

ANNEX I: COVERAGE AND QUALITY OF INFRASTRUCTURE IN LAC

A1.1 **Infrastructure in LAC is considered by sectors below.** Comparisons are usually drawn with the entire universe of 93 middle-income countries, including LAC, and two Asian nations: (i) the Republic of Korea, the per capita income of which was very close to the LAC average in 1985, but which has subsequently grown much faster; and (ii) China, the rapid recent growth of which arguably represents the greatest competitive challenge for LAC. For quality and efficiency indicators, an OECD average is also included where possible, as an indicator of best practice. Data on comparators' GDP is included at the end of the section, along with a list of the countries in the regional aggregates.

A. Transport

A1.2 **LAC had more roads than East Asia and the middle income average in 1985, but has fallen behind since.** By 2001, road density, normalized to adjust for country size, had barely grown, while those of both Korea and middle-income countries had.¹ The road network is particularly extensive in a few smaller countries, led by Jamaica and Costa Rica. These are also the two countries with the greatest expansion in their road networks over the period of analysis. In contrast, El Salvador and Guatemala show slight declines, possibly related to the civil conflicts they suffered during this period. If the road network were measured instead relative to the labor force, the regional leaders would be Costa Rica and Brazil. On that alternative basis, all countries in the region would have seen a decline in the extent of their network over 1980-2001, while East Asia would still have experienced an expansion. Today, road density by any measure is much lower in LAC than in middle income countries or China (Annex table 1).

Annex table 1. Road density is much lower in LAC than in Middle Income Countries or China

	per 1000 person	km/1000 km ²	per US \$Million of GDP
<i>Total roads</i>			
Latin America & Caribbean	0.31	8.20	0.10
China	1.38	189.25	1.39
Middle income	1.39	59.90	0.77
<i>Paved roads</i>			
Latin America & Caribbean	0.08	2.21	0.03
China	1.25	172.22	1.26
Middle income	0.73	31.33	0.40

Source: World Development Indicators, 2002 except for paved roads data which is latest available year between 1995 and 2002. GDP per capita in PPP international dollars is 4379 for China, 5069 for middle income countries and 6381 for LAC. In 2000 US\$, the difference is much starker: \$983 for China, \$1876 for middle income countries and \$3759 for LAC

¹ If roads are normalized instead according to the labor force, the relative trends across regions are the same as those shown in the graph, although in terms of levels they rank differently, with Latin America ahead of East Asia, although by a margin that declines over time.

A1.3 **The quality of Latin America's roads is generally poor.** Less than a third of the national road network is in good condition in most countries for which data is available (Annex Table 1.) In fact, only two countries come above this threshold: Argentina, at 80%, and Guatemala at 75% (a figure that appears optimistic, although the establishment of a roads fund has had a positive impact on road condition). Even fewer regional roads are in good condition, in all countries other than Nicaragua. And while little data is available for the rural and local roads that make up the remainder of the network, condition seems to be even worse, with only 8% in good condition in Peru and Ecuador, for example. Pavement rates are also low: in 1999, 27% of the roads in LAC were paved, against 54% in middle-income countries, and 75% in Korea. This proportion had risen faster in LAC since 1990, when the rate was 22%, compared with 51% for middle-income countries and 72% for Korea.²

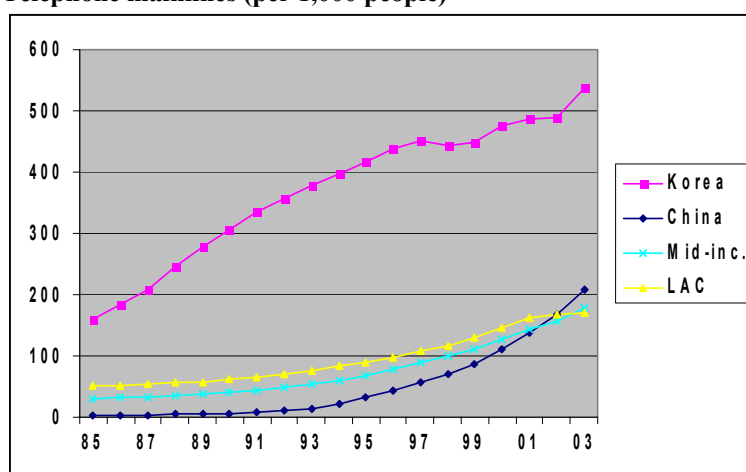
Annex table 2: Quality of national roads in selected LAC countries, on governments' assessments

