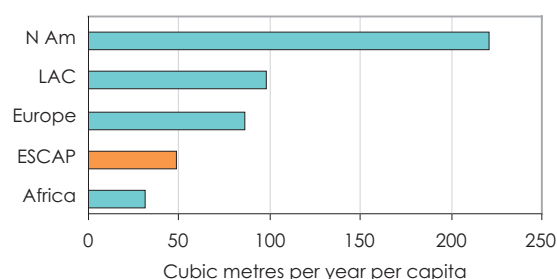


26. Water use

Water is a vital resource, but millions of people do not have access to clean water resources and experience water shortages. The overwhelming majority of them live in Asia and the Pacific, despite high levels of total water consumption in the region.

Domestic water withdrawal per capita in Asia and the Pacific is nearly 49 cubic metres per year, which places the region ahead of Africa, at 31, but behind Latin America and the Caribbean, at 98. North America has the highest level of domestic water use per capita at 221, while Europe is a more efficient user of water, at 86 cubic metres per capita.

Figure 26.1 Domestic water withdrawal per capita in the regions of the world, 2000

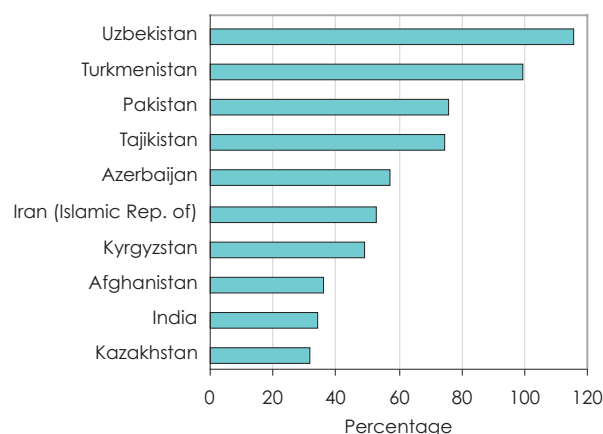


Within the Asian and Pacific region, there is a broad range of water withdrawal levels for domestic use. Central Asia withdraws 98 cubic metres per capita while the SAARC and ASEAN regions have similar annual per capita withdrawal levels, at 42 and 41 cubic metres, respectively. High-income countries use more than three times as much water as low- and middle-income countries, which withdraw similar amounts of water per capita for domestic use, at 44 and 43 cubic metres.

Armenia has an annual per capita water withdrawal level of 286 cubic metres, which is nearly six times as much as the regional average. Four of the five developing countries with the highest levels of per capita water withdrawal for domestic use are in Central Asia, and three are also landlocked countries. The three countries with the lowest level of per capita water withdrawal for domestic use are Cambodia, Myanmar and Papua New Guinea.

Of the 10 countries with the highest amounts of water withdrawal as a proportion of total renewable water, 6 are in Central Asia, and 7 of them are landlocked countries. Seven of these countries withdraw more than 40 per cent of the renewable water resources, indicating severe stress on their water resources (ESCAP, 2005b).

Figure 26.2 The 10 Asian and Pacific countries/areas with highest proportion of water withdrawal in relation to total renewable water, 1998-2002

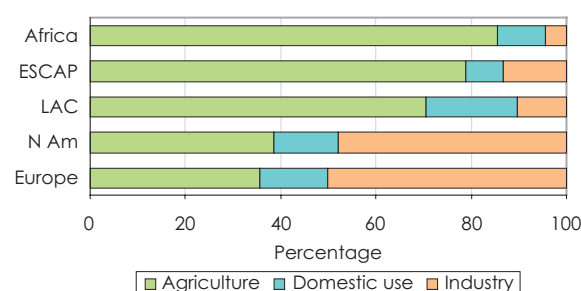


The Asian and Pacific region is home to more than 60 per cent of the world's population and agricultural land. The region is also the largest consumer of water by far, with a withdrawal rate of 2,384 billion cubic metres per year, which is more than the consumption of rest of the world.

The Asian and Pacific region uses the largest proportion of its water — nearly 79 per cent of its total withdrawal — for agriculture. This is followed by industrial use, at about 13 per cent, and domestic purposes, at 8 per cent. Of the 32 developing countries in Asia and the Pacific for which data are available, 29 withdraw more than 50 per cent of their water for agriculture. In 16 of these countries, more than 90 per cent of the water withdrawn is used in the agricultural sector.

