

Facts About Global Groundwater Usage

compiled by



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- Groundwater is the world's most extracted raw material with withdrawal rates currently in the estimated range of 982 km³/year.¹
- About 70% of groundwater withdrawn worldwide is used for agriculture.²
- Groundwater provides almost half of all drinking water worldwide.³
- Globally, about 38% of irrigated lands are equipped for irrigation with groundwater.⁴
- The total volume of groundwater in the upper 2 km of the Earth's continental crust (not inclusive of high-latitude North America or Asia) is approximately 22.6 million km³, of which 0.1 million km³ to 5.0 million km³ is less than 50 years old (judged as "modern" or recently recharged).⁵
- The volume of modern groundwater is equivalent to a body of water with a depth of about 3 m spread over the continents.⁶



The 15 nations with the largest estimated annual groundwater extractions (2010)⁷ are:

Country	Population 2010 (in thousands)	Groundwater extraction			
		Estimated groundwater extraction 2010 (km ³ /yr)	Breakdown by sector		
			Groundwater extraction for irrigation (%)	Groundwater extraction for domestic use (%)	Groundwater extraction for industry (%)
India	1224614	251.00	89	9	2
China	1341335	111.95	54	20	26
United States	310384	111.70	71	23	6
Pakistan	173593	64.82	94	6	0
Iran	73974	63.40	87	11	2
Bangladesh	148692	30.21	86	13	1
Mexico	113423	29.45	72	22	6
Saudi Arabia	27448	24.24	92	5	3
Indonesia	239871	14.93	2	93	5
Turkey	72752	13.22	60	32	8
Russia	142985	11.62	3	79	18
Syria	20411	11.29	90	5	5
Japan	126536	10.94	23	29	48
Thailand	69122	10.74	14	60	26
Italy	60551	10.40	67	23	10

¹ Margat, J., and J. van der Gun. 2013. *Groundwater around the World*. CRC Press/Balkema.

² *Ibid.*

³ Smith, M., K. Cross, M. Paden, and P. Laban. 2016. *Spring — Managing groundwater sustainability*. IUCN, Gland, Switzerland.

⁴ Siebert, S., et al. 2010. Groundwater use for irrigation — a global inventory. *Hydrology and Earth Systems Science* 14, no. 10: 1863–1880. www.hydrol-earth-syst-sci.net/14/1863/2010/doi:10.5194/hess-14-1863-2010.

⁵ Gleeson, T., K.M. Befus, S. Jasechko, E. Luijendijk, and M.B. Cardendas. 2016. The global volume and distribution of modern groundwater. *Nature Geoscience* 9, no. 2: 161-167.

⁶ *Ibid.*

⁷ Margat, J., and J. van der Gun. 2013. *Groundwater around the World*. CRC Press/Balkema.

The 15 nations with groundwater having the largest share in total annual freshwater withdrawals, ranked by all water use sectors⁸

Country or territory	Groundwater share in total freshwater withdrawal (excluding reservoir losses)			
	All water use sectors (%)	Irrigation sector (%)	Domestic water sector (%)	Industry sector (%)
Bahrain	100	90	100	100
Barbados	100	Not reported	Not reported	Not reported
Malta	100	100	100	100
Montenegro	100	Not reported	100	Not reported
Palestinian Territory	100	61	69	Not reported
Oman	100	97	100	100
Qatar	100	84	100	0
United Arab Emirates	100	84	0	0
Denmark	98	Not reported	Not reported	Not reported
Libya	98	97	100	100
Croatia	97	Not reported	100	100
Iceland	97	Not reported	Not reported	Not reported
Djibouti	95	95	67	100
Saudi Arabia	95	94	100	100
Mongolia	91	83	100	100

⁸ Margat, J., and J. van der Gun. 2013. *Groundwater around the World*. CRC Press/Balkema.

The National Ground Water Association has prepared, with permission of the authors and the publisher, an Excel® spreadsheet that captures information such as in these tables for 234 nations. To request a copy, email ngwa@ngwa.org and enter "World groundwater use spreadsheet" in the subject line.



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