

WaSH M&E

Operational Definitions for WaSH Monitoring and Evaluation March 2017

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Operational Definitions for WaSH M&E

Introduction

An operational definition describes how a property will be measured. This is distinct from the conceptual definition of a term, which is a commonly understood, abstract definition that may be found in dictionaries (Sevilla et al., 1992). Operational definitions enable different individuals and teams to measure, observe, or quantify a variable in the same way across different contexts, so that their results can be interpreted and compared. For this reason, operational definitions are necessary for obtaining WaSH monitoring and evaluation data that are fit-for-purpose.

Without standard operational definitions, different enumerators could visit the same water source on the same day and assign it different values with respect to source type, functionality, flow rate, continuity, and other variables of interest. For example, the question of whether a water source is “functional” may be reasonably answered in many different ways. A handpump that yields no water at first, then produces a trickle of water (with a flow rate of 0.8 liters per minute) after 60 seconds of vigorous pumping might be classified as “functional” by one observer, “nonfunctional” by another, and “partially functional” by a third. No classification is inherently more valid than the others, but each is meaningless without the criteria used to determine it. If all three observers are collecting data as part of the same monitoring program, their pooled data will be useless. A clear and explicit operational definition of functionality is needed, so that all three observers can collect consistent and compatible measurements.

The following operational definition enables different observers to classify the functionality of a water source in a consistent way: “A functional water source is one with water available at the time of inspection, such that an enumerator could fill a 20-L container within 10 minutes.” This is not necessarily superior to other definitions, but it can be feasibly measured in the field with adequate reproducibility using readily available equipment, and is sufficiently specific and inclusive to enable classification of most water sources under most circumstances.

The operational definitions listed below are by no means definitive or exhaustive. Some are existing operational definitions drawn or adapted from international monitoring efforts such as the WHO/UNICEF Joint Monitoring Programme (JMP). Others are definitions developed by The Water Institute at UNC, drawing on multiple sources. The definitions below have been used for monitoring and evaluation of water, sanitation, and hygiene programs across multiple contexts, and have proven feasible and useful for this purpose.

Facility Functionality

- **Functional water source:** A functional water source is one with water available at the time of inspection, such that an enumerator could fill a 20-L container within 10 minutes. For sources with handpumps, if no water is obtained within 50 pump strokes, the source is considered to be non-functional.
- **Functional sanitation facility:** An operational sanitation facility is one that can be used for its intended purpose at the time of the visit.
- **Water source failure:** Failure within a given period (e.g. two weeks, one year, etc.) is defined as a system that broke down and was nonfunctional for one full day or more at some point during that period. Failure does not include seasonal unavailability.
- **Seasonal nonfunctionality:** Seasonal nonfunctionality is defined as the state of a system that becomes nonfunctional for one full day or more during the dry season* (having been previously functional) and for which water supplies (if observable) are inadequate for functionality, or for which no observable mechanical or technical problems are present (if water supplies cannot be observed). Seasonal nonfunctionality thus excludes breakdown or mechanical failure**.

*Note that not all climates have distinct wet and dry seasons.

**Note that, while it may be feasible to determine whether some sources (e.g. dug wells or springs) are nonfunctional due to the unavailability of water during the dry season, it may not be possible to definitively determine the cause of nonfunctionality (as seasonal vs mechanical/technical) for a borehole. For such sources, the above term more accurately quantifies nonfunctionality during the dry season without an identified mechanical cause, and this should be taken into account when interpreting seasonal nonfunctionality data.

- Dry season: Time of year when low rainfall is experienced. This is defined under the Koppen Climate Classification (Kottek et al., 2006).
 - For tropical climates, the dry season includes all months in which average rainfall is below 60mm.
 - For other climates, a formula is used to determine which months fall in the dry season (Kottek et al., 2006).
- Wet season: time of year when the most rainfall is experienced (all months that are not part of the dry season). Also known as: rainy season, monsoon, etc.
- **Breakdown:** A facility is not-functional for a full day or more, and an observable mechanical or technical problem is present. (Breakdown excludes seasonal nonfunctionality, facilities that are locked but otherwise functional, etc.)
- **Continuity:** Continuous service means that facilities are functional and accessible at all times of the day and night. A facility to which access is administratively restricted during certain hours (e.g. a latrine or water source that is locked at night, or a piped system that is

only pressurized during certain hours) is not considered to provide continuous service, even if the service disruption is not due to any technical problems.

- **Discontinuous service:** Service that is discontinuous means that users cannot use the facility for its intended purpose at all hours of the day and night (this could be due to closure, scheduled discontinuity, or for any other reason [including unknown reasons]). A borehole that stops producing water for several hours each day after heavy pumping and a latrine that is locked at night both provide discontinuous service.
- **Repair:** Taking actions that restore an existing facility to functionality and that cost of less than 10% of the estimated replacement cost of the facility. Examples could include replacing a gasket or valve.

Rehabilitation: Taking actions to restore an existing facility to functionality and that cost ten or more percent of the estimated replacement cost of a facility. Examples could include removing sediment from a clogged borehole and replacing multiple handpump components.