	<i>Length of total road network (km)</i>	<i>National roads as% of total</i>	<i>National roads in good condition (%)</i>	<i>Regional roads as% of total</i>	<i>Regional roads in good condition (%)</i>
Peru	78,200	22	23	18	15
Colombia	166,233	10	29	40	n.a.
Ecuador	43,200	20	26	26	10
Nicaragua	18,950	9.2	24	3.4	26
Guatemala	26,000	15	75	12	45
Brazil	1,611,000	4.5	24	14	n.a.
Argentina	630,000	6.0	80	30	78
Mexico	302,000	16	23	27	n.a.
Haiti	3,400	20	16	44	4.0

Source: World Bank reports

B. Telecommunications

Annex Figure 1: Telephone mainlines (per 1,000 people)

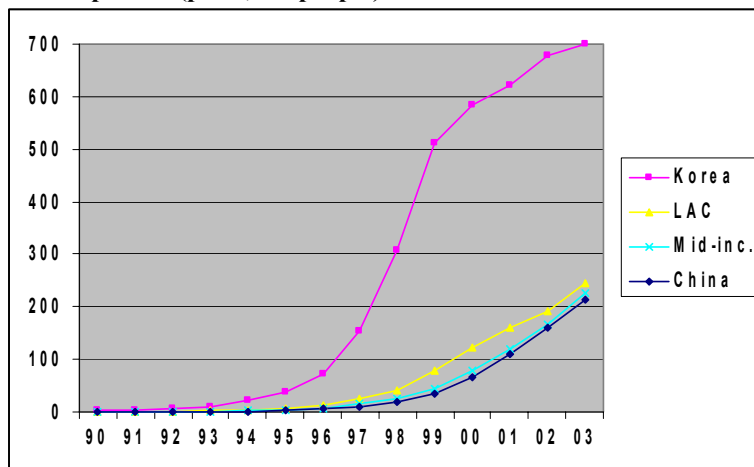


Source: International Telecommunication Union

² International Road Federation, from World Development Indicators Database, World Bank

A1.4 **Despite a strong performance by some countries, Latin America has fallen behind all comparators for telephone mainline coverage since 2002.** In 1985, the region was well ahead of both China and middle-income countries in general, but already far behind Korea (see Annex Figure 1). But in 2003, LAC's 170 lines per 1,000 people was behind 209 in China and 178 for middle-income countries. For Korea, the total was 538. The 2003 range within LAC spanned from 17 in Haiti and 37 in Nicaragua to 251 in Costa Rica and 280 in Uruguay. (See Annex Table 2 for fixed and cellular subscription numbers by country).

Annex Figure 2: Mobile phones (per 1,000 people)

