

VII. Environment

Snapshot

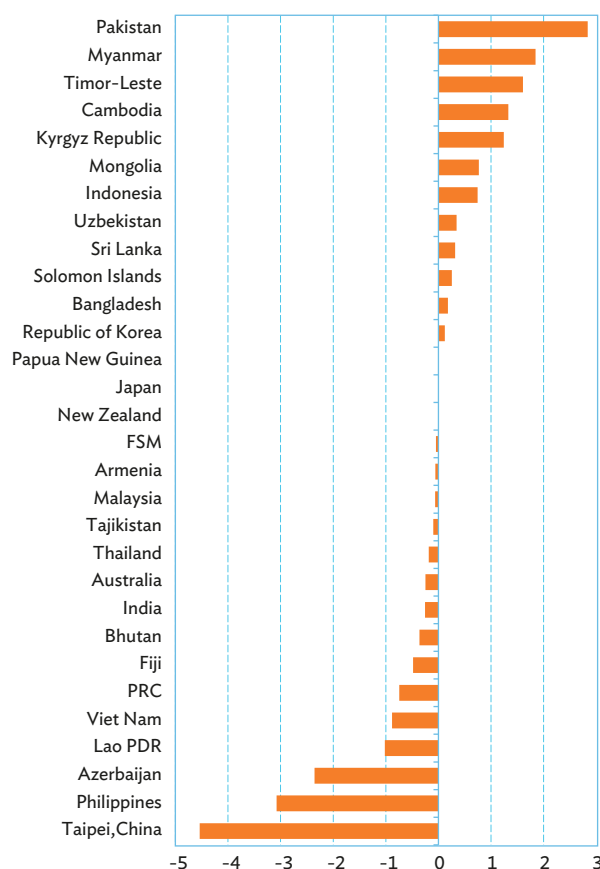
- More than a third of the ADB member economies in Asia and the Pacific increased their total area of forested land in 2015, compared to the previous year. Since 2000, the total forested area in developing member economies has increased by 4.8%.
- As Asia and the Pacific's share of global GDP expands, so does its contribution to the global carbon dioxide (CO₂) emissions.

Key Trends

More than half of the ADB member economies in Asia and the Pacific increased their total area of forested land in 2015, compared to the previous year. From 2000 to 2015, the total forested area increased by 4.8% in developing ADB member economies and decreased by 2.4% in developed ADB member economies (Table 2.7.2). In 2015, 16 of 46 regional economies for which data were available expanded their forest land; and in 16 economies, the forest land remained unchanged. (Figure 2.7.1). Significant gains in reforestation were observed in Taipei,China (4.5%); the Philippines (3.1%); and Azerbaijan (2.4%). The biggest losses in the amount of forested land in 2015 occurred in Pakistan (2.8%), Myanmar (1.9%), and Timor-Leste (1.6%).

As Asia and the Pacific's share of global GDP expands, so does its contribution to the global CO₂ emissions. In 2014, Asia and the Pacific was responsible for nearly half (47.7%) of total global carbon dioxide emissions, while the region's top five emitters—the People's Republic of China (PRC), India, Japan, the Republic of Korea, and Indonesia contributed more than 85% of the region's total emissions (Figure 2.7.2).

Figure 2.7.1: Deforestation Rates, 2015 (%)



