

# Socioeconomic Development

**G**HG emissions can only be understood properly within the broader socioeconomic context. Such a context gives a sense not just of emissions, but the degree to which countries have the financial and institutional capacity to address the causes and consequences of climate change. Similarly, an understanding of different levels of development provides a sense of the context within which climate change competes for political attention. In particular, in many countries other issues are likely to take greater priority over considerations of GHGs in many policy-making spheres. For these reasons, this chapter examines the major emitters across a range of non-emissions issues.

Perhaps the most striking aspect of the major GHG emitting countries is the disparity in development levels. One measure of development, which provides a clear picture of the disparity, is per capita income figures (Figures 7.1 and 7.2). Figure 7.3 depicts the relationship between income and emission levels. In 2002, annual per capita income among the top emitting countries ranged from over \$34,000 in the United States (4<sup>th</sup> globally) to under \$2,000

in Pakistan (138<sup>th</sup> globally).<sup>46</sup> Other measures of a country's capacity to address climate change or other complex social challenges include life expectancy, educational achievement, and quality of governance (for example, political stability, level of corruption). As might be expected, the disparities in these measures largely mirror those for per capita income, although there are exceptions (Table 7).

Certain patterns and observations are notable:

- China and India, the world's largest countries, have per capita incomes that are six to eight times lower than those in industrialized countries when measured in purchasing power parity.<sup>47</sup> Some 550 million people in these two countries (16 percent of China's population and 35 percent of India's) subsist on less than \$1 a day.<sup>48</sup>
- Per capita income is lower in the two largest EITs (Russia and Ukraine) than in several advanced developing countries (Argentina, Brazil, South

**Figure 7.1. Income Per Capita, Top 25 GHG Emitting Countries**

Country	2002 \$PPP	(Rank)	% Growth, 1980–2002	
			Average Annual	Total
United States	34,557	(4)	2.0	54
Canada	28,728	(7)	1.7	45
Australia	27,256	(11)	1.9	52
Germany	26,141	(13)	1.7	46
France	26,090	(14)	1.7	44
Japan	25,788	(15)	2.0	56
Italy	25,453	(17)	1.7	46
United Kingdom	25,139	(18)	2.2	62
EU-25	22,917	(21)	2.1	57
Spain	20,777	(25)	2.3	67
South Korea	16,570	(33)	6.1	270
Saudi Arabia	11,994	(43)	-2.9	-47
Argentina	10,664	(46)	-0.6	-12
Poland	10,299	(48)	3.2	46
South Africa	9,750	(51)	-0.6	-13
Mexico	8,662	(59)	0.6	13
Russia	7,993	(61)	-2.2	-24
Brazil	7,480	(64)	0.4	9
Iran	6,277	(73)	1.1	28
Turkey	6,145	(76)	1.9	51
Ukraine	4,719	(97)	-5.1	-47
China	4,379	(100)	8.2	468
Indonesia	3,057	(118)	3.4	111
India	2,572	(121)	3.5	115
Pakistan	1,941	(138)	2.2	63
<b>Developed</b>	<b>22,254</b>		<b>0.9</b>	<b>23</b>
<b>Developing</b>	<b>3,806</b>		<b>1.9</b>	<b>50</b>
<b>World</b>	<b>6,980</b>		<b>1.3</b>	<b>32</b>

