Lesson Plan 10: Designing a Sanitation System **50 minutes total**



**Lesson Description**



This lesson introduces the factors that affect the design and selection of sanitation technologies. Participants are given their Sanitation System Design Workbooks, which they will use during the workshop to design a sanitation system appropriate for their project. The focus is on designing the latrine components of the sanitation system, and will briefly address sludge treatment, use and disposal.

**Learning Outcomes**





At the end of this session participants will be able to:

1. Identify factors that affect the design and selection of sanitation technologies.
2. Explain how the Sanitation System Design Workbook will be used during the workshop.

**Materials**



* Sanitation System Design Workbooks (1 per participant)
* Flipchart paper
* Markers
* Tape
* Pens or pencils (1 per participant)

Optional:

* Technology Cards (1 set for the trainer)

**Preparation**



* Print a Sanitation System Design Workbook for each participant
* Print extra worksheets from the Workbook in case participants need them
* Write the heading “*Factors Affecting Dream Home*” on flipchart paper
* Write the heading “*People’s Needs and Preferences*” on flipchart paper
* Write the heading “*Environmental and Technical Factors*” on flipchart paper
* Write the heading “*Local Materials, Skills and Labour*” on flipchart paper
* Write the heading “*Economic Factors*” on flipchart paper
* Write the heading “*Health and Safety*” on flipchart paper
* Write the heading “*People’s Needs and Preferences*” on flipchart paper
* Optional: Print and cut out the technology cards at the end of the Sanitation System Design Workbook (1 set for the trainer)
* Optional: Write the learning outcomes in flipchart paper

**Introduction 5 minutes**



1. Ask the participants to imagine that they have been given the gift to build a brand new home. It can be anywhere and any style.
2. In pairs, ask the participants to discuss “Describe your new home and why you want it built that way”.
3. Share some answers as a large group focusing on why people made their choices and identifying the qualities of the home. For example, if someone says that their home lots of windows, then you can identify that light is important to them. If the house is made of bricks, then you can identify that they want a home built with high quality, durable materials. If they want many bathrooms, then convenience may be important. Record responses on the “*Factors Affecting Dream Home”* flipchart.

* *Convenience, space, beauty, environment, cost, materials*

1. In pairs, ask the participant to discuss “If you are building a latrine, what factors from the list would be important to you?”
2. Present the lesson description or the learning outcomes.

**Factors Affecting Design and Selection 15 minutes**



1. Identify the main factors that affect the design of an appropriate sanitation technology. Ask participants give a few examples of each one. Record responses on the appropriate flipchart.

* *People’s Needs and Preferences: Squat or sit, latrine near or far from the home, private so no one sees them enter the latrine, beautiful so they can be proud of it when guests come over. Ensuring that it is appropriate and socially acceptable may be the most important factors in getting people to use latrines!*
* *Environmental and Technical: Available space, type of housing, water availability, soil type, depth to groundwater, distance from drinking water sources, flooding, terrain, temperature, operation and maintenance requirements*
* *Local Materials, Skills and Labour: Cement may not be locally available, wood may be very expensive, there is a local company that installs biogas reactors, there are skilled masons available, community people are not willing to do any of the physical work themselves but will contribute sand and gravel*
* *Economic Factors: How much technologies cost locally, how much people are able and willing to pay, what options are available for people who cannot afford it?*
* *Health and Safety:* *What is the risk of* g*roundwater contamination, does the latrine keep excreta contained and out of contact from humans and animals?, can the latrine be kept clean?, can the latrine be emptied safely and hygienically?, is sludge safe to use on crops?*

1. **There are three other considerations as well when designing technologies. Ask participants to give a few examples of each consideration.

* *Implications on other components of the sanitation system: How does the technology limit choices for other components of the system? Does the technology fit with previously selected components of the sanitation system?*

*For example, a pour flush toilet cannot be used with a composting latrine, a dry toilet cannot be used with a septic tank, wet sludge from a pit latrine must be dried before it can be composted.*

* *Challenges of implementing the technology: Some technologies may be more difficult to implement. They may require extensive behaviour change, or attitude changes.*

*For example, people don’t think human feces should be used in agriculture, a local pit emptying business does not exist and must be set up, the community does not want to pay to have a small sludge treatment facility built or operated.*

* *Regulations: There may be regulations, laws, or incentive programs that either help or do not allow a certain technology to be implemented.*