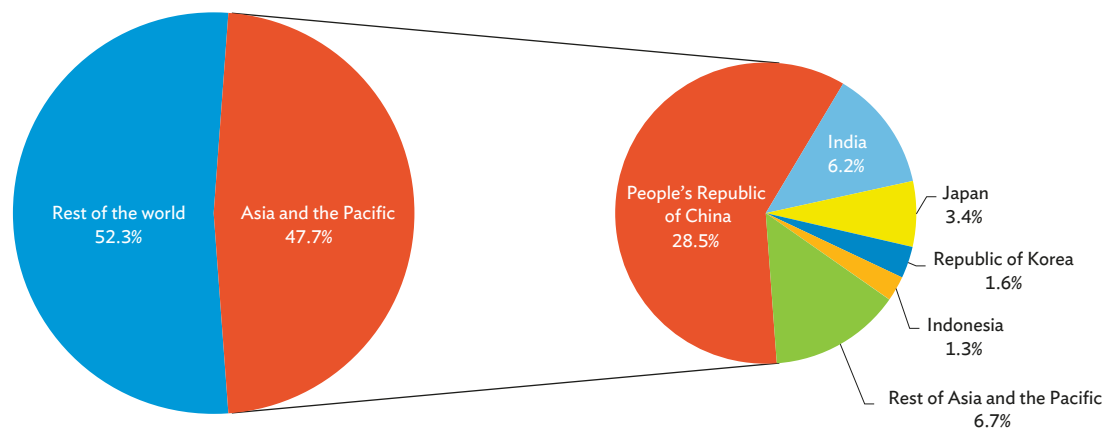
FSM = Federated States of Micronesia, Lao PDR = Lao People's Democratic Republic, PRC = People's Republic of China.

Note: Deforestation rates for Afghanistan, Brunei Darussalam, the Cook Islands, Georgia, Kazakhstan, Kiribati, Maldives, the Marshall Islands, Nepal, Palau, Samoa, Singapore, Tonga, Turkmenistan, Tuvalu, and Vanuatu are zero.

Source: Table 2.7.2, Key Indicators for Asia and the Pacific 2018.

[Click here for figure data](#)

Figure 2.7.2: Emissions of Carbon Dioxide Accounted for by Asia and the Pacific, 2014
(% of global carbon dioxide emissions)



Sources: Table 2.7.2, Key Indicators for Asia and the Pacific 2018; and World Bank. World Development Indicators Online. <http://data.worldbank.org/indicator> (accessed 14 June 2018).

[Click here for figure data](#)

Data Issues and Comparability

Data on greenhouse gases (GHGs) have been compiled from the Emissions Database for Global Atmospheric Research, a joint project of the European Commission Joint Research Centre and the Netherlands Environmental Assessment Agency. This database applies a technology-based emissions factor approach consistently for all economies. It utilizes a consistent set of activity data for calculating various substances, GHGs, and air pollutants; and relies on the spatial allocation of emissions on a 0.1 degree by 0.1 degree grid.

There may be substantial uncertainty in economy-level data—especially for methane, nitrous oxide, and other GHGs—due to the limited accuracy of international activity data and the emission factors selected for calculating emissions on an economy level. However, since Intergovernmental Panel on Climate Change methodologies are consistently used, and data are based on international information sources, there is sound basis for comparability.⁶

The Food and Agricultural Organization of the UN monitors land use and forestry data using its own expert sources, country reports, satellite imagery, and official data reported on through questionnaires conducted by the organization.

⁶ More information on the methodologies can be found at <http://edgar.jrc.ec.europa.eu/methodology.php>.

Table 2.7.1: Agriculture Land Use
(% of total land area)

