Virginia Events

- **ADA Accessibility Basics for Portable Restrooms**
  ADA Accessibility Basics for Portable Restrooms Door Width and Floor Space Rules for Accessible Units Handrail and Seat Height Requirements in ADA Portable Toilets Turning Radius Considerations for Wheelchair Users in Mobile Restrooms Site Placement Tips for Accessible Portable Sanitation Inspection Checklist for ADA Compliance in Temporary Restrooms Lighting and Signage Standards for Accessible Toilet Units Common Mistakes in ADA Portable Restroom Setup How Local Codes Affect ADA Restroom Rentals Calculating Unit Counts for Events with Accessibility Needs Training Staff on ADA Portable Restroom Handling Upgrading Existing Portable Toilets to meet ADA Guidelines
- **Comparing Standard Portable Toilets and Deluxe Units**
  Comparing Standard Portable Toilets and Deluxe Units Feature Checklist for Choosing a Restroom Trailer Space and Capacity Differences across Portable Restroom Models When to Select ADA Units Over Standard Portable Toilets Balancing Budget and Comfort in Portable Toilet Selection Matching Portable Restroom Types to Event Profiles Construction Site Needs and Portable Restroom Unit Choices Advanced Features Available in High Comfort Portable Toilets Number of Restroom Trailers Needed for Large Gatherings Assessing Traffic Flow for Multiple Portable Restroom Types Rental Logistics for Mixed Portable Toilet Fleets Future Trends in Portable Restroom Design and Features
- **About Us**

Choices

Understanding ADA Requirements for Portable Restrooms

When it comes to construction sites, the selection of portable restroom units is far from a trivial matter. Various factors must be considered to ensure that the chosen units meet the specific needs of the site and its workforce. Deluxe restroom trailers offer premium amenities including running water, mirrors, and climate control for upscale Virginia events **luxury porta potty rental cost** Tent. The first and perhaps most critical factor is the number of workers on site. A general rule of thumb is to provide one portable restroom unit for every 10 workers, though this can vary based on the duration of the project, shift patterns, and local regulations.

Another significant consideration is the duration of the construction project. Short-term projects might manage with basic units that are serviced less frequently, whereas long-term projects necessitate more durable, high-capacity units with frequent servicing schedules to maintain hygiene standards. Accessibility is also crucial; construction sites often have uneven terrain or are in development stages where pathways are not yet established. Therefore, selecting units with sturdy steps or ramps ensures that all workers, regardless of mobility, can access the facilities safely.

Environmental conditions play a role too. For instance, in areas prone to extreme weather conditions like heavy rain or snow, choosing units with enhanced stability features or even indoor placement options becomes necessary. Ventilation within these portable restrooms is another environmental factor; good airflow reduces odors and enhances user comfort, especially important in hot climates where heat can exacerbate unpleasant smells.

Moreover, privacy and security should not be overlooked. Construction sites can be chaotic with many people coming and going; thus, ensuring that portable restrooms offer adequate privacy through lockable doors and opaque materials adds a layer of comfort for users. Additionally, some sites might require gender-specific facilities if theres a mixed-gender workforce or compliance with certain regulations.

Lastly, cost-effectiveness versus functionality must be balanced. While basic models might suffice for small or short-term projects, investing in more advanced units equipped with

handwashing stations or waste disposal systems could prove more economical over time by reducing service frequency and improving worker satisfaction.

In conclusion, selecting the right portable restroom units for construction sites involves a careful evaluation of worker numbers, project length, accessibility needs, environmental factors, privacy concerns, and budget considerations. By addressing these factors thoughtfully, construction managers can ensure that their workforce has access to facilities that contribute positively to their well-being and productivity on site.

When it comes to construction sites, ensuring the availability of proper sanitation facilities is crucial not only for the health and comfort of workers but also for compliance with regulatory standards. Portable restrooms play a significant role in meeting these needs, and there are several types designed specifically for construction environments.

The most common type is the standard portable toilet, a self-contained unit that is easy to transport and set up. These units are typically equipped with basic amenities like a toilet seat, holding tank, and sometimes a small sink for handwashing. They are ideal for short-term projects where space might be limited, and they require minimal maintenance beyond regular servicing.

For larger construction sites or those expected to run over an extended period, more advanced options like flushable portable restrooms come into play. These units offer a more home-like experience with flushing toilets that dispose of waste into a holding tank. This can significantly enhance worker satisfaction and hygiene, as they closely mimic indoor restroom facilities.

Another specialized option includes trailer-mounted restroom units. These trailers can house multiple toilet stalls along with urinals and sinks within one structure, providing a communal bathroom solution thats particularly useful when dealing with large crews. Some high-end models even include features like air conditioning, heating, and better ventilation systems to cope with extreme weather conditions.

For environmentally conscious sites or those located in sensitive areas, there are eco-friendly portable restrooms available. These use biodegradable chemicals or composting technology to minimize environmental impact. Composting toilets, for instance, convert human waste into compost through natural processes without water usage or traditional sewage systems.

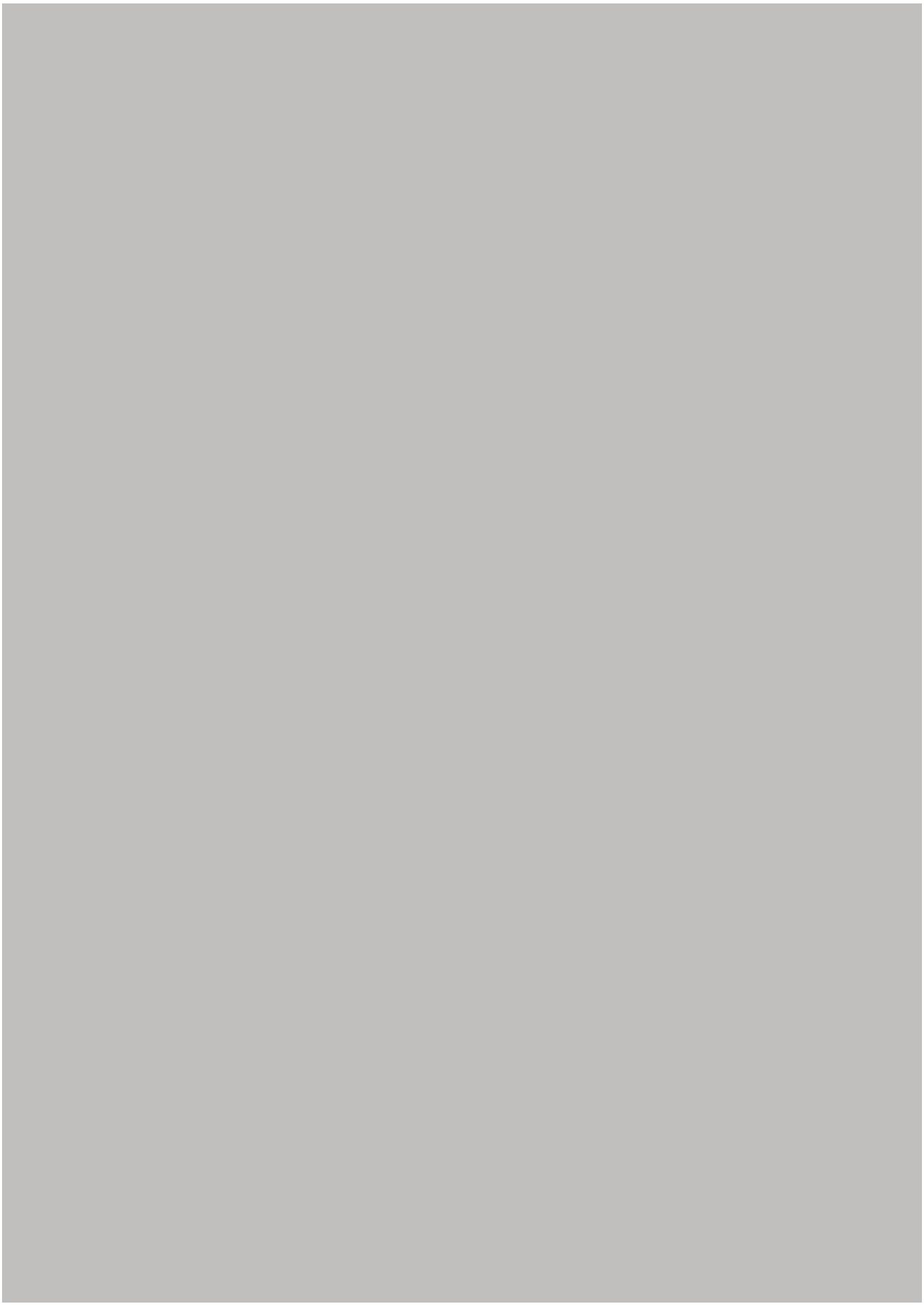
Lastly, accessibility is another critical consideration; ADA-compliant portable restrooms cater to workers with disabilities by offering wider doors, grab bars, and sufficient space for maneuvering wheelchairs or other mobility aids inside the unit.

Choosing the right type of portable restroom involves balancing cost, duration of the project, number of workers, environmental considerations, and specific site requirements. By selecting appropriate sanitation solutions tailored to these factors, construction managers can ensure their workforce remains healthy, productive, and compliant with safety regulations throughout the project lifecycle.

restroom rentals virginia

Social Signals:

Clear Restroom Social Signal:



How to reach us:

Essential Features of ADA Compliant Portable Restrooms

When it comes to managing a construction site, ensuring that workers have access to clean and functional portable restrooms is crucial. This is where porta potty rentals come into play, offering a convenient solution to the sanitation needs of a bustling construction environment. However, the success of these portable restrooms hinges significantly on proper maintenance and hygiene considerations.

First and foremost, regular maintenance is essential to keep the porta potties in top working condition. This includes routine checks for any mechanical issues, such as broken flushes or leaking tanks. Ensuring that the units are serviced and repaired promptly can prevent minor problems from escalating into major inconveniences. Additionally, the cleanliness of the interior and exterior of the units must be maintained. This involves regular cleaning of the floors, walls, and fixtures to prevent the buildup of dirt, grime, and unpleasant odors.

