Table 2. Freshwater Withdrawal by Country and Sector

Description

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. The following table presents *The World's Water* 2006 update of 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 approximately the year of withdrawal. The table also gives the breakdown of that water use by the domestic, agricultural, and industrial sectors, in both percentage of total water use and cubic meters per person per year. The data sources are also 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.

In 2003, the Food and Agriculture Organization of the United Nations published a comprehensive update of its water use estimates in the Aquastat dataset, and it has continued to provide new and updated numbers. As a result, new estimates of water use by country are available, as are new estimates of the sectoral breakdown. An advantage of the Aquastat dataset is that it provides what appears to be a consistent set of information, but users should be very careful to understand which numbers are measured and which are only calculated (see Limitations).

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. Separate data are now provided for the independent states of the former Soviet Union, but not for the former states of Yugoslavia. Industrial withdrawals for Panama, St. Lucia, St. Vincent, and the Grenadines are included in the domestic category.

The 2003 revision of the FAO Aquastat dataset is the most dramatic change in water use data in recent years, yet these data are marred by inadequate information on sources and assumptions. They should be used with great care, and with appropriate caveats about their quality. As an example, the latest actual measured data on water use in Canada comes from a detailed national assessment published in 1996 by Environment Canada (see later reference "o"). More recent data can be found on the Aquastat database, but these data simply take the 1996 measured value and modify it for the change in population in Canada—thus the 2000 Aquastat value is modeled, not measured. Although we often report the Aquastat values in this table, in the case of Canada, we have chosen to rely on the 1996 measured value, while awaiting a Canadian reassessment (now under way).

Another major limitation of these data is that they do not include the use of rainfall in agriculture. 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 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. We note that budgetary constraints continue to delay any major new data initiatives.

Region & Country	Year	Total Freshwater Withdrawal (km^3/yr)	Per Capita Withdrawal (m^3/p/yr)	Domestic Use (%)	Industrial Use (%)	Agricultural Use (%)	Domestic Use m3/p/yr	Industrial Use m3/p/yr	Agricultural Use m3/p/yr	Source	2005 Population (millions)
AFRICA											
Algeria	2000	6.07	185	22	13	65	41	24	120	I	32.85
Angola	2000	0.35	22	23	17	60	5	4	13	I	15.94
Benin	2001	0.13	15	32	23	45	5	4	7	I	8.44
Botswana	2000	0.19	107	41	18	41	44	19	44	I	1.77
Burkina Faso	2000	0.80	60	13	1	86	8	1	52	I	13.23
Burundi	2000	0.29	38	17	6	77	6	2	30	I	7.55
Cameroon	2000	0.99	61	18	8	74	11	5	45	I	16.32
Cape Verde	2000	0.02	39	7	2	91	3	1	36	I	0.51
Central African Republic	2000	0.03	7	80	16	4	6	1	0	I	4.04
Chad	2000	0.23	24	17	0	83	4	0	20	I	9.75
Comoros	1999	0.01	13	48	5	47	6	1	6	I	0.80
Congo, Democratic Republic (formerly Zaire)	2000	0.36	6	53	17	31	3	1	2	I	57.55
Congo, Republic of	2000	0.03	8	59	29	12	4	2	1	I	4.00
Cote D'Ivoire	2000	0.93	51	24	12	65	12	6	33	I	18.15
Djibouti	2000	0.02	25	84	0	16	21	0	4	I	0.79
Egypt	2000	68.30	923	8	6	86	70	55	793	I	74.03
Equatorial Guinea	2000	0.11	220	83	16	1	183	35	2	I	0.50
Eritrea	2000	0.30	68	3	0	97	2	0	66	I	4.40
Ethiopia	2002	5.56	72	6	0	94	4	0	67	I	77.43
Gabon	2000	0.12	87	50	8	42	43	7	37	I	1.38
Gambia	2000	0.03	20	23	12	65	5	2	13	I	1.52
Ghana	2000	0.98	44	24	10	66	11	4	29	I	22.11
Guinea	2000	1.51	161	8	2	90	12	4	144	I	9.40
Guinea-Bissau	2000	0.18	113	13	5	82	15	6	93	I	1.59
Kenya	2000	1.58	46	30	6	64	14	3	29	I	34.26
Lesotho	2000	0.05	28	40	40	20	11	11	6	I	1.80
Liberia	2000	0.11	34	27	18	55	9	6	18	I	3.28
Libya	2000	4.27	730	14	3	83	102	22	606	I	5.85
Madagascar	2000	14.96	804	3	2	96	23	13	769	I	18.61
Malawi	2000	1.01	78	15	5	80	12	4	63	I	12.88
Mali	2000	6.55	484	9	1	90	44	5	436	I	13.52
Mauritania	2000	1.70	554	9	3	88	49	16	489	I	3.07
Mauritius	2000	0.61	488	25	14	60	124	69	294	a	1.25
Morocco	2000	12.60	400	10	3	87	40	12	348	I	31.48