Facility Characteristics

- **On-plot Facility:** An on-plot facility is defined as a facility within the household's plot or compound, if the plot or compound has distinct boundaries. If there are no distinct boundaries, an on-plot facility is a facility within 50 meters of the entrance to the respondents dwelling that the respondent has the right to use at all times.
- **Private facility:** A private facility is defined as a facility that is used by one or more persons who are members of a single household. (WHO/UNICEF, 2006)
- **Shared facility:** A shared facility is defined as a facility that is used by members of two or more households. (WHO/UNICEF, 2006)
- **Primary water source:** The water source that supplies most of the household drinking-water needs (WHO/UNICEF, 2006)
- **Improved water source:** An "improved" drinking-water source is one that, by the nature of its construction and when properly used, adequately protects the source from outside contamination, particularly faecal matter (WHO/UNICEF, 2006).
 - Improved source types include:
 - Piped water into dwelling
 - Piped water to yard/plot
 - Public tap or standpipe
 - Tubewell or borehole
 - Protected dug well
 - Protected spring
 - Rainwater
 - Unimproved water sources include:
 - Unprotected spring
 - Unprotected dug well
 - Cart with small tank/drum
 - Tanker-truck
 - Surface water
 - Bottled water and sachet water (Considered unimproved with respect to adequacy of quantity for domestic uses, not necessarily with respect to quality)
- **Improved sanitation facility:** An "improved" sanitation facility is one that hygienically separates human excreta from human contact (WHO/UNICEF, 2006).
 - Improved sanitation facility types include:
 - Flush toilet
 - Piped sewer system
 - Septic tank
 - Flush/pour flush to pit latrine

- Ventilated improved pit latrine (VIP)
 - Pit latrine with slab
 - Composting toilet
- Unimproved sanitation facility types include:
 - Flush/pour flush to elsewhere
 - Pit latrine without slab
 - Bucket
 - Hanging toilet or hanging latrine
 - Shared sanitation facility
 - No facilities or bush or field
- **Sanitary Inspection:** a sanitary inspection is an on-site inspection of a water source to identify actual and potential sources of contamination (WHO, 1996).
 - **Visible crack (in concrete slabs or walls):** a crack of sufficient dimensions that it can be easily seen with the naked eye, and also of sufficient extent that water may be able to penetrate the surface in which the crack is observed.
 - **Superficial crack (in concrete slabs or walls):** a superficial or hairline crack that is not easily observed with the naked eye, and through which (in the judgement of the observer) it is very unlikely that water could penetrate. These are often formed during the natural curing of concrete, and may not pose increased risk to a water source.
 - **Adequate fencing:** adequate fencing is present if the fencing keeps livestock out of the area. If a goat or other animal could reach the facility, it does not have adequate fencing. An otherwise adequate fence that has a permanent gap, rather than a gate which can be securely fastened, is generally not considered adequate fencing.
 - **Walls extending below the surface of the ground at all points:** Concrete walls extending below the surface of the ground are designed to protect boreholes from lateral intrusion of contaminated water. If there are any gaps where walls are not present, or have been eroded such that surface runoff could penetrate beneath the walls at any point, the walls are not considered to extend below the surface of the ground at all points.
- **Full water container (for flow rate):** the container is full when water starts to spill over the top – the container should be fully expanded when doing the flow rate test.
- **Full pump stroke:** A single stroke of a pump mechanism all the way up and all the way down (once), completing a single cycle of the mechanisms complete range of motion. This should be done without forcefully striking the pump mechanism at the extremes of its range of motion, to avoid damaging the mechanism.

- **Signs of Use**
 - **Water points**
 - Facility is functional at the time of visit and any of the following apply:
 - Community members observed fetching water from the facility
 - Community member and water committee members (if present) report that the facility is regularly used
 - Spilled water on the ground near the facility without another observable source
 - Presence of containers, funnels, laundry, or other items associated with water use
 - **Sanitation facilities**
 - Facility is functional at the time of visit and any of the following apply:
 - Community members observed using the facility
 - Community member and water committee members (if present) report that the facility is regularly used
 - The path to the facility is clear and shows signs of recent use (footprints, etc.)
 - Facility is not in “like-new” condition: some dirt, footprints, or other signs of wear
 - There is a smell of recent defecation
 - Evidence of excreta in pit, if pit is visible
- **Accessible to users with disabilities:** A facility is considered to be accessible to users with disabilities if *all* of the following apply:
 - Even ground leading up to the facility, or a ramp is present
 - No obstacles are present which would prevent a wheelchair from accessing the facility
 - Sanitation only: handrails are present to allow persons with disabilities to use facility
- **Safe disposal of excreta:** Safe disposal of excreta include the following (WHO/UNICEF, 2016):
 - excreta are transported and delivered to a treatment plant by means of a piped sewer
 - Excreta remains safely buried within an in situ disposal system
 - Excreta are safely emptied (with all workers wearing appropriate personal protective equipment) and safely buried
 - Excreta are safely emptied and delivered to a treatment plant by motorized, mechanical, or manual equipment (carts or trucks) with all workers wearing appropriate personal protective equipment)

Management Characteristics

- **Availability of Spare Parts:** Spare parts required for maintaining the community's water and sanitation facilities can be obtained within three days, and the WaSH committee (or other management structure) knows where and how to obtain them.
- **Availability of Tools:** All tools required to perform maintenance of the community's water and sanitation facilities are present within the community at the time of the visit (Note that for many facility types, installation and maintenance manuals provided by the Rural Water Supply Network and others list tools required for maintenance).

Household characteristics

- **Household:** is defined as either:
 - A) If multiple units of: a mother plus (non-adult) children living under the same roof, each of those units counts as a household
 - B) Else, all individuals cohabitating in a single dwelling count as one household.
- **Female Head of household:** An adult female household member who is recognized as the female leader of the family unit by its other members (if any). If no such household member exists, another adult may be interviewed.
- **Safe water storage:** Safe water storage is defined as the storage of water for drinking purposes in a container meeting all of the following criteria (From Mintz et al., 1995):
 - Narrow mouth (<10 cm*) to prevent users from introducing their hands into the opening
 - Container is covered with a tightly-fitting lid at the time of the visit (presence of a lid nearby does NOT count)
 - Container has a tap or spigot that is used for dispensing water
- **Handwashing facilities:** A handwashing facility/station includes any fixed location where handwashing takes place. In cultural contexts where handwashing supplies are brought to the point of use, the presence of these supplies in an accessible location shall constitute a movable "HW station."
 - For a sanitation facility to include handwashing facilities, soap (or its equivalent) and water must be within 3 m of the intended point of use. Note: if these supplies are not present within 3 m, the sanitation facility is not considered to include handwashing facilities, even if one or more households using the sanitation facility possess movable HW station.
- **Hygiene supplies:** Hygiene supplies are defined as:
 - Presence of water for handwashing: water is available and accessible to all users at the time of inspection.
 - Presence of soap (or its equivalent) for handwashing: liquid or solid soap are available and accessible to all users upon inspection.