Hygiene is another critical aspect that cannot be overlooked. Construction sites are often dusty and dirty, and the portable restrooms can quickly become unsanitary if not managed properly. Providing adequate supplies such as hand soap, paper towels, and disinfectant wipes is vital. These supplies should be restocked regularly to ensure they are always available for use. Furthermore, implementing a schedule for deep cleaning the units can help maintain a high standard of hygiene. This might include sanitizing the surfaces, emptying and cleaning the waste tanks, and replacing liners.

Another important consideration is the placement of the porta potties. They should be strategically located to ensure easy access for all workers, regardless of their location on the site. This might mean placing multiple units in different areas to avoid long lines and queues. Additionally, ensuring that the units are well-lit and secure can enhance the safety and comfort of the workers using them.

In conclusion, the maintenance and hygiene of porta potties on a construction site are paramount to the health and productivity of the workforce. By prioritizing regular maintenance,

providing necessary hygiene supplies, and ensuring proper placement, construction managers can create a more comfortable and sanitary work environment. This not only improves the overall experience for the workers but also contributes to the efficiency and success of the project.

Placement and Accessibility Considerations for ADA Porta

Potties on Site

Okay, lets talk about the nitty-gritty of keeping your construction crew happy and sanitary: cost analysis and budgeting for portable toilet services. I know, its not the most glamorous topic, but its crucial to a smooth-running and compliant construction site.

Think about it. You cant just plop down any old porta-potty and hope for the best. Theres a lot more to it than meets the eye. First, you need to figure out how many units you actually *need*. A good rule of thumb is one toilet per ten workers for a 40-hour work week. But thats just a starting point. Are you dealing with mostly male or female workers? Are some tasks particularly messy, requiring more frequent handwashing? These factors directly impact the frequency of servicing, which, of course, affects your bottom line.

Next, consider the type of units. Standard portable toilets are the workhorse, but you might need to upgrade. Handicap-accessible units are mandatory for compliance, and you might want to splurge on units with hand sanitizers or even handwashing stations for better hygiene. Think about the duration of your project too. A short-term project might justify simpler, cheaper units, while a long-term project might benefit from more durable and feature-rich options.

Now, for the cost analysis. Get quotes from multiple providers. Dont just focus on the initial rental price. Ask about delivery and pickup fees, the frequency of servicing (pumping and cleaning), and any extra charges for damage or misuse. Negotiate! Providers are often willing to work with you, especially if youre renting multiple units for an extended period.

Budgeting is where it all comes together. Create a spreadsheet outlining all the potential costs: rental fees, servicing fees, potential damage fees, and even a small contingency fund for unexpected issues. Track your actual expenses against your budget regularly. This helps you identify any overspending early on and make adjustments to stay on track.

Finally, remember that skimping on portable toilet services is a false economy. A clean, well-maintained restroom facility boosts morale, reduces sick days, and demonstrates that you value your workers well-being. Its an investment, not just an expense. So, do your homework, plan carefully, and budget accordingly. Your crew (and your project) will thank you for it.

About Wastewater

Not to be confused with Wastwater.

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Part of a series on

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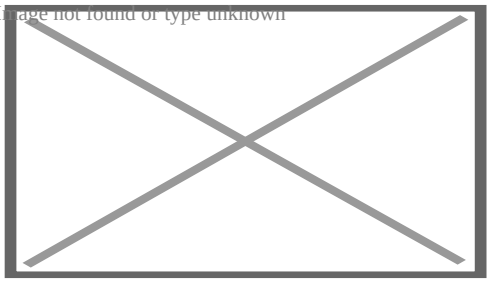

Air pollution from a factory

Air

- Acid rain
- Air quality index
- Atmospheric dispersion modeling
- Chlorofluorocarbon
- Combustion
- Exhaust gas
- Haze
- Household air pollution
- Global dimming
- Global distillation
- Indoor air quality
- Non-exhaust emissions
- Ozone depletion
- Particulates
- Persistent organic pollutant
- Smog
- Soot
- Volatile organic compound

Biological

- Biological hazard
- Genetic
- Illegal logging
- Introduced species
    - Invasive species

Digital

- Information

Electromagnetic

- Light
  - Ecological
  - Overillumination
- Radio spectrum

Natural

- Ozone
- Radium and radon in the environment
- Volcanic ash
- Wildfire

Noise

- Transportation
- Health effects from noise
- Marine mammals and sonar
- Noise barrier
- Noise control
- Soundproofing

Radiation

- Actinides
- Bioremediation
- Depleted uranium
- Nuclear fission
- Nuclear fallout
- Plutonium
- Poisoning
- Radioactivity
- Uranium
- Radioactive waste

Soil

- Agricultural
- Land degradation
- Bioremediation
- Defecation
- Electrical resistance heating
- Illegal mining
- Soil guideline values
- Phytoremediation

Solid waste

- Advertising mail
- Biodegradable waste
- Brown waste
- Electronic waste
- Food waste
- Green waste
- Hazardous waste
- Industrial waste
- Litter
- Mining
- Municipal solid waste
- Nanomaterials
- Plastic
- Packaging waste
- Post-consumer waste
- Waste management

Space

- Space debris

Visual

- Air travel
- Advertising clutter
- Overhead power lines
- Traffic signs
- Urban blight
- Vandalism

War

- Chemical warfare
- Herbicidal warfare
  - Agent Orange
- Nuclear holocaust
  - Nuclear fallout
  - Nuclear famine
  - Nuclear winter
- Scorched earth
- Unexploded ordnance
- War and environmental law

Water

- Agricultural wastewater
- Biosolids
- Diseases
- Eutrophication
- Firewater
- Freshwater
- Groundwater
- Hypoxia
- Industrial wastewater
- Marine
- Monitoring
- Nonpoint source
- Nutrient
- Ocean acidification
- Oil spill
- Pharmaceuticals
- Freshwater salinization
- Septic tanks
- Sewage
- Shipping
- Sludge
- Stagnation
- Sulfur water
- Surface runoff
- Turbidity
- Urban runoff
- Water quality
- Wastewater

Topics

- History
- Pollutants
  - Heavy metals
  - Paint

Misc

- Area source
- Brain health and pollution
- Debris
- Dust
- Garbology
- Legacy
- Thermal pollution
- Midden
- Point source
- Waste
  - Toxic

Lists

- Diseases
- Law by country
- Most polluted cities
- Least polluted cities by PM2.5
- Treaties
- Most polluted rivers

Categories

- By country

- Environment portal
- Ecology portal

Wastewater (or **waste water**) is water generated after the use of freshwater, raw water, drinking water or saline water in a variety of deliberate applications or processes.[1]: 1 Another definition of wastewater is "Used water from any combination of domestic, industrial, commercial or agricultural activities, surface runoff / storm water, and any sewer inflow or sewer infiltration".[2]: 175 In everyday usage, wastewater is commonly a synonym for sewage (also called domestic wastewater or municipal wastewater), which is wastewater that is produced by a community of people.

As a generic term, wastewater may also describe water containing contaminants accumulated in other settings, such as:

- Industrial wastewater: waterborne waste generated from a variety of industrial processes, such as manufacturing operations, mineral extraction, power generation, or water and wastewater treatment.
- Cooling water, is released with potential thermal pollution after use to condense steam or reduce machinery temperatures by conduction or evaporation.

- Leachate: precipitation containing pollutants dissolved while percolating through ores, raw materials, products, or solid waste.
- Return flow: the flow of water carrying suspended soil, pesticide residues, or dissolved minerals and nutrients from irrigated cropland.
- Surface runoff: the flow of water occurring on the ground surface when excess rainwater, stormwater, meltwater, or other sources, can no longer sufficiently rapidly infiltrate the soil.
- Urban runoff, including water used for outdoor cleaning activity and landscape irrigation in densely populated areas created by urbanization.
- Agricultural wastewater: animal husbandry wastewater generated from confined animal operations.

References

[edit]

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2. **^** *Tilley, E.; Ulrich, L.; Lüthi, C.; Reymond, Ph.; Zurbrügg, C. (2014). Compendium of Sanitation Systems and Technologies – (2nd Revised ed.). Swiss Federal Institute of Aquatic Science and Technology (Eawag), Duebendorf, Switzerland. ISBN 978-3-906484-57-0. Archived from the original on 8 April 2016.*

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Wastewater

Sources and types	○ Acid mine drainage ○ Ballast water ○ Bathroom ○ Blackwater (coal) ○ Blackwater (waste) ○ Boiler blowdown ○ Brine ○ Combined sewer ○ Cooling tower ○ Cooling water ○ Fecal sludge ○ Greywater ○ Infiltration/Inflow ○ Industrial wastewater ○ Ion exchange ○ Leachate ○ Manure ○ Papermaking ○ Produced water ○ Return flow ○ Reverse osmosis ○ Sanitary sewer ○ Septage ○ Sewage ○ Sewage sludge ○ Toilet ○ Urban runoff
Quality indicators	○ Adsorbable organic halides ○ Biochemical oxygen demand ○ Chemical oxygen demand ○ Coliform index ○ Oxygen saturation ○ Heavy metals ○ pH ○ Salinity ○ Temperature ○ Total dissolved solids ○ Total suspended solids ○ Turbidity ○ Wastewater surveillance

Treatment options	○ Activated sludge ○ Aerated lagoon ○ Agricultural wastewater treatment ○ API oil–water separator ○ Carbon filtering ○ Chlorination ○ Clarifier ○ Constructed wetland ○ Decentralized wastewater system ○ Extended aeration ○ Facultative lagoon ○ Fecal sludge management ○ Filtration ○ Imhoff tank ○ Industrial wastewater treatment ○ Ion exchange ○ Membrane bioreactor ○ Reverse osmosis ○ Rotating biological contactor ○ Secondary treatment ○ Sedimentation ○ Septic tank ○ Settling basin ○ Sewage sludge treatment ○ Sewage treatment ○ Sewer mining ○ Stabilization pond ○ Trickling filter ○ Ultraviolet germicidal irradiation ○ UASB ○ Vermifilter ○ Wastewater treatment plant