*For example, subsidies, regulations about technologies that contaminate groundwater, free marketing may be available for a locally branded latrine.*

1. Explain that we will discuss these factors more as we look at each component of the sanitation system.

**Sanitation System Design Workbook 25 minutes**



1. Explain that each participant will design a complete sanitation system by the end of this workshop. Their design will be based on a community that they either know or make up.
2. Hand out a Sanitation System Design Workbook to each participant.
3. Ask participants to write their name on the front of their workbook. Tell them to leave it in the classroom or bring it every day.
4. Ask participants to open to the “Project Profile” section. Tell them this is where they will describe their project location and community. They will have some time to do this after you have explained the entire workbook.
5. Ask participants to turn to the “Superstructure” section. Explain that this is a design page. There is a page like this for every part of the latrine and every component of the sanitation system.
6. Tell participants that at the end of the lesson on each latrine part and sanitation system components, they will get a chance to work on their design. They will design and select the technology that is most appropriate for their community. They will draw or tape a picture of the technology in the top box. Then they will write explanations in each other box about why their choice is appropriate. They will need to address each of the factors that were just discussed. Remind them of the flipcharts where you wrote all the factors.

Note: Participants may want to select more than one technology. They can draw or tape more than one technology on the page, or use multiple pages. Have spare worksheets available. If a participant does select more than one option, ask them why someone might use one option instead of the other (e.g., cost, preference).

1. Ask the participants to turn back to the “Project Profile” section. Ask them to think of a real project (current or future). If they do not have a project in mind, they can make one up.

Optional: Participants can work individually or in small groups to design a sanitation system.

1. Ask the participants to fill in all the boxes in the “Project Profile” section. If they cannot think of a project now, they can do this tonight and have it ready for tomorrow. Ask them to add as much detail as possible.

**Review 5 minutes**



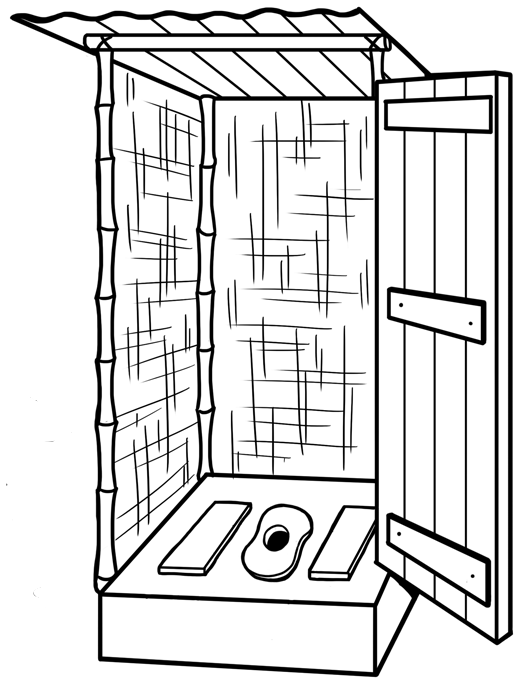
1. Ask participants to think about their own latrine and what about it they like. Ask them to identify which category of factors the thing they like about their latrine falls under. Share some responses as a large group.
2. Ask participants if there is anything they would like to change about their latrine. Ask what category of factors it falls under. Share some responses as a large group.

**Reflections on Lesson**



Sanitation System Design Workbook

Name:   
  
Date:



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**1 Introduction**

This will be your design workbook for this workshop. As you learn about each component of the sanitation system, you will select a technology that you think will work best for your community. You will design an entire sanitation system in this workbook, with a focus on the latrine. A sanitation system also includes emptying the latrine, and the safe treatment, use or disposal of the sludge.

The five components of a sanitation system are illustrated in the following diagram:

**Sanitation System**

User Interface

Excreta

Storage

Emptying and Transport

Treatment

Use or Disposal

To design each part of your sanitation system, you can draw or tape a picture of the selected technology in the box on each page. You can look at the illustrations in the Technical Briefs and the cards at the end of this Workbook to see what the different sanitation technologies look like.

There may be more than one appropriate technology for each component. If you wish to select more than one technology, you may put more than one option on the page, or ask for additional worksheets. Be sure to fill in all the boxes to explain why each technology you select is appropriate.

