces and urine
Managed in different ways:
- Direct disposal on land or in water
- Direct use as fertilizer, soil conditioner and for aquaculture
- Pre-treatment prior to use
- Dilution with water to convey (sewage) for disposal or use
  - Direct use of untreated (raw) sewage
  - Treatment and discharge to land or water
  - Treatment and reuse (agriculture, aquaculture, horticulture, industrial and civil use)

**Graywater:** Other wastewater from human activity
- Not directly from human feces and urine
- Wastewater from washing, bathing, etc
- Contains human wastes and exudates
Human Excreta – Both Resource & Risk

- Human excreta as a potential resource
- Contains nutrients (N, P, K, and organic matter)
- Nutrients and organic matter are:
  - Detrimental in water, esp. surface water
    - Eutrophication, anoxia, fish kills
- Beneficial on land
  - Fertilizer, soil conditioner, land stabilizer
- Widely used as a fertilizer and soil amendment in both developed and developing countries
- Potential for excreta misuse and environmental pollution is great without proper attention to management plans and human behavior considerations

- Nitrogen (N) 4.5
- Phosphorous (P) 0.6
- Potassium 1.0
- Organic matter
- (as BOD) 35
- Annual amounts person/kg
Pros and cons of Urban and Peri-urban agriculture

- Better nutrition
- Savings in buying food for households
- Income from sales
- Jobs and
- A greener environment

Risks are:
- Pathogens and toxic contamination from liquid and solid waste, and air pollution
- Proximity to animals carrying zoonotic diseases, and
- Environmental damage
Current Policy/ Regulation

• No separate policy/regulation for septage management/use of WW in agriculture

• Several environmental laws
  – Prohibits discharge without treatment
  – Standards prescribed for industrial effluent
  – Penal provisions for violation of law
  – Success not very evident

• Hence need for a policy for strengthening Institutional, technical, Financial, Transport, Treatment & disposal, Revenue generation etc.
Key Challenges

• Limited/no physical infrastructure to treat septage in the country, and very limited use of mechanized de-sludging

• Manual scavenging still widespread, although prohibited by law; on-site sanitation not viewed as a problem or priority

• Emphasis on centralized, advanced engineering solutions for sanitation; septage management not perceived as a solution

• Most cities and states do not have policies on septage management and lack data concerning onsite sanitation systems in their jurisdictions

• Discharge vs Reuse issues, lack of standards
Key Challenges continued

- Low prioritization and awareness of the public and government agencies;
- Lack of explicit policies on sanitation, particularly safe disposal;
- Focus on project- and technology-based investment decisions rather than city wide planning;
- Lack of attention on access by the poor to safe sanitation; and
- Supply-driven rather than demand-responsive sanitation solutions.
Fragmented Policy & weak enforcement

- Inadequate policies & lack of comprehensive implementation
- Responsibility fragmented/multiple agencies
- Inadequate stake holders awareness
- Lack of Trained manpower
- Low tariff/o & m funding
- Institutional issues
Key Areas for Policy & Strategy

- Recognizing importance of Urban & Peri-urban agriculture: Food Security for Households
- Health issues & environment
- Land Use management & Physical Planning
- Legislation & Governance on a variety of issues e.g. Compost quality, heavy metal residues in fruits & vegetables, WW quality for agriculture etc., etc.
- Research Agenda to support Policy e.g. Model codes & conduct, Appropriate technologies
- Develop Guidelines for users
Principles for Policy

• Principle 1: Municipal Waste water, organic fraction of MSW, municipal sludge and treated septage contain valuable nutrients and organic matter that can be recycled or recovered as energy
  – Land application of septage, organics from MSW can be considered a beneficial use when properly managed to enhance soil fertility, soil structure and plant growth.
  – Municipal and treated septage applied to land can also provide nutrients such as nitrogen and phosphorus and organic matter, which are wasted if the material is landfilled or combusted without energy and ash recovery.
  – Phosphorus is a limited non-renewable resource that should be recycled from human waste.
Principles for Policy

Principle 2: Adequate source reduction and treatment of municipal sludge and septage should effectively reduce pathogens, trace metals, vector attraction, odours and other substances of concern.

- Applicable safety, quality and management standards, requirements or guidelines for municipal wastes must be met.

- All departments should encourage and support the continuous improvement of the quality of municipal wastes through source control initiatives and the implementation of best management practices in order to limit any potential adverse impacts associated with their use.
Principles for Policy

• **Principle 3:** The beneficial use of municipal wastes, municipal sludge and treated septage should minimize the net GHG emissions.
  
  – Land application of municipal wastes can supplement and may reduce fertilizer use. Land application results in the storage of carbon in the soil, thereby minimizing greenhouse gas (GHG) emissions to the atmosphere
  
  – To minimize GHG emissions, methane should be captured to generate heat and/or energy to be considered a beneficial use
Principles for Policy

• Principle 4: Beneficial uses and sound management practices of municipal waste, municipal sludge and treated septage must adhere to all applicable safety, quality and management standards, requirements and guidelines.
  – Sound management to include the best management practices
  – Municipal wastes to be used as fertilizers or soil supplements, to be regulated under the Fertilizers Act.
Guidelines to be Developed

• Intended purpose
• Collection & transportation
• Treatment options
• Management practices
• Land application
• Characteristics & Quality
• Environmental & Health Issues
• Contingency Planning
• Supporting Legislation