Disposal options

- Combined sewer
- Evaporation pond
- Groundwater recharge
- Infiltration basin
- Injection well
- Irrigation
- Marine dumping
- Marine outfall
- Reclaimed water
- Sanitary sewer
- Septic drain field
- Sewage farm
- Storm drain
- Surface runoff
- Vacuum sewer

- Image not found or type unknown Category: Sewerage

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Pollution

History

Air	○ Acid rain
	○ Air quality index
	○ Air pollution measurement
	○ Atmospheric dispersion modeling
	○ Chlorofluorocarbon
	○ Combustion
	  ○ Biofuel
	  ○ Biomass
	  ○ Coal
	  ○ Joss paper
	  ○ Open burning of waste
	○ Construction
	  ○ Renovation
	○ Demolition
	○ Exhaust gas
	  ○ Diesel exhaust
	○ Haze
	  ○ Smoke
	○ Indoor air quality
	○ Internal combustion engine
	○ Global dimming
	○ Global distillation
	○ Mining
	○ Ozone depletion
	○ Particulates
	  ○ Asbestos
	  ○ Oil refining
	  ○ Polluting cooking fuels
	○ Persistent organic pollutant
	○ Smelting
	○ Smog
	○ Soot
	  ○ Black carbon
	○ Volatile organic compound
	○ Waste

Biological	○ Biological hazard ○ Genetic pollution ○ Introduced species ○ Invasive species
Digital	○ Information pollution

Electromagnetic

- Light
  - Ecological light pollution
  - Overillumination
- Radio spectrum pollution

Natural

- Ozone
- Radium and radon in the environment
- Volcanic ash
- Wildfire

Noise

- Transportation
  - Land
  - Water
  - Air
  - Rail
  - Sustainable transport
- Urban
- Sonar
  - Marine mammals and sonar
- Industrial
- Military

Radiation

- Abstract
- Noise control
- Actinides
- Bioremediation
- Nuclear fission
- Nuclear fallout
- Plutonium
- Poisoning
- Radioactivity
- Uranium
- Electromagnetic radiation and health
- Radioactive waste

Soil

- Agricultural pollution
  - Herbicides
  - Manure waste
  - Pesticides
- Land degradation
- Bioremediation
- Open defecation
- Electrical resistance heating
- Soil guideline values
- Phytoremediation

Solid waste	○ Advertising mail
	○ Biodegradable waste
	○ Brown waste
	○ Electronic waste
	  ○ Battery recycling
	○ Foam food container
	○ Food waste
	○ Green waste
	○ Hazardous waste
	  ○ Biomedical waste
	  ○ Chemical waste
	  ○ Construction waste
	  ○ Lead poisoning
	  ○ Mercury poisoning
	  ○ Toxic waste
	○ Industrial waste
	  ○ Lead smelting
	○ Litter
	○ Mining
	  ○ Coal mining
	  ○ Gold mining
	  ○ Surface mining
	  ○ Deep sea mining
	  ○ Mining waste
	  ○ Uranium mining
	○ Municipal solid waste
	  ○ Garbage
	○ Nanomaterials
	○ Plastic pollution
	  ○ Microplastics
	○ Packaging waste
	○ Post-consumer waste
	○ Waste management
	  ○ Landfill
	  ○ Thermal treatment

Space	○ Satellite ○ Air travel
Visual	○ Clutter (advertising) ○ Traffic signs ○ Overhead power lines ○ Vandalism

War	○ Chemical warfare ○ Herbicidal warfare (Agent Orange) ○ Nuclear holocaust (Nuclear fallout - nuclear famine - nuclear winter) ○ Scorched earth ○ Unexploded ordnance ○ War and environmental law

Water	○ Agricultural wastewater
	○ Biological pollution
	○ Diseases
	○ Eutrophication
	○ Firewater
	○ Freshwater
	○ Groundwater
	○ Hypoxia
	○ Industrial wastewater
	○ Marine
	  ○ debris
	○ Monitoring
	○ Nonpoint source pollution
	○ Nutrient pollution
	○ Ocean acidification
	○ Oil exploitation
	○ Oil exploration
	○ Oil spill
	○ Pharmaceuticals
	○ Sewage
	  ○ Septic tanks
	  ○ Pit latrine
	○ Shipping
	○ Stagnation
	○ Sulfur water
	○ Surface runoff
	○ Thermal
	○ Turbidity
	○ Urban runoff
	○ Water quality

Topics	○ Pollutants
	  ○ Heavy metals
	  ○ Paint
	○ Brain health and pollution

Misc	○ Area source ○ Debris ○ Dust ○ Garbology ○ Legacy pollution ○ Midden ○ Point source ○ Waste
Responses	○ Cleaner production ○ Industrial ecology ○ Pollution haven hypothesis ○ Pollutant release and transfer register ○ Polluter pays principle ○ Pollution control ○ Waste minimisation ○ Zero waste
Lists	○ Diseases ○ Law by country ○ Most polluted cities ○ Least polluted cities by $PM_{2.5}$ ○ Most polluted countries ○ Most polluted rivers ○ Treaties

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Plumbing

Fundamental concepts	○ Air gap (plumbing) ○ Backflow ○ Compatibility (chemical) ○ Corrosion ○ Drain (plumbing) ○ Drinking water ○ Fuel gas ○ Friction loss ○ Grade (slope) ○ Greywater ○ Heat trap ○ Hydrostatic loop ○ Leak ○ Neutral axis ○ Onsite sewage facility ○ Pressure ○ Sanitary sewer ○ Sewer gas ○ Sewage ○ Sewerage ○ Siphon ○ Storm sewer ○ Stormwater ○ Surface tension ○ Tap water ○ Thermal expansion ○ Thermal insulation ○ Thermosiphon ○ Trap (plumbing) ○ Venturi effect ○ Wastewater ○ Water hammer ○ Water supply network ○ Water table ○ Well

Technology

- Brazing
- British Standard Pipe (BSP)
- Cast iron pipe
- Chemical drain cleaners
- Compression fitting
- Copper tubing
- Crimp (joining)
- Drain-waste-vent system
- Ductile iron pipe
- Flare fitting
- Garden Hose Thread (GHT)
- Gasket
- Hydronics
- Leak detection
- National pipe thread (NPT)
- Nominal Pipe Size (NPS)
- O-ring
- Oakum
- Pipe (fluid conveyance)
- Pipe dope
- Pipe support
- Plastic pipework
- Push-to-pull compression fittings
- Putty
- Sealant
- Sewage pumping
- Soldering
- Solvent welding
- Swaging
- Thread seal tape
- Threaded pipe
- Tube bending
- Water heat recycling

Components

- Atmospheric vacuum breaker
- Automatic bleeding valve
- Automatic faucet
- Backflow prevention device
- Ball valve
- Bleed screw
- Booster pump
- Butterfly valve
- Check valve
- Chemigation valve
- Chopper pump
- Circulator pump
- Cistern
- Closet flange
- Concentric reducer
- Condensate pump
- Coupling (piping)
- Diaphragm valve
- Dielectric union
- Double check valve
- Eccentric reducer
- Expansion tank
- Faucet aerator
- Float switch
- Float valve
- Floor drain
- Flow limiter
- Flushing trough
- Flushometer
- Gate valve
- Globe valve
- Grease trap
- Grinder pump
- Hose coupling
- Manifold
- Needle valve
- Nipple (plumbing)
- Pinch valve
- Piping and plumbing fitting
- Plug (sanitation)
- Pressure regulator
- Pressure vacuum breaker
- Pressure-balanced valve
- Pump
- Radiator (heating)
- Reduced pressure zone device
- Reducer
- Relief valve

Plumbing fixtures	○ Accessible bathtub ○ Bathtub ○ Bidet ○ Dehumidifier ○ Dishwasher ○ Drinking fountain ○ Electric water boiler ○ Evaporative cooler ○ Flush toilet ○ Garbage disposal unit ○ Hot water storage tank ○ Humidifier ○ Icemaker ○ Instant hot water dispenser ○ Laundry tub ○ Shower ○ water recycling shower ○ Sink ○ Storage water heater ○ Sump pump ○ Tankless water heating ○ Urinal ○ Washing machine ○ Washlet ○ Water dispenser ○ Water filter ○ Water heating ○ Water softening
Specialized tools	○ Basin wrench ○ Blowtorch ○ Borescope ○ Core drill ○ Drain cleaner ○ Driving cap ○ Flare-nut wrench ○ Pipecutter ○ Pipe wrench ○ Plumber's snake ○ Plumber wrench ○ Plunger ○ Strap wrench ○ Tap and die

Measurement and control	○ Control valve ○ Flow sensor ○ Pressure sensor ○ Water detector ○ Water metering ○ Hydronic balancing ○ Hydrostatic testing ○ Leak detection
Professions, trades, and services	○ Mechanical, electrical, and plumbing ○ Pipe marking ○ Pipefitter ○ Pipelayer ○ Plumber
Industry organizations and standards	○ International Association of Plumbing and Mechanical Officials (IAPMO) ○ NSF International ○ Plumbing & Drainage Institute (PDI) ○ Uniform Plumbing Code (UPC) ○ World Plumbing Council (WPC)
Health and safety	○ Plumbing code ○ Scalding ○ Waterborne disease ○ Fire sprinkler system ○ Piping
See also	○ Template:HVAC ○ Template:Public health ○ Template:Sewerage ○ Template:Human waste elimination ○ Template:Wastewater

Disambiguation icon

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This set index article includes a list of related items that share the same name (or similar names).

If an internal link incorrectly led you here, you may wish to change the link to point directly to the intended article.

About Sanitation

Not to be confused with Sanitization.