ADB Regional Member	Agricultural Land				Arable Land				Permanent Cropland			
	2000	2005	2010	2015	2000	2005	2010	2015	2000	2005	2010	2015
Developing ADB Member Economies												
Central and West Asia												
Afghanistan	57.8	58.1	58.1	58.1	11.8	12.0	11.9	11.9	0.1	0.2	0.2	0.2
Armenia	46.5	56.4	60.9	58.9	15.8	16.0	15.8	15.7	1.3	1.8	1.9	2.0
Azerbaijan	57.4	57.6	57.7	57.7	22.1	22.3	22.8	23.4	2.9	2.7	2.8	2.9
Georgia	43.2	36.3	35.7	36.7	11.4	6.8	6.0	6.4	3.9	1.6	1.8	2.3
Kazakhstan	79.8	78.6	80.4	80.4	11.2	10.6	10.6	10.9	0.1	0.0	0.0	0.0
Kyrgyz Republic	55.9	56.0	55.3	55.0	7.1	6.7	6.7	6.7	0.3	0.4	0.4	0.4
Pakistan	47.6	46.7	45.7	47.0	40.3	39.1	38.1	39.5	0.9	1.0	1.1	1.1
Tajikistan	32.7	33.4	34.0	34.2	5.6	5.4	5.4	5.3	0.7	0.8	0.9	1.0
Turkmenistan	75.5	74.2	72.4	72.0	4.1	4.3	4.1	4.1	0.1	0.1	0.1	0.1
Uzbekistan	64.2	62.9	62.7	62.9	10.5	10.3	10.2	10.3	0.8	0.8	0.8	0.9
East Asia												
China, People's Republic of	55.6	55.1	54.8	56.2	12.6	12.0	11.4	12.7	1.2	1.3	1.5	1.7
Hong Kong, China	6.7	6.7	5.2	4.9	4.8	4.8	3.3	3.0	1.0	1.0	1.0	1.0
Korea, Republic of	20.5	19.4	18.2	17.8	17.8	17.0	15.5	15.0	2.1	1.9	2.1	2.2
Mongolia	84.0	73.0	73.1	72.7	0.8	0.4	0.4	0.4	0.0	0.0	0.0	0.0
Taipei, China	24.0	23.5	23.0	22.5	17.5	17.0	16.9	16.7	6.5	6.5	6.1	5.8
South Asia												
Bangladesh	72.2	71.5	71.0	70.6	64.1	60.8	59.9	59.6	3.5	6.1	6.5	6.4
Bhutan	13.3	15.6	13.6	13.8	2.7	4.4	2.6	2.6	0.5	0.5	0.3	0.3
India	60.9	60.6	60.4	60.4	54.1	53.6	52.8	52.6	3.1	3.4	4.1	4.4
Maldives	30.0	30.0	26.3	26.3	10.0	10.0	13.0	13.0	16.7	16.7	10.0	10.0
Nepal	29.6	29.3	28.8	28.7	16.4	15.9	15.2	14.7	0.8	0.9	1.1	1.5
Sri Lanka	37.5	40.0	41.8	43.7	14.6	17.5	19.1	20.7	15.9	15.5	15.6	15.9
Southeast Asia												
Brunei Darussalam	1.9	2.1	2.5	2.7	0.4	0.4	0.8	0.9	0.8	0.9	1.1	1.1
