

Chapter 11

TABLE 11.1 Principal Health and Productivity Consequences of Environmental Damage

| Environmental Problem | Effect on Health | Effect on Productivity |
|------------------------------------|--|--|
| Water pollution and water scarcity | More than 2 million deaths and billions of illnesses a year attributable to pollution; poor household hygiene and added health risks caused by water scarcity | Declining fisheries; rural household time and municipal costs of providing safe water; aquifer depletion leading to irreversible compaction; constraint on economic activity because of water shortages |
| Air pollution | Many acute and chronic health impacts: excessive urban particulate matter levels are responsible for 300,000 to 700,000 premature deaths annually and for half of childhood chronic coughing; 400 million to 700 million people, mainly women and children in poor rural areas, affected by smoky indoor air | Restrictions on vehicle and industrial activity during critical episodes; effect of acid rain on forests and water bodies |
| Solid and hazardous wastes | Diseases spread by rotting garbage and blocked drains; risks from hazardous wastes typically local but often acute | Pollution of groundwater resources |
| Soil degradation | Reduced nutrition for poor farmers on depleted soils; greater susceptibility to drought | Field productivity losses in range of 0.5% to 1.5% of gross national product (GNP) common on tropical soils; offsite siltation of reservoirs, river-transport channels, and other hydrologic investments |
| Deforestation | Localized flooding, leading to death and disease | Loss of sustainable logging potential and of erosion prevention, watershed stability, and carbon sequestration provided by forests |
| Loss of biodiversity | Potential loss of new drugs | Reduction of ecosystem adaptability and loss of genetic resources |

TABLE 11.1 (continued)

| Environmental Problem | Effect on Health | Effect on Productivity |
|-----------------------|--|--|
| Atmospheric changes | Possible shifts in vector-borne diseases; risks from climatic natural disasters; diseases attributable to ozone depletion (perhaps 300,000 additional cases of skin cancer a year worldwide; 1.7 million cases of cataracts) | Sea-rise damage to coastal investments; regional changes in agricultural productivity; disruption of marine food chain |

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Figure 11.1 Static Efficiency in Resource Allocation