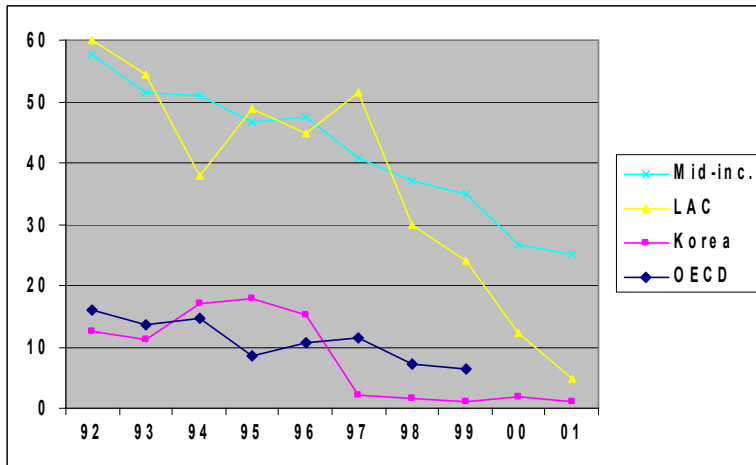


Source: International Telecommunication Union

A1.5 **Mobile phone expansion has made up for slow fixed line growth, although China is still ahead for total telephone subscriptions.** Cellular penetration was higher in 2003 in LAC, at 246 per 1,000 people, than middle-income countries (225) and China (215). Korea was even further ahead than for fixed lines than, at 701 (Annex Figure 2). Within LAC, the lowest levels were 2 (2002) in Cuba, 38 in Haiti and 49 in Honduras. However, countries at the top end: Chile (511) and Jamaica (535 in 2002) compare for cellular density with some much wealthier countries, including the U.S. (488 in 2002 and 543 in 2003). If mobile and fixed lines are added together, which is appropriate as the two are partly substitutes and recent cellular growth has apparently come at the expense of fixed line expansion, the LAC figure of 416 puts it above middle-income countries (403), but just below China (424). LAC now has 45% more cellular subscriptions than fixed lines, a margin that is greater than in China (2.7%), Korea (30%) and middle-income countries (27%).

A1.6 **The quality of fixed telephone service has improved even more dramatically in LAC than comparators.** Between 1992 and 2001, the number of faults reported per 100 lines fell from 60 to 4.7 in LAC, against 58 to 25 in middle-income countries and 12.5 to 1.2 in Korea (Annex Figure 3). In high-income OECD countries, the decline was from 18 in 1992 to 6.3 in 1999, the last year for which an aggregate figure is available. And while LAC was still behind Korea in 2001, fewer faults were reported in the region that year than for some OECD members, including the U.S. (12 per 100 lines) and Australia (8.3). Waiting times for the installation of new lines, which stretched to several months in LAC in 1985, had also fallen to a few days. Technological progress is behind much of this improvement.

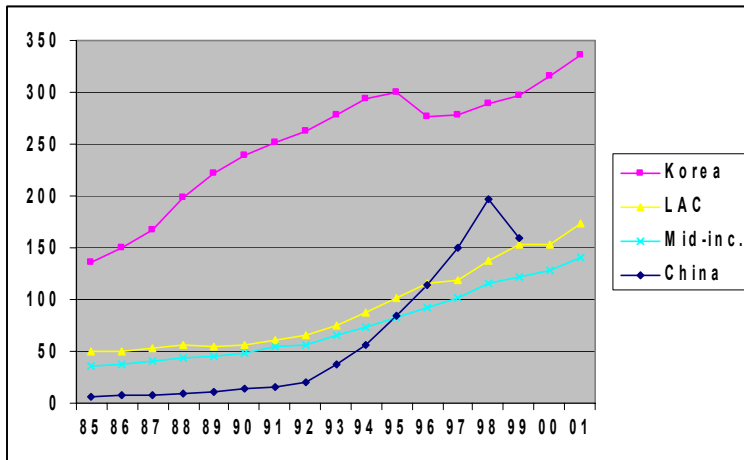
Annex Figure 3: Telephone faults reported (per 100 lines)