- Acceptable equivalents to soap include:
 - Ash stored expressly for the purpose of handwashing; Ash in a hearth or cooking space is not considered the equivalent of soap.]
 - Waterless hand sanitizer such as gelled alcohol (note, if waterless hand sanitizer is present and accessible, hygiene supplies shall be considered to be present, even if water is not available.)
 - **Knowledge of critical handwashing times:** An individual has adequate knowledge of handwashing practices when they can mention the following pieces of information without prompting:
 - Knowledge of critical times for handwashing (must mention 3/4):
 - Before cooking,
 - before eating,
 - after using the bathroom,
 - after changing child's diapers/cleaning a child who has defecated
 - Knowledge of proper handwashing technique: use of soap (or its equivalent) and water
 - **Proper handwashing technique:** Using water, soap (or its equivalent), as well as the use of a rubbing motion (ideally scrubbing all surfaces of both hands including under the nails, but any vigorous rubbing motion may be accepted)*.
- *Note that while a duration of at least 30 seconds is recommended, this is so rare that including this criterion would likely reduce the value of any data obtained. Separate measurement of handwashing duration is recommended for those wishing to capture this variable.

Community characteristics

- **Open-defecation free (ODF):** A community may receive ODF status if at the time of certification the following conditions are met (Kar and Chambers, 2008):
 - Community verification and certification committees report that the community is open-defecation free
 - No feces are observed in the open, particularly at former open defecation sites
 - Observation at dawn and dusk does not detect anyone practicing open defecation
 - Observers from neighboring communities do not detect any open defecation
 - Latrines show evidence of use (see definition for “signs of use”)
 - No reports of open defecation in conversations with community members, including children.

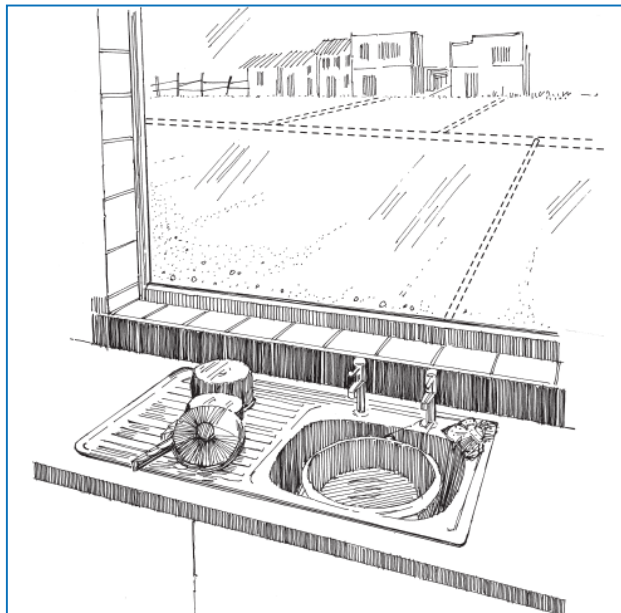
Note: at the time of the survey, the community may have ODF certification, but the above conditions may not be met.

For more information, refer to the CLTS handbook:

<http://www.communityledtotalsanitation.org/sites/communityledtotalsanitation.org/files/media/cltshandbook.pdf>

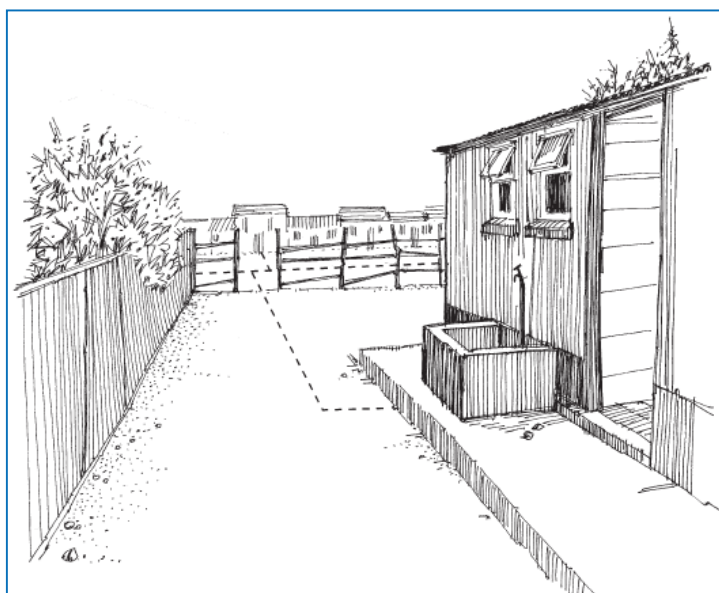
Drinking-water source categories

- **Piped water into dwelling**, also called a household connection, is defined as a water service pipe connected with in-house plumbing to one or more taps (e.g. in the kitchen and/or in the bathroom). (WHO/UNICEF, 2006)



