

# Annex 1

## Glossary of terms used in Guidelines

This glossary does not aim to provide precise definitions of technical or scientific terms, but rather to explain in plain language the meaning of terms frequently used in these Guidelines.

- Abattoir** – Slaughterhouse where animals are killed and processed into food and other products.
- Advanced or tertiary treatment** – Treatment steps added after the secondary treatment stage to remove specific constituents, such as nutrients, suspended solids, organics, heavy metals or dissolved solids (e.g. salts).
- Anaerobic pond** – Treatment pond where anaerobic digestion and sedimentation of organic wastes occur; usually the first type of pond in a waste stabilization pond system; requires periodic removal of accumulated sludge formed as a result of sedimentation.
- Aquaculture** – Raising plants or animals in water (water farming).
- Aquifer** – A geological area that produces a quantity of water from permeable rock.
- Arithmetic mean** – The sum of the values of all samples divided by the number of samples; provides the average number per sample.
- Biochemical oxygen demand (BOD)** – The amount of oxygen that is required to biochemically convert organic matter into inert substances; an indirect measure of the amount of biodegradable organic matter present in the water or wastewater.
- Blackwater** – Source-separated wastewater from toilets, containing faeces, urine and flushing water (and eventually anal cleansing water in “washing” communities).
- Buffer zone** – Land that separates wastewater, excreta and/or greywater use areas from public access areas; used to prevent exposures to the public from hazards associated with wastewater, excreta and/or greywater.
- Cartage** – The process of manually transporting faecal material off site for disposal or treatment.
- Coagulation** – The clumping together of particles to increase the rate at which sedimentation occurs. Usually triggered by the addition of certain chemicals (e.g. lime, aluminium sulfate, ferric chloride).
- Constructed wetlands** – Engineered pond or tank-type units to treat faecal sludge or wastewater; consist of a filtering body planted with aquatic emergent plants.
- Cost-benefit analysis** – An analysis of all the costs of a project and all of the benefits. Projects that provide the most benefits at the least cost are the most desirable.
- Cyst** – Environmentally resistant infective parasitic life stage (e.g. *Giardia*, *Taenia*).
- Cysticercosis** – Infection with *Taenia solium* (pig tapeworm) sometimes leads to cysticerci (an infective life stage) encysting in the brain of humans, leading to neurological symptoms such as epilepsy.
- Depuration** – Transfer of fish to clean water prior to consumption in an attempt to purge their bodies of contamination, potentially including some pathogenic microorganisms.
- Diarrhoea** – Loose, watery and frequent bowel movements, often associated with an infection.
- Disability adjusted life years (DALYs)** – Population metric of life years lost to disease due to both morbidity and mortality.
- Disease** – Symptoms of illness in a host, e.g. diarrhoea, fever, vomiting, blood in urine, etc.
- Disinfection** – The inactivation of pathogenic organisms using chemicals, radiation, heat or physical separation processes (e.g. membranes).

- Drain** – A conduit or channel constructed to carry off stormwater runoff, wastewater or other surplus water. Drains can be open ditches or lined, unlined or buried pipes.
- Drip irrigation** – Irrigation delivery systems that deliver drips of water directly to plants through pipes. Small holes or emitters control the amount of water that is released to the plant. Drip irrigation does not contaminate aboveground plant surfaces.
- Dual-media filtration** – Filtration technique that uses two types of filter media to remove particulate matter with different chemical and physical properties (e.g. sand, anthracite, diatomaceous earth).
- Effluent** – Liquid (e.g. treated or untreated wastewater) that flows out of a process or confined space).
- Encyst** – The development of a protective cyst for the infective stage of different parasites (e.g. helminths such as foodborne trematodes, tapeworms, and some protozoa such as *Giardia*).
- Epidemiology** – The study of the distribution and determinants of health-related states or events in specified populations, and the application of this study to the control of health problems.
- Escherichia coli* (*E. coli*)** – A bacterium found in the gut, used as an indicator of faecal contamination of water.
- Excreta** – Faeces and urine (see also faecal sludge, septage and nightsoil).
- Exposure** – Contact of a chemical, physical or biological agent with the outer boundary of an organism (e.g. through inhalation, ingestion or dermal contact).
- Exposure assessment** – The estimation (qualitative or quantitative) of the magnitude, frequency, duration, route and extent of exposure to one or more contaminated media.
- Facultative pond** – Aerobic pond used to degrade organic matter and inactivate pathogens; usually the second type of pond in a waste stabilization pond system.
- Faecal sludge** – Sludges of variable consistency collected from on-site sanitation systems, such as latrines, non-sewered public toilets, septic tanks and aqua privies. Septage, the faecal sludge collected from septic tanks, is included in this term (see also excreta and nightsoil).
- Flocculation** – The agglomeration of colloidal and finely divided suspended matter after coagulation by gentle stirring by either mechanical or hydraulic means.
- Geometric mean** – A measure of central tendency, just like a median. It is different from the traditional mean (which is called the arithmetic mean) because it uses multiplication rather than addition to summarize data values. The geometric mean is a useful summary when changes in the data occur in a relative fashion.
- Greywater** – Water from the kitchen, bath and/or laundry, which generally does not contain significant concentrations of excreta.
- Groundwater** – Water contained in rocks or subsoil.
- Grow-out pond** – Pond used to raise adult fish from fingerlings.
- Hazard** – A biological, chemical, physical or radiological agent that has the potential to cause harm.
- Health-based target** – A defined level of health protection for a given exposure. This can be based on a measure of disease, e.g.  $10^{-6}$  DALY per person per year, or the absence of a specific disease related to that exposure.
- Health impact assessment** – The estimation of the effects of any specific action (plans, policies or programmes) in any given environment on the health of a defined population.