Source: International Telecommunication Union

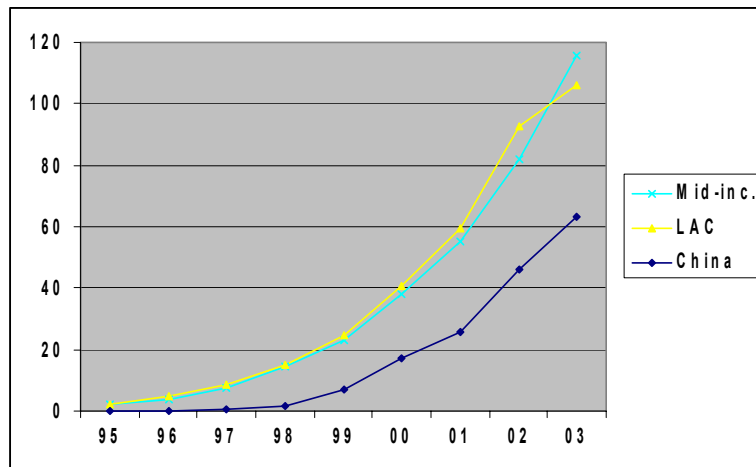
A1.7 In fixed telecommunications, labor productivity has risen fast. Due largely to technological improvements in the telecommunications sector, the number of fixed lines per telecom employee has risen sharply in LAC and worldwide in recent years, and now stands at above the middle-income average but well below Korea and the OECD average.

Annex Figure 4: Mainlines per telecom employee



A1.8 Internet use has spread fast in LAC, but growth has slowed relative to middle income countries since 2002. In LAC in 2003, there were 106 users per 1,000 people, compared to 116 in middle-income countries, 63 in China (Annex Figure 5) and 610 in Korea, which is not included in the graph due to data incompleteness. But LAC's growth of internet use between 2002 and 2003 was much slower, at 15%, than China (37%) and middle-income countries overall (41%). Within the region, the range stretched from 81 in Haiti and 21 in Paraguay to 272 in Chile.

Annex Figure 5: Internet users (per 1,000 people)



Source: International Telecommunication Union

Annex Table 2: Telephone subscriptions in LAC (per 1,000 people)

	1985			2003		
	Mainlines	Mobile	Total	Mainlines	Mobile	Total
Argentina	90	0	90	219*	178*	396
Bolivia	27	0	27	72	152	224
Brazil	53	0	53	223	264	486
Chile	44	0	44	221	511	732
Colombia	57	0	57	179	141	321
Costa Rica	79	0	79	251*	111*	362
Cuba	27	0	27	..	2*	..
Dominican Republic	23	0	23	115	271	387
Ecuador	30	0	30	122	189	312
El Salvador	19	0	19	116	176	292
Guatemala	16	0	16	71*	131*	202
Guyana	23	0	23	92*	99*	191
Haiti	5	0	5	17	38	55
Honduras	11	0	11	48*	49*	97
Jamaica	33	0	33	170*	535*	704
Mexico	50	0	50	158	291	449
Nicaragua	13	0	13	37	85	123
Panama	78	0	78	122	268	390
Paraguay	21	0	21	46	299	345
Peru	21	0	21	67	106	173
Trinidad and Tobago	102	0	102	250*	278*	528
Uruguay	96	0	96	280*	193*	472
Venezuela, RB	71	0	71	111	273	384

* 2002 data

Source: International Telecommunication Union (from World Development Indicators Database, World Bank)

C. Energy

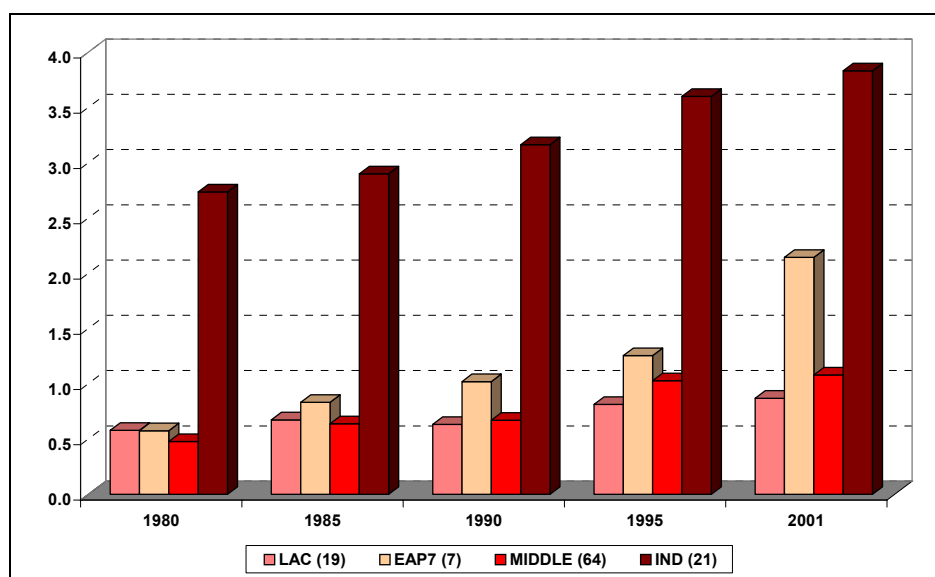
Annex Table 3: Households reporting access to electricity