You may use a real project and community to design your sanitation system. If you do not have a specific project in mind, you may make one up. There is space for you to describe your project location and the community on the “Project Profile” page.

**2 Project Profile**

**Project Location** (Region or Town)

**Rural / Urban / Peri-Urban**

**Geography / Environment** (for example, flat, mountainous, desert)

**Climate** (for example, rainy and dry seasons, high and low temperatures)

**Surface Water** (for example, ponds, lakes, rivers)

**Groundwater** (for example, highest annual groundwater level)

**Soil Conditions** (for example, sandy, rocky, difficult to dig)

**Natural Disasters** (for example, flooding, hurricanes, cyclones, earthquakes)

**Space Availability** (for example, limited space to build latrines)

**Number of Households and Public Facilities** (for example, school, clinic)

**User Groups** (for example, people with physical disabilities, healthy women, pregnant women, healthy men, children, chronically ill, elderly)

**Current Sanitation Habits** (for example, open defecation, every house has a pit latrine but most people don’t use them, pits are emptied manually)

**Other Important Information**

**Your Goal for the Project**

You can draw a picture of the project location and community here:

**3 Superstructure**

Draw or tape the superstructure that you have selected in the box below. List the materials you need for each part of the structure. You can draw, tape or write the list of accessories that users will need in the second box.

Accessories (for example, hand rails, ramp, light, lock)

Superstructure

Explain why your choice is appropriate by filling in the following six boxes:

**People’s Needs and Preferences**

(Is the technology appropriate? Is the technology acceptable?)

**Environmental and Technical Factors**

(Does the technology work in the location? How well does the technology perform?)

**Will this technology work with the other latrine parts?**

**Will this technology work with the other sanitation system components?**

**What may be some challenges with this technology?**

**Are there any regulations that may help or affect people using this technology?**

**Health and Safety**

(Is it safe for people and the environment? What precautions should people take to make sure they are safe?)

**Local Materials, Skills and Labour**

(What is available locally?)

**Economic Factors**

(How much will it cost? Can people afford it? What options are available for people who cannot afford it?)

**4 Toilet**

Draw or tape the toilet technology you have selected in the box below. You can draw, tape or write the list of accessories that users will need in the second box.

Accessories (for example, water, paper or leaves for anal cleansing, portable chair, handrails for support, toddler seat, stool)

Toilet

Explain why your choice is appropriate by filling in the following six boxes:

**People’s Needs and Preferences**

(Is the technology appropriate? Is the technology acceptable?)

**Environmental and Technical Factors**

(Does the technology work in the location? How well does the technology perform?)

**Will this technology work with the other latrine parts?**

**Will this technology work with the other sanitation system components?**

**What may be some challenges with this technology?**

**Are there any regulations that may help or affect people using this technology?**

**Health and Safety**

(Is it safe for people and the environment? What precautions should people take to make sure they are safe?)

**Local Materials, Skills and Labour**

(What is available locally?)

**Economic Factors**

(How much will it cost? Can people afford it? What options are available for people who cannot afford it?)

**5 Slab**

Draw or tape the slab technology you have selected in the box below.

Slab

Explain why your choice is appropriate by filling in the following six boxes:

**People’s Needs and Preferences**

(Is the technology appropriate? Is the technology acceptable?)

**Environmental and Technical Factors**

(Does the technology work in the location? How well does the technology perform?)

**Will this technology work with the other latrine parts?**

**Will this technology work with the other sanitation system components?**

**What may be some challenges with this technology?**

**Are there any regulations that may help or affect people using this technology?**

**Health and Safety**

(Is it safe for people and the environment? What precautions should people take to make sure they are safe?)

**Local Materials, Skills and Labour**

(What is available locally?)

**Economic Factors**

(How much will it cost? Can people afford it? What options are available for people who cannot afford it?)

**6 Excreta Storage**

Draw or tape the excreta storage technology you have selected in the box below. Describe the size and other details in the second box.

Number of years to fill:

Size – Depth:

Size – Width and Length or Diameter

Footing and/or pit lining material (if required):

Excreta Storage

Explain why your choice is appropriate by filling in the following six boxes:

**People’s Needs and Preferences**

(Is the technology appropriate? Is the technology acceptable?)

**Environmental and Technical Factors**

(Does the technology work in the location? How well does the technology perform?)