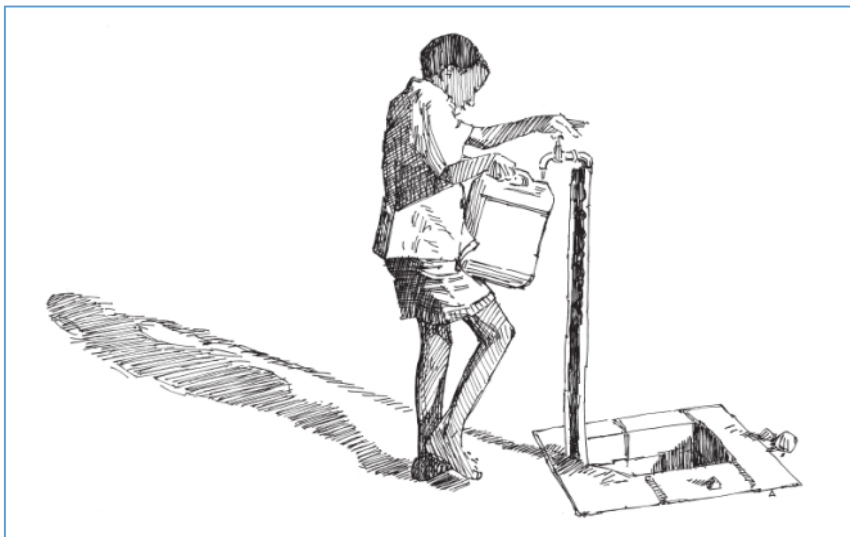
Source: Shaw, 2005

- **Piped water to yard/plot**, also called a yard connection, is defined as a piped water connection to a tap placed in the yard or plot outside the house. This refers to a piped connection for a particular house that is located outside—it does not refer to a public piped connection that is located in a public space near a house. (WHO/UNICEF, 2006)



Source: Shaw, 2005

- **Public tap or standpipe** is a public water point from which people can collect water. A standpipe is also known as a public fountain or public tap. Public standpipes can have one or more taps and are typically made of brickwork, masonry or concrete. (WHO/UNICEF, 2006)



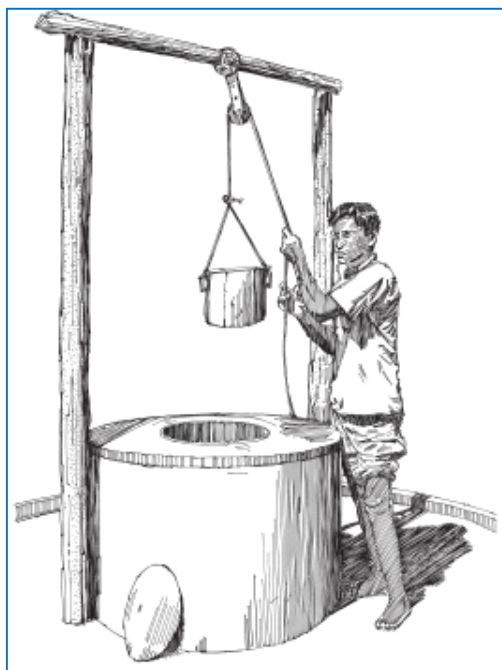
Source: Shaw, 2005

- **Tubewell or borehole** is a deep hole that has been driven, bored or drilled, with the purpose of reaching groundwater supplies. Boreholes/tubewells are constructed with casing, or pipes, which prevent the small diameter hole from caving in and protects the water source from infiltration by run-off water. Water is delivered from a tubewell or borehole through a pump, which may be powered by human, animal, wind, electric, diesel or solar means. Boreholes/tubewells are usually protected by a platform around the well, which leads spilled water away from the borehole and prevents infiltration of run-off water at the well head. (WHO/UNICEF, 2006)



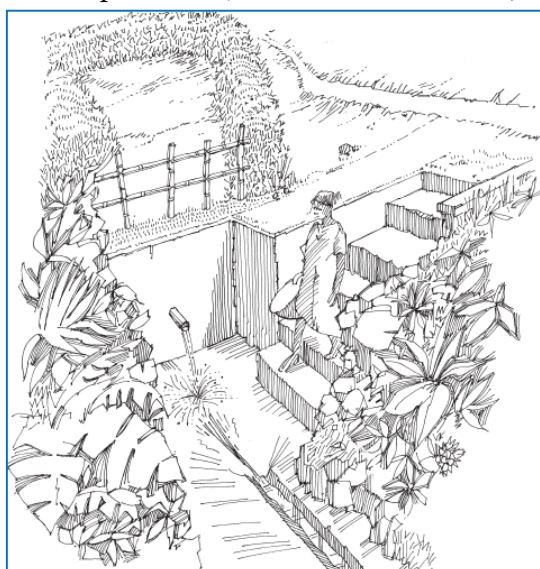
Source: Shaw, 2005

- **Protected dug well** is a dug well that is protected from runoff water by a well lining or casing that is raised above ground level and a platform that diverts spilled water away from the well. A protected dug well is also covered, so that bird droppings and animals cannot fall into the well (WHO/UNICEF, 2006). A well that is raised but not covered is not protected. A well that is covered but not raised is not protected. Only wells that are both covered and raised, and also lined, are protected.



Source: Shaw, 2005

- **Protected spring**. The spring is typically protected from runoff, bird droppings and animals by a "spring box", which is constructed of brick, masonry, or concrete and is built around the spring so that water flows directly out of the box into a pipe or cistern, without being exposed to outside pollution. (WHO/UNICEF, 2006)



Source: Shaw, 2005

- **Rainwater** refers to rain that is collected or harvested from surfaces (by roof or ground catchment) and stored in a container, tank or cistern until used. (WHO/UNICEF, 2006)



Source: Shaw, 2005

- **Unprotected spring.** This is a spring that is subject to runoff, bird droppings, or the entry of animals. Unprotected springs typically do not have a "spring box". (WHO/UNICEF, 2006)