	Total	Urban	Rural
Argentina (2002)	n.a.	100%	n.a.
Brazil (2002)	96%	99%	79%
Costa Rica (2002)	98%	100%	96%
Guatemala (2000)	73%	95%	56%
Jamaica (2000)	87%	92%	79%
Mexico (2000)	97%	n.a.	n.a.
Peru (2000)	69%	92%	28%

Source: adapted from Ernst & Young country briefs

A1.9 Electricity coverage is close to comprehensive in many urban areas, but remains thin in some rural areas. Annex Table 3 above shows that while more than 90% of urban dwellers have access to electricity in most of the region, there are major gaps in rural areas. Of the countries for which data is available, the urban-rural disparity is most extreme in Peru.

Annex Figure 6: Electricity generating capacity, medians by region (megawatts per 1,000 workers)



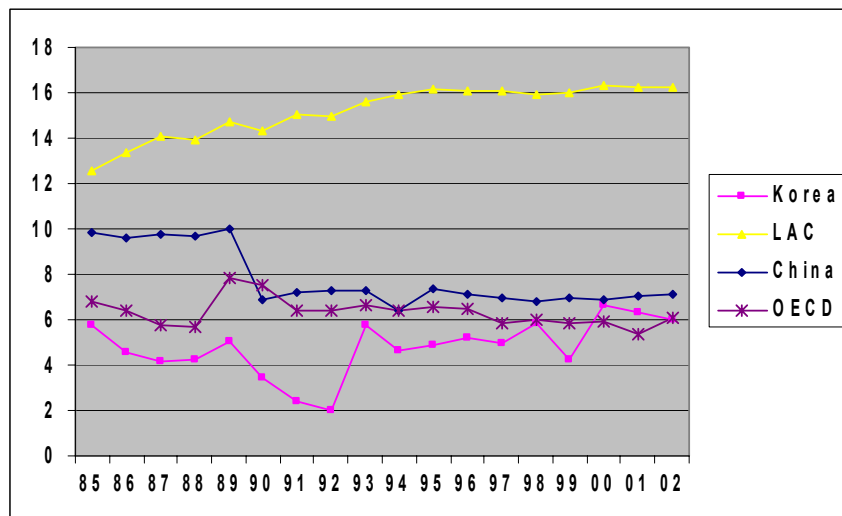
Source: Calderón and Servén (2004a)

A1.10 Slower growth in generation capacity has left LAC behind middle-income countries in terms of generation capacity. Overall, the region has slipped behind middle-income countries since the 1990s, while the gap with East Asia has widened considerably. There is great variation across Latin America in power generation capacity

per worker, which partly reflects geographical characteristics. In 2001 Paraguay ranked far ahead, due to the huge Itaipú hydroelectric project. It was followed by Venezuela and Argentina, with Bolivia at the bottom. Over the period, Nicaragua and Peru showed virtually no change in power generation capacity per worker, while Paraguay had the fastest growth, followed by Chile.