Cambodia	27.0	30.3	30.9	30.9	21.0	21.0	21.5	21.5	0.8	0.9	0.9	0.9
Indonesia	26.0	28.6	30.7	31.5	11.3	12.7	13.0	13.0	8.6	9.9	11.6	12.4
Lao People's Democratic Republic	7.8	8.6	9.6	10.3	4.0	5.0	6.1	6.6	0.4	0.4	0.6	0.7
Malaysia	21.4	21.7	22.7	23.9	2.9	2.9	2.8	2.9	17.6	18.0	19.0	20.1
Myanmar	16.5	17.2	19.2	19.5	15.2	15.4	16.5	16.7	0.9	1.4	2.2	2.4
Philippines	37.7	38.1	40.6	41.7	16.9	16.8	17.8	18.7	15.8	16.3	17.8	17.9
Singapore	1.8	1.1	1.1	0.9	1.5	1.0	0.9	0.8	0.3	0.1	0.1	0.1
Thailand	38.8	38.4	41.2	43.3	30.6	29.8	30.8	32.9	6.6	7.1	8.8	8.8
Viet Nam	28.2	32.4	34.7	37.8	19.9	20.5	20.8	22.6	6.2	9.8	11.9	13.1
The Pacific												
Cook Islands	20.0	11.4	5.6	6.3	7.5	5.2	2.9	4.2	12.5	6.2	2.7	2.1
Fiji	23.4	23.4	23.3	23.3	9.3	9.3	9.0	9.0	4.5	4.5	4.7	4.7
Kiribati	42.0	42.0	42.0	42.0	2.5	2.5	2.5	2.5	39.5	39.5	39.5	39.5
Marshall Islands	66.7	72.2	72.2	63.9	5.6	11.1	11.1	11.1	44.4	44.4	44.4	36.1
Micronesia, Federated States of	32.1	32.1	31.4	31.4	3.6	3.6	2.9	2.9	24.3	24.3	24.3	24.3
Nauru	20.0	20.0	20.0	20.0	-	-	-	-	20.0	20.0	20.0	20.0
Palau	10.9	10.9	10.9	10.9	2.2	2.2	2.2	2.2	4.3	4.3	4.3	4.3
Papua New Guinea	2.2	2.3	2.6	2.6	0.5	0.5	0.7	0.7	1.4	1.3	1.5	1.5
Samoa	17.0	14.8	12.4	12.4	4.9	3.9	2.8	2.8	11.0	9.5	7.8	7.8
Solomon Islands	2.7	3.2	3.8	3.9	0.5	0.6	0.7	0.7	2.0	2.3	2.9	2.9
Timor-Leste	22.7	25.9	25.0	25.6	8.1	11.4	10.1	10.4	4.5	4.4	4.8	5.0
Tonga	41.7	41.7	44.4	45.8	20.8	20.8	23.6	25.0	15.3	15.3	15.3	15.3
Tuvalu	66.7	56.7	60.0	60.0	-	-	-	-	66.7	56.7	60.0	60.0
Vanuatu	14.4	15.0	15.3	15.3	1.6	1.6	1.6	1.6	9.3	9.9	10.3	10.3
Developed ADB Member Economies												
Australia	59.3	57.9	51.9	47.6	6.2	6.4	5.5	6.0	0.0	0.0	0.1	0.0
Japan	14.4	12.9	12.6	12.3	12.3	12.0	11.7	11.5	1.0	0.9	0.9	0.8
New Zealand	58.5	44.5	43.3	42.2	5.7	1.6	1.9	2.2	0.2	0.2	0.3	0.3

