

Freshwater Withdrawal by Country and Sector (2013 Update)

Description

As with data table 1, this table on freshwater withdrawals has appeared in some form in every volume of *The World's Water* and remains highly popular. The use of water varies greatly from country to country and from region to region. Data on water use by regions and by different economic sectors are among the most sought after in the water resources area. Ironically, these data are often the least reliable and most inconsistent of all water resources information. This table includes the data available on total freshwater withdrawals by country in cubic kilometers per year and cubic meters per person per year, using national population estimates from 2010. The table also gives the breakdown of that water use by the municipal, agricultural, and industrial sectors, in both percentage of total water use and cubic meters per person per year. Note that “municipal” withdrawals were previously called “domestic” withdrawals and now often include some estimates of commercial and institutional use in the single category.

Data for a number of countries have been updated in this table since the previous volume of *The World's Water*. The AQUASTAT database of the Food and Agriculture Organization of the United Nations (FAO) continues to provide the bulk of the data, but we also work to update water-use data using country-specific sources. The data sources are explicitly identified.

“Withdrawal” typically refers to water taken from a water source for use. It does not refer to water “consumed” in that use. The domestic sector typically includes household and municipal uses as well as commercial and governmental water use. The industrial sector includes water used for power plant cooling and industrial production. The agricultural sector includes water for irrigation and livestock.

Limitations

Extreme care should be used when applying these data. They come from a wide variety of sources and are collected using a wide variety of approaches, with few formal standards. As a result, this table includes data that are actually measured, estimated, modeled using different assumptions, or derived from other data. The data also come from different years, making direct intercomparisons difficult. For example, some water-use data are over twenty years old. Also note that the per capita water-use estimates are computed using withdrawals from different years, but population estimates are normalized for 2010.

As noted in past volumes of *The World's Water*, the FAO AQUASTAT data set, while the most comprehensive single database, contains inadequate information on sources and assumptions and often contains modeled rather than measured values. Data from this database should be used with great care and with appropriate caveats about their quality.

Another major limitation of these data is that they do not include the use of rainfall in agriculture—what is sometimes referred to as “green water.” Many countries use a significant fraction of the rain falling on their territory for agricultural production, but this water use is neither accurately measured nor reported in this data set. We repeat our regular call for a systematic reassessment of water-use data and for national and international commitments to collect and standardize this information.

Sources

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DATA TABLE 2 Freshwater Withdrawal by Country and Sector (2013 Update)

Region	Country	Year	Freshwater Withdrawal (km ³ /yr)	Total		Domestic Use (%)	Industrial Use (%)	Agricultural Use (%)	Domestic Use m ³ /p/yr	Industrial Use m ³ /p/yr	Agricultural Use m ³ /p/yr	Source	2010 Population (millions)
				Freshwater Withdrawal (m ³ /p/yr)	Per Capita Withdrawal								
AFRICA	Algeria	2001	5.70	161	24	15	61	39	24	98	f	35.42	
	Angola	2005	0.70	37	45	34	21	17	13	8	f	18.99	
	Benin	2001	0.13	14	32	23	45	5	3	6	f	9.21	
	Botswana	2000	0.19	96	41	18	41	39	17	39	f	1.98	
	Burkina Faso	2001	0.72	44	39	2	59	17	1	26	f	16.29	
	Burundi	2000	0.29	34	17	6	77	6	2	26	f	8.52	
	Cameroon	2000	0.97	49	17	7	76	8	3	37	f	19.96	
	Cape Verde	2000	0.02	39	7	2	91	3	1	36	f	0.51	
	Central African Republic	2005	0.07	16	83	17	1	13	3	0	f	4.51	
	Chad	2005	0.88	76	12	12	76	9	9	58	f	11.51	
	Comoros	1999	0.01	14	48	5	47	7	1	7	f	0.69	
	Congo, Democratic Republic (formerly Zaire)	2005	0.68	10	68	21	11	7	2	1	f	67.83	
	Congo, Republic of	2000	0.05	13	70	22	9	9	3	1	f	3.76	
	Côte d'Ivoire	2005	1.50	70	41	21	38	29	15	26	f	21.57	
	Djibouti	2000	0.02	23	84	0	16	19	0	4	f	0.88	
	Egypt	2000	68.30	809	8	6	86	62	49	695	f	84.47	
	Equatorial Guinea	2000	0.02	29	79	15	6	23	4	2	f	0.69	
	Eritrea	2004	0.58	111	5	0	95	6	0	105	f	5.22	
	Ethiopia	2002	5.60	66	6	0	94	4	0	62	f	84.98	
	Gabon	2005	0.14	93	61	10	29	57	9	27	f	1.50	
Gambia	2000	0.09	51	38	19	43	20	10	22	f	1.75		
Ghana	2000	0.98	40	24	10	66	10	4	27	f	24.33		
Guinea	2001	0.55	53	38	9	53	20	5	28	f	10.32		