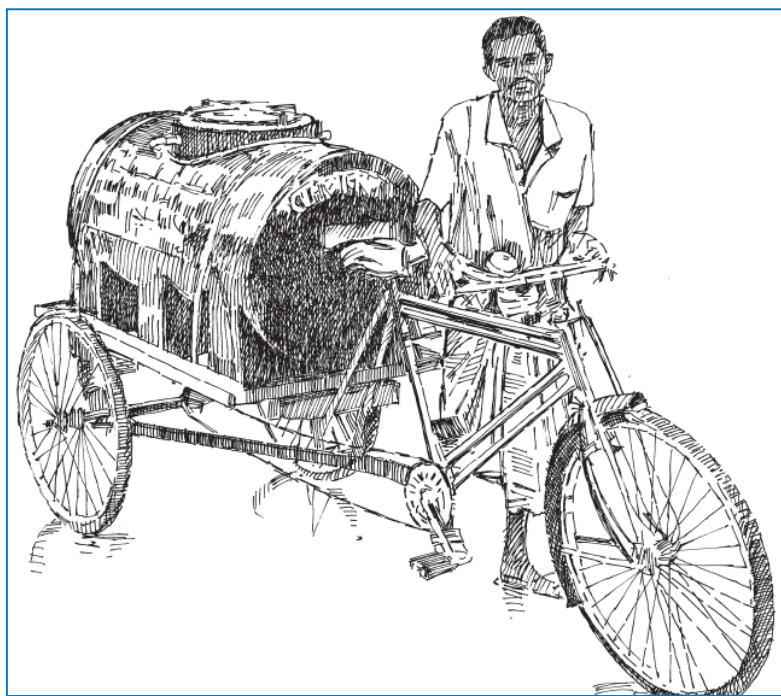
Source: Shaw, 2005

- **Unprotected dug well.** This is a dug well for which one of the following conditions is true: 1) the well is not raised and lined (protected from runoff water); or 2) the well is not covered (protected from bird droppings and animals, etc.). If at least one of these conditions is true, the well is unprotected. (WHO/UNICEF, 2006)



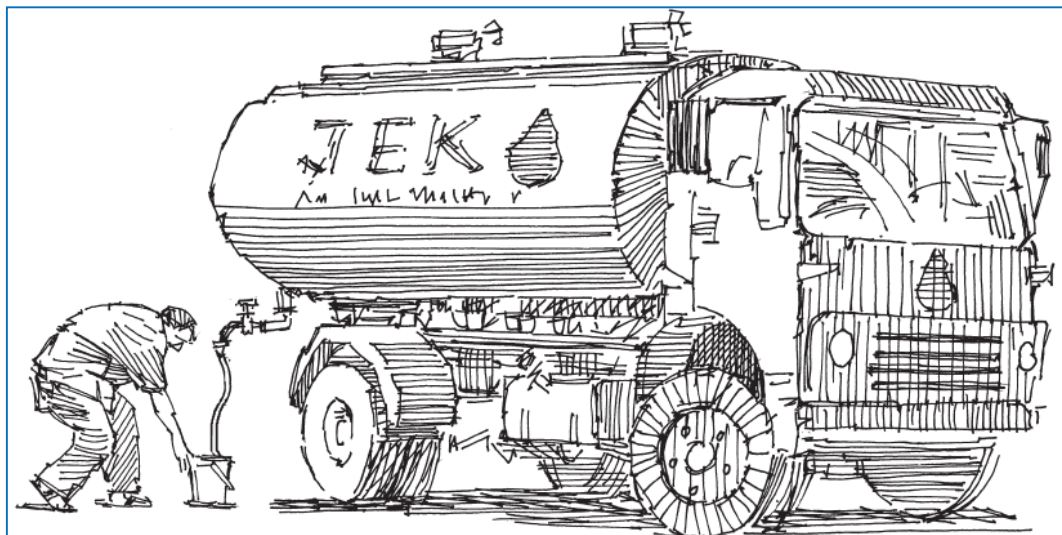
Source: Shaw, 2005

- **Cart with small tank/drum.** This refers to water sold by a provider who transports water into a community. The types of transportation used include donkey carts, motorized vehicles and other means. (WHO/UNICEF, 2006)



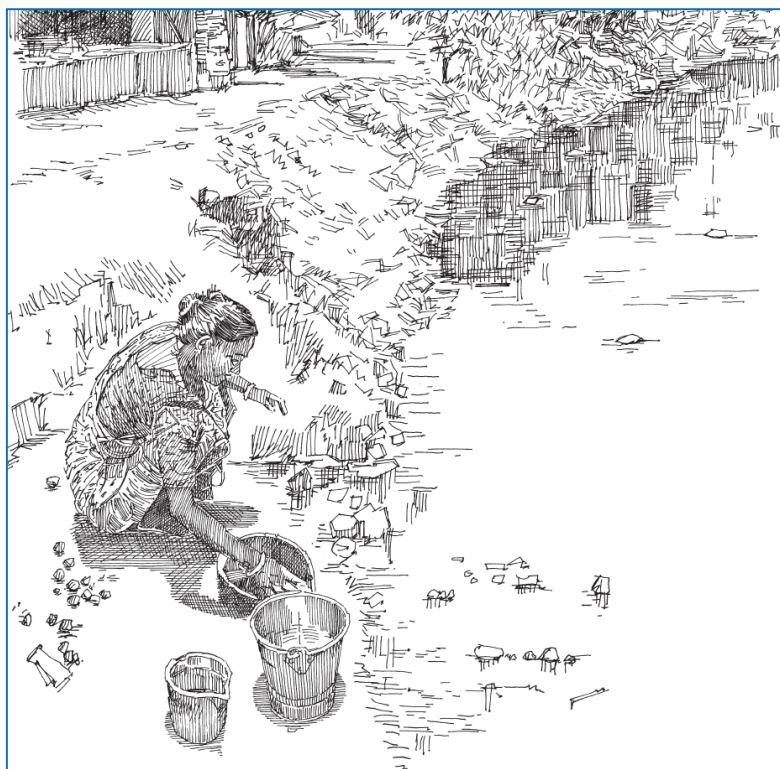
Source: Shaw, 2005

- **Tanker-truck.** The water is trucked into a community and sold from the water truck. (WHO/UNICEF, 2006)