**Will this technology work with the other latrine parts?**

**Will this technology work with the other sanitation system components?**

**What may be some challenges with this technology?**

**Are there any regulations that may help or affect people using this technology?**

**Health and Safety**

(Is it safe for people and the environment? What precautions should people take to make sure they are safe?)

**Local Materials, Skills and Labour**

(What is available locally?)

**Economic Factors**

(How much will it cost? Can people afford it? What options are available for people who cannot afford it?)

**7 Handwashing Station**

Draw or tape the handwashing station you have selected in the box below. You may choose a second option if there is more than one appropriate technology.

Handwashing – Second Option

Handwashing – First Option

Explain why your choice is appropriate by filling in the following six boxes:

**People’s Needs and Preferences**

(Is the technology appropriate? Is the technology acceptable?)

**Environmental and Technical Factors**

(Does the technology work in the location? How well does the technology perform?)

**Will this technology work with the other latrine parts?**

**Will this technology work with the other sanitation system components?**

**What may be some challenges with this technology?**

**Are there any regulations that may help or affect people using this technology?**

**Health and Safety**

(Is it safe for people and the environment? What precautions should people take to make sure they are safe?)

**Local Materials, Skills and Labour**

(What is available locally?)

**Economic Factors**

(How much will it cost? Can people afford it? What options are available for people who cannot afford it?)

**8 Latrine Emptying and Sludge Transport**

Draw, tape or describe the latrine emptying and sludge transport technologies you have selected in the boxes below.

Sludge Transport

Latrine Emptying

Explain why your choices are appropriate by filling in the following six boxes:

**People’s Needs and Preferences**

(Is the technology appropriate? Is the technology acceptable?)

**Environmental and Technical Factors**

(Does the technology work in the location? How well does the technology perform?)

**Will these technologies work with the other latrine parts?**

**Will these technologies work with the other sanitation system components?**

**What may be some challenges with these technologies?**

**Are there any regulations that may help or affect people using these technologies?**

**Health and Safety**

(Is it safe for people and the environment? What precautions should people take to make sure they are safe?)

**Local Materials, Skills and Labour**

(What is available locally?)

**Economic Factors**

(How much will it cost? Can people afford it? What options are available for people who cannot afford it?)

**9 Sludge Treatment, Use or Disposal**

Draw, tape or describe the sludge treatment and use or disposal technologies you have selected in the boxes below.

Sludge Use or Disposal

Sludge Treatment

Explain why your choices are appropriate by filling in the following six boxes.

**People’s Needs and Preferences**

(Is the technology appropriate? Is the technology acceptable?)

**Environmental and Technical Factors**

(Does the technology work in the location? How well does the technology perform?)

**Will these technologies work with the other sanitation system components?**

**What may be some challenges with these technologies?**

**Are there any regulations that may help or affect people using these technologies?**

**Health and Safety**

(Is it safe for people and the environment? What precautions should people take to make sure they are safe?)

**Local Materials, Skills and Labour**

(What is available locally?)

**Economic Factors**

(How much will it cost? Can people afford it? What options are available for people who cannot afford it?)

# 10 Technology Cards

**Superstructures**

|  |  |  |
| --- | --- | --- |
| Superstructure: Plastic or Tarpaulin  (Credit: Cambodia DRHC, 2010) | Superstructure: Leaf, Straw or Thatch  (Credit: Cambodia DRHC, 2010) | Superstructure: Palm Stem or Reeds  (Credit: Cambodia DRHC, 2010) |
| Superstructure: Rice Bags or Cement Sacks  (Credit: Cambodia DRHC, 2010) | Superstructure: Leaf Mats or Woven Reeds  (Credit: Cambodia DRHC, 2010) | Superstructure: Mud or Clay  (Credit: Cambodia DRHC, 2010) |
| Superstructure: Bamboo or Wood Poles  (Credit: Cambodia DRHC, 2010) | Superstructure: Metal Sheets      (Credit: Cambodia DRHC, 2010) | Superstructure: Wood  (Credit: Cambodia DRHC, 2010) |
| Superstructure: Brick or Block  (Credit: Cambodia DRHC, 2010) | OTHER | OTHER |