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Data Table 2. continued

Region	Country	Year	Freshwater Withdrawal (km ³ /yr)	Per Capita Withdrawal (m ³ /p/yr)	Domestic Use		Industrial Use		Agricultural Use		Domestic Use (m ³ /p/yr)	Industrial Use (m ³ /p/yr)	Agricultural Use (m ³ /p/yr)	Source	2010 Population (millions)
					(%)	(%)	(%)	(%)	(%)	(%)					
AFRICA, cont.	Guinea-Bissau	2000	0.18	109	13	5	82	14	5	90	f	1.65			
	Kenya	2003	2.74	67	17	4	79	11	2	53	f	40.86			
	Lesotho	2000	0.04	19	46	46	9	9	9	2	f	2.08			
	Liberia	2000	0.13	32	54	36	9	17	11	3	f	4.10			
	Libya	2000	4.30	657	14	3	83	92	20	545	f	6.55			
	Madagascar	2000	16.50	819	1	1	98	8	8	803	f	20.15			
	Malawi	2005	1.40	89	11	4	86	10	4	77	f	15.69			
	Mali	2000	6.50	488	9	1	90	44	5	439	f	13.32			
	Mauritania	2005	1.40	416	7	2	91	29	8	379	f	3.37			
	Mauritius	2003	0.73	563	30	3	68	169	17	383	f	1.30			
	Morocco	2000	12.60	389	10	3	87	39	12	339	f	32.38			
	Mozambique	2001	0.88	38	19	3	78	7	1	29	f	23.41			
	Namibia	2002	0.29	131	25	5	70	33	6	92	f	2.212			
	Niger	2005	0.98	62	30	3	67	19	2	41	f	15.89			
	Nigeria	2005	13.00	82	31	15	54	25	12	44	f	158.26			
	Rwanda	2000	0.15	15	24	8	68	4	1	10	f	10.28			
	Senegal	2002	2.22	173	4	3	93	7	5	161	f	12.86			
	Sierra Leone	2005	0.21	36	52	26	22	19	9	8	f	5.84			
	Somalia	2003	3.30	352	1	0	99	4	0	351	f	9.36			
	South Africa	2000	12.50	248	31	6	63	77	15	156	f	50.49			
Sudan and South Sudan	2005	27.60	639	4	1	95	26	4	607	f	43.19				
Swaziland	2000	1.04	865	2	1	97	17	9	839	f	1.20				
Tanzania, Republic of	2002	5.20	115	10	0	89	12	0	103	f	45.04				
Togo	2002	0.17	25	53	2	45	13	1	11	f	6.78				