A1.11 In the energy sector, transmission and distribution losses have risen in LAC and are much higher than elsewhere. At 16% in 2002, the level in Latin America is nearly three times that of OECD countries (6.1%) and Korea (6.0%). LAC's losses are also well above the middle-income average of 12%. Within the region, a few countries show extremely high losses, which signify serious inefficiency: Haiti (51%), Dominican Republic (33%), Nicaragua (29%) and Venezuela (25%). The best performers were Paraguay (3.2%) and Trinidad and Tobago (4.7%.) Besides these two, only three other countries improved losses over the period over the period: Chile, El Salvador, and Jamaica.

Annex Figure 7: Electric power transmission and distribution losses (percentage of output)



Source: World Development Indicators Database

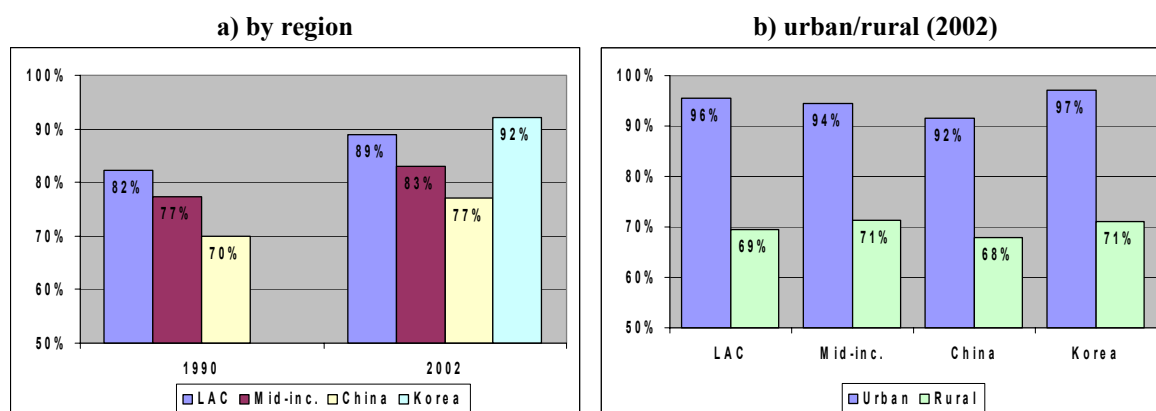
D. Water and sanitation

A1.12 In access to safe water, LAC surpasses the mid-income average (as well as China), with poorer nations making the greatest gains in the 1990s. The region increased coverage of safe water, which has both a quality and coverage aspect, from 82% of the population in 1990 to 89% in 2002 (Annex Figure 8a). Expansion during the period was in line, in percentage point terms, to that in China and middle income countries in general, but still left the region with lower coverage than Korea³. Across Latin America and the Caribbean, the degree of disparity apparently declined over the 1990s, as countries with lower access caught up. But the range is still wide, extending from 71% in Haiti to 98% in Uruguay (2002.) In Paraguay, access jumped from 62% to 83% from 1990 to 2002. Ecuador, El Salvador, Guatemala and Haiti also increased levels by 15 or more percentage points. The only country where coverage shrank over

³ Data for 1990 was not available for Korea, and neither was information on sanitation access.

the period was Trinidad and Tobago, where the level declined from 92% to 91%. (See below for further data on countries' coverage levels.)

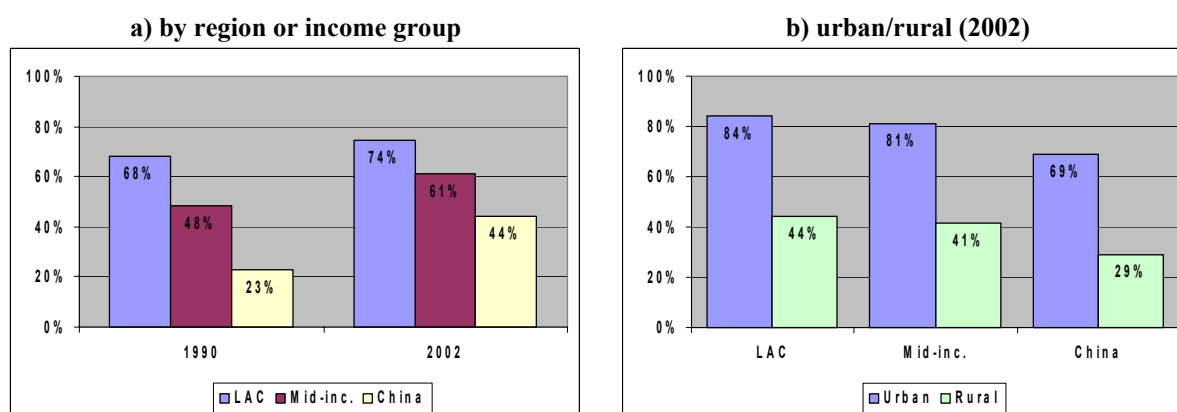
Annex Figure 8: Population with access to improved water sources⁴