Source: Shaw, 2005

- **Surface water** is water located above ground and includes rivers, dams, lakes, ponds, streams, canals, and irrigation channels. (WHO/UNICEF, 2006)



Source: Shaw, 2005

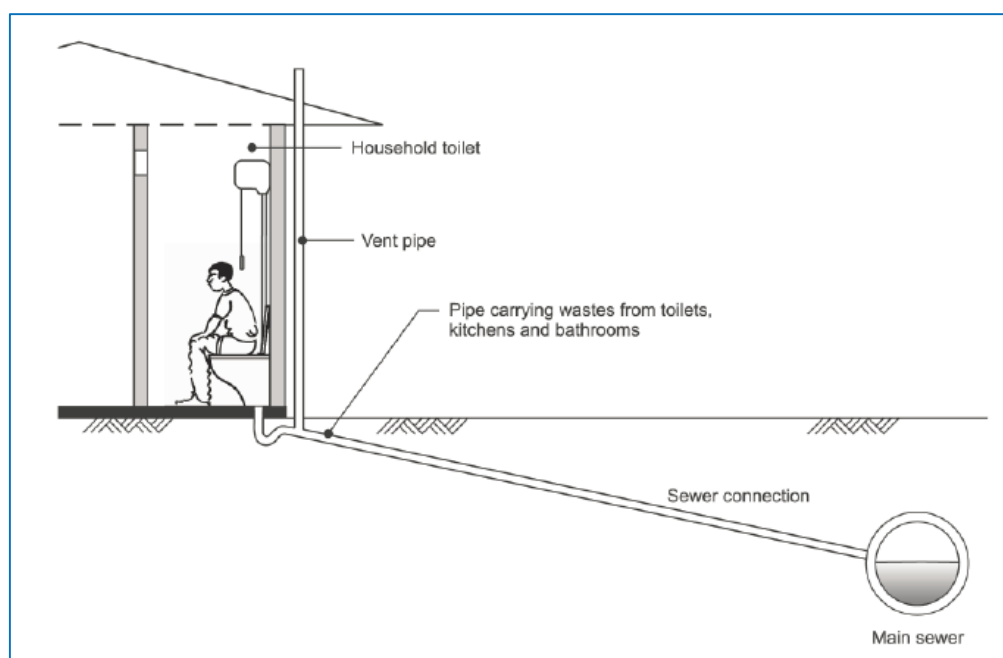
- **Bottled water** is considered to be improved only when the household uses drinking-water from an improved source for cooking and personal hygiene; where this information is not available, bottled water is classified on a case-by-case basis. (WHO/UNICEF, 2006)



Source: Shaw, 2005

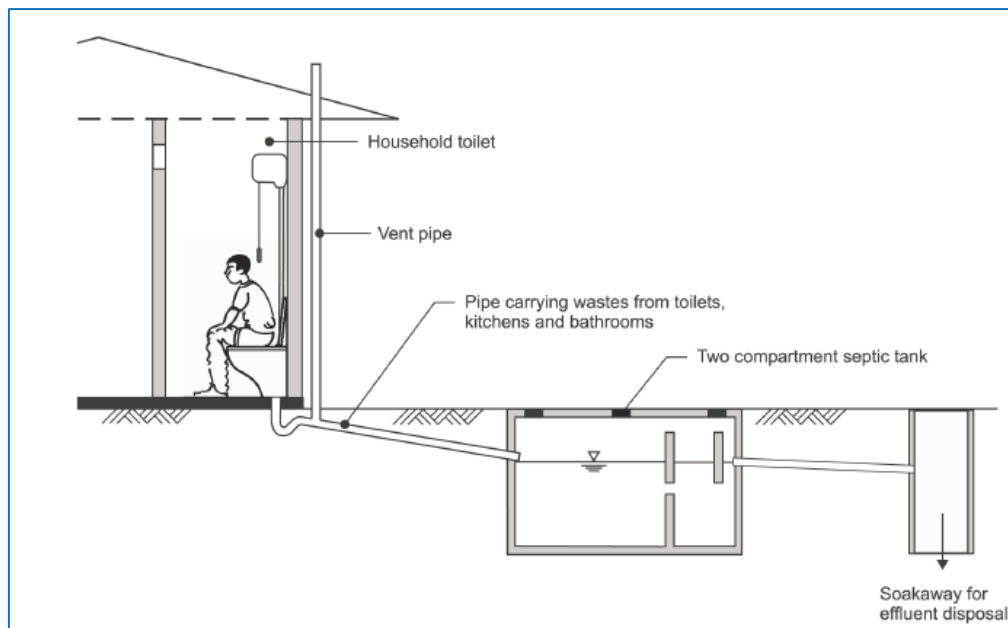
Sanitation categories

- Flush toilet uses a cistern or holding tank for flushing water, and a water seal (which is a U-shaped pipe below the seat or squatting pan) that prevents the passage of flies and odours. A pour flush toilet uses a water seal, but unlike a flush toilet, a pour flush toilet uses water poured by hand for flushing (no cistern is used). (WHO/UNICEF, 2006)
- Piped sewer system is a system of sewer pipes, also called sewerage, that is designed to collect human excreta (faeces and urine) and wastewater and remove them from the household environment. Sewerage systems consist of facilities for collection, pumping, treating and disposing of human excreta and wastewater. (WHO/UNICEF, 2006)



Source: Shaw, 2005

- Septic tank is an excreta collection device consisting of a water-tight settling tank, which is normally located underground, away from the house or toilet. The treated effluent of a septic tank usually seeps into the ground through a leaching pit. It can also be discharged into a sewerage system. (WHO/UNICEF, 2006)