In the other developing regions of the world, agriculture also consumes the largest share of water withdrawn. In Africa, agricultural consumption comprises 84 per cent of total water consumption, whereas in Latin America and the Caribbean this share is about 71 per cent. Both these regions differ from Asia and the Pacific in that they consume more water for domestic purposes than for industry. In

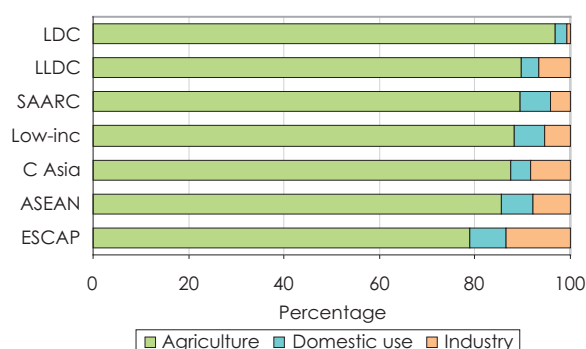
Figure 26.3 Water withdrawal by sector in the regions of the world, 2000



North America and Europe, the largest share of water is used for industry, followed by agriculture and domestic purposes.

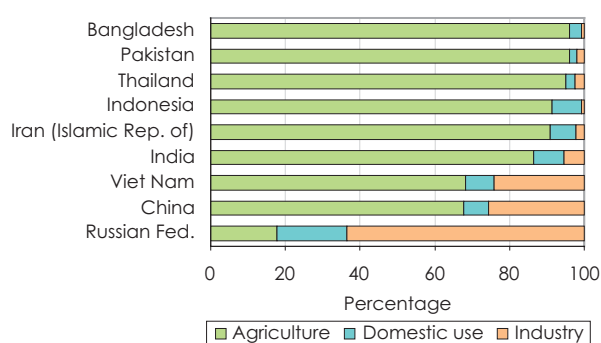
Groups of countries within Asia and the Pacific follow a pattern similar to that of the region as a whole, except the SAARC region and the least developed countries (five of the eight SAARC members are least developed countries), which have a higher share of water consumption for domestic purposes than for industrial use.

Figure 26.4 Water withdrawal by sector in selected Asian and Pacific country/area groupings, 2000



In Asia and the Pacific, the six largest consumers of water for which trend data are available are China, India, Pakistan, Indonesia, the Russian Federation and the Islamic Republic of Iran. All except the Russian Federation increased water withdrawal between the early 1990s and 2000. Bangladesh, Thailand and Viet Nam are also among the countries withdrawing high levels of water in the region, that is, above 70 billion cubic metres per year.

Figure 26.5 Water withdrawal by sector in selected Asian and Pacific countries/areas, 2000



Domestic water withdrawal per capita (cubic metres per year): Drinking water plus water withdrawn for homes, municipalities, commercial establishments, and public services, divided by population. *Aggregates:* Averages are calculated using total population as weight. *Source:* Food and Agriculture Organization of the United Nations, FAO Information system on Water and Agriculture (online database, accessed in September 2007).

Annual withdrawals of ground and surface water (percentage of total renewable water): The gross amount of water extracted in a day from any source either permanently or temporarily. Water sources can be either withdrawn from surface water, groundwater or produced (non-conventional water sources), such as reused treated wastewater and desalinated water. *Source:* Food and Agriculture Organization of the United Nations, FAO Information system on Water and Agriculture (online database, accessed in September 2007).

Total water withdrawal (billion cubic metres per year): The gross quantity of water withdrawn for agricultural, industrial and domestic purposes in a given country. Does not include other categories of water use, such as for cooling of power plants, mining, recreation, navigation, or fisheries. *Aggregates:* Sum of individual country values. *Source:* Food and Agriculture Organization of the United Nations, FAO Information system on Water and Agriculture (online database, accessed in September 2007).

Water withdrawal for domestic use (percentage of total water withdrawal): The total water withdrawn by the public distribution network. It can include that part of the industries, which are connected to the network. *Aggregates:* Averages are calculated as the sum of individual country values within each group divided by the total water withdrawal of each group. *Source:* Food and Agriculture Organization of the United Nations, FAO Information system on Water and Agriculture (online database, accessed in September 2007).