Mozambique	2000	0.63	32	11	2	87	4	1	28	l	19.79
Namibia	2000	0.3	148	24	5	71	35	7	105	l	2.03
Niger	2000	2.18	156	4	0	95	6	0	149	l	13.96
Nigeria	2000	8.01	61	21	10	69	13	6	42	l	131.53
Rwanda	2000	0.15	17	24	8	68	4	1	11	l	9.04
Senegal	2002	2.22	190	4	3	93	8	6	177	l	11.66
Sierra Leone	2000	0.38	69	5	3	92	4	2	63	l	5.53
Somalia	2000	3.29	400	0	0	100	2	0	398	l	8.23
South Africa	2000	12.50	264	31	6	63	82	16	166	l	47.43
Sudan	2000	37.32	1,030	3	1	97	27	7	996	l	36.23
Swaziland	2000	1.04	1,010	2	1	97	20	10	979	l	1.03
Tanzania	2000	5.18	135	10	0	89	14	0	120	l	38.33
Togo	2000	0.17	28	53	2	45	15	1	12	l	6.15
Tunisia	2000	2.64	261	14	4	82	37	10	214	l	10.10
Uganda	2002	0.30	10	43	17	40	4	2	4	l	28.82
Zambia	2000	1.74	149	17	7	76	25	10	113	l	11.67
Zimbabwe	2002	4.21	324	14	7	79	45	23	256	l	13.01
NORTH AND CENTRAL AMERICA											
Antigua and Barbuda	1990	0.005	63	60	20	20	38	13	13	g	0.08
Barbados	2000	0.09	333	33	44	22	111	147	73	l	0.27
Belize	2000	0.15	556	7	73	20	39	406	111	l	0.27
Canada	1996	44.72	1,386	20	69	12	271	952	163	o	32.27
Costa Rica	2000	2.68	619	29	17	53	182	106	331	l	4.33
Cuba	2000	8.20	728	19	12	69	138	89	500	l	11.27
Dominica	1996	0.02	213	-	-	-				h	0.08
Dominican Republic	2000	3.39	381	32	2	66	122	7	252	l	8.90
El Salvador	2000	1.28	186	25	16	59	46	29	111	l	6.88
Guatemala	2000	2.01	160	6	13	80	10	21	128	l	12.60
Haiti	2000	0.99	116	5	1	94	5	1	110	l	8.53
Honduras	2000	0.86	119	8	12	80	10	14	95	l	7.21
Jamaica	2000	0.41	155	34	17	49	53	26	76	l	2.65
Mexico	2000	78.22	731	17	5	77	127	40	564	l	107.03
Nicaragua	2000	1.30	237	15	2	83	36	5	197	l	5.49
Panama	2000	0.82	254	67	5	28	170	13	72	l	3.23
St. Lucia	1997	0.01	81	-	-	-				g	0.16
St. Vincent and the Grenadines	1995	0.01	83	-	-	-				g	0.12
Trinidad and Tobago	2000	0.31	237	68	26	6	161	62	13	l	1.31
United States of America	2000	477.00	1,600	13	46	41	203	736	660	j	298.21