- High-growing crops** – Crops that grow above the ground and do not normally touch it (e.g. fruit trees).
- High-rate treatment processes** – Engineered treatment processes characterized by high flow rates and low hydraulic retention times. Usually include a primary treatment step to settle solids followed by a secondary treatment step to biodegrade organic substances.
- Hydraulic retention time** – Time the wastewater takes to pass through the system.
- Hypochlorite** – Chemical frequently used for disinfection (sodium or calcium hypochlorite).
- Indicator organisms** – Microorganisms whose presence is indicative of faecal contamination and possibly of the presence of more harmful microorganisms.
- Infection** – The entry and development or multiplication of an infectious agent in a host. Infection may or may not lead to disease symptoms (e.g. diarrhoea). Infection can be measured by detecting infectious agents in excreta or colonized areas or through measurement of a host immune response (i.e. the presence of antibodies against the infectious agent).
- Intermediate host** – The host occupied by juvenile stages of a parasite prior to the definitive host and in which asexual reproduction often occurs (e.g. for foodborne trematodes or schistosomes the intermediate hosts are specific species of snails).
- Legislation** – Law enacted by a legislative body or the act of making or enacting laws.
- Localized irrigation** – Irrigation application technologies that apply the water directly to the crop, either through drip irrigation or bubbler irrigation. Generally use less water and result in less crop contamination and reduce human contact with the wastewater.
- Log reduction** – Organism removal efficiencies: 1 log unit = 90%; 2 log units = 99%; 3 log units = 99.9%; and so on.
- Low-growing crops** – Crops that grow below, on or near the soil surface (e.g. carrots, lettuce).
- Low-rate biological treatment systems** – Use biological processes to treat wastewater in large basins, usually earthen ponds. Characterized by long hydraulic retention times. Examples of low-rate biological treatment processes include waste stabilization ponds, wastewater storage and treatment reservoirs and constructed wetlands.
- Maturation pond** – An aerobic pond with algal growth and high levels of bacterial removal; usually the final type of pond in a waste stabilization pond system.
- Median** – The middle value of a sample series (50% of the values in the sample are lower and 50% are greater than the median).
- Membrane filtration** – Filtration technique based on a physical barrier (a membrane) with specific pore sizes that traps contaminants larger than the pore size on the top surface of the membrane. Contaminants smaller than the specified pore size may pass through the membrane or may be captured within the membrane by some other mechanism.
- Metacercariae (infective)** – Life cycle stage of trematode parasites infective to humans. Metacercariae can form cysts in fish muscle tissue or on the surfaces of plants, depending on the type of trematode species.
- Multiple barriers** – Use of more than one preventive measure as a barrier against hazards.
- Nightsoil** – Untreated excreta transported without water, e.g. via containers or buckets; often used as a popular term in an unspecific manner to designate faecal matter of any origin; its technical use is therefore not recommended.

- Off-site sanitation** – System of sanitation where excreta are removed from the plot occupied by the dwelling and its immediate surroundings.
- On-site sanitation** – System of sanitation where the means of storage are contained within the plot occupied by the dwelling and its immediate surroundings. For some systems (e.g. double-pit or vault latrines), treatment of the faecal matter happens on site also, through extended in-pit consolidation and storage. With other systems (e.g. septic tanks, single-pit or vault installations), the sludge has to be collected and treated off site (see also faecal sludge).
- Oocyst** – A structure that is produced by some coccidian protozoa (i.e. *Cryptosporidium*) as a result of sexual reproduction during the life cycle. The oocyst is usually the infectious and environmental stage, and it contains sporozoites. For the enteric protozoa, the oocyst is excreted in the faeces.
- Operational monitoring** – The act of conducting a planned sequence of observations or measurements of control parameters to assess whether a control measure is operating within design specifications (e.g. for wastewater treatment turbidity). Emphasis is given to monitoring parameters that can be measured quickly and easily and that can indicate if a process is functioning properly. Operational monitoring data should help managers to make corrections that can prevent hazard break-through.
- Overhanging latrine** – A latrine that empties directly into a pond or other water body.
- Pathogen** – A disease-causing organism (e.g. bacteria, helminths, protozoa and viruses).
- pH** – An expression of the intensity of the basic or acid condition of a liquid.
- Policy** – The set of procedures, rules and allocation mechanisms that provide the basis for programmes and services. Policies set priorities and often allocate resources for their implementation. Policies are implemented through four types of policy instruments: laws and regulations; economic measures; information and education programmes; and assignment of rights and responsibilities for providing services.
- Primary treatment** – Initial treatment process used to remove settleable organic and inorganic solids by sedimentation and floating substances (scum) by skimming. Examples of primary treatment include primary sedimentation, chemically enhanced primary sedimentation and upflow anaerobic sludge blanket reactors.
- Quantitative microbial risk assessment (QMRA)** – Method for assessing risk from specific hazards through different exposure pathways. QMRA has four components: hazard identification; exposure assessment; dose–response assessment; and risk characterization.
- Regulations** – Rules created by an administrative agency or body that interpret the statute(s) setting out the agency’s purpose and powers or the circumstances of applying the statute.
- Restricted irrigation** – Use of wastewater to grow crops that are not eaten raw by humans.
- Risk** – The likelihood of a hazard causing harm in exposed populations in a specified time frame, including the magnitude of that harm.
- Risk assessment** – The overall process of using available information to predict how often hazards or specified events may occur (likelihood) and the magnitude of their consequences.
- Risk management** – The systematic evaluation of the wastewater, excreta or greywater use system, the identification of hazards and hazardous events, the assessment of risks and the development and implementation of preventive strategies to manage the risks.