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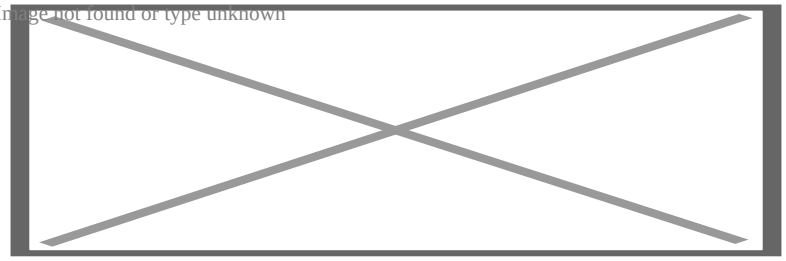

The sanitation system: collection, transport, treatment, disposal or reuse.

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Part of a series on

Public health

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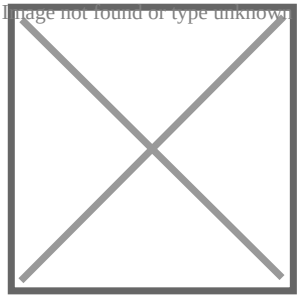

- Outline

Subfields

- Community health
- Dental public health
- Environmental health
- Epidemiology
- Health economics
- Health education
- Health promotion
- Health policy
- Health politics
- Mental health
- Occupational safety
- Rehabilitation (penology)
- Sexual and reproductive health
- Sanitation
- World health (Global health - International health)

Prevention
○ Disease surveillance ○ Harm reduction ○ Health promotion (Behavior change) ○ Health indicators ○ Human right to water and sanitation ○ Right to health ○ Supervised injection site ○ Universal health care
Lists and categories
○ Terminology ○ Journals ○ National public health agencies
○ Medicine portal ○ Society portal

Sanitation refers to public health conditions related to clean drinking water and treatment and disposal of human excreta and sewage.[1] Preventing human contact with feces is part of sanitation, as is hand washing with soap. Sanitation systems aim to protect human health by providing a clean environment that will stop the transmission of disease, especially through the fecal–oral route.[2] For example, diarrhea, a main cause of malnutrition and stunted growth in children, can be reduced through adequate sanitation.[3] There are many other diseases which are easily transmitted in communities that have low levels of sanitation, such as ascariasis (a type of intestinal worm infection or helminthiasis), cholera, hepatitis, polio, schistosomiasis, and trachoma, to name just a few.

A range of sanitation technologies and approaches exists. Some examples are community-led total sanitation, container-based sanitation, ecological sanitation, emergency sanitation, environmental sanitation, onsite sanitation and sustainable sanitation. A sanitation system includes the capture, storage, transport, treatment and disposal or reuse of human excreta and wastewater.[4] Reuse activities within the sanitation system may focus on the nutrients, water, energy or organic matter contained in excreta and wastewater. This is referred to as the "sanitation value chain" or "sanitation economy".[5][6] The people responsible for cleaning, maintaining, operating, or emptying a sanitation technology at any step of the sanitation chain are called "sanitation workers".[7]: 2

Several sanitation "levels" are being used to compare sanitation service levels within countries or across countries.[8] The sanitation ladder defined by the Joint Monitoring Programme in 2016 starts at open defecation and moves upwards using the terms

"unimproved", "limited", "basic", with the highest level being "safely managed".[8] This is particularly applicable to developing countries.

The Human right to water and sanitation was recognized by the United Nations General Assembly in 2010. Sanitation is a global development priority and the subject of Sustainable Development Goal 6.[9] The estimate in 2017 by JMP states that 4.5 billion people currently do not have safely managed sanitation.[9] Lack of access to sanitation has an impact not only on public health but also on human dignity and personal safety.

Definitions

[edit]

Animated video to underline the importance of sanitation (here with a focus on toilets) on public health in developing countries

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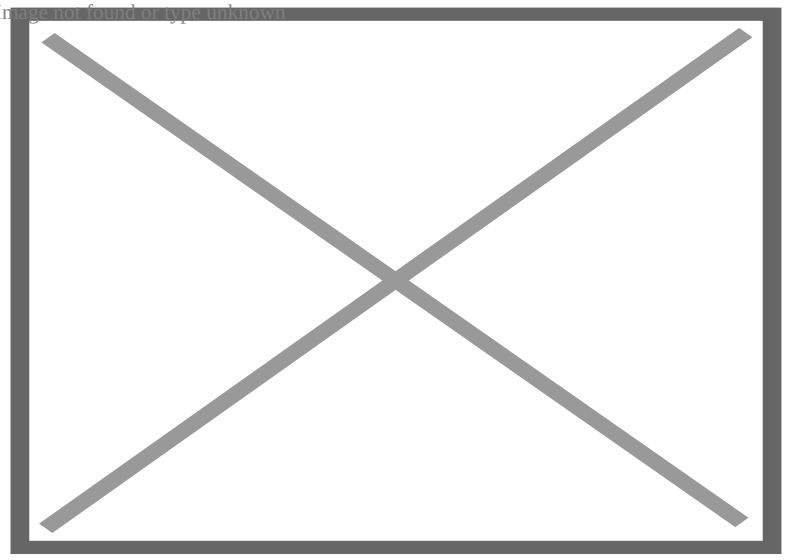


Urban improved sanitation facilities versus rural improved sanitation facilities, 2015.[10]

There are some variations on the use of the term "sanitation" between countries and organizations. The World Health Organization defines the term "sanitation" as follows:

> "Sanitation generally refers to the provision of facilities and services for the safe disposal of human urine and faeces. The word 'sanitation' also refers to the maintenance of hygienic conditions, through services such as garbage collection and wastewater disposal."[11]

Sanitation includes all four of these technical and non-technical systems: Excreta management systems, wastewater management systems (included here are wastewater treatment plants), solid waste management systems as well as drainage systems for rainwater, also called stormwater drainage.[*citation needed*] However, many in the WASH sector only include excreta management in their definition of sanitation.

Another example of what is included in sanitation is found in the handbook by Sphere on "Humanitarian Charter and Minimum Standards in Humanitarian Response" which describes minimum standards in four "key response sectors" in humanitarian response situations. One of them is "Water Supply, Sanitation and Hygiene Promotion" (WASH) and it includes the following areas: Hygiene promotion, water supply, excreta management, vector control, solid waste management and WASH in disease outbreaks and healthcare settings.[12]: 91

Hygiene promotion is seen by many as an integral part of sanitation. The Water Supply and Sanitation Collaborative Council defines sanitation as "The collection, transport, treatment and disposal or reuse of human excreta, domestic wastewater and solid waste, and associated hygiene promotion."[13]

Despite the fact that sanitation includes wastewater treatment, the two terms are often used side by side as "sanitation and wastewater management".

Another definition is in the DFID guidance manual on water supply and sanitation programmes from 1998:[14]

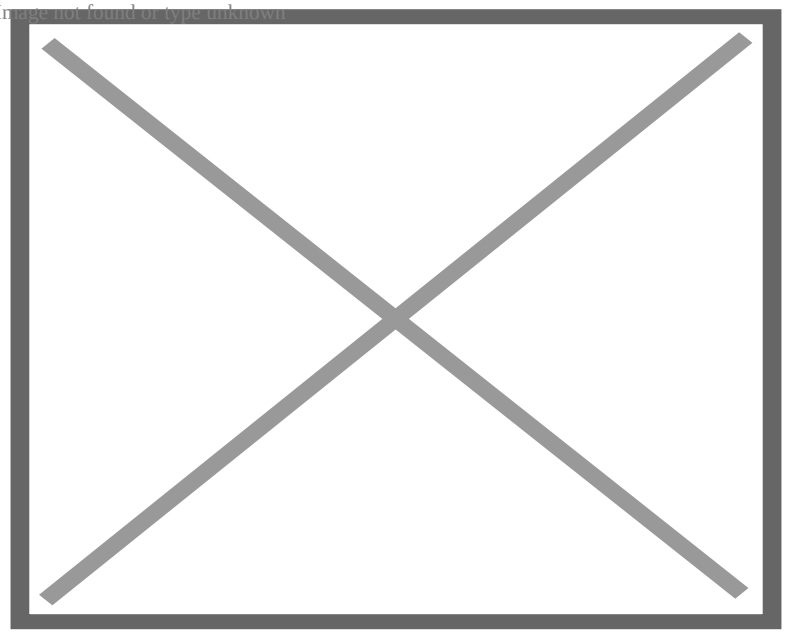
> "For the purposes of this manual, the word 'sanitation' alone is taken to mean the safe management of human excreta. It therefore includes both the 'hardware' (e.g. latrines and sewers) and the 'software' (regulation, hygiene promotion) needed to reduce faecal-oral disease transmission. It encompasses too the re-use and ultimate disposal of human excreta. The term environmental sanitation is used to cover the wider concept of controlling all the factors in the physical environment which may have deleterious impacts on human health and well-being. In developing countries, it normally includes drainage, solid waste management, and vector control, in addition to the activities covered by the definition of sanitation."

Sanitation can include personal sanitation and public hygiene. Personal sanitation work can include handling menstrual waste, cleaning household toilets, and managing household garbage. Public sanitation work can involve garbage collection, transfer and treatment (municipal solid waste management), cleaning drains, streets, schools, trains, public spaces, community toilets and public toilets, sewers, operating sewage

treatment plants, etc.[15]: 4 Workers who provide these services for other people are called sanitation workers.

Purposes

[edit]



Access to safe drinking water and sanitation (2016)

The overall purposes of sanitation are to provide a healthy living environment for everyone, to protect the natural resources (such as surface water, groundwater, soil), and to provide safety, security and dignity for people when they defecate or urinate.[*citation ne*

The Human Right to Water and Sanitation was recognized by the United Nations (UN) General Assembly in 2010.[16][17][18] It has been recognized in international law through human rights treaties, declarations and other standards. It is derived from the human right to an adequate standard of living.[19]

Effective sanitation systems provide barriers between excreta and humans in such a way as to break the disease transmission cycle (for example in the case of fecal-borne diseases).[20] This aspect is visualised with the F-diagram where all major routes of fecal-oral disease transmission begin with the letter F: feces, fingers, flies, fields, fluids, food.[21]

Sanitation infrastructure has to be adapted to several specific contexts including consumers' expectations and local resources available.[*citation needed*]

Sanitation technologies may involve centralized civil engineering structures like sewer systems, sewage treatment, surface runoff treatment and solid waste landfills. These structures are designed to treat wastewater and municipal solid waste. Sanitation technologies may also take the form of relatively simple onsite sanitation systems. This can in some cases consist of a simple pit latrine or other type of non-flush toilet for the excreta management part.