**Toilets**

|  |  |  |
| --- | --- | --- |
| C:\Users\Sandy\Documents\_CAWST\Sanitation\Images\AKVO Sanitation Illustrations\Small Versions\AKVO_User Experience_Urinal_2009_Low Res.pngToilet: Male Urinal  (Credit: AKVO) | C:\Users\Sandy\Documents\_CAWST\Sanitation\Images\Latrine Design Construction (Marci)\png\LDC08_female urinal (med).pngToilet: Female Urinal | C:\Users\Sandy\Documents\_CAWST\Sanitation\Images\Compendium\Tilley_UDDT_squatting - wipers_2014.pngToilet: Squatting Urine Diversion for Wipers  (Credit: Tilley et al., 2014) |
| C:\Users\Sandy\Documents\_CAWST\Sanitation\Images\Compendium\Tilley_UDDT_squatting - washers_2014.pngToilet: Squatting Urine Diversion for Washers  (Credit: Tilley et al., 2014) | **C:\Users\Sandy\Documents\_CAWST\Images\AKVO Sanitation Illustrations\Small Versions\AKVO_User Experience_Urine Diverting Dry Toilet_2009_Low.png**Toilet: Sitting Urine Diversion  (Credit: AKVO) | C:\Users\Sandy\Documents\_CAWST\Sanitation\Images\Latrine Design Construction (Marci)\png\LDC04_squatting cistern flush (med).pngToilet: Squatting Cistern Flush |
| C:\Users\Sandy\Documents\_CAWST\Sanitation\Images\Latrine Design Construction (Marci)\png\Cistern Flush Toilet.pngToilet: Sitting Cistern Flush | C:\Users\Sandy\Documents\_CAWST\Sanitation\Images\Latrine User Challenges (Marci)\png\Slab with pour flush pan (Small).pngToilet: Squatting Pour Flush | Toilet: Sitting Pour Flush  (Credit: Shaw/WEDC, 2014) |
| C:\Users\Sandy\Documents\_CAWST\Sanitation\Images\Latrine Design Construction (Marci)\dry drop hole.pngToilet: Squatting Dry Drop Hole Without Lid | C:\Users\Sandy\Documents\_CAWST\Sanitation\Images\Sanitation Ladder\Toilets 2.pngToilet: Sitting Dry Drop Hole Without Lid | C:\Users\Sandy\Documents\_CAWST\Sanitation\Images\Latrine Design Construction (Marci)\png\Lid_Drop hole.pngToilet: Squatting Dry Drop Hole with Lid |
| C:\Users\Sandy\Documents\_CAWST\Sanitation\Images\Latrine Design Construction (Marci)\toilet - sit dry drop lid.pngToilet: Sitting Dry Drop Hole With Lid | OTHER | OTHER |

**Slabs**

|  |  |  |
| --- | --- | --- |
| C:\Users\Sandy\Documents\_CAWST\Sanitation\Images\WEDC\Shaw_WEDC_Dome Slab_2014.pngSlab: Concrete Dome  (Credit: WEDC, 2014) | C:\Users\Sandy\Documents\_CAWST\Sanitation\Images\WEDC\Chatterton_Reinforced_concrete_latrine_slab_2014 (Small).jpgSlab: Reinforced Concrete  (Credit: WEDC, 2014) | C:\Users\AaronTanner\Desktop\Rejig the cahin\Images from wedc\KCH_TEC_SLAB_Plastic_slab_-bw.jpgSlab: Plastic  (Credit: WEDC, 2014) |
| C:\Users\Sandy\Documents\_CAWST\Sanitation\Images\Latrine Design Construction (Marci)\Slab - wood.pngSlab: Wood or Bamboo | C:\Users\Sandy\Documents\_CAWST\Sanitation\Images\WEDC\Chatterton_WEDC_Wood Slab_2014.pngSlab: Pole and Earth/Clay  (Credit: Chatterton/WEDC, 2014) | C:\Users\Sandy\Documents\_CAWST\Sanitation\Images\Sanplat_Tearfund.pngSanPlat  (Credit: Tearfund) |
| OTHER | OTHER | OTHER |

