
Glossary

Most of the definitions presented in the glossary have been taken from the *Water Footprint Manual* (Hoesktra *et al.*, 2011), the European *Water Framework Directive* (EC, 2000) and the *European Environment Agency online multilingual environmental glossary* (EEA, 2012). These are in line with the significant work of the UN Statistics Division on *System of Environmental-Economic Accounting for Water (SEEA-Water)* (UN Statistics Division, 2012).

Available groundwater resource It means the long-term annual average rate of overall recharge of the body of groundwater less the long-term annual rate of flow required to achieve the ecological quality objectives for associated surface waters, to avoid any significant diminution in the ecological status of such waters and to avoid any significant damage to associated terrestrial ecosystems.

Blue water Fresh surface water and groundwater, i.e. the water in freshwater lakes, rivers and aquifers.

Blue water availability Runoff (through groundwater and rivers) minus environmental requirements, such as river environmental flows or wetland needs. Blue water availability typically varies within the year and from year to year as well.

Blue water footprint Volume of surface and groundwater appropriated by humans to produce or consume a good or service. Consumption refers to the volume of freshwater used and then evaporated or incorporated into a product. It also includes water abstracted from surface or groundwater in a catchment and transferred to another catchment or disposed into the sea or saline water bodies. It is the amount of water abstracted from groundwater or surface water that does not return to the catchment from which it was withdrawn.

Blue water scarcity The ratio of blue water footprint to blue water availability. Blue water scarcity varies within the year and from year to year.

Body of groundwater It means a distinct volume of groundwater within an aquifer or aquifers.

Body of surface water It means a discrete and significant element of surface water such as a lake, a reservoir, a stream, river or canal, part of a stream, a transitional water or a stretch of coastal water.

Crop yield Weight of harvested crop per unit of harvested area. It can be measured in terms of dry matter.

Direct water footprint The direct water footprint of a consumer or producer (or a group of consumers or producers) refers to the freshwater consumption and pollution that is associated to the water use by the consumer or producer. It is distinct from the indirect water footprint, which refers to the water consumption and pollution that can be associated with the production of the goods and services consumed by the consumer or the inputs used by the producer.

Economic water productivity (or apparent water productivity) Economic value of the products produced per unit of water consumption or pollution. See also *water productivity*. It is a ratio of production value over water consumption, and differs from the marginal value (the productivity of the last unit of water), generally used to determine allocation efficiency.

Ecosystem green water requirements (or terrestrial ecosystem water requirements) The amount of green water consumed by forest and other terrestrial ecosystems, which contributes to the supply of ecosystem services at a wide range of spatial and temporal scales.

Ecosystem water requirements The amount of green water and blue water consumed by aquatic and terrestrial ecosystems, which contributes to the supply of ecosystem services at a wide range of spatial and temporal scales.

Environmental flow requirements (or aquatic ecosystem water requirements or ecosystem blue water requirements) The quantity, quality and timing of water flows required to sustain freshwater and estuarine ecosystems and the human livelihoods and well-being that depend on these ecosystems.

Environmental security When social systems interact with ecological systems in a sustainable ways, all individuals have fair and accessible access to ecosystem services, and mechanisms exists to prevent environmental degradation and crisis.

Evapotranspiration This term represents the combination of evaporative losses from the soil surface and transpiration from the plant surface. These two phenomena occur simultaneously and there is no easy way of distinguishing between them.

Extended water footprint The extended water footprint (EWF) refers to a set of indicators for economic and quantitative analysis of water resources. The EWF combines the contribution of the standard water footprint accounting in terms of water consumed/polluted with an economic perspective primarily based on the determination of the economic value of water.

Food security Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life.

Good groundwater chemical status It is the chemical status of a groundwater body whose chemical composition: is not affected by salt intrusion; meets the established quality requirements; does not prevent that the associated surface waters achieve the established environmental objectives; and does not cause significant damages to the associated terrestrial ecosystems.

Good groundwater quantitative status It is the status of a groundwater body where: the average annual abstraction rate on the long term is lower than the available water resources, and is not affected by anthropogenic alterations that can prevent that the associated surface waters achieve the established environmental objectives or can cause water salinization or other intrusion.

- Good groundwater status** It means the status achieved by a groundwater body when both its quantitative status and its chemical status are at least *good*.
- Good surface water status** It means the status achieved by a surface water body when both its ecological status and its chemical status are at least *good*.
- Green water** The precipitation on land that does not run off or percolate deeply recharging the groundwater, and is stored in the soil or temporarily stays on top of the soil or vegetation. It corresponds to the pedologic water, or water hold in the rootzone.
- Green water footprint** Volume of rainwater consumed during the vegetal production process. This is particularly relevant for agricultural and forestry products (products based on crops or wood), where it refers to the total rainwater evapotranspiration (from fields and plantations) plus the water incorporated into the harvested crop or wood.
- Grey water footprint** The grey water footprint of a product is an indicator of freshwater pollution that can be associated with the production of a product over its full supply chain. It is defined as the volume of freshwater that is required to assimilate the load of pollutants based on existing ambient water quality standards. It is calculated as the volume of water that is required to dilute pollutants to such an extent that the quality of the water remains above agreed water quality standards.
- Gross value added (GVA)** It is the value of goods and services produced in an economy at different stages of the productive process. The gross value added at market prices is equal to the gross output (value of production) minus the intermediate consumption.
- Groundwater** It means all water which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil.
- Groundwater governance** It is the exercise of political, economic and administrative authority in the management of groundwater resources at all levels comprising the mechanisms, processes and institutions through which the citizens of the nation articulate their interests, mediate their differences and fulfil their legal rights and obligations to ensure sustainable and efficient utilization of groundwater resources for the benefit of humankind and dependent ecosystems.
- Groundwater recharge** The process by which external water is added to the zone of saturation of an aquifer, either directly into a formation or indirectly by way of another formation.
- Indirect water footprint** The indirect water footprint of a consumer or producer refers to the freshwater consumption and pollution *behind* products being consumed or produced. It is equal to the sum of the water footprints of all products consumed by the consumer or of all (non-water) inputs used by the producer.
- Infiltration** It refers to the downward movement of water into soils and may be defined for rain or ponded conditions.
- Net Income** It is equal to the income that a firm or a nation has after subtracting costs and expenses from the total revenue. Net income is an accounting term. It refers to the GVA plus subsidies and taxes, minus the consumption of fixed capital and salary payments, rentals and interests.
- Pollution** Pollution means the direct or indirect introduction, as a result of human activity, of substances or heat into the air, water or land which may be harmful