Providing sanitation to people requires attention to the entire system, not just focusing on technical aspects such as the toilet, fecal sludge management or the wastewater treatment plant.[22] The "sanitation chain" involves the experience of the user, excreta and wastewater collection methods, transporting and treatment of waste, and reuse or disposal. All need to be thoroughly considered.[22]

Economic impacts

[edit]

The benefits to society of managing human excreta are considerable, for public health as well as for the environment. As a rough estimate: For every US$1 spent on sanitation, the return to society is US$5.50.[23]: 2

For developing countries, the economic costs of inadequate sanitation is a huge concern. For example, according to a World Bank study, economic losses due to inadequate sanitation to The Indian economy are equivalent to 6.4% of its GDP.[24] Most of these are due to premature mortality, time lost in accessing, loss of productivity, additional costs for healthcare among others.[24] Inadequate sanitation also leads to loss from potential tourism revenue.[24] This study also found that impacts are disproportionately higher for the poor, women and children. Availability of toilet at home on the other hand, positively contributes to economic well-being of women as it leads to an increase in literacy and participation in labor force.[25]

Types and concepts (for excreta management)

[edit]

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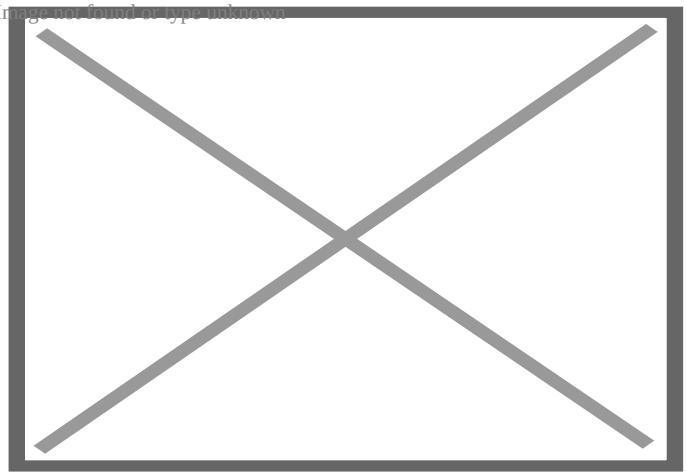

Percentage of population served by different types of sanitation systems[26]

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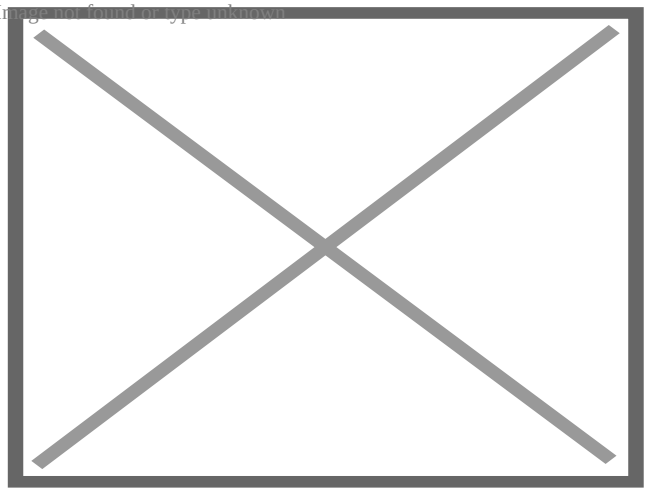


Example of sanitation infrastructure: Shower, double-vault urine-diverting dry toilet (UDDT) and waterless urinal in Lima, Peru

The term sanitation is connected with various descriptors or adjectives to signify certain types of sanitation systems (which may deal only with human excreta management or with the entire sanitation system, i.e. also greywater, stormwater and solid waste management) – in alphabetical order:

Basic sanitation

[edit]

In 2017, JMP defined a new term: "basic sanitation service". This is defined as the use of improved sanitation facilities that are not shared with other households. A lower level of service is now called "limited sanitation service" which refers to use of improved sanitation facilities that are shared between two or more households.[9]

Container-based sanitation

[edit]
This section is an excerpt from Container-based sanitation.[edit]
Container-based sanitation (abbreviated as CBS) refers to a sanitation system where toilets collect human excreta in sealable, removable containers (also called cartridges) that are transported to treatment facilities.[27] This type of sanitation involves a commercial service which provides certain types of portable toilets, and delivers empty containers when picking up full ones. The service transports and safely disposes of or reuses collected excreta. The cost of collection of excreta is usually borne by the users. With suitable development, support and functioning partnerships, CBS can be used to provide low-income urban populations with safe collection, transport and treatment of excrement at a lower cost than installing and maintaining sewers.[28] In most cases, CBS is based on the use of urine-diverting dry toilets.

Community-based sanitation

[edit]

Community-based sanitation is related to decentralized wastewater treatment (DEWATS).[*citation needed*]

Community-led total sanitation

[edit]

This section is an excerpt from Community-led total sanitation.[edit]

Dry sanitation

[edit]

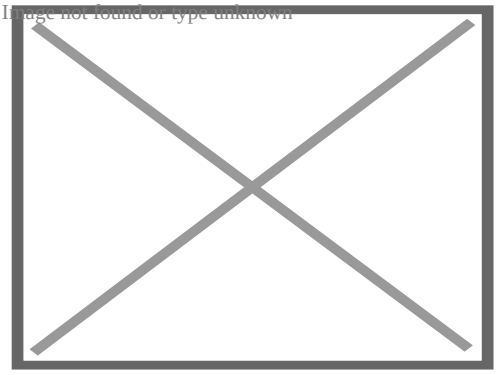
The term "dry sanitation" is not in widespread use and is not very well defined. It usually refers to a system that uses a type of dry toilet and no sewers to transport excreta. Often when people speak of "dry sanitation" they mean a sanitation system that uses urine-diverting dry toilet (UDDTs).[29][30]

Ecological sanitation

[edit]

This section is an excerpt from Ecological sanitation.[edit]

Ecological sanitation, commonly abbreviated as ecosan (also spelled eco-san or EcoSan), is an approach to sanitation provision which aims to safely reuse excreta in agriculture.[31] It is an approach, rather than a technology or a device which is characterized by a desire to "close the loop", mainly for the nutrients and organic matter between sanitation and agriculture in a safe manner. One of the aims is to minimise the use of non-renewable resources. When properly designed and operated, ecosan systems provide a hygienically safe system to convert human excreta into nutrients to be returned to the soil, and water to be returned to the land. Ecosan is also called resource-oriented sanitation.



Emergency pit lining kits by Evenproducts

Emergency sanitation

[edit]

This section is an excerpt from Emergency sanitation.[edit]
Emergency sanitation is the management and technical processes required to provide sanitation in emergency situations. Emergency sanitation is required during humanitarian relief operations for refugees, people affected by natural disasters and internally displaced persons.[32] There are three phases of emergency response: Immediate, short term and long term.[32] In the immediate phase, the focus is on managing open defecation, and toilet technologies might include very basic latrines, pit latrines, bucket toilets, container-based toilets, chemical toilets. The short term phase might also involve technologies such as urine-diverting dry toilets, septic tanks, decentralized wastewater systems. Providing handwashing facilities and management of fecal sludge are also part of emergency sanitation.

Environmental sanitation

[edit]

Environmental sanitation encompasses the control of environmental factors that are connected to disease transmission. Subsets of this category are solid waste

management, water and wastewater treatment, industrial waste treatment and noise pollution control. According to World health organization (WHO) Environmental sanitation was defined as the control of all those factors in the physical environment which exercise a harmful effect on human being physical development, health and survival. One of the primary function of environmental sanitation is to protect public health.[*citation needed*]

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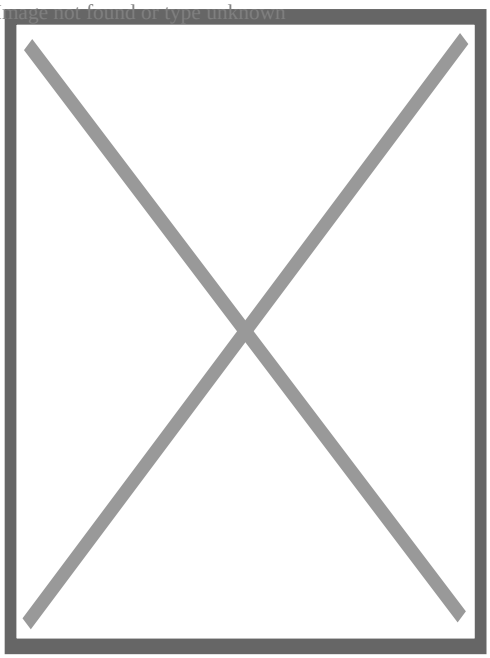

Environmental sanitation by an NGO member

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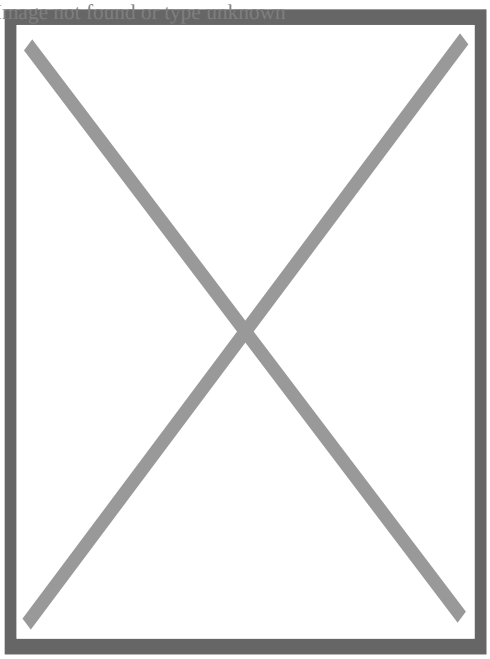


A clean exercise organized by an NGO

Fecal sludge management

[edit]

This section is an excerpt from Fecal sludge management.[edit]
Fecal sludge management (FSM) (or faecal sludge management in British English) is the storage, collection, transport, treatment and safe end use or disposal of fecal sludge.[33] Together, the collection, transport, treatment and end use of fecal sludge constitute the "value chain" or "service chain" of fecal sludge management. Fecal sludge is defined very broadly as what accumulates in onsite sanitation systems (e.g. pit latrines, septic tanks and container-based solutions) and specifically is not transported through a sewer. It is composed of human excreta, but also anything else that may go into an onsite containment technology, such as flushwater, cleansing materials (e.g. toilet paper and anal cleansing materials), menstrual hygiene products, grey water (i.e. bathing or kitchen water, including fats, oils and grease), and solid waste. Fecal sludge that is removed from septic tanks is called septage.