**Excreta Storage**

|  |  |  |
| --- | --- | --- |
| C:\Users\Sandy\Documents\_CAWST\Sanitation\Images\AKVO Sanitation Illustrations\Small Versions\AKVO_Collection_Single Pit_2009(small).pngExcreta Storage: Pit  (Credit: AKVO) | C:\Users\Sandy\Documents\_CAWST\Sanitation\Images\AKVO Sanitation Illustrations\Small Versions\AKVO_Collection_Single Ventilated Improved Pit_2009(small).pngExcreta Storage: Ventilated Improved Pit (VIP)  (Credit: AKVO) | C:\Users\Sandy\Documents\_CAWST\Sanitation\Images\AKVO Sanitation Illustrations\Small Versions\AKVO_Collection_Arborloo_2009(small).pngExcreta Storage: Arborloo  (Credit: AKVO) |
| C:\Users\Sandy\Documents\_CAWST\Sanitation\Images\AKVO Sanitation Illustrations\Small Versions\AKVO_Modified_Raised Pit(Small).pngExcreta Storage: Raised Pit  (Credit: modified from AKVO) | C:\Users\Sandy\Documents\_CAWST\Sanitation\Images\AKVO Sanitation Illustrations\Small Versions\AKVO_modified_Offset Pit (Small).pngExcreta Storage: Offset Pit  (Credit: modified from AKVO) | C:\Users\Sandy\Documents\_CAWST\Sanitation\Images\AKVO Sanitation Illustrations\Small Versions\AKVO_Collection_Twin Pits Pour Flush_2009(small).pngExcreta Storage: Offset Twin Pits  (Credit: AKVO) |
| C:\Users\Sandy\Documents\_CAWST\Sanitation\Images\AKVO Sanitation Illustrations\Small Versions\AKVO_Collection_Double Ventilated Improved Pit_2009(small).pngExcreta Storage: Twin Pits  (Credit: AKVO) | C:\Users\Sandy\Documents\_CAWST\Sanitation\Images\AKVO Sanitation Illustrations\Small Versions\AKVO_Collection_Septic Tank_2009(small).pngExcreta Storage: Septic Tank  (Credit: AKVO) | C:\Users\Sandy\Documents\_CAWST\Sanitation\Images\AKVO Sanitation Illustrations\AKVO_Aqua_privy_2008.jpgExcreta Storage: Aqua Privy  (Credit: AKVO) |
| C:\Users\Sandy\Documents\_CAWST\Sanitation\Images\AKVO Sanitation Illustrations\Small Versions\AKVO_Collection_Biogas Reactor_2009(small).pngExcreta Storage: Biogas Reactor  (Credit: AKVO) | C:\Users\Sandy\Documents\_CAWST\Sanitation\Images\AKVO Sanitation Illustrations\Small Versions\AKVO_Modified Dehyd 2009_Composting Chamber_SD_2 (sm).pngExcreta Storage: Composting Chamber  (Credit: modified from AKVO) | C:\Users\Sandy\Documents\_CAWST\Sanitation\Images\AKVO Sanitation Illustrations\Small Versions\AKVO_Modified_Fossa Alterna-2_SD (Small).pngExcreta Storage: Fossa Alterna (Composting)  (Credit: modified from AKVO) |
| C:\Users\Sandy\Documents\_CAWST\Sanitation\Images\AKVO Sanitation Illustrations\Small Versions\AKVO_Collection_Dehydration Vault_2009(small).pngExcreta Storage: Dehydrating Chamber  (Credit: AKVO) | C:\Users\Sandy\Documents\_CAWST\Sanitation\Images\AKVO Sanitation Illustrations\Small Versions\AKVO_Collection_Removable Container_modified 2009(small).pngExcreta Storage: Removable Container  (Credit: modified from AKVO) | C:\Users\Sandy\Documents\_CAWST\Sanitation\Images\AKVO Sanitation Illustrations\Small Versions\AKVO_Collection_Holding Tank (Small).pngExcreta Storage: Holding Tank  (Credit: modified from AKVO) |
| C:\Users\Sandy\Documents\_CAWST\Sanitation\Images\AKVO Sanitation Illustrations\Small Versions\Modified AKVO_Collection_Holding Tank_SD(small).pngExcreta Storage: Offset Holding Tank  (Credit: modified from AKVO) | OTHER | OTHER |