Source: WHO and UNICEF

A1.13 The region is also well ahead for sanitation coverage, but recent expansion has been relatively slow, and some countries in LAC still have a long way to go. Overall, access to improved sanitation facilities rose from 68% in 1990 to 74% in 2002 (Annex Figure 9a.) But by 2002, while 100% of the inhabitants of Trinidad and Tobago and 98% of Cubans had access, this was true for only 34% of Haitians, 45% of Bolivians and 57% of those in the Dominican Republic.

Annex Figure 9: Population with access to improved sanitation facilities⁵



Source: WHO and UNICEF

⁴ Access to an improved water source refers to reasonable access to an adequate amount of water from an improved source, such as a household connection, public standpipe, borehole, protected well or spring, and rainwater collection. Reasonable access is defined as the availability of at least 20 liters a person a day from a source within one kilometer of the dwelling.

⁵ Access to improved sanitation facilities refers to at least adequate excreta disposal facilities (private or shared, but not public) that can effectively prevent human, animal, and insect contact with excreta. Improved facilities range from simple but protected pit latrines to flush toilets with a sewerage connection. To be effective, facilities must be correctly constructed and properly maintained.

A1.14 **For both water and sanitation, rural areas are far behind urban zones, although the gap has narrowed.** Whereas in 1990, only 58% of LAC's rural inhabitants had access to safe water and 35% to improved sanitation facilities, these levels had jumped to 69 and 44 respectively, by 2002. For urban areas, the increases were slower: from 93 to 96% for water and 83 to 84% for sanitation. But by 2002, the urban-rural gap was still larger, in percentage point terms, in LAC than in comparators for safe water access (Annex Figure 8b), while for sanitation, the disparity was similar to that in middle-income countries and China (Annex Figure 9b). The largest rural shortfalls are now in the region's largest countries: in Brazil, urban sanitation access is 83%, but just 35% in rural areas; and in Mexico the corresponding levels are 90% and 39%.

Annex Table 4: Improved water sources in LAC (percentage of population with access)

	1990			2002		
	Urban	Rural	Total	Urban	Rural	Total
Argentina	97	73	94	97	..	..
Bolivia	91	48	72	95	68	85
Brazil	93	55	83	96	58	89
Chile	98	49	90	100	59	95
Colombia	98	78	92	99	71	92
Costa Rica	100	..	..	100	92	97
Cuba	95	..	..	95	78	91
Dominican Rep.	97	72	86	98	85	93
Ecuador	81	54	69	92	77	86
El Salvador	88	47	67	91	68	82
Guatemala	88	69	77	99	92	95
Guyana	..	..	..	83	83	83
Haiti	77	43	53	91	59	71
Honduras	89	78	83	99	82	90
Jamaica	97	86	92	98	87	93
Mexico	90	54	80	97	72	91
Nicaragua	92	42	69	93	65	81
Panama	99	..	..	99	79	91
Paraguay	80	46	62	100	62	83
Peru	88	42	74	87	66	81
Trinidad & Tobago	93	89	92	92	88	91
Uruguay	98	..	..	98	93	98
Venezuela, RB	..	..	..	85	70	83

