**Table S1: Overview of Water Scarcity Metrics and Water Stress Thresholds.**

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| **Indicator** | **Definition** | **Thresholds** | **Explanation** | **Originator** |
| **Per capita water availability** |
| Water Stress Index, Falkenmark Index | Available water normalized by population | < 100 persons/flow unit (one million cubic meters per year) = limited water management problems; 100-500 p/FU = general water management problems; 500-1000 p/FU = water stress; 1000-2000 p/FU = chronic water scarcity; 2000 p/FU = water barrier | Based on estimates of water requirements in the household, agricultural, industrial and energy sectors, and the needs of the environment. Original commentary included extended discussion of possibility for green water to fulfill much of this need. | Falkenmark, M., & Lindh, G. (mid-1970s); Falkenmark M, Lundqvist J, Widstrand C (1989) |
|  |  | Adjustment of water stress level from 500 p/FU to 600 p/FU  | "In a first effort to characterize the water scarcity in Africa along these lines (14), the water competition level 500 p/flow unit was chosen as the lower level of the water stressed condition. It turned out, however, that half the population was included in the lower part of that interval. Therefore, in this study the lower limit was raised to 600 in order not to exaggerate the situation." | Falkenmark M. (1989) The Massive Water Scarcity Now Threatening Africa: Why Isn't It Being Addressed? Ambio 18, 112-118. |
|  |  |  >1700 m3 per capita per year = adequate water;1,000-1,7000 m3/y = water stress;500-1000 m3/y = water scarcity; < 500 m3/y = absolute scarcity | Recalculation, with rounding, of p/FU to m3 per capita per year. Document states this conversion has been made earlier, but this was the earliest I identified. Cutoff for adequate water (1,700 m3/y) is rounded up from a conversion of 600 p/FU, which originally demarcated the threshold between "general water management problems" and "water stress" | Engelman R. & LeRoy P. (1993) Sustaining water. Population and the future of renewable water supplies. Population Action International, Washington, DC. |
| Basic Human Water Requirement | Daily water requirement for basic human needs | Suggests am absolute minimum of 25 liters per person per day for drinking and sanitation | Based on estimates of personal water requirements in various climates | Gleick P.H. (1996) Basic Water Requirements for Human Activities: Meeting Basic Needs. Water International 21, 83-92. |
| **Use to Availability** |
| withdrawal-to-availability ratio (WTA), consumption-to-availability ratio, use-to-availability ratio, water use to resource ratio, Criticality ratio, water satisfaction ratio | Some measure of use (demand, withdrawals, or consumption) relative to availability (mean annual runoff, hydrologic calculation of annual renewable water). Refinements include decreasing temporal and spatial scale. | Mean annual runoff/withdrawals > 20 = favorable, interference only in highly concentrated areas; 10-20 = generally acceptable, some districts with temporary water shortage and regional water plans necessary; 5-10 = inadequate, comprehensive planning and considerable investment required;<5 = water is a limiting factor of the economic development  | Commentary suggests this classification was developed to describe the cost of infrastructure in post-water Europe. Focus seems to be primarily on dilution and water treatment. | Balcerski W. (1964) Javaslat a vízi létesítmények osztályozásának új alapelveire / A proposal toward new principles underpinning the classification of water conditions. Vízgazdálkodás : a vízügyi dolgozók lapja (Water Management) 4, 134-136. Cited by Szesztay K. (1970) The hydrosphere and the human environment. Paper presented IASH Symposium Wellington. |
|  |  | Withdrawal/runoff: 10-20% = water resources are inadequate, comprehensive planning and considerable investment required; >20% water is a limiting factor of the economic development | Describes this as a "rough characterization" and cites Szesztay | Falkenmark M. & Lindh G. (1974) How Can We Cope with the Water Resources Situation by the Year 2015? Ambio 3, 114-122. |
|  |  | Use/availability: <10% = low water stress; 10-20% = moderate water stress; 20-40% = medium-high water stress; >40% = high water stress.  | Addition of higher-stress category and re-naming of water stress categories. Cites Falkenmark and Lindh (1976) and others for 20% threshold. 40% cutoff cited only as "The other demarcations are based on estimates in the literature." | Raskin P., Gleick P., Kirshen P. et al. (1997) Water futures: assessment of long-range patterns and problems. Comprehensive assessment of the freshwater resources of the world. SEI. Adopted by and cited as United Nations Commission on Sustainable Development. (1997) Comprehensive assessment of the freshwater resources of the world. p. 88. United Nations Economic and Social Council. |