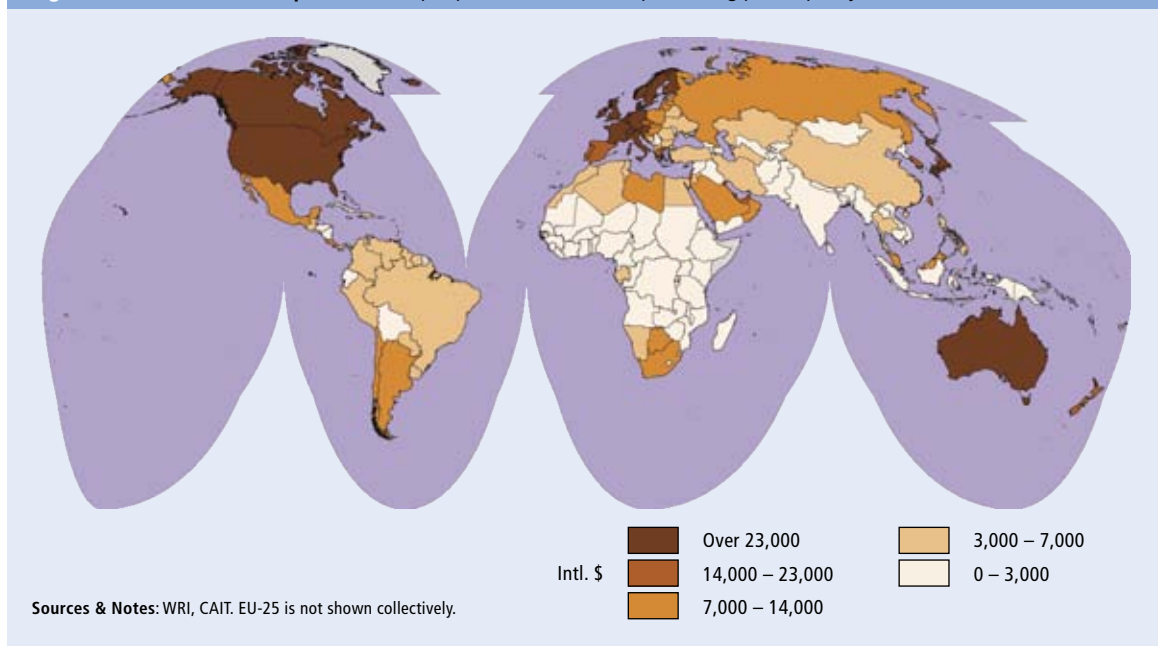
**Notes:** GDP is measured in terms of purchasing power parity (constant 2000 international dollars). Growth figures for Poland, Russia, and Ukraine are from 1990, due to lack of GDP data in 1980.

Korea, Mexico, and South Africa). On the governance scale, Russia and Ukraine likewise rank lower than many developing countries among the major emitters.

- South Korea stands well above most other developing countries on health, literacy, and governance measures. South Korea's economic development levels exceed those of several industrialized countries, including some EU members.
- South Africa, while ranking relatively high on governance, is well below all other major emitters in life expectancy (49 years), largely as a result of its AIDS epidemic.
- Four developing countries among the major emitters—India, Indonesia, Iran, and Pakistan—rank in the lower half globally on life expectancy, literacy, and governance measures.

Per capita income is on the rise for most countries, in some cases dramatically. For most developed countries among the major emitters, per capita income rose between 40 and 60 percent from 1980 to 2002. By far the largest gains among the major emitters were in China and South Korea (468 percent and 270 percent, respectively). India and Indonesia experienced gains exceeding 100 percent. For most other middle-income developing countries, however, income was almost stagnant; over the period from 1980 to 2002, incomes in Brazil and Mexico grew only 9 and 13 percent, respectively. Per capita incomes fell in five of the major emitters: 12 percent in Argentina, 13 percent in South Africa, 24 percent in Russia, and 47 percent in Saudi Arabia and Ukraine.<sup>49</sup>

**Figure 7.2. Income Per Capita, 2002 (\$ per person, measured in purchasing power parity)**



On the whole, per capita income has grown faster in percentage terms in developing countries (50 percent) than in developed countries (23 percent). These figures, however, may be misleading because developing country growth is from a much smaller base. As a result, the *absolute* income gains in developing countries were much lower than in developed countries. Measured in 2000 U.S. dollars, incomes in developing countries grew by under \$500 (from \$880 to \$1,318) from 1980 to 2002, while developed country incomes grew by almost \$4,000 (from \$16,703 to \$20,561), or 8 times more. Thus, even as incomes rise rapidly in developing countries, the absolute income gaps between rich and poor continue to widen. This dynamic is expected to continue (Figure 7.4).