Water withdrawal for agriculture (percentage of total water withdrawal): Quantity of water used for agricultural purposes, including irrigation and for livestock. Methods for computing agricultural water withdrawal vary from country to country. *Aggregates:* Averages are calculated as the sum of individual country values within each group divided by the total water withdrawal of each group. *Source:* Food and Agriculture Organization of the United Nations, FAO Information system on Water and Agriculture (online database, accessed in September 2007).

Water withdrawal for industry (percentage of total water withdrawal): Quantity of water used for industrial purposes. Usually, this sector refers to self-supplied industries not connected to any distribution network. *Aggregates:* Averages are calculated as the sum of individual country values within each group divided by the total water withdrawal of each group. *Source:* Food and Agriculture Organization of the United Nations, FAO Information system on Water and Agriculture (online database, accessed in September 2007).

26.1 Water domestic use and resources

	Domestic water withdrawal per capita			Annual withdrawals of ground and surface water		
	Cubic metres per year			% of total renewable water		
	1990	1995	2000	1988-1992	1993-1997	1998-2002
East and North-East Asia						
China	30.5		32.7	17.7	18.6	22.3
DPR Korea			78.0			11.7
Hong Kong, China						
Macao, China						
Mongolia			36.4		1.2	1.3
Republic of Korea			141.5			26.7
South-East Asia						
Brunei Darussalam				0.9	1.1	
Cambodia			4.7			0.9
Indonesia	25.9		31.3	2.6		2.9
Lao PDR			24.9			0.9
Malaysia	45.2	65.2	65.3	1.7		1.6
Myanmar			8.9			3.2
Philippines		62.2	62.1		5.8	6.0
Singapore						
Thailand	27.6		35.8			21.2
Timor-Leste						
Viet Nam	30.2		70.0	6.1		8.0
South and South-West Asia						
Afghanistan			20.3			35.8
Bangladesh	15.0		18.1			6.6
Bhutan			35.8			0.4
India	29.1		49.9	26.4		34.1
Iran (Islamic Rep. of)			75.0		50.9	53.0
Maldives						
Nepal			12.3			4.8
Pakistan			22.7	69.9		76.1
Sri Lanka	11.4		16.0	19.5		25.2
Turkey			81.6	14.8		17.6
North and Central Asia						
Armenia	273.1	268.1	285.5	33.3	27.8	28.0
Azerbaijan	102.2	99.9	101.9	51.4	54.6	57.0
Georgia	133.3		152.5	5.5		5.7
Kazakhstan	38.3	36.6	39.5	33.4	30.7	31.9
Kyrgyzstan	62.6		64.7	53.4	49.0	49.0
Russian Federation	98.6		97.5	1.8	1.7	1.7
Tajikistan	91.5		71.3	75.2	74.3	74.8
Turkmenistan	52.1		93.3	100.1	96.2	99.7
Uzbekistan	100.0		112.0	124.0	115.2	115.7
Pacific						
American Samoa						
Cook Islands						
Fiji			12.5			0.2
French Polynesia						
Guam						
Kiribati						
Marshall Islands						
Micronesia (F.S.)						
Nauru						
New Caledonia						
Niue						
Northern Mariana Is.						
Palau						
Papua New Guinea			7.4			0.0
Samoa						
Solomon Islands						
Tonga						
Tuvalu						
Vanuatu						
ESCAP Developed Economies						
Australia			183.9			4.9
Japan			137.0	21.3		20.6
New Zealand			264.7			0.6
ESCAP	34.3		49.0			
LLDC			60.1			
LDC			15.5			
SIDS						
ASEAN	28.1		41.1			
SAARC	27.2		42.4			
Central Asia	91.1		97.8			
Low-income	29.5		44.4			
Middle-income	37.4		43.0			
High-income			145.1			
Africa			31.1			
Latin America & Carib.			97.7			
North America	210.7		221.3			
Europe			86.3			
Other Asia-Pacific			60.5			
World						