**Handwashing Station**

|  |  |  |
| --- | --- | --- |
| C:\Users\Sandy\Documents\_CAWST\Sanitation\Images\Latrine Design Construction (Marci)\png\LDC10_handwashing sink on wall (Small).pngHandwashing: Sink | C:\Users\Sandy\Documents\_CAWST\Sanitation\Images\Env San\tippy tap.tifHandwashing: Tip py Tap | C:\Users\Sandy\Documents\_CAWST\Sanitation\Images\Latrine Design Construction (Marci)\png\LDC14_handwashing hanging bottle (Small).pngHandwashing: Hanging Bottle |
| Handwashing: Rainwater Barrel C:\Users\Sandy\Documents\_CAWST\Sanitation\Images\Latrine Design Construction (Marci)\png\LDC13_handwashing rainbarrel (Small).png | C:\Users\Sandy\Documents\_CAWST\Sanitation\Images\Latrine Design Construction (Marci)\png\LDC12_handwashing bucket (Small).pngHandwashing: Bucket with Tap | OTHER |

**Emptying Latrines and Transporting Sludge**

|  |  |  |
| --- | --- | --- |
| C:\Users\Sandy\Documents\_CAWST\Sanitation\Images\AKVO Sanitation Illustrations\Small Versions\AKVO_Empyting Transport_Motorized_2009 (small).pngEmptying and Transport: Vacuum Truck  (Credit: AKVO) | Emptying and Transport: Small Motorized Pump  (Credit: UN-Habitat) | Emptying: Hand-Powered Pump  (Credit: SSWM) |
| C:\Users\Sandy\Documents\_CAWST\Sanitation\Images\AKVO Sanitation Illustrations\Small Versions\AKVO_Empyting Tranport_Shovel_2009_Modified(sm).pngEmptying: Shovel and Bucket  (Credit: modified from AKVO) | Transport: Motorized | Transport: Human-Powered |
| OTHER | OTHER | OTHER |

**Treatment, Use and Disposal**

|  |  |  |
| --- | --- | --- |
| C:\Users\Sandy\Documents\_CAWST\Sanitation\Images\AKVO Sanitation Illustrations\Small Versions\AKVO_Treatment_Co-composting_2009 (small).pngTreatment: Composting  (Credit: AKVO) | C:\Users\Sandy\Documents\_CAWST\Sanitation\Images\AKVO Sanitation Illustrations\Small Versions\AKVO_Treatment_Unplanted Drying Bed_2009_modified(Sm).pngTreatment: Drying  (Credit: AKVO) | C:\Users\Sandy\Documents\_CAWST\Sanitation\Images\AKVO Sanitation Illustrations\Small Versions\AKVO_Empyting Transport_Jerrycan_2009 (Sm).pngTreatment: Storage  (Credit: AKVO) |
| C:\Users\Sandy\Documents\_CAWST\Sanitation\Images\AKVO Sanitation Illustrations\Small Versions\AKVO_Treatment_Upflow Anaerobic Sludge Blanket Reactor_2009(Sm0.pngTreatment: Anaerobic Digestion (Biogas)  (Credit: AKVO) | C:\Users\Sandy\Documents\_CAWST\Sanitation\Images\AKVO Sanitation Illustrations\Small Versions\AKVO_Use Disposal_Application of Urine_2009 (sm).pngUse: Fertilizer (urine)  (Credit: AKVO) | C:\Users\Sandy\Documents\_CAWST\Sanitation\Images\AKVO Sanitation Illustrations\Small Versions\AKVO_Use Disposal_Application of Compost_2009 (small).pngUse: Soil Conditioner (Feces or Mixed Excreta)  (Credit: AKVO) |
| C:\Users\Sandy\Documents\_CAWST\Sanitation\Images\AKVO Sanitation Illustrations\AKVO_Use Disposal_Biogas as Energy_2009_Low Res.jpgUse: Bioga s Production  (Credit: AKVO) | C:\Users\Sandy\Documents\_CAWST\Sanitation\Images\AKVO Sanitation Illustrations\Small Versions\AKVO_Disposal_Burial_Modified_2009 (Small).pngDisposal: Burying  (Credit: modified from AKVO) | C:\Users\Sandy\Documents\_CAWST\Sanitation\Images\AKVO Sanitation Illustrations\Small Versions\AKVO_Use Dipsosal_Surface Disposal_2009 (sm0.pngDisposal: Su rface  (Credit: AKVO) |
| C:\Users\Sandy\Documents\_CAWST\Sanitation\Images\AKVO Sanitation Illustrations\Small Versions\AKVO_Use Disposal_Soak Pit_2009 (Sm).pngDisposal: Infiltration (Urine)  (Credit: AKVO) | OTHER | OTHER |