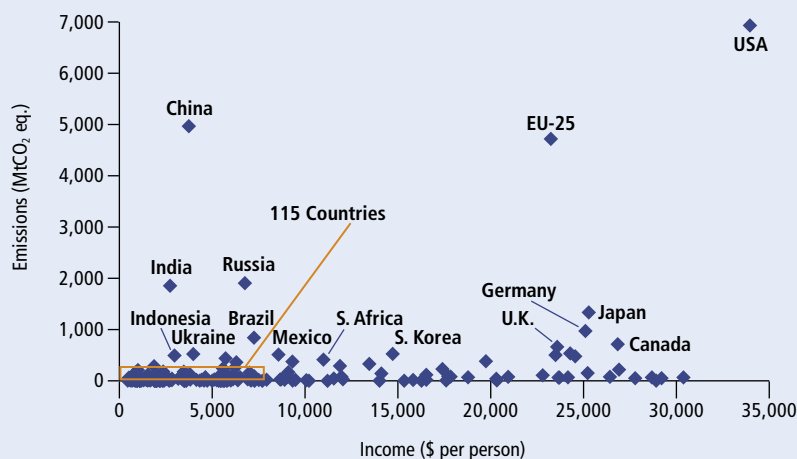
A cause and consequence of low levels of socioeconomic development is lack of access to modern energy services. A full one-third of the developing country population—over 1.5 billion—lacks access to electricity (Figure 7.5). Four of the major GHG emitters have major electricity access deficits, with India alone accounting for almost 600 million people. About half of the developing world—2.4 billion people—rely on traditional forms of biomass for cooking and heating.<sup>50</sup> It follows that without commercial energy services, modern conveniences like refrigeration are often unobtainable.

Similar disparities characterize transport. Figure 7.6 shows motor vehicle ownership, with the U.S. and Europe having one vehicle for every one or two persons. A second tier includes South Korea, Argentina, Russia, and Mexico. India and China, by contrast, have on the order of 10-12 vehicles for every 1,000 people, although vehicle use in these countries is growing rapidly. Differing levels of motorization, like electrification, help explain large per capita emissions disparities discussed in Chapter 4, as well as disparities at the sector level, discussed in Part II.

## Implications for International Climate Cooperation

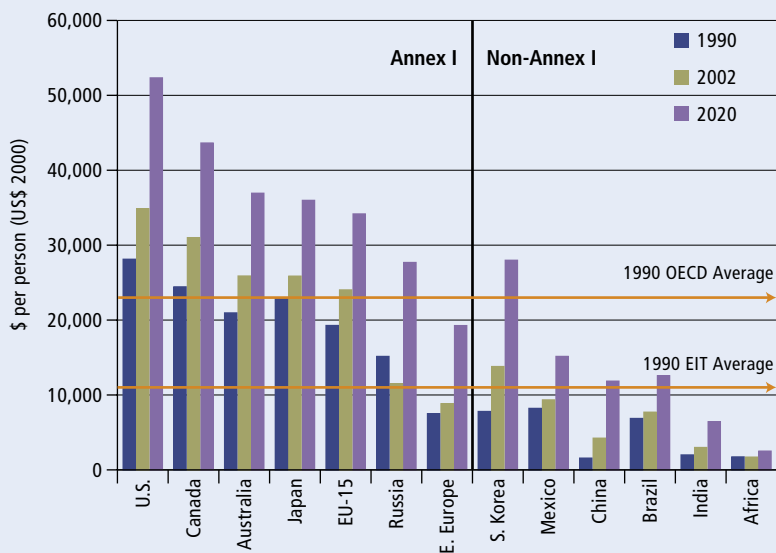
The Climate Convention recognizes the need for advancing economic and social development, particularly for developing country Parties, noting that “economic development is essential for adopting measures to address climate change.”<sup>51</sup> The Convention also notes that “Parties should protect the climate system ... in accordance with their common but differentiated responsibilities and *respective capabilities*.”<sup>52</sup> The issues discussed in this chapter will thus likely be a part of future decision-making. But exactly how is not clear.