26.2 Water uses by sector

	Total water withdrawal		For domestic use		Water withdrawal For agriculture		For industry	
	Billion cubic metres per year				% of total water withdrawal			
	1990	2000	1990	2000	1990	2000	1990	2000
East and North-East Asia								
China	500.0	630.3	7.0	6.6	83.0	67.7	10.0	25.7
DPR Korea		9.0		19.8		55.0		25.2
Hong Kong, China								
Macao, China								
Mongolia	0.4 (93)	0.4	19.9 (93)	20.5	53.0 (93)	52.3	27.1 (93)	27.3
Republic of Korea		18.6		35.6		48.0		16.4
South-East Asia								
Brunei Darussalam	0.1 (91)							
Cambodia		4.1		1.5		97.8		0.5
Indonesia	74.3	82.8	6.4	8.0	93.1	91.3	0.5	0.7
Lao PDR		3.0		4.3		90.3		5.7
Malaysia	10.1	9.0	8.1	16.9	82.0	62.1	9.9	21.1
Myanmar		33.2		1.2		98.3		0.5
Philippines	27.7 (95)	28.5	15.4 (95)	16.6	76.3 (95)	74.0	8.3 (95)	9.4
Singapore								
Thailand		87.1		2.5		95.0		2.5
Timor-Leste								
Viet Nam	54.3	71.4	3.7	7.8	86.5	68.1	9.8	24.1
South and South-West Asia								
Afghanistan		23.3		1.8		98.2		0.0
Bangladesh		79.4		3.2		96.2		0.7
Bhutan		0.4		4.8		95.2		1.2
India	500.0	645.8	5.0	8.1	92.0	86.5	3.0	5.5
Iran (Islamic Rep. of)	70.0 (93)	72.9	6.3 (93)	6.8	91.6 (93)	90.9	2.1 (93)	2.3
Maldives								
Nepal		10.2		2.9		96.5		0.6
Pakistan	155.6 (91)	169.4	1.6 (91)	1.9	96.8 (91)	96.0	1.6 (91)	2.0
Sri Lanka	9.8	12.6	2.0	2.4	96.0	95.2	2.0	2.5
Turkey	31.6 (92)	37.5	16.5 (92)	14.8	72.5 (92)	74.3	11.1 (92)	11.0
North and Central Asia								
Armenia	3.5	3.0	27.6	29.8	67.4	65.8	5.0	4.4
Azerbaijan	15.6	17.3	4.7	4.8	72.5	67.5	22.8	27.7
Georgia	3.5	3.6	21.0	19.9	58.9	59.0	20.1	21.1
Kazakhstan	36.6	35.0	1.7	1.7	80.3	81.8	18.0	16.5
Kyrgyzstan	11.0	10.1	2.5	3.2	91.9	93.8	5.6	3.1
Russian Federation	82.6	76.7	17.7	18.8	23.5	17.8	58.7	63.5
Tajikistan	12.0	12.0	4.0	3.7	91.0	91.6	4.9	4.7
Turkmenistan	24.7	24.6	0.8	1.7	98.7	97.6	0.5	0.8
Uzbekistan	62.5	58.3	3.3	4.7	94.7	93.2	2.0	2.1
Pacific								
American Samoa								
Cook Islands								
Fiji		0.1		14.3		71.4		14.3
French Polynesia								
Guam								
Kiribati								
Marshall Islands								
Micronesia (F.S.)								
Nauru								
New Caledonia								
Niue								
Northern Mariana Is.								
Palau								
Papua New Guinea		0.1		50.0		1.3		37.5
Samoa								
Solomon Islands								
Tonga								
Tuvalu								
Vanuatu								
ESCAP Developed Economies								
Australia		23.9		14.7		75.3		10.0
Japan	91.4 (92)	88.4	18.6 (92)	19.7	64.1 (92)	62.5	17.3 (92)	17.9
New Zealand		2.1		48.3		42.2		9.5
ESCAP		2 384.0		7.7		78.9		13.4
LLDC		197.5		3.7		89.6		6.7
LDC		153.6		2.5		96.9		0.6
SIDS								
ASEAN		319.1		6.6		85.6		7.8
SAARC		941.1		6.3		89.5		4.2
Central Asia		163.8		4.3		87.4		8.4
Low-income		1 129.7		6.2		88.3		5.4
Middle-income		1 121.3		7.6		71.4		21.0
High-income		133.1		21.5		62.4		16.1
Africa		210.8		9.9		84.0		4.2
Latin America & Carib.		265.1		19.1		70.7		10.4
North America		525.3		13.3		38.7		48.0
Europe		332.6		14.3		35.6		50.1
Other Asia-Pacific		96.0		6.6		90.2		3.2
World								