Improved and unimproved sanitation

[edit]

This section is an excerpt from Improved sanitation.[edit]
Improved sanitation (related to but distinct from a "safely managed sanitation service") is a term used to categorize types of sanitation for monitoring purposes. It refers to the management of human feces at the household level. The term was coined by the Joint Monitoring Program (JMP) for Water Supply and Sanitation of UNICEF and WHO in 2002 to help monitor the progress towards Goal Number 7 of the Millennium Development Goals (MDGs). The opposite of "improved sanitation" has been termed "unimproved sanitation" in the JMP definitions. The same terms are used to monitor progress towards Sustainable Development Goal 6 (Target 6.2, Indicator 6.2.1) from 2015 onwards.[34] Here, they are a component of the definition for "safely managed sanitation service".

Lack of sanitation

[edit]

Lack of sanitation refers to the absence of sanitation. In practical terms it usually means lack of toilets or lack of hygienic toilets that anybody would want to use voluntarily. The result of lack of sanitation is usually open defecation (and open urination but this is of less concern) with associated serious public health issues.[35] It is estimated that 2.4 billion people still lacked improved sanitation facilities including 660 million people who lack access to safe drinking water as of 2015.[36][37]

Onsite sanitation or non-sewered sanitation system

[edit]

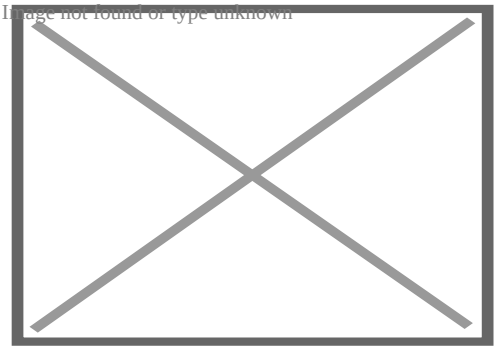
Onsite sanitation (or on-site sanitation) is defined as "a sanitation system in which excreta and wastewater are collected and stored or treated on the plot where they are generated".[22]: 173 Another term that is used for the same system is non-sewered sanitation systems (NSSS), which are prevalent in many countries.[38] NSSS play a vital role in the safe management of fecal sludge, accounting for approximately half of all existing sanitation provisions.[38] The degree of treatment may be variable, from none to advanced. Examples are pit latrines (no treatment) and septic tanks (primary treatment of wastewater). On-site sanitation systems are often connected to fecal sludge management (FSM) systems where the fecal sludge that is generated onsite is treated at an offsite location. Wastewater (sewage) is only generated when piped water supply is available within the buildings or close to them.[*citation needed*]

A related term is a decentralized wastewater system which refers in particular to the wastewater part of on-site sanitation. Similarly, an onsite sewage facility can treat the wastewater generated locally.[*citation needed*]

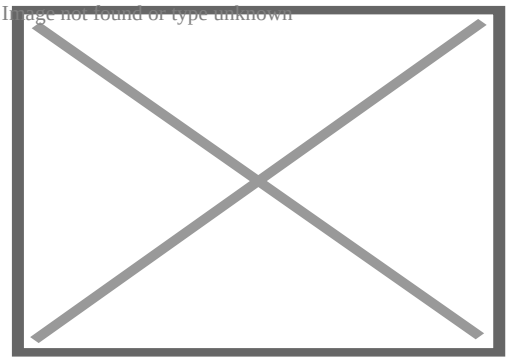
The global methane emissions from NSSS in 2020 was estimated to as 377 Mt CO2e per year or 4.7% of global anthropogenic methane emissions, which are comparable to the greenhouse gas emissions from wastewater treatment plants.[38] This means that the GHG emissions from the NSSS as a non-negligible source.[38]

Safely managed sanitation

[edit]



Share of population using safely managed sanitation facilities in 2022[39]



Number of handwashing facilities in the world, 2022

Safely managed sanitation is the highest level of household sanitation envisioned by the Sustainable Development Goal Number 6.[40] It is measured under the Sustainable Development Goal 6.2, Indicator 6.2.1, as the "Proportion of population using (a) safely managed sanitation services and (b) a hand-washing facility with soap and water".[41][9] The current value in the 2017 baseline estimate by JMP is that 4.5 billion people currently do not have safely managed sanitation.[9]

Safely managed sanitation is defined as an improved sanitation facility which is not shared with other households, and where the excreta produced is either treated and disposed in situ, stored temporarily and then emptied and transported to treatment off-site, or transported through a sewer with wastewater and then treated off-site.[41] In other words, safely managed sanitation is a basic sanitation service where in addition excreta are safely disposed of in situ or transported and treated offsite.[9]

Sustainable sanitation

[edit]

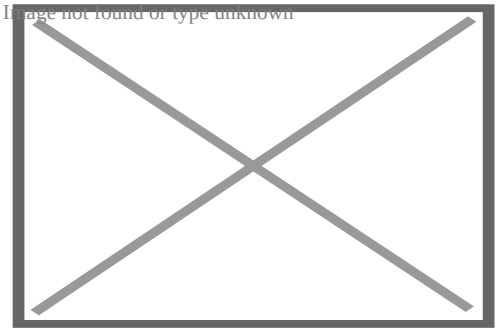
This section is an excerpt from Sustainable sanitation.[edit]
Sustainable sanitation is a sanitation system designed to meet certain criteria and to work well over the long-term. Sustainable sanitation systems consider the entire "sanitation value chain", from the experience of the user, excreta and wastewater collection methods, transportation or conveyance of waste, treatment, and reuse or disposal.[42] The Sustainable Sanitation Alliance (SuSanA) includes five features (or criteria) in its definition of "sustainable sanitation": Systems need to be economically and socially acceptable, technically and institutionally appropriate and protect the environment and natural resources.[43]

Other types, concepts and systems

[edit]

Wastewater management

[edit]
Main articles: Wastewater and Wastewater treatment



Sewage treatment plant, Australia.

Wastewater management consists of collection, wastewater treatment (be it municipal or industrial wastewater), disposal or reuse of treated wastewater. The latter is also referred to as water reclamation.[*citation needed*]

Sanitation systems in urban areas of developed countries usually consist of the collection of wastewater in gravity driven sewers, its treatment in wastewater treatment plants for reuse or disposal in rivers, lakes or the sea.[*citation needed*]

In developing countries most wastewater is still discharged untreated into the environment. Alternatives to centralized sewer systems include onsite sanitation, decentralized wastewater systems, dry toilets connected to fecal sludge management.

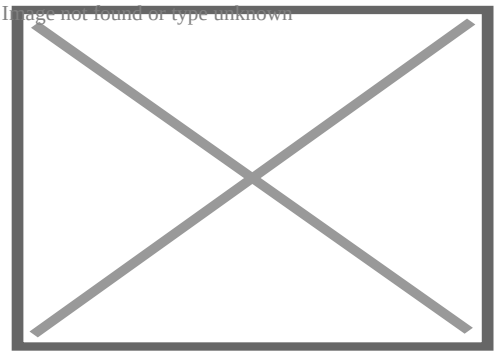
Stormwater drainage

[edit]
Main article: Storm drain

Sewers are either combined with storm drains or separated from them as sanitary sewers. Combined sewers are usually found in the central, older parts or urban areas. Heavy rainfall and inadequate maintenance can lead to combined sewer overflows or sanitary sewer overflows, i.e., more or less diluted raw sewage being discharged into the environment. Industries often discharge wastewater into municipal sewers, which can complicate wastewater treatment unless industries pre-treat their discharges.[44]

Solid waste disposal

[edit]
Main article: Waste management



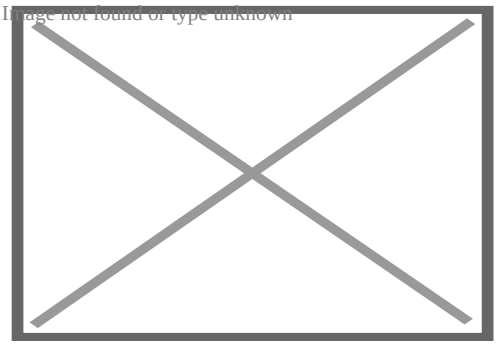
Hiriya Landfill, Israel.

Disposal of solid waste is most commonly conducted in landfills, but incineration, recycling, composting and conversion to biofuels are also avenues. In the case of landfills, advanced countries typically have rigid protocols for daily cover with topsoil, where underdeveloped countries customarily rely upon less stringent protocols.[45] The importance of daily cover lies in the reduction of vector contact and spreading of pathogens. Daily cover also minimizes odor emissions and reduces windblown litter. Likewise, developed countries typically have requirements for perimeter sealing of the landfill with clay-type soils to minimize migration of leachate that could contaminate groundwater (and hence jeopardize some drinking water supplies).

For incineration options, the release of air pollutants, including certain toxic components is an attendant adverse outcome. Recycling and biofuel conversion are the sustainable options that generally have superior lifecycle costs, particularly when total ecological consequences are considered.[46] Composting value will ultimately be limited by the market demand for compost product.[*citation needed*]

Food safety

[edit]



Modern restaurant food preparation area.