Figure 7.3. Income Per Capita and GHG Emissions



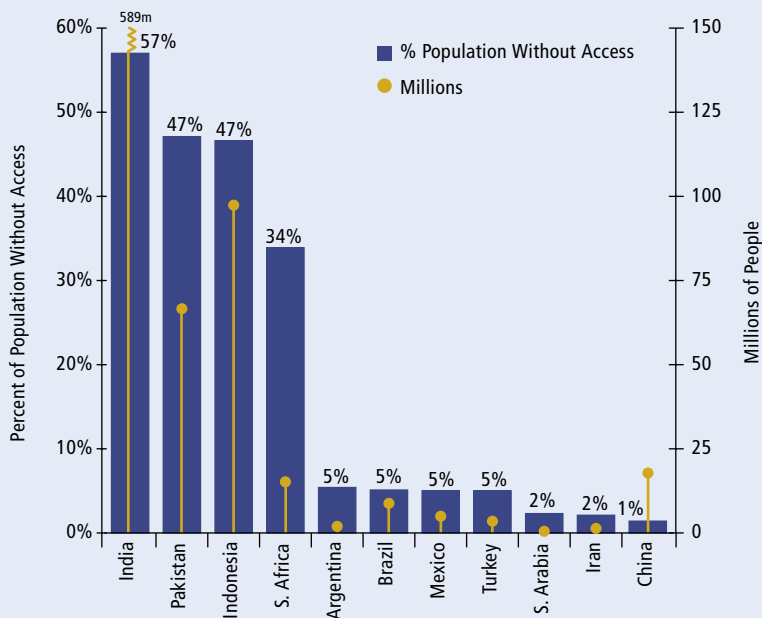
Sources & Notes: WRI, CAIT. Data is for 2000. There are several countries not shown, such as Luxembourg, with per capita incomes that exceed \$35,000 per year.

Figure 7.4. Projected Income Relative to Historical Levels



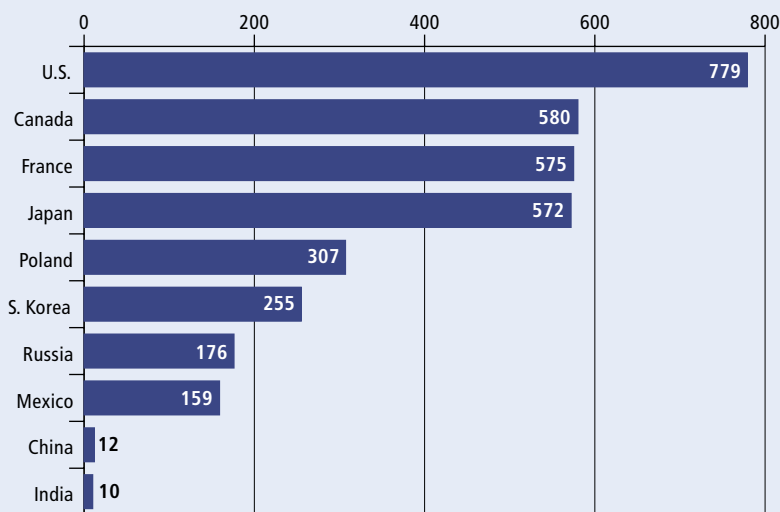
Sources & Notes: EIA, 2005b. OECD and EIT averages reflect only those countries included in Annex I of the Climate Convention (e.g., Mexico and S. Korea are excluded from OECD).

Figure 7.5. Access to Electricity



Sources & Notes: WRI, 2005c, based on data from IEA, 2002. Countries shown are the top 25 GHG emitters with populations lacking access to electricity.

Figure 7.6. Motor Vehicles per 1,000 People



Sources & Notes: World Bank, 2005. Data ranges from 1997–2000.