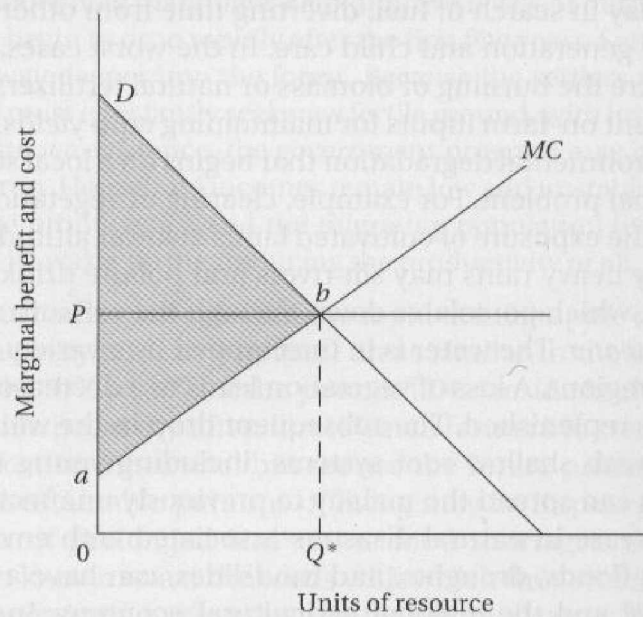


Figure 11.2 Optimal Resource Allocation over Time

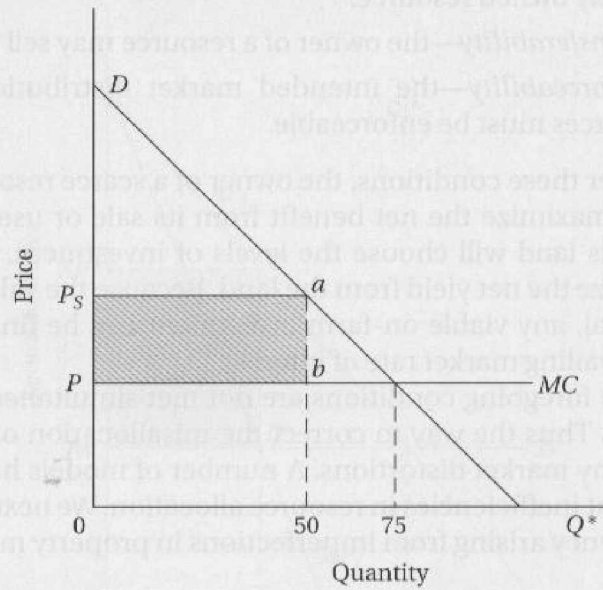


Figure 11.3 Common Property Resources and Misallocation

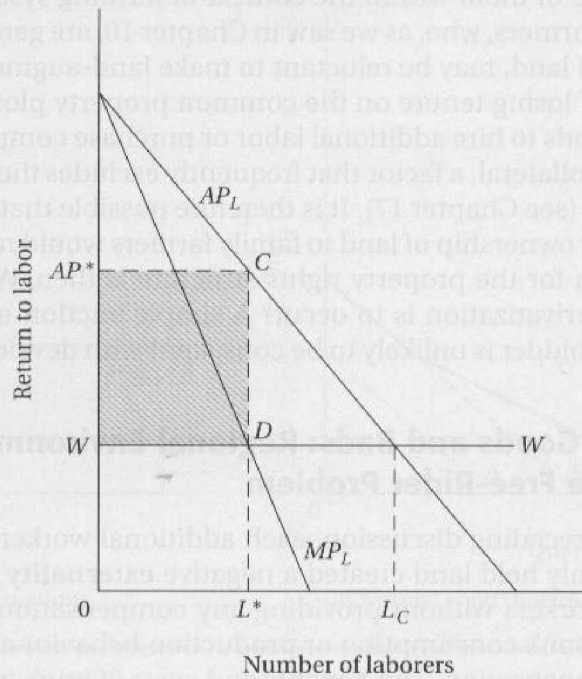


Figure 11.4 Public Goods, Normal Goods, and the Free-Rider Problem

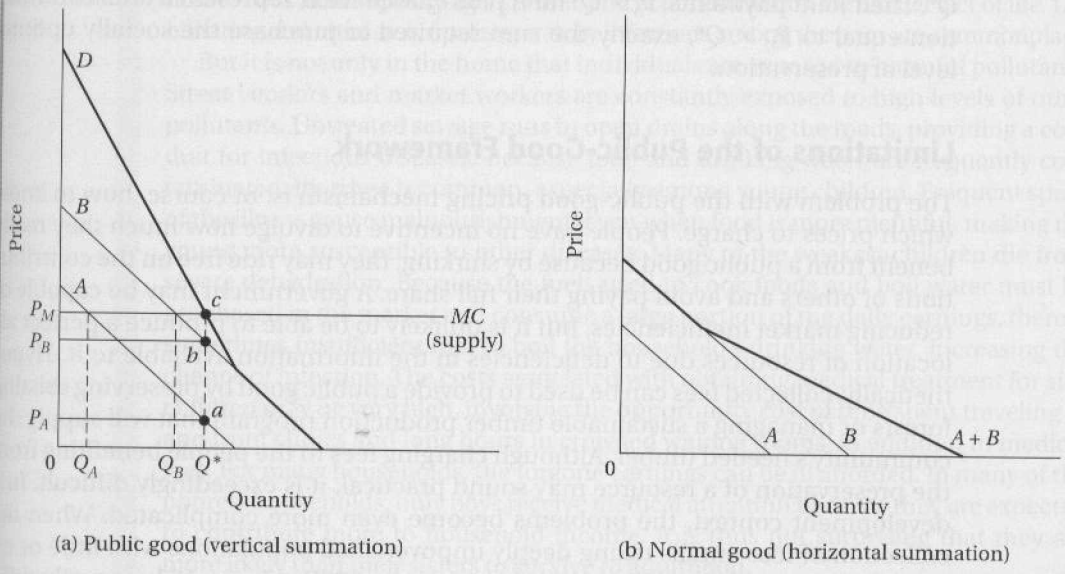


Figure 11.5 Pollution Externalities: Private versus Social Costs and the Role of Taxation