SOUTH AMERICA											
Argentina	2000	29.19	753	17	9	74	128	71	558	l	38.75
Bolivia	2000	1.44	157	13	7	81	21	11	127	l	9.18
Brazil	2000	59.30	318	20	18	62	65	57	196	l	186.41
Chile	2000	12.55	770	11	25	64	87	194	489	l	16.30
Colombia	2000	10.71	235	50	4	46	118	9	108	l	45.60
Ecuador	2000	16.98	1,283	12	5	82	160	68	1055	l	13.23
Guyana	2000	1.64	2,187	2	1	98	37	19	2143	l	0.75
Paraguay	2000	0.49	80	20	8	71	16	6	56	l	6.16
Peru	2000	20.13	720	8	10	82	60	73	587	l	27.97
Suriname	2000	0.67	1,489	4	3	93	67	43	1379	l	0.45
Uruguay	2000	3.15	910	2	1	96	22	10	878	l	3.46
Venezuela	2000	8.37	313	6	7	47	19	22	149	l	26.75
ASIA											
Afghanistan	2000	23.26	779	2	0	98	14	0	765	l	29.86
Armenia	2000	2.95	977	30	4	66	293	43	642	l	3.02
Azerbaijan	2000	17.25	2,051	5	28	68	99	567	1385	l	8.41
Bahrain	2000	0.30	411	40	3	57	163	12	233	l	0.73
Bangladesh	2000	79.40	560	3	1	96	18	4	538	l	141.82
Bhutan	2000	0.43	199	5	1	94	10	2	187	l	2.16
Brunei	1994	0.09	243	nd	nd	nd				e	0.37
Cambodia	2000	4.08	290	1	0	98	3	0	284	l	14.07
China	2000	549.76	415	7	26	68	27	107	281	i	1,323.35
Cyprus	2000	0.21	250	27	1	71	68	4	179	m	0.84
Georgia	2000	3.61	808	20	21	59	161	170	477	l	4.47
India	2000	645.84	585	8	5	86	47	32	506	l	1,103.37
Indonesia	2000	82.78	372	8	1	91	30	3	339	l	222.78
Iran	2000	72.88	1,048	7	2	91	71	24	953	l	69.52
Iraq	2000	42.70	1,482	3	5	92	47	68	1367	l	28.81
Israel	2000	2.05	305	31	7	62	94	20	189	l	6.73
Japan	2000	88.43	690	20	18	62	136	123	431	l	128.09
Jordan	2000	1.01	177	21	4	75	37	8	133	l	5.70
Kazakhstan	2000	35.00	2,360	2	17	82	40	390	1930	l	14.83
Korea Democratic People's Republic	2000	9.02	401	20	25	55	80	101	220	l	22.49
Korea Rep	2000	18.59	389	36	16	48	139	64	186	l	47.82
Kuwait	2000	0.44	164	45	2	52	73	3	86	l	2.69
Kyrgyz Republic	2000	10.08	1,916	3	3	94	60	59	1797	l	5.26
Laos	2000	3.00	507	4	6	90	22	29	457	l	5.92
Lebanon	2000	1.38	385	33	1	67	126	2	257	l	3.58
Malaysia	2000	9.02	356	17	21	62	60	75	221	l	25.35