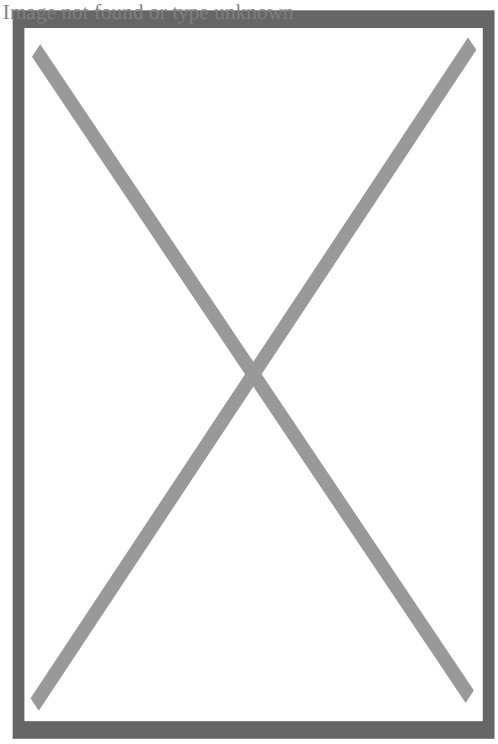
Main article: Food safety

Sanitation within the food industry means the adequate treatment of food-contact surfaces by a process that is effective in destroying vegetative cells of microorganisms of public health significance, and in substantially reducing numbers of other undesirable microorganisms, but without adversely affecting the food or its safety for the consumer (U.S. Food and Drug Administration, Code of Federal Regulations, 21CFR110, USA). Sanitation Standard Operating Procedures are mandatory for food industries in United States. Similarly, in Japan, food hygiene has to be achieved through compliance with food sanitation law.[47]

In the food and biopharmaceutical industries, the term "sanitary equipment" means equipment that is fully cleanable using clean-in-place (CIP) and sterilization-in-place (SIP) procedures: that is fully drainable from cleaning solutions and other liquids. The design should have a minimum amount of deadleg, or areas where the turbulence during cleaning is insufficient to remove product deposits.[48] In general, to improve cleanability, this equipment is made from Stainless Steel 316L, (an alloy containing small amounts of molybdenum). The surface is usually electropolished to an effective surface roughness of less than 0.5 micrometre to reduce the possibility of bacterial adhesion.

Hygiene promotion

[edit]
Further information: Hygiene



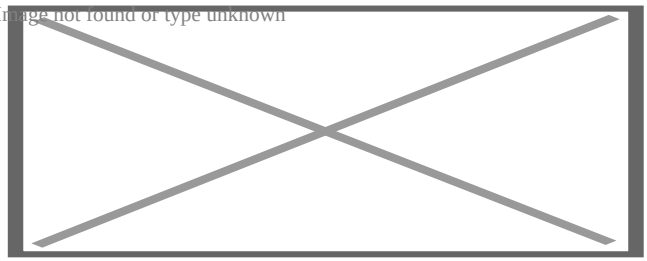
Hygiene education (on proper handwashing) in Afghanistan

In many settings, provision of sanitation facilities alone does not guarantee good health of the population. Studies have suggested that the impact of hygiene practices have as great an impact on sanitation related diseases as the actual provision of sanitation facilities. Hygiene promotion is therefore an important part of sanitation and is usually key in maintaining good health.[49]

Hygiene promotion is a planned approach of enabling people to act and change their behavior in an order to reduce and/or prevent incidences of water, sanitation and hygiene (WASH)[50] related diseases. It usually involves a participatory approach of engaging people to take responsibility of WASH services and infrastructure including its operation and maintenance. The three key elements of promoting hygiene are; mutual sharing of information and knowledge, the mobilization of affected communities and the provision of essential material and facilities.[12]

Health aspects

[edit]



The "F-diagram" (feces, fingers, flies, fields, fluids, food), showing pathways of fecal-oral disease transmission. The vertical blue lines show barriers: toilets, safe water, hygiene and handwashing.

A video shedding light on the unsafe and undignified working conditions of many sanitation workers in India

Main article: WASH § Health aspects

This section is an excerpt from WASH § WASH-attributable burden of diseases and injuries.[edit]

The WHO has investigated which proportion of death and disease worldwide can be attributed to insufficient WASH services. In their analysis they focus on the following four health outcomes: diarrhea, acute respiratory infections, malnutrition, and soil-transmitted Helminthiasis (STHs).[51]: vi These health outcomes are also included as an indicator for achieving Sustainable Development Goal 3 ("Good Health and Well-being"): Indicator 3.9.2 reports on the "mortality rate attributed to unsafe water, sanitation, and lack of hygiene".

In 2023, WHO summarized the available data with the following key findings: "In 2019, use of safe WASH services could have prevented the loss of at least 1.4 million lives and 74 million disability-adjusted life years (DALYs) from four health outcomes. This represents 2.5% of all deaths and 2.9% of all DALYs globally."[51]: vi Of the four health outcomes studied, it was diarrheal disease that had the most striking correlation, namely the highest number of "attributable burden of disease": over 1 million deaths and 55 million DALYs from diarrheal diseases were linked with lack of WASH. Of these deaths, 564,000 deaths were linked to unsafe sanitation in particular.

Environmental aspects

[edit]

Indicator organisms

[edit]

When analyzing environmental samples, various types of indicator organisms are used to check for fecal pollution of the sample. Commonly used indicators for bacteriological water analysis include the bacterium *Escherichia coli* (abbreviated as *E. coli)* and non-specific fecal coliforms. With regards to samples of soil, sewage sludge, biosolids or fecal matter from dry toilets, helminth eggs are a commonly used indicator. With helminth egg analysis, eggs are extracted from the sample after which a viability test is done to distinguish between viable and non viable eggs. The viable fraction of the helminth eggs in the sample is then counted.

Climate change

[edit]
Main article: WASH § Climate change aspects

Global mechanisms

[edit]

Sustainable Development Goal Number 6

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Further information: Sustainable Development Goal 6

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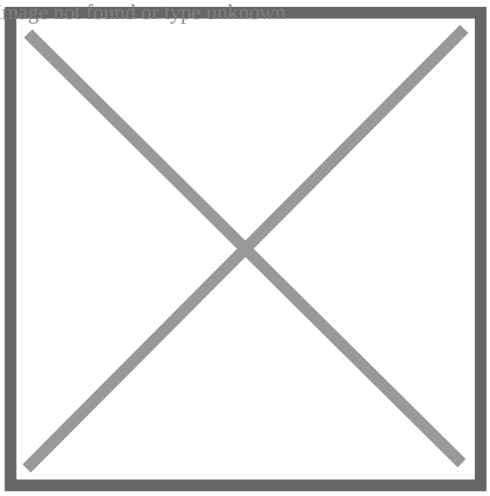

United Nations SDG 6 Logo

In the year 2016, the Sustainable Development Goals replaced the Millennium Development Goals. Sanitation is a global development priority and included Sustainable Development Goal 6 (SDG 6).[9] The target is about "clean water and sanitation for all" by 2030.[52] It is estimated that 660 million people still lacked access to safe drinking water as of 2015.[36][37]

Since the COVID-19 pandemic in 2020, the fight for clean water and sanitation is more important than ever. Handwashing is one of the most common prevention methods for Coronavirus, yet two out of five people do not have access to a hand-washing station.[53]

Millennium Development Goal Number 7 until 2015

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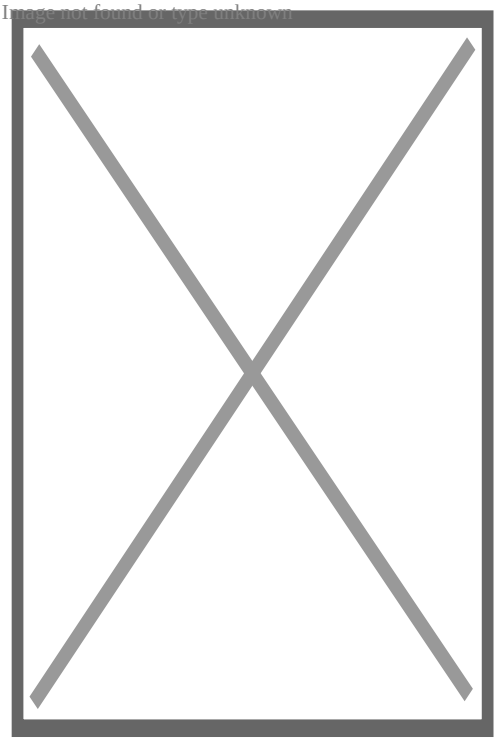

Example for lack of sanitation: Unhygienic pit latrine with ring slab in Kalibari community in Mymensingh, Bangladesh

The United Nations, during the Millennium Summit in New York in 2000 and the 2002 World Summit on Sustainable Development in Johannesburg, developed the Millennium Development Goals (MDGs) aimed at poverty eradication and sustainable development. The specific sanitation goal for the year 2015 was to reduce by half the number of people who had no access to potable water and sanitation in the baseline year of 1990. As the JMP and the United Nations Development Programme (UNDP) Human Development Report in 2006 has shown, progress meeting the MDG sanitation target is slow, with a large gap between the target coverage and the current reality.

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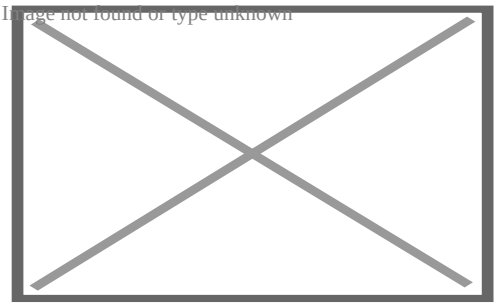

Modified logo of International Year of Sanitation, used in the UN Drive to 2015 campaign logo

In December 2006, the United Nations General Assembly declared 2008 "The International Year of Sanitation", in recognition of the slow progress being made towards the MDGs sanitation target.[54] The year aimed to develop awareness and

more actions to meet the target.