| **Environmental Flow Withholding** |
| Water Stress Indicator | Use relative to availability less environmental flow requirements | Withdrawal/(Mean annual runoff - Environmental Water Requirement): >1 = Overexploited (current water use is tapping into EWR)— environmentally water scarce basins; 0.6-1 = Heavily exploited, environmentally water stressed basins; 0.3-0.6 = Moderately exploited; < 0.3 = Slightly exploited. | "These categories, as well as the categories suggested in table 2, were rather arbitrary. However, the following should be taken into account while interpreting WSI values. Water problems usually aggravate during the dry season of the year or in drought years. The methods at present do not suggest means of addressing this seasonal issue as average annual values are used throughout the study. It is however very likely that in basins with a high WSI, EWR are tapped into during dry periods and during dry years. This is why the basins with WSI values of 0.6 may be classified as water stressed. | Smakhtin V., Revenga C. & Doll P. (2004) Taking into account environmental water requirements in global-scale water resources assessments.  |
| Consumption to Q90 ratio | average monthly consumption relative to “Q90” (monthly discharge is higher than the Q90 value 90% of the time) | > 1 | "A value of one or greater for the consumption-to-Q90 ratio implies that the entire low monthly runoff in a river basin is depleted." | Alcamo J., Flörke M. & Marker M. (2007) Future long-term changes in global water resources driven by socio-economic and climatic changes. Hydrological Sciences Journal 52, 247-275. |
| **Inter- and Intra-annual Compound Use-to-Availability** |
| Cumulative Withdrawal to Demand ratio (CWD) | compares cumulative daily withdrawals to cumulative daily demand, where withdrawals are limited by availability (which can include environmental flows) | CWD≥0.8 indicates low or no stress;0.5≤CWD<0.8 denotes medium stress;CWD≤0.5 represents high stress | "These criteria were determined arbitrarily so that the highly stressed areas generally involve a well-established WWR" (withdrawal to availability ratio) | Hanasaki N., Kanae S., Oki T. et al. (2008) An integrated model for the assessment of global water resources – Part 2: Applications and assessments. Hydrology and Earth System Science 12, 1027-1037. |
| Blue Water Sustainability Index (BlWSI) | ratio of nonrenewable groundwater abstraction plus surface water over-abstraction (includes environmental flow requirement) to consumptive blue water use. The BlWSI is a dimensionless quantity and ranges between 0 and 1, which essentially expresses the fraction of the CBWU that is met from unsustainable water resources | 0-0.01; 0.01-0.05; 0.05-0.1; 0.1-0.15; 0.15-0.2; 0.2-0.25; 0.25-0.5; >0.5 | No normative description of levels | Wada Y. & Bierkens M.F.P. (2014) Sustainability of global water use: past reconstruction and future projections. Environmental Research Letters 9, 104003. |
| Dynamic Water Stress Index (DWSI) | a compound statistic calculated from the monthly time series combining the mean duration and the frequency of water scarcity with the severity of the water stress | 0-0.2; 0.2-0.4; 0.4-0.6;0.6-0.8; 0.8-1 | Describes extent and frequency of monthly withdrawal-to-availability ratio exceeding 0.4. ; No normative description of levels | Wada Y., van Beek L.P.H., Viviroli D. et al. (2011) Global monthly water stress: 2. Water demand and severity of water stress. Water Resources Res 47, W07518. |
| **Integrated Water Stress Indicators (examples)** |
| Economic water scarcity |  |  |  | Seckler D., Amarasinghe U., Molden D. et al. (1998) World water demand and supply, 1990 to 2025: Scenarios and issues. Research Report. International Water Management Institute (IWMI), Colombo, Sri Lanka. |
| Water Poverty Index |  |  |  | Sullivan C. (2002) Calculating a Water Poverty Index. World Development 30, 1195-1210. |
| Watershed Sustainability Index (WSI)  |  |  |  | Chaves H. & Alipaz S. (2007) An Integrated Indicator Based on Basin Hydrology, Environment, Life, and Policy: The Watershed Sustainability Index. Water Resources Management 21, 883-895. |
| Human Water Security Threat |  |  |  | Vorosmarty C.J., McIntyre P., Gessner M.O. et al. (2010) Global threats to human water security and river biodiversity. Nature 467, 555-561. |
| Water Footprint |  |  |  | Hoekstra A.Y. (2013) The water footprint of modern consumer society. Earthscan, London. |
| Life Cycle Analysis |  |  |  | Boulay A.-M., Bare J., De Camillis C. et al. (2015) Consensus building on the development of a stress-based indicator for LCA-based impact assessment of water consumption: outcome of the expert workshops. The International Journal of Life Cycle Assessment, 1-7. |