Maldives	1987	0.003	9	98	2	0	9	0	0	e	0.33
Mongolia	2000	0.44	166	20	27	52	34	45	86	l	2.65
Myanmar	2000	33.23	658	1	1	98	8	4	646	l	50.52
Nepal	2000	10.18	375	3	1	96	11	2	362	l	27.13
Oman	2000	1.36	529	7	2	90	38	11	476	l	2.57
Pakistan	2000	169.39	1,072	2	2	96	21	22	1030	l	157.94
Philippines	2000	28.52	343	17	9	74	57	32	254	l	83.05
Qatar	2000	0.29	358	24	3	72	86	10	257	l	0.81
Saudi Arabia	2000	17.32	705	10	1	89	69	8	628	l	24.57
Singapore	1975	0.19	44	45	51	4	20	22	2	c	4.33
Sri Lanka	2000	12.61	608	2	2	95	14	15	579	l	20.74
Syria	2000	19.95	1,048	3	2	95	34	19	994	l	19.04
Tajikistan	2000	11.96	1,837	4	5	92	68	86	1683	l	6.51
Thailand	2000	82.75	1,288	2	2	95	32	32	1225	l	64.23
Turkey	2001	39.78	544	15	11	74	80	59	404	m	73.19
Turkmenistan	2000	24.65	5,104	2	1	98	86	39	4978	l	4.83
United Arab Emirates	2000	2.30	511	23	9	68	118	44	349	l	4.50
Uzbekistan	2000	58.34	2,194	5	2	93	104	45	2045	l	26.59
Vietnam	2000	71.39	847	8	24	68	66	205	577	l	84.24
Yemen	2000	6.63	316	4	1	95	13	2	301	l	20.98
EUROPE											
Albania	2000	1.71	546	27	11	62	146	61	339	l	3.13
Austria	1999	3.67	448	35	64	1	157	286	4	m	8.19
Belarus	2000	2.79	286	23	47	30	67	134	86	l	9.76
Belgium	1998	7.44	714	13	85	1	95	610	9	k	10.42
Bosnia and Herzegovina											3.91
Bulgaria	2003	6.92	895	3	78	19	27	700	168	m	7.73
Croatia											4.55
Czech Republic	2002	1.91	187	41	57	2	76	107	4	m	10.22
Denmark	2002	0.67	123	32	26	42	40	32	52	m	5.43
Estonia	2002	1.41	1,060	56	39	5	591	418	52	m	1.33
Finland	1999	2.33	444	14	84	3	61	371	12	m	5.25
France	2000	33.16	548	16	74	10	86	408	54	m	60.50
Germany	2001	38.01	460	12	68	20	57	312	91	m	82.69
Greece	1997	8.70	782	16	3	81	128	25	630	m	11.12
Hungary	2001	21.03	2,082	9	59	32	192	1222	668	m	10.10
Iceland	2003	0.17	567	34	66	0	193	373	1	m	0.30
Ireland	1994	1.18	284	23	77	0	64	220	0	m	4.15
Italy	1998	41.98	723	18	37	45	131	265	326	m	58.09
Latvia	2003	0.25	108	55	33	12	59	35	13	m	2.31

Lithuania	2003	3.33	971	78	15	7	758	149	64	m	3.43
Luxembourg	1999	0.06	121	42	45	13	51	55	16	m	0.47
Macedonia	2000	2.27	1,118							m	2.03
Malta	2000	0.02	50	74	1	25	37	0	13	m	0.40
Moldova	2000	2.31	549	10	58	33	55	316	181	l	4.21
Netherlands	2001	8.86	544	6	60	34	33	326	184	m	16.30
Norway	1996	2.40	519	23	67	10	118	347	54	k	4.62
Poland	2002	11.73	304	13	79	8	40	240	25	m	38.53
Portugal	1998	11.09	1,056	10	12	78	101	128	827	m	10.50
Romania	2003	6.50	299	9	34	57	26	103	171	m	21.71
Russian Federation	2000	76.68	535	19	63	18	100	340	95	l	143.20
Serbia and Montenegro											10.50
Slovakia	2003	1.04	193							m	5.40
Slovenia	2002	0.90	457							m	1.97
Spain	2002	37.22	864	13	19	68	116	160	588	m	43.06
Sweden	2002	2.68	296	37	54	9	109	161	26	m	9.04
Switzerland	2002	2.52	348	24	74	2	84	257	7	m	7.25
Ukraine	2000	37.53	807	12	35	52	98	286	424	l	46.48
United Kingdom	1994	11.75	197	22	75	3	43	148	6	d	59.67
OCEANIA											
Australia	2000	24.06	1,193	15	10	75	176	120	898	n	20.16
Fiji	2000	0.07	82	14	14	71	12	12	58	l	0.85
New Zealand	2000	2.11	524	48	9	42	251	50	220	l	4.03
Papua New Guinea	1987	0.10	17	56	43	1	9	7	0	c	5.89
Solomon Islands	1987			40	20	40	0	0	0	c	0.48

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