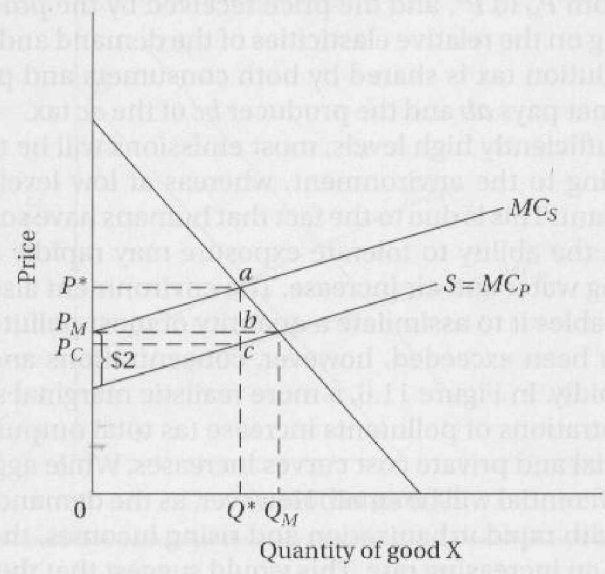


Figure 11.6 Increasing Pollution Externalities with Economic Growth

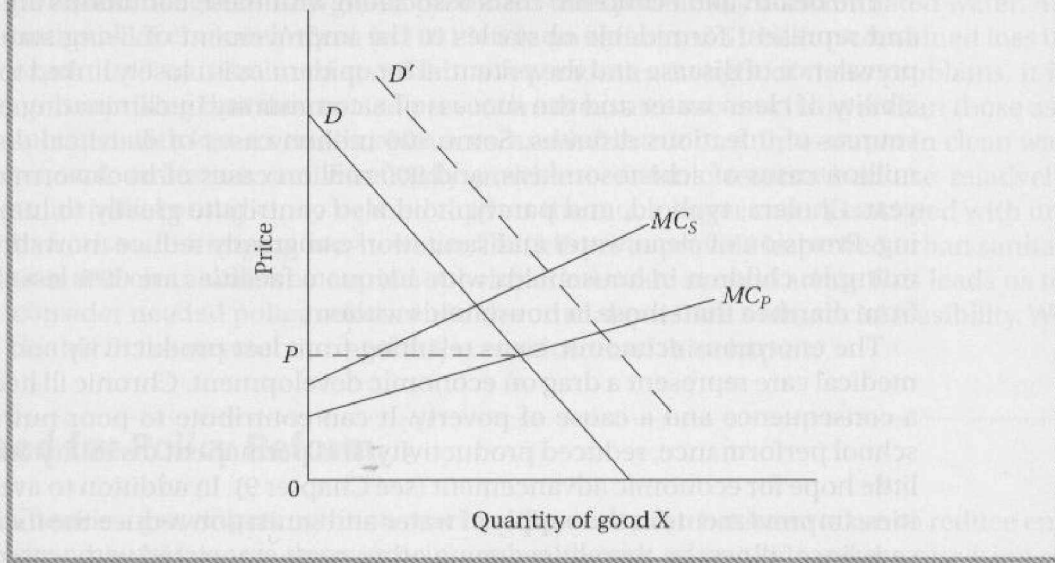


TABLE 11.2 Disparities in Consumption: Annual per Capita Consumption (in PPP dollars) in Selected High-, Medium-, and Low-Income Nations

| Country | Total Value of Private Consumption (1997) | Fish (kg) (1997) | Meat (kg) (1998) | Cereals (kg) (1997) | Paper (kg) (1998) | Fossil Fuels (kg of oil equivalent) (1997) | Passenger Cars (per 1,000 people) (1996) |
|-----------------|---|------------------|------------------|---------------------|-------------------|--|--|
| United States | \$21,680 | 21.0 | 122.0 | 975.0 | 293.0 | 6,902 | 489.0 |
| Singapore | \$16,340 | 34.0 | 77.0 | 159.0 | 168.0 | 7,825 | 120.0 |
| Japan | \$15,554 | 66.0 | 42.0 | 334.0 | 239.0 | 3,277 | 373.0 |
| Germany | \$15,229 | 13.0 | 87.0 | 496.0 | 205.0 | 3,625 | 500.0 |
| Poland | \$5,087 | 12.0 | 73.0 | 696.0 | 54.0 | 2,585 | 209.0 |
| Trinidad/Tobago | \$4,864 | 12.0 | 28.0 | 237.0 | 41.0 | 6,394 | 94.0 |
| Turkey | \$4,377 | 7.2 | 19.0 | 502.0 | 32.0 | 952 | 55.0 |
| Indonesia | \$1,808 | 18.0 | 9.0 | 311.0 | 17.0 | 450 | 12.2 |
| China | \$1,410 | 26.0 | 47.0 | 360.0 | 30.0 | 700 | 3.2 |
| India | \$1,166 | 4.7 | 4.3 | 234.0 | 3.7 | 268 | 4.4 |
| Bangladesh | \$780 | 11.0 | 3.4 | 250.0 | 1.3 | 67 | 0.5 |
| Nigeria | \$692 | 5.8 | 12.0 | 228.0 | 1.9 | 186 | 6.7 |
| Zambia | \$625 | 8.2 | 12.0 | 144.0 | 1.6 | 77 | 17.0 |

Source: World Resources Institute, 2001 *World Resources Report*: (Washington, D.C.: WRI), p. 27. Reprinted with permission.