-- = magnitude equals zero, 0.0 = magnitude is less than half of unit employed, ADB = Asian Development Bank.

Source: Food and Agriculture Organization of the United Nations. FAOSTAT Database. <http://www.fao.org/faostat/en/#data/RL> (accessed 4 June 2018).

[Click here for table data](#)

Pollution

Table 2.7.2: Deforestation and Pollution

ADB Regional Member	Deforestation Rate ^a (% change)		Carbon Dioxide Emissions ^b (t '000)		Nitrous Oxide Emissions (t '000 CO ₂ equivalent)	
	2000	2015	2000	2014	2000	2012
Developing ADB Member Economies						
Central and West Asia						
Afghanistan	-	-	774	9,809	3,317	3,424
Armenia	0.06	-0.06	3,465	5,530	462	1,023
Azerbaijan	-0.23	-2.36	29,508	37,488	2,030	2,673
Georgia	-0.03	-	4,536	8,988	2,437	2,352
Kazakhstan	0.17	-	118,099	248,315	14,865	17,822
Kyrgyz Republic	-0.26	1.24	4,635	9,608	1,452	1,567
Pakistan	1.91	2.84	106,449	166,298	26,350	30,651
Tajikistan	-0.05	-0.10	2,237	5,189	1,110	1,848
Turkmenistan	-	-	37,539	68,423	3,046	4,924
Uzbekistan	-0.52	0.34	121,829	105,214	9,610	13,192
East Asia						
China, People's Republic of	-1.13	-0.75	3,405,180	10,291,927	414,138	587,166
Hong Kong, China	...	...	40,440	46,223	513	476
Korea, Republic of	0.13	0.12	447,561	587,156	18,576	14,979
Mongolia	0.69	0.77	7,506	20,840	5,058	3,548
Taipei, China	-	-4.54	229,840 (2001)	268,515	3,930 (2001)	4,503 (2014)
South Asia						
Bangladesh	0.18	0.18	27,869	73,190	20,770	26,683
Bhutan	-0.38	-0.36	396	1,001	281	555
India	-0.22	-0.25	1,031,853	2,238,377	207,700	239,755
Maldives	-	-	451	1,335	12	27
Nepal	2.30	-	3,069	8,031	4,232	4,598
Sri Lanka	0.42	0.32	10,238	18,394	2,044	2,174
Southeast Asia						
Brunei Darussalam	0.40	-	4,712	9,109	395	342
Cambodia	1.20	1.33	1,977	6,685	3,295	16,685
Indonesia	1.89	0.75	263,419	464,176	94,933	93,139
Lao People's Democratic Republic	0.67	-1.02	939	1,955	3,265	8,987
Malaysia	0.36	-0.06	125,734	242,821	13,822	15,310
Myanmar	1.23	1.85	10,088	21,632	31,300	26,783
Philippines	-0.68	-3.08	73,307	105,654	12,365	12,762
Singapore	-	-	49,006	56,373	6,635	1,909
Thailand	-1.80	-0.18	181,271	316,213	18,677	30,833
Viet Nam	-2.06	-0.88	53,645	166,911	19,746	34,494
The Pacific						
Cook Islands	-0.47	-	...	...	...	...
Fiji	-0.28	-0.48	843	1,170	343	344
Kiribati	-	-	29	62	3	4
Marshall Islands	-	-	77	103	0	0
Micronesia, Federated States of	-0.05	-0.05	125	150	11	11
Nauru	...	...	84	48	0	0
Palau	-0.38	-	249	260	0	0
Papua New Guinea	0.01	0.01	2,666	6,318	1,613	1,234
Samoa	-2.46	-	143	198	37	40
Solomon Islands	0.25	0.26	150	202	2,425	2,656
Timor-Leste	1.29	1.61	...	469	164	226
Tonga	-	-	95	121	22	22
Tuvalu	-	-	7	11	1	1
Vanuatu	-	-	84	154	118	109
Developed ADB Member Economies						
Australia	-0.02	-0.25	329,443	361,262	75,581	54,247
Japan	0.03	0.01	1,220,528	1,214,048	30,411	24,911
New Zealand	-0.48	-0.00	32,981	34,664	11,549	11,880

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Table 2.7.2: Deforestation and Pollution (continued)