*Review memberships of Convention and Protocol Annexes.* Annex I of the Convention (and Annex B of the Kyoto Protocol) includes primarily developed countries and transition economies, whereas Annex II includes only the wealthier developed countries. Since these Annexes were agreed upon in the early 1990s, the national circumstances of many Parties have changed significantly, as has the membership of the OECD. Present Annex memberships correspond neither to any memberships in international organizations nor any particular indicators of social or economic development. Indeed, as shown in Figure 7.4, some non-Annex I countries (including some not shown) already have income levels that approach or exceed those that non-Annex I countries had when the Annex memberships were determined.

Given that these Annexes largely define which rights and obligations adhere to which Parties, membership (or lack thereof) has a major bearing on the evolution of the climate change regime. Depending on how the regime evolves in the period after Kyoto's first commitment period (that is, after 2012), it may be necessary to modify existing Annexes or create additional ones.

*Institutional and technical capacity will influence the degree to which countries can reliably formulate, implement, and comply with climate commitments.* Since the adoption of the Kyoto Protocol, a wide range of proposals have been made for a successor agreement. Different options implicitly require different levels of capacity.<sup>53</sup> Adopting legally binding emission caps, for instance, presupposes significant institutional, financial, and technical capacity that may not exist in many developing countries. New laws and regulations that cover the entire economies of some countries may be needed. Parties must have the ability to exercise regulatory control over their private and public entities, and must apply appropriate sanctions in cases of noncompliance. Kyoto-style targets require quantitative precision, and thus high-quality monitoring tools and robust national GHG inventories, developed in accordance with international standards. This is a major challenge, since to date, almost all developing countries have reported difficulty in compiling their emissions inventories under the UNFCCC.<sup>54</sup> As suggested by the Convention, Parties should adopt commitments that are at least somewhat commensurate with their present or anticipated future capacities.<sup>55</sup> Along these lines, additional efforts to enhance developing country capacities are

needed, so that these countries will be in a position to make significant contributions to the objectives of the Climate Convention.

**Successful GHG mitigation approaches, particularly those pertaining to developing countries, are likely those that are supportive of development needs and mitigative capacity.** Many developing countries must deal with extreme poverty and major social challenges, and climate change is likely to continue to rank low as a political priority in those countries. Accordingly, successful international climate change initiatives will likely be those that can mitigate GHGs while also helping countries meet their development aspirations. Such a “sustainable development policies and measures” approach is examined in depth in a companion publication entitled *Growing in the Greenhouse: Protecting the Climate by Putting Development First* (Box 7.1).

**Capacity building assistance is needed to help engage some of the larger developing countries.** Lack of capacity or low levels of development cannot alone be a reason for doing little or nothing on climate change. As discussed in Chapter 2, the engagement of the large-emitting countries is essential to accomplishing the Climate Convention objective. This holds true even for those major emitters that have other more pressing priorities, such as India, South Africa,

#### Box 7.1. Sustainable Development Policies and Measures (SD-PAMs)

The SD-PAMs concept involves identifying policies and measures that are aimed first and foremost at national development priorities, while finding low-carbon routes to achieve them (Winkler et al., 2002). The existence of SD-PAMs, or at least of potential synergies between climate policy and sustainable development, is widely recognized, as is the desirability of finding these synergies. For instance, Brazil's embrace of biofuels in the transport sector had little to do with climate change, but this strategy has offset more than 400 MtCO<sub>2</sub> over the past few decades.

A companion report to this publication, *Growing in the Greenhouse: Protecting the Climate by Putting Development First*, examines case studies of actual and potential SD-PAMs that would enhance development prospects while limiting GHG emissions. The report also suggests that integrating SD-PAMs within an international climate agreement is, rather than a threat to development, an opportunity for developing countries to participate in global efforts to combat climate change while advancing their own priorities.

Sources: Winkler et al., 2002; Bradley and Baumert, 2005.

and Indonesia. The challenge instead is determining the appropriate strategies in these countries—and in developed country assistance programs, including capacity building—for slowing and eventually reversing GHG emission growth. Although there are over 100 countries that have both low income and emission levels (Figure 7.3), ensuring that these countries are engaged in mitigation efforts seems less critical to achieving the objective of the Climate Convention.