There are numerous reasons for this gap. A major one is that sanitation is rarely given political attention received by other topics despite its key importance. Sanitation is not high on the international development agenda, and projects such as those relating to water supply projects are emphasised.[55]

The Joint Monitoring Programme for Water Supply and Sanitation of WHO and UNICEF (JMP) has been publishing reports of updated estimates every two years on the use of various types of drinking-water sources and sanitation facilities at the national, regional and global levels. The JMP report for 2015 stated that:[36]

- Between 1990 and 2015, open defecation rates have decreased from 38% to 25% globally. Just under one billion people (946 million) still practise open defecation worldwide in 2015.
- 82% of the global urban population, and 51% of the rural population is using improved sanitation facilities in 2015, as per the JMP definition of "improved sanitation".[56]

Initiatives to promote sanitation

[edit]

In 2011 the Bill & Melinda Gates Foundation launched the "Reinvent the Toilet Challenge" to promote safer, more effective ways to treat human waste.[57] The program is aimed at developing technologies that might help bridge the global sanitation gap (for example the Omni Processor, or technology for fecal sludge management). In 2015, the Bill & Melinda Gates Foundation published their "Water, sanitation, and hygiene strategy portfolio update and overview" called "Building demand for sanitation".[58]

The latest innovations in the field of public health sanitation, currently in the testing phase, comprise - use of 'locally produced alcohol-based hand rub'; 'novel latrine improvement'; and 'container-based sanitation'. Centers for Disease Control and Prevention (CDC), the national public health agency of the United States has recognized the stated three initiatives.

Capacity development

[edit]

Capacity development is regarded as an important mechanism to achieve progress in the sanitation sector.[59] For example, in India the Sanitation Capacity Building

platform (SCBP) was designed to "support and build the capacity of town/cities to plan and implement decentralized sanitation solutions" with funding by the Bill & Melinda Gates Foundation from 2015 to 2022.[60][61] Results from this project showed that capacity development best happens on the job and in a learning organization culture.[62] In a government capacity development initiative, it is critical to have an enabling policy and program funding to translate capacity development input into program and infrastructure outputs. Capacity development aims to empower staff and institutions, develop a learning strategy, learning content and training modules, as well as strengthened partnerships and institutions of learning.[62] The Capacity Development Effectiveness Ladder Framework (CDEL) identifies five critical steps for capacity development interventions: Developing original learning content, partnerships for learning and outreach, learning strategy, visioning change and designing solutions, contribution to capacity development discourse.[62][63]

Costs

[edit]

A study was carried out in 2018 to compare the lifecycle costs of full sanitation chain systems in developing cities of Africa and Asia. It found that conventional sewer systems are in most cases the most expensive sanitation options, followed, in order of cost, by sanitation systems comprising septic tanks, ventilated improved pit latrines (VIP), urine diversion dry toilets and pour-flush pit latrines.[64] The main determinants of urban sanitation financial costs include: Type of technology, labour, material and utility cost, density, topography, level of service provided by the sanitation system, soil condition, energy cost and others (distance to wastewater treatment facility, climate, end-use of treatment products, business models, water table height).[64]

Some grassroots organizations have trialled community-managed toilet blocks whose construction and maintenance costs can be covered by households. One study of Mumbai informal settlements found that US$1.58 per adult would be sufficient for construction, and less than US$1/household/month would be sufficient for maintenance.[65]

History

[edit]
Further information: History of water supply and sanitation, Toilet § History, and History of waste management

Major human settlements could initially develop only where fresh surface water was plentiful, such as near rivers or natural springs. Throughout history people have devised systems to get water into their communities and households, and to dispose

(and later also treat) wastewater.[66] The focus of sewage treatment at that time was on conveying raw sewage to a natural body of water, e.g. a river or ocean, where it would be diluted and dissipated.

The Sanitation in the Indus Valley Civilization in Asia is an example of public water supply and sanitation during the Bronze Age (3300–1300 BCE). Sanitation in ancient Rome was quite extensive. These systems consisted of stone and wooden drains to collect and remove wastewater from populated areas—see for instance the Cloaca Maxima into the River Tiber in Rome. The first sewers of ancient Rome were built between 800 and 735 BCE.[67]

By country

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Water supply and sanitation by country

- Afghanistan
- Algeria
- Angola
- Argentina
- Australia
- Azerbaijan
- Bangladesh
- Belgium
- Belize
- Benin
- Bhutan
- Bolivia
- Bosnia and Herzegovina
- Brazil
- Burkina Faso
- Cambodia
- Canada
- Chile
- China
- Colombia
- Costa Rica
- Cuba
- Democratic Republic of the Congo
- Denmark
- Dominican Republic
- Ecuador
- Egypt
- El Salvador
- Ethiopia
- France
- Georgia
- Germany
- Ghana
- Greece
- Grenada
- Guatemala
- Guyana
- Haiti
- Honduras
- India
- Indonesia
- Iran
- Iraq
- Ireland
- Israel
- Italy
- Jamaica
- Japan

Society and culture

[edit]

There is a vast number of professions that are involved in the field of sanitation, for example on the technical and operations side: sanitation workers, waste collectors, sanitary engineers.

See also

[edit]

- List of abbreviations used in sanitation
- List of countries by proportion of the population using improved sanitation facilities
- List of water supply and sanitation by country
- Environmental health
- Water pollution
- Water security
- Self-supply of water and sanitation
- Sustainable Sanitation Alliance
- World Toilet Day

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Public health

General

- Auxology
- Biological hazard
- Chief medical officer
- Cultural competence
- Deviance
- Environmental health
- Eugenics
  - History of
  - Liberal
- Euthenics
- Genomics
- Globalization and disease
- Harm reduction
- Health economics
- Health literacy
- Health policy
  - Health system
  - Health care reform
- Housing First
- Human right to water and sanitation
- Management of depression
  - Public health law
  - National public health institute
- Health politics
- Labor rights
- Maternal health
- Medical anthropology
- Medical sociology
- Mental health (Ministers)
- Occupational safety and health
- Pharmaceutical policy
- Pollution
  - Air
  - Water
  - Soil
  - Radiation
  - Light
- Prisoners' rights
- Public health intervention
- Public health laboratory
- Right to food
- Right to health
- Right to a healthy environment
- Right to housing
- Right to rest and leisure
- Right to sit
- Security of person
- Sexual and reproductive health

Preventive healthcare

- Behavior change
  - Theories
- Drug checking
- Family planning
- Harm reduction
- Health promotion
- Human nutrition
  - Healthy diet
  - Preventive nutrition
- Hygiene
  - Food safety
  - Hand washing
  - Infection control
  - Oral hygiene
- Needle and syringe programmes
- Occupational safety and health
  - Human factors and ergonomics
  - Hygiene
  - Controlled Drugs
  - Injury prevention
  - Medicine
  - Nursing
- Patient safety
  - Organization
- Pharmacovigilance
- Reagent testing
- Safe sex
- Sanitation
  - Emergency
  - Fecal–oral transmission
  - Open defecation
  - Sanitary sewer
  - Waterborne diseases
  - Worker
- School hygiene
- Smoking cessation
- Supervised injection site
- Vaccination
- Vector control

Population health	○ Biostatistics
	○ Child mortality
	○ Community health
	○ Epidemiology
	○ Global health
	○ Health impact assessment
	○ Health system
	○ Infant mortality
	○ Open-source healthcare software
	○ Multimorbidity
	○ Public health informatics
	○ Social determinants of health
	  ○ Commercial determinants of health
	  ○ Health equity
	  ○ Race and health
	○ Social medicine

Biological and epidemiological statistics	○ Case–control study
	○ Randomized controlled trial
	○ Relative risk
	○ Statistical hypothesis testing
	  ○ Analysis of variance (ANOVA)
	  ○ Regression analysis
	  ○ ROC curve
	  ○ Student's *t*-test
	  ○ *Z*-test
	○ Statistical software

Infectious and epidemic disease prevention	○ Asymptomatic carrier
	○ Epidemics
	  ○ List
	○ Notifiable diseases
	  ○ List
	○ Public health surveillance
	  ○ Disease surveillance
	○ Quarantine
	○ Sexually transmitted infection
	○ Social distancing
	○ Tropical disease
	○ Vaccine trial
	○ WASH

Food hygiene and safety management	○ Food
	  ○ Additive
	  ○ Chemistry
	  ○ Engineering
	  ○ Microbiology
	  ○ Processing
	  ○ Safety
	  ○ Safety scandals
	○ Good agricultural practice
	○ Good manufacturing practice
	  ○ HACCP
	  ○ ISO 22000

Health behavioral sciences	○ Diffusion of innovations ○ Health belief model ○ Health communication ○ Health psychology ○ Positive deviance ○ PRECEDE–PROCEED model ○ Social cognitive theory ○ Social norms approach ○ Theory of planned behavior ○ Transtheoretical model

Organizations, education and history	**Organizations**	○ Caribbean ○ ○ Caribbean Public Health Agency ○ China ○ ○ Center for Disease Control and Prevention ○ Europe ○ ○ Centre for Disease Prevention and Control ○ ○ Committee on the Environment, Public Health and Food Safety ○ Russia ○ ○ Rospotrebnadzor ○ India ○ ○ Ministry of Health and Family Welfare ○ Canada ○ ○ Health Canada ○ ○ Public Health Agency ○ U.S. ○ ○ Centers for Disease Control and Prevention ○ ○ Health departments in the United States ○ ○ Council on Education for Public Health ○ ○ Public Health Service ○ World Health Organization ○ World Toilet Organization
	Education	○ (Full list) ○ Health education ○ Higher education ○ ○ Bachelor of Science in Public Health ○ ○ Doctor of Public Health ○ ○ Professional degrees of public health ○ ○ Schools of public health
	History	○ History of public health in the United Kingdom ○ History of public health in the United States ○ History of public health in Australia ○ Sara Josephine Baker ○ Samuel Jay Crumbine ○ Carl Rogers Darnall ○ Joseph Lister ○ Margaret Sanger ○ John Snow ○ Typhoid Mary ○ Radium Girls ○ Germ theory of disease ○ Social hygiene movement

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