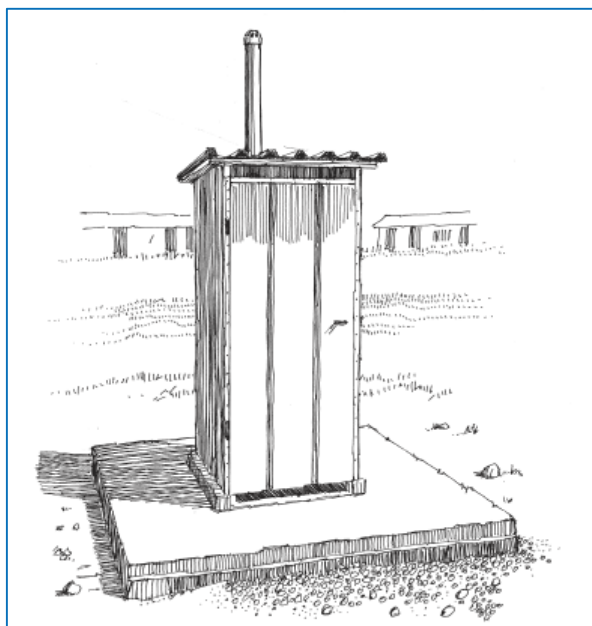
Source: Shaw, 2005

- Flush/pour flush to pit latrine refers to a system that flushes excreta to a hole in the ground or leaching pit (protected, covered). (WHO/UNICEF, 2006)



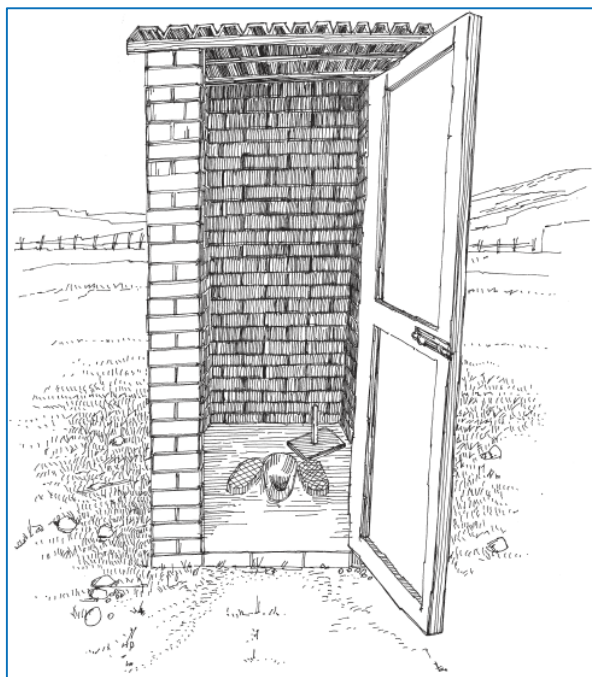
Source: Shaw, 2005

- Ventilated improved pit latrine (VIP) is a dry pit latrine ventilated by a pipe that extends above the latrine roof. The open end of the vent pipe is covered with gauze mesh or fly-proof netting and the inside of the superstructure is kept dark. (WHO/UNICEF, 2006)



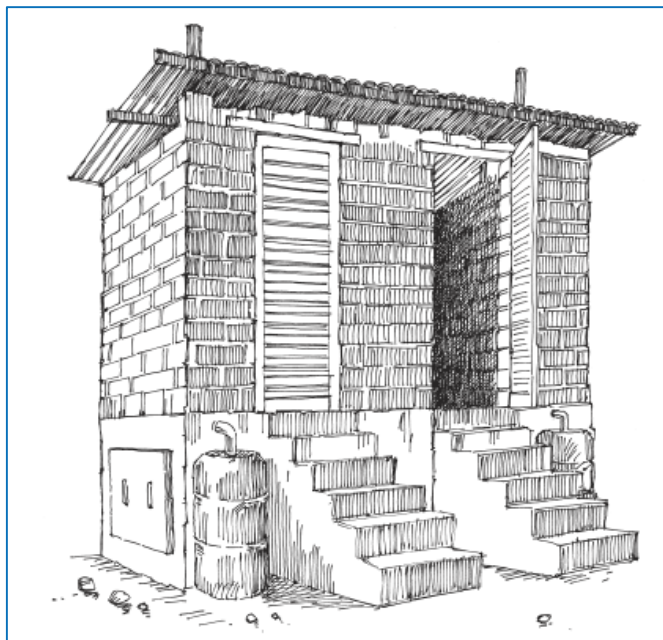
Source: Shaw, 2005

- Pit latrine with slab is a dry pit latrine whereby the pit is fully covered by a slab or platform that is fitted either with a squatting hole or seat. The platform should be solid and can be made of any type of material (concrete, logs with earth or mud, cement, etc.) as long as it adequately covers the pit without exposing the pit content other than through the squatting hole or seat.
(WHO/UNICEF, 2006)



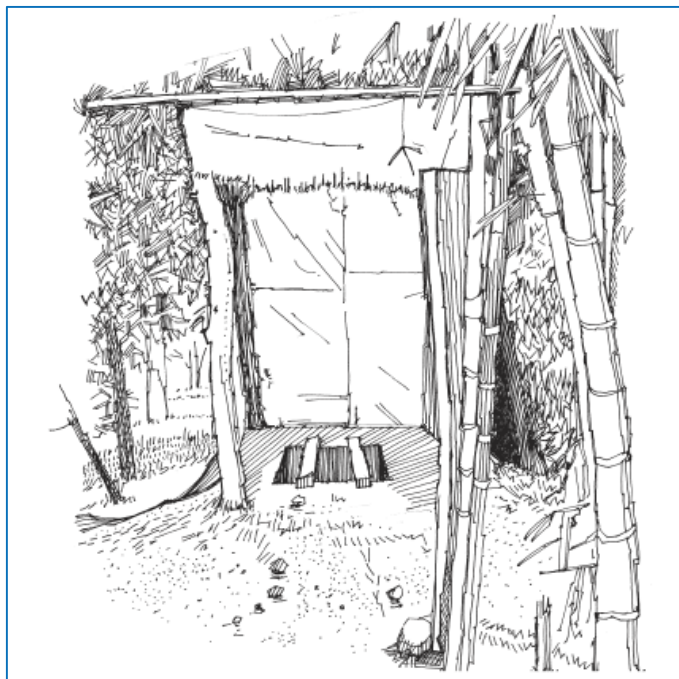
Source: Shaw, 2005

- Composting toilet is a dry toilet into which carbon-rich material (vegetable wastes, straw, grass, sawdust, ash) are added to the excreta and special conditions maintained to produce inoffensive compost. A composting latrine may or may not have a urine separation device. (WHO/UNICEF, 2006)