Tunisia	2001	2.85	275	13	4	82	36	11	225	f	10.37
Uganda	2002	0.32	9	48	14	38	5	1	4	f	33.80
Zambia	2002	1.50	113	18	8	73	20	9	83	f	13.26
Zimbabwe	2002	4.21	333	14	7	79	47	23	263	f	12.64
NORTH AND CENTRAL AMERICA											
Antigua and Barbuda	2005	0.008	90	63	21	15	57	19	14	f	0.09
Barbados	2005	0.10	390	20	26	54	78	101	210	f	0.26
Belize	2000	0.22	703	5	49	46	35	344	323	f	0.313
Canada	2006	45.08	1,330	20	69	12	260	913	157	g	33.89
Costa Rica	2003	0.54	116				0	0	0	h	4.64
Cuba	2007	4.40	393	27	17	56	106	67	220	f	11.20
Dominica	2004	0.02	301							d	0.07
Dominican Republic	2005	5.50	538	26	1	72	140	5	387	f	10.23
El Salvador	2007	1.80	291	22	14	64	64	41	186	f	6.19
Guatemala	2006	3.50	243	15	31	54	37	75	131	f	14.38
Haiti	2000	1.20	118	19	4	78	22	5	92	f	10.19
Honduras	2006	2.10	276	16	23	60	44	63	165	f	7.62
Jamaica	2000	0.41	150	34	17	49	51	26	73	f	2.73
Mexico	2009	80.40	727	14	9	77	102	67	557	f	110.65
Nicaragua	2001	1.40	240	13	2	85	31	5	204	f	5.82
Panama	2000	0.91	259	23	2	76	60	5	197	f	3.51
St. Lucia	2005	0.02	115							d	0.17
St. Vincent and the Grenadines	1995	0.01	92							d	0.11
Trinidad and Tobago	2000	0.23	171	66	25	9	113	43	15	f	1.34
United States of America	2005	482.20	1,518	13	46	41	193	699	626	e	317.64
SOUTH AMERICA											
Argentina	2000	32.60	802	22	12	66	176	96	529	f	40.67
Bolivia	2000	2.60	259	21	12	67	54	31	174	f	10.03
Brazil	2006	58.07	297	28	17	55	83	52	162	f	195.42
Chile	2007	26.70	1,558	4	10	86	62	156	1340	f	17.13
Colombia	2000	12.70	274	57	4	39	156	10	107	f	46.30
Ecuador	2005	9.90	719	13	6	81	93	43	582	f	13.77

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Data Table 2. *continued*

Region	Country	Year	Total Freshwater Withdrawal		Per Capita Withdrawal		Domestic Use (%)		Industrial Use (%)		Agricultural Use (%)		Domestic Use (m ³ /p/yr)		Industrial Use (m ³ /p/yr)		Agricultural Use (m ³ /p/yr)		2010 Population (millions)
			(km ³ /yr)	(m ³ /p/yr)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	
SOUTH AMERICA, cont.	Guyana	2000	1.64	2,154	2	1	98	36	19	2111	f	0.76							
	Paraguay	2000	0.49	76	20	8	71	15	6	54	f	6.46							
	Peru	2000	19.30	654	7	8	85	46	52	556	f	29.50							
	Suriname	2000	0.67	1,278	4	3	93	57	37	1183	f	0.52							
	Uruguay	2000	3.70	1,097	11	2	87	121	22	955	f	3.37							
	Venezuela	2000	9.10	313	49	8	44	154	25	138	f	29.04							
	Afghanistan	2000	20.30	697	1	1	99	7	7	690	f	29.12							
ASIA	Armenia	2007	2.90	938	30	4	66	281	41	616	f	3.09							
	Azerbaijan	2005	12.21	1,367	4	19	76	55	260	1039	f	8.93							
	Bahrain	2003	0.36	442	50	6	45	221	27	199	f	0.81							
	Bangladesh	2008	35.87	253	10	2	88	25	5	222	f	141.82							
	Bhutan	2008	0.34	480	5	1	94	24	5	451	f	0.71							
	Brunei	1994	0.09	221	nd	nd	nd	nd	nd	nd	c	0.41							
	Cambodia	2006	2.20	146	4	2	94	6	3	137	f	15.05							
	China	2007	578.9	425	12	23	64	52	99	272	j	1,361.76							
	Cyprus	2000	0.21	239	27	1	71	65	3	170	b	0.88							
	Georgia	2005	1.80	427	20	22	58	85	94	247	f	4.22							
	India	2010	761.00	627	7	2	90	46	14	567	f	1,214.46							
	Indonesia	2000	113.30	487	12	7	82	58	34	400	f	232.52							
	Iran	2004	93.30	1,243	7	1	92	85	12	1143	f	75.08							
Iraq	2000	66.00	2,097	7	15	79	147	315	1657	f	31.47								
Israel	2004	1.95	268	36	6	58	97	16	156	f	7.29								
Japan	2001	90.00	709	19	18	63	135	127	446	f	127.00								
Jordan	2005	0.94	145	31	4	65	45	6	95	f	6.47								
Kazakhstan	2010	21.10	1,339	4	30	66	54	402	884	f	15.75								