ADB Regional Member	Methane Emissions (t '000 CO ₂ equivalent)		Other Greenhouse Gases ^c (t '000 CO ₂ equivalent)	
	2000	2012	2000	2012
Developing ADB Member Economies				
Central and West Asia				
Afghanistan	9,384	13,763	126	349
Armenia	2,565	3,426	112	710
Azerbaijan	9,955	19,955	464	1,142
Georgia	4,137	5,019	3	227
Kazakhstan	38,779	71,350	14,065	30,363
Kyrgyz Republic	3,486	4,291	93	68
Pakistan	117,125	158,337	757	1,159
Tajikistan	3,304	5,408	798	367
Turkmenistan	21,241	22,009	124	595
Uzbekistan	37,233	47,333	298	989
East Asia				
China, People's Republic of	1,043,400	1,752,290	104,677	251,254
Hong Kong, China	2,695	3,147	155	150
Korea, Republic of	30,916	32,625	14,934	8,968
Mongolia	9,218	6,257	26,233	2,216
Taipei, China	12,646 (2001)	5,636 (2014)	6,304 (2001)	3,663 (2014)
South Asia				
Bangladesh	89,247	105,142	686	1,329
Bhutan	1,032	1,770	644	488
India	561,733	636,396	56,626	153,658
Maldives	34	52	0	-0
Nepal	21,206	23,982	2,443	7,995
Sri Lanka	9,606	11,864	441	91
Southeast Asia				
Brunei Darussalam	3,882	4,539	101	427
Cambodia	14,985	35,915	23,021	73,300
Indonesia	170,032	223,316	63,048	2,556
Lao People's Democratic Republic	7,219	15,011	13,588	136,841
Malaysia	29,309	34,271	5,144	3,866
Myanmar	66,942	80,637	78,176	406,274
Philippines	49,911	57,170	12,487	3,891
Singapore	1,684	2,386	1,410	3,299
Thailand	83,564	106,499	8,756	45,556
Viet Nam	75,430	113,564	5,782	25,707
The Pacific				
Cook Islands	...	...	...	...
Fiji	705	715	9	52
Kiribati	13	16	-	-0
Marshall Islands	6	8	...	...
Micronesia, Federated States of	28	30	...	...
Nauru	3	3	-0	-0
Palau	1	1	...	...
Papua New Guinea	2,001	2,143	1,949	2,188
Samoa	116	133	-0	0
Solomon Islands	1,394	1,449	0	0
Timor-Leste	450	732	-	-0
Tonga	58	61	-0	0
Tuvalu	3	3	-0	0
Vanuatu	267	254	0	-0
Developed ADB Member Economies				
Australia	128,133	125,588	520,911	174,653
Japan	47,496	38,957	51,527	71,746
New Zealand	26,584	28,658	1,506	1,764

... = data not available, - = magnitude equals zero, -0 or 0 = magnitude is less than half of unit employed, ADB = Asian Development Bank, CO₂ = carbon dioxide, t = metric ton.

a Rate refers to percentage change over previous year. A negative value indicates that the deforestation rate is decreasing (i.e., reforestation).

b Data from the World Bank are expressed in kilotons (kt), while data provided in the table are expressed in thousands of metric tons (t), using a conversion factor of 1 kt = 1000 t.

c Other greenhouse gas emissions refer to hydrofluorocarbons, perfluorocarbons, and sulphur hexafluoride.

Sources: Food and Agriculture Organization. FAOSTAT Database. <http://www.fao.org/faostat/en/#data/RL> (accessed 6 June 2018); and World Bank. World Development Indicators Online. <http://data.worldbank.org/indicator> (accessed 7 June 2018). For Taipei, China: Government of Taipei, China, Directorate-General of Budget, Accounting and Statistics; and Statistical Yearbook 2016. <http://eng.dgbas.gov.tw/lp.asp?CtNode=2351&CtUnit=1072&BaseDSD=36&mp=2> (accessed 7 June 2018).

[Click here for table data](#)