**Secondary treatment** – Wastewater treatment step that follows primary treatment.

Involves the removal of biodegradable dissolved and colloidal organic matter using high-rate, engineered aerobic biological treatment processes. Examples of secondary treatment include activated sludge, trickling filters, aerated lagoons and oxidation ditches.

**Septage** – Sludge removed from septic tanks.

**Septic tank** – An underground tank that treats wastewater by a combination of solids settling and anaerobic digestion. The effluents may be discharged into soak pits or small-bore sewers.

**Sewage** – Mixture of human excreta and water used to flush the excreta from the toilet and through the pipes; may also contain water used for domestic purposes.

**Sewer** – A pipe or conduit that carries wastewater or drainage water.

**Sewerage** – A complete system of piping, pumps, basins, tanks, unit processes and infrastructure for the collection, transporting, treating and discharging of wastewater.

**Sludge** – A mixture of solids and water that settles to the bottom of latrines, septic tanks and ponds or is produced as a by-product of wastewater treatment (sludge produced from the treatment of municipal or industrial wastewater is not discussed in this volume).

**Source separation** – Diversion of urine, faeces, greywater or all, followed by separate collection (and treatment).

**Subsurface irrigation** – Irrigation below the soil surface; prevents contamination of aboveground parts of crops

**Surface water** – All water naturally open to the atmosphere (e.g. rivers, streams, lakes and reservoirs).

**Thermotolerant coliforms** – Group of bacteria whose presence in the environment usually indicates faecal contamination; previously called faecal coliforms.

**Tolerable daily intake (TDI)** – Amount of toxic substance that can be taken on a daily basis over a lifetime without exceeding a certain level of risk

**Tolerable health risk** – Defined level of health risk from a specific exposure or disease that is tolerated by society, used to set health-based targets.

**Turbidity** – The cloudiness of water caused by the presence of fine suspended matter.

**Ultraviolet radiation (UV)** – Light waves shorter than visible blue-violet waves of the spectrum (from 380 to 10 nanometres) used for pathogen inactivation (bacteria, protozoa and viruses).

**Unrestricted irrigation** – The use of treated wastewater to grow crops that are normally eaten raw.

**Upflow anaerobic sludge blanket reactor** – High-rate anaerobic unit used for the primary treatment of domestic wastewater. Wastewater is treated during its passage through a sludge layer (the sludge “blanket”) composed of anaerobic bacteria. The treatment process is designed primarily for the removal of organic matter (biochemical oxygen demand).

**Validation** – Testing the system and its individual components to prove that it is capable of meeting the specified targets (i.e. microbial reduction targets). Should take place when a new system is developed or new processes are added.

**Vector** – Insect that carries disease from one animal or human to another (e.g. mosquitoes).

**Vector-borne disease** – Diseases that can be transmitted from human to human via insects (e.g. malaria).

- Verification monitoring** – The application of methods, procedures, tests and other evaluations, in addition to those used in operational monitoring, to determine compliance with the system design parameters and/or whether the system meets specified requirements (e.g. microbial water quality testing for *E. coli* or helminth eggs, microbial or chemical analysis of irrigated crops).
- Waste-fed aquaculture** – Use of wastewater, excreta and/or greywater as inputs to aquacultural systems.
- Waste stabilization ponds (WSP)** – Shallow basins that use natural factors such as sunlight, temperature, sedimentation, biodegradation, etc., to treat wastewater or faecal sludges. Waste stabilization pond treatment systems usually consist of anaerobic, facultative and maturation ponds linked in series.
- Wastewater** – Liquid waste discharged from homes, commercial premises and similar sources to individual disposal systems or to municipal sewer pipes, and which contains mainly human excreta and used water. When produced mainly by household and commercial activities, it is called domestic or municipal wastewater or domestic sewage. In this context, domestic sewage does not contain industrial effluents at levels that could pose threats to the functioning of the sewerage system, treatment plant, public health or the environment.
- Withholding period** – Time to allow pathogen die-off between waste application and harvest.