Korea Democratic People's Republic	2005	8.70	363	10	13	76	36	47	276	f	23.99
Korea Republic	2002	25.47	525	26	12	62	136	63	326	f	48.50
Kuwait	2002	0.91	299	44	2	54	132	6	162	f	3.05
Kyrgyzstan	2006	8.00	1,441	3	4	93	45	58	1340	f	5.55
Laos	2005	3.50	544	4	5	91	23	27	495	f	6.44
Lebanon	2005	1.31	308	29	11	60	89	34	185	f	4.25
Malaysia	2005	11.20	401	35	43	22	140	173	88	f	27.91
Maldives	2008	0.006	19	95	5	0	18	1	0	c	0.31
Mongolia	2009	0.55	204	13	43	44	26	88	90	f	2.70
Myanmar	2000	33.23	658	10	1	89	66	4	586	f	50.50
Nepal	2006	9.50	318	2	0	98	6	0	312	f	29.85
Oman	2003	1.32	455	10	1	88	45	5	400	f	2.91
Pakistan	2008	183.50	993	5	1	94	52	8	933	f	184.75
Palestine Territory, Occupied	2005	0.42	95	48	7	45	46	7	43	f	4.41
Philippines	2009	81.6	872	8	10	82	70	87	715	f	93.62
Qatar	2005	0.44	294	39	2	59	115	6	174	f	1.51
Saudi Arabia	2006	23.67	902	9	3	88	81	27	793	f	26.25
Singapore	1975	0.19	39	45	51	4	18	20	2	b	4.84
Sri Lanka	2005	13.00	637	6	6	87	38	38	554	f	20.41
Syria	2005	16.80	746	9	4	88	67	30	657	f	22.51
Tajikistan	2006	11.50	1,625	6	4	91	98	65	1479	f	7.07
Thailand	2007	57.31	841	5	5	90	40	41	760	f	68.14
Turkey	2003	40.10	530	15	11	74	78	58	393	f	75.71
Turkmenistan	2004	28.00	5,409	3	3	94	162	162	5085	f	5.18
United Arab Emirates	2005	4.00	849	15	2	83	127	17	705	f	4.71
Uzbekistan	2005	56.00	2,015	7	3	90	141	60	1813	f	27.79
Vietnam	2005	82.00	921	1	4	95	9	37	875	f	89.03
Yemen	2005	3.57	147	7	2	91	10	3	134	f	24.26
EUROPE											
Albania	2006	1.30	410	43	18	39	176	74	160	f	3.17
Austria	2002	3.70	441	18	79	3	79	348	13	f	8.39
Belarus	2000	4.30	448	27	54	19	121	242	85	f	9.59