Source: WHO, UNICEF (from World Development Indicators Database, World Bank)

Annex Table 5: Improved sanitation facilities in LAC (percentage of population with access)

	1990			2002		
	Urban	Rural	Total	Urban	Rural	Total
Argentina	87	47	82	..	..	..
Brazil	82	37	70	83	35	75
Bolivia	49	13	33	58	23	45
Chile	91	52	85	96	64	92
Colombia	95	52	82	96	54	86
Costa Rica	..	97	..	89	97	92
Cuba	99	95	98	99	95	98
Dominican Rep.	60	33	48	67	43	57
Ecuador	73	36	56	80	59	72
El Salvador	70	33	51	78	40	63
Guatemala	71	35	50	72	52	61
Guyana	..	..	..	86	60	70
Haiti	27	11	15	52	23	34
Honduras	77	31	49	89	52	68
Jamaica	85	64	75	90	68	80
Mexico	84	20	66	90	39	77
Nicaragua	64	27	47	78	51	66
Panama	..	..	..	89	51	72
Paraguay	71	46	58	94	58	78
Peru	68	15	52	72	33	62
Trinidad & Tobago	100	100	100	100	100	100
Uruguay	95	..	..	95	85	94
Venezuela, RB	..	..	..	71	48	68

Source: WHO, UNICEF (from World Development Indicators Database, World Bank)

Annex Table 6: GDP and constituents of comparator groups

GDP per capita, PPP (current international \$)		
	1985	2003
China	823	5,003
Korea, Rep.	4,354	17,971
Latin America & Caribbean	4,320	7,400
Middle income	2,580	6,110
High income (OECD)	13,800	30,180

Annex Table 7: Countries in LAC and middle income aggregates

LAC		Middle-income countries	
Antigua & Barbuda	Albania	Georgia	Peru
Argentina	Algeria	Grenada	Philippines
Barbados	American Samoa	Guatemala	Poland
Belize	Antigua & Barbuda	Guyana	Romania
Bolivia	Argentina	Honduras	Russian Federation
Brazil	Armenia	Hungary	Samoa
Chile	Azerbaijan	Indonesia	Saudi Arabia
Colombia	Barbados	Iran, Islamic Rep.	Serbia & Montenegro
Costa Rica	Belarus	Iraq	Seychelles
Cuba	Belize	Jamaica	Slovak Republic
Dominica	Bolivia	Jordan	South Africa
Dominican Republic	Bosnia & Herzegovina	Kazakhstan	Sri Lanka
Ecuador	Botswana	Kiribati	St. Kitts & Nevis
El Salvador	Brazil	Latvia	St. Lucia
Grenada	Bulgaria	Lebanon	St. Vincent & Grenadines
Guatemala	Cape Verde	Libya	Suriname
Guyana	Chile	Lithuania	Swaziland
Haiti	China	Macedonia, FYR	Syrian Arab Republic
Honduras	Colombia	Malaysia	Thailand
Jamaica	Costa Rica	Maldives	Tonga
Mexico	Croatia	Marshall Islands	Trinidad & Tobago
Nicaragua	Cuba	Mauritius	Tunisia
Panama	Czech Republic	Mayotte	Turkey
Paraguay	Djibouti	Mexico	Turkmenistan
Peru	Dominica	Micronesia, Fed. Sts.	Ukraine
St. Kitts and Nevis	Dominican Republic	Morocco	Uruguay
St. Lucia	Ecuador	Namibia	Vanuatu
St. Vincent & Grenadines	Egypt, Arab Rep.	Northern Mariana Islands	Venezuela, RB
Suriname	El Salvador	Oman	West Bank & Gaza
Trinidad & Tobago	Estonia	Palau	
Uruguay	Fiji	Panama	
Venezuela, RB	Gabon	Paraguay	

Notes: Middle-income economies are those in which 2003 GNI per capita was between \$765 and \$9,385. Latin America and Caribbean regional aggregate does not include high-income economies.