to human health or the quality of aquatic ecosystems or terrestrial ecosystems directly depending on aquatic ecosystems, which result in damage to material property, or which impair or interfere with amenities and other legitimate uses of the environment.

Renewable resources Natural resources that, after exploitation, can return to their previous stock levels by natural processes of growth or replenishment.

River basin district It means the area of land and sea, made up of one or more neighbouring river basins together with their associated groundwater and coastal waters, which is identified under Article 3(1) of the Water Framework Directive (WFD) as the main unit for management of river basins.

Surface water Surface water means inland waters, except groundwater; transitional waters and coastal waters, except in respect of chemical status for which it shall also include territorial waters.

Value of production It is defined as the total economic value received for the commodities sold in the market.

Virtual water export The virtual water export from a geographically delineated area (e.g. a nation or catchment area) is the volume of virtual water associated with the export of goods or services from the area. It is the total volume of fresh-water consumed or polluted to produce the products for export.

Virtual water flow The virtual water flow between two geographically delineated areas (e.g. two nations) is the volume of virtual water that is being transferred from the one to another area as a result of product trade.

Virtual water import The virtual water import into a geographically delineated area (e.g. a nation or catchment area) is the volume of virtual water associated with the import of goods or services into the area. It is the total volume of fresh-water used (in the export areas) to produce the products. Viewed from the perspective of the importing area, this water can be seen as an additional source of water that comes on top of the available water resources within the area itself.

Water abstraction See *water withdrawal*.

Water consumption The volume of freshwater used and then evaporated or incorporated into a product. It also includes water abstracted from surface or groundwater in a catchment and returned to another catchment or the sea.

Water demand It is defined as the volume of water requested by users to satisfy their needs. In a simplified way it is often considered equal to water abstraction, although conceptually the two terms do not have the same meaning. In economic terms, demand is the willingness of users/companies to pay for a specific service or product.

Water footprint The water footprint is an indicator of freshwater use that looks at both direct and indirect water use of a consumer or producer. The water footprint of an individual, community or business is defined as the total volume of freshwater that is used to produce the goods and services consumed by the individual or community or produced by the business. Water use is measured in terms of water volumes consumed (evaporated) and/or polluted per unit of time. A water footprint can be calculated for a particular product, for any well-defined group of consumers (e.g. an individual, family, village, city, province, catchment, given geographical area, state or nation) or producers (e.g. a public organization, private enterprise or economic sector). The water footprint is a geographically

explicit indicator, not only showing volumes of water use and pollution, but also the locations.

Water footprint of a product The water footprint of a product (a commodity, good or service) is the total volume of freshwater used to produce the product, summed over the various steps of the production chain. The water footprint of a product refers not only to the total volume of water used; it also refers to where and when the water is used.

Water footprint of the consumption of a geographically delineated area It is defined as the total amount of freshwater that is used to produce the goods and services consumed by the inhabitants of a geographically delineated area. Part of this water footprint lies outside the boundaries of the area. The term should not be confused with the *water footprint within a geographically delineated area*, which refers to the total freshwater volume consumed or polluted within the boundaries of the area.

Water footprint within a geographically delineated area It is defined as the total freshwater consumption and pollution within the boundaries of the area. The area can be, for example, a hydrological unit like a catchment area or a river basin or an administrative unit like a municipality, province, state or nation.

Water productivity Product units produced per unit of water consumption or pollution. Water productivity (product units/m³) is the inverse of the water footprint (m³/product unit). Blue water productivity refers to the product units obtained per m³ of blue water consumed. Green water productivity refers to the product units obtained per m³ of green water consumed. Grey water productivity refers to the product units obtained per m³ of grey water produced. The term *water productivity* is a similar term as the terms labour productivity or land productivity, but now production is divided over the water input. When water productivity is measured in monetary output instead of physical output per unit of water, one can speak about *economic water productivity*.

Water security Water security is defined as the availability of an acceptable quantity and quality of water for health, livelihoods, ecosystems and production, coupled with an acceptable level of water-related risks to people, environments and economies.

Water use Three types of water use are distinguished: a) withdrawal, where water is taken from a river, or surface or underground reservoir, and after use returned to a natural water body, e.g. water used for cooling in industrial processes. Such return flows are particularly important for downstream users in the case of water taken from rivers; b) consumptive, which starts with withdrawal but in this case without any return, e.g. irrigation, steam escaping into the atmosphere, water contained in final products, i.e. it is no longer available directly for subsequent uses; c) non-withdrawal, i.e. the in situ use of a water body for navigation (including the floating of logs by the lumber industry), fishing, recreation, effluent disposal and hydroelectric power generation.

Water withdrawal It is the volume of freshwater abstraction from a surface or groundwater source. Part of the freshwater withdrawal will evaporate, another part will return to the catchment where it was withdrawn and yet another part may return to another catchment or the sea.

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