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Data Table 2. continued

Region	Country	Year	Total Freshwater Withdrawal		Per Capita Withdrawal (m ³ /p/yr)	Domestic Use (%)		Industrial Use (%)		Agricultural Use (%)		Domestic Use m ³ /p/yr	Industrial Use m ³ /p/yr	Agricultural Use m ³ /p/yr	Source	2010 Population (millions)
			(km ³ /yr)	(m ³ /p/yr)		(%)	(%)	(%)	(%)							
EUROPE cont.	Belgium	2007	6.20	580	12	88	1	70	510	7	b, f	10.70				
	Bosnia and Herzegovina	2009	0.34	90								3.76				
	Bulgaria	2009	6.10	814	16	68	16	130	553	130	f	7.50				
	Croatia	2010	0.63	143	85	14	1	121	20	1	f	4.41				
	Czech Republic	2007	1.70	163	41	57	2	67	93	3	f	10.41				
	Denmark	2009	0.66	120	58	5	36	70	6	43	f	5.48				
	Estonia	2007	1.80	1,344	3	97	1	40	1304	13	f	1.34				
	Finland	2005	1.60	299	25	72	3	75	215	8	f	5.35				
	France	2007	31.60	504	18	69	12	91	348	61	f	62.64				
	Germany	2007	32.30	394	12	68	20	47	268	78	b	82.06				
	Greece	2007	9.50	849	9	2	89	76	17	756	f	11.18				
	Hungary	2007	5.60	562	12	83	5	67	466	28	f	9.97				
	Iceland	2005	0.17	516	50	8	42	258	41	217	f	0.33				
	Ireland	1994	1.18	257	23	77	0	58	198	0	f	4.59				
	Italy	2000	45.40	755	20	36	44	151	272	332	f	60.10				
	Latvia	2002	0.40	179	38	49	13	68	87	23	f	2.24				
Lithuania	2007	2.40	737	7	90	3	52	664	22	f	3.26					
Luxembourg	1999	0.06	116	63	37	1	73	43	1	b	0.49					
Macedonia	2007	1.00	489	21	67	12	103	328	59	f	2.04					
Malta	2002	0.05	122	63	1	35	77	1	43	f	0.41					
Moldova	2007	1.10	308	14	83	3	43	255	9	f	3.58					
Netherlands	2008	10.60	637	12	87	1	76	554	6	f	16.65					
Norway	2006	2.90	597	28	43	29	167	257	173	b	4.86					
Poland	2009	12.00	315	31	60	10	98	189	32	f	38.04					

Portugal	2002	8.50	792	8	19	73	63	150	578	f	10.73
Romania	2003	6.50	307	22	61	17	67	187	52	f	21.19
Russian Federation	2000	76.68	546	20	60	20	109	328	109	b, f	140.37
Serbia	2009	4.10	418	17	82	2	71	343	8	f	9.80
Slovakia	2007	0.69	128	47	50	3	60	64	4	f	5.41
Slovenia	2009	0.94	464	18	82	1	84	381	5	f	2.02
Spain	2008	32.50	717	18	22	61	129	158	437	f	45.32
Sweden	2007	2.60	280	37	59	4	103	165	11	f	9.29
Switzerland	2000	2.60	342	40	58	2	137	199	7	f	7.59
Ukraine	2005	19.20	423	24	70	6	101	296	25	f	45.43
United Kingdom	2007	13.00	210	57	33	10	120	69	21	a, f	61.90
OCEANIA											
Australia	2010	59.84	2,782	16	11	74	445	306	2058	i	21.51
Fiji	2000	0.08	94	28	11	61	26	10	57	f	0.85
New Zealand	2002	4.80	1,115	21	4	74	234	45	825	f	4.30
Papua New Guinea	2005	0.39	57	57	43	0	32	24	0	a, f	6.89
Solomon Islands	1987			40	20	40	0	0	0	a, f	0.54
Timor-Leste	2004	1.17	1,064	8	1	91	85	11	968	f	1.10

Notes:

Figures may not add to totals because of independent rounding.

Population data from Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, World Population Prospects: The 2008 Revision. Total Population, Both Sexes. Estimates 2010 (New York: United Nations, 2009). http://esa.un.org/unpd/wpp2008/all-wpp-indicators_components.htm.

US data include freshwater only; previous data included saline water.

China data include Hong Kong.