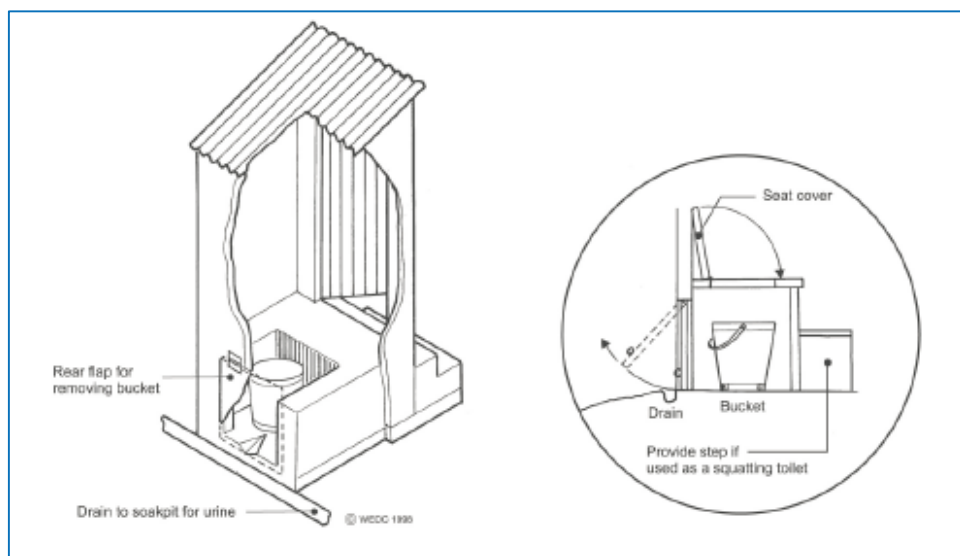
Source: Shaw, 2005

- Flush/pour flush to elsewhere refers to excreta being deposited in or nearby the household environment (not into a pit, septic tank, or sewer). Excreta may be flushed to the street, yard/plot, open sewer, a ditch, a drainage way or other location. (WHO/UNICEF, 2006)
- Pit latrine without slab uses a hole in the ground for excreta collection and does not have a squatting slab, platform or seat. An open pit is a rudimentary hole. (WHO/UNICEF, 2006)



Source: Shaw, 2005

- Bucket refers to the use of a bucket or other container for the retention of faeces (and sometimes urine and anal cleaning material), which are periodically removed for treatment, disposal, or use as fertilizer. (WHO/UNICEF, 2006)



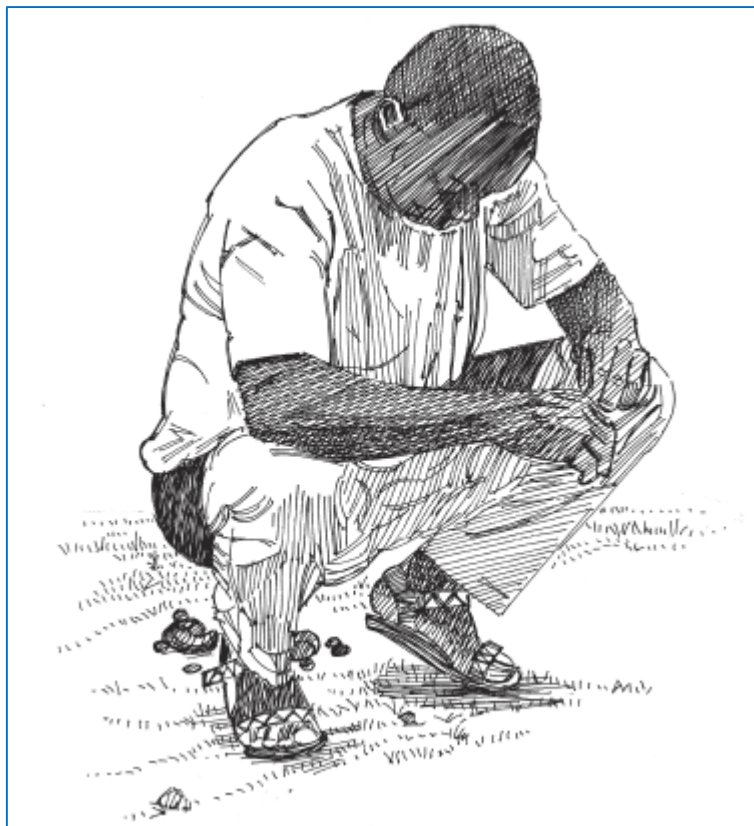
Source: Shaw, 2005

- Hanging toilet or hanging latrine is a toilet built over the sea, a river, or other body of water, into which excreta drops directly. (WHO/UNICEF, 2006)



Source: Shaw, 2005

- No facilities or bush or field includes defecation in the bush or field or ditch; excreta deposited on the ground and covered with a layer of earth (cat method); excreta wrapped and thrown into garbage; and defecation into surface water (drainage channel, beach, river, stream or sea). (WHO/UNICEF, 2006)



Source: Shaw, 2005

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