Freshwater

Table 2.7.3: Freshwater Resources

ADB Regional Member	Internal Renewable Freshwater Resources				Annual Freshwater Withdrawals (m ³ billion)	Water Productivity ^a (constant 2010 \$ per m ³)
	(m ³ billion per year)		(m ³ per inhabitant per year)			
	2002	2014	2002	2014		
Developing ADB Member Economies						
Central and West Asia	370	370	1,554	1,210		
Afghanistan	47	47	2,194	1,450	20 (2000)	...
Armenia	7	7	2,251	2,273	3 (2015)	3.5 (2015)
Azerbaijan	8	8	980	832	12 (2012)	4.5 (2012)
Georgia	58	58	12,555	14,532	2 (2008)	6.2 (2008)
Kazakhstan	64	64	4,287	3,651	20 (2010)	7.4 (2010)
Kyrgyz Republic	49	49	9,732	8,237	8 (2006)	0.5 (2006)
Pakistan	55	55	381	291	184 (2008)	0.9 (2008)
Tajikistan	63	63	9,905	7,482	11 (2006)	0.4 (2006)
Turkmenistan	1	1	305	261	28 (2004)	0.4 (2004)
Uzbekistan	16	16	651	547	49 (2005)	0.5 (2005)
East Asia^b	2,913	2,913	2,137	1,994		
China, People's Republic of	2,813	2,813	2,141	1,999	594 (2015)	15.0 (2015)
Hong Kong, China	...	...	...	...	...	...
Korea, Republic of	65	65	1,387	1,289	29 (2005)	30.8 (2005)
Mongolia	35	35	14,239	11,761	1 (2009)	12.3 (2009)
Taipei, China	...	...	...	...	...	...
South Asia	1,883	1,880	1,482	1,235		
Bangladesh	105	105	771	652	36 (2008)	2.9 (2008)
Bhutan	81	78	135,361	100,671	0 (2008)	3.9 (2008)
India	1,446	1,446	1,326	1,103	648 (2010)	2.6 (2010)
Maldives	0	0	103	82	...	...
Nepal	198	198	8,084	6,951	9 (2006)	1.4 (2006)
Sri Lanka	53	53	2,770	2,549	13 (2005)	3.2 (2005)
Southeast Asia	4,985	4,985	9,223	7,884		
Brunei Darussalam	9	9	24,752	20,085	...	...
Cambodia	121	121	9,510	7,742	2 (2006)	4.1 (2006)
Indonesia	2,019	2,019	9,288	7,839	113 (2000)	4.0 (2000)
Lao People's Democratic Republic	190	190	34,606	27,992	3 (2005)	1.4 (2005)
Malaysia	580	580	23,769	19,122	11 (2005)	18.3 (2005)
Myanmar	1,003	1,003	20,600	18,610	33 (2000)	0.5 (2000)
Philippines	479	479	5,892	4,757	82 (2009)	2.3 (2009)
Singapore	1	1	145	107	...	...
Thailand	225	225	3,500	3,303	57 (2007)	5.5 (2007)
Viet Nam	359	359	4,387	3,846	82 (2005)	1.0 (2005)
The Pacific^b	892	892	111,664	84,640		
Cook Islands	...	...	...	...	...	...
Fiji	29	29	35,001	32,003	0 (2005)	35.7 (2005)
Kiribati	...	...	...	...	...	...
Marshall Islands	...	...	...	...	...	...
Micronesia, Federated States of	...	...	...	...	...	...
Nauru	...	...	...	...	...	...
Palau	...	...	...	...	...	...
Papua New Guinea	801	801	141,695	105,132	0 (2005)	27.3 (2005)
Samoa	...	...	...	...	...	...
Solomon Islands	45	45	102,782	76,594	...	...
Timor-Leste	8	8	9,181	6,932	1 (2004)	0.5 (2004)
Tonga	...	...	...	...	...	...
Tuvalu	...	...	...	...	...	...
Vanuatu	10	10	51,546	37,793	...	...
Developed ADB Member Economies	1,249	1,249	8,342	8,054		
Australia	492	492	25,213	20,527	17 (2015)	78.0 (2015)
Japan	430	430	3,406	3,397	81 (2009)	67.4 (2009)
New Zealand	327	327	82,534	72,201	5 (2010)	28.2 (2010)
DEVELOPING ADB MEMBER ECONOMIES^b	11,043	11,040	3,229	2,808		
ALL ADB REGIONAL MEMBERS^b	12,292	12,289	3,443	3,007		

... = data not available, 0 = magnitude is less than half of unit employed, \$ = United States dollars, ADB = Asian Development Bank, m³ = cubic meter.

a Gross domestic product in constant 2010 United States dollars per cubic meter of total freshwater withdrawal.

b For reporting economies only.

Sources: Food and Agriculture Organization. AQUASTAT Database. <http://www.fao.org/nr/water/aquastat/data/query/index.html> (accessed 11 June 2018); and World Bank. World Development Indicators Online. <http://data.worldbank.org/indicator> (accessed 11 June 2018).

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