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PART 1. THE ECONOMIC COSTS OF ECOLOGICAL DEFICITS

Deserts Invading China (pages 7–28)


2. Ibid.

3. Ibid.


5. Ibid.


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9. Ibid., p. 229.

10. Ibid., p. 231.


15. Environmental Protection Agency cited in French, op. cit. note 1.

16. Ibid.


22. Ibid.


29. Chen Xiwen, Deputy Director, Development Research Center of the State Council, and colleagues, discussion in Beijing with author, 16 May 2002.


31. Data are from discussions with officials of Helin county, Inner Mongolia, 17 May 2002.

32. Ibid.

34. Ibid.
35. Author’s observation confirmed by discussions with scientists at the Cold and Arid Regions Environmental and Engineering Research Institute, Lanzhou, China.
38. FAO, op. cit. note 20; “Grapes of Wrath in Inner Mongolia,” op. cit. note 4.
42. “Grapes of Wrath in Inner Mongolia,” op. cit. note 4.
43. Ibid.
44. Asian Development Bank, op. cit. note 41.
45. Grain production in 1950 from U.S. Department of Agriculture (USDA), World Grain Database, unpublished printout; Figure 1–1 and current levels from USDA, Production, Supply, and Distribution, electronic database, updated 10 May 2002.
46. USDA, Production, Supply, and Distribution, op. cit. note 45; IMF, op. cit. note 27.
47. Grain import dependence from USDA, Production, Supply, and Distribution, op. cit. note 45.
48. Data for China’s trade surplus with the United States from the U.S. Department of Commerce; grain prices from Wall Street Journal, various issues.

Assessing the Food Prospect (pages 29–58)

7. Ibid.


12. Figure 1–2 from U.S. Department of Agriculture (USDA), *Production, Supply, and Distribution*, electronic database, updated 10 May 2002.


19. Gleick, op. cit. note 5, p. 64.


22. Water usage from Gleick, op. cit. note 5, p. 52; pumping from Postel, op. cit. note 21.


28. Water to grain conversion from FAO, op. cit. note 21.


30. Overpumping from Postel, op. cit. note 21; population from United Nations, op. cit. note 2.


35. Figure 1–3 and data from FAO, *FAOSTAT Statistics Database*, op. cit. note 5.


39. USDA, op. cit. note 12.

40. Fish feed requirements from Rosamond L. Naylor et al., “Effect of Aquaculture on World Fish Supplies,” *Nature*, 29
June 2000, p. 1019; poultry feed requirements from Bishop et al., op. cit. note 38.

41. Beef conversion from Baker, op. cit. note 38; grain to pork conversion from Southard, op. cit. note 38.

42. Aquaculture from FAO, op. cit. note 34; beef from FAO, FAOSTAT Statistics Database, op. cit. note 5, with meat updated 28 May 2002.


44. Figure 1–4 from USDA, op. cit. note 12.


47. USDA, op. cit. note 12; animal protein consumption from FAO, FAOSTAT Statistics Database, op. cit. note 5, updated 28 May 2002.


52. Derpsch, op. cit. note 49.

53. USDA, op. cit. note 12.


56. Postel, op. cit. note 21, pp. 189–92.


Facing the Climate Challenge (pages 59–80)


2. Ibid.


10. Munich Re quoted in Leggett, op. cit. note 8, p. 42.


13. USDA, op. cit. note 12.


19. Coal from ibid.


24. Figure 1–5 from AWEA, op. cit. note 20, from Christopher Flavin, “Wind Energy Surges,” in Worldwatch Institute, op. cit. note 20, pp. 42–43, and from Windpower Monthly, various issues.

cabs/usa.html>. According to Debra Lew and Jeffrey Logan, “Energizing China’s Wind Power Sector,” Pacific Northwest Laboratory, 2001, at <www.pnl.gov/china/ChinaWnd.htm> viewed 25 May 2001, China has at least 250 gigawatts of exploitable wind potential, roughly equal to the current installed electrical capacity in China as reported by EIA.


37. Damage from Munich Re, op. cit. note 9; economy from IMF, op. cit. note 33.


PART 2. ECO-ECONOMY INDICATORS: TWELVE TRENDS TO TRACK

Population Growing by 80 Million Annually (pages 87–90)

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Economic Growth Losing Momentum (pages 91–94)


Grain Harvest Growth Slowing (pages 95–98)

1. Figure 2–3 from U.S. Department of Agriculture (USDA), World Agricultural Supply and Demand Estimate (Washington, DC: October 2001), pp. 46–47.

2. Ibid., pp. 43–44.


4. Ibid., p. 31.

5. Ibid., p. 49.

6. Ibid., p. 8.

7. Ibid., p. 33.

8. Ibid.

9. Ibid.

10. Ibid., p. 42.

11. Ibid., pp. 43–44.


2. USDA, World Agricultural Supply and Demand Estimate, op. cit. note 1; USDA, Production, Supply, and Distribution, op. cit. note 1.


5. Ratio of 1,000 tons of water for 1 ton of grain from U.N. Food and Agriculture Organization (FAO), Yield Response to Water (Rome: 1979).


8. Ibid.; 1 ton equals 1 cubic meter.


10. USDA, Production, Supply, and Distribution, op. cit. note 1.


**Forest Cover Shrinking** (pages 103–07)


7. Matthews et al., op. cit. note 2, pp. 4–5.


9. FAO, op. cit note 3, p. 37; Matthews et al., op. cit. note 2, p. 4.

10. FWI and GFW, op. cit. note 5, p. xii.


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Water Scarcity Spreading (pages 108–11)


9. Chenaran Agricultural Center, Ministry of Agriculture, according to Hamid Taravati, publisher, Iran, e-mail to author, 25 June 2002.

10. Ibid.


Carbon Emissions Climbing (pages 112–15)


2. Dunn, op. cit. note 1.


9. IPCC, op. cit. note 1, p. 12.

10. Fossil fuel subsidies from Dunn, op. cit. note 4, p. 10.

**Global Temperature Rising** (pages 116–18)

1. Figure 2–7 from National Aeronautics and Space Administration, Goddard Institute for Space Studies, “Global Temperature Anomalies in .01 C,” at <www.giss.nasa.gov/data/update/gistemp/GLB.Ts.txt>, viewed 20 June 2002.

2. Ibid.

3. Ibid.


5. Ibid.


7. IPCC, op. cit. note 4.

**Ice Melting Everywhere** (pages 119–23)

5. Thompson, op. cit. note 1.
7. Thompson, op. cit. note 1.
13. Ibid.

Wind Electric Generation Soaring (pages 124–28)

10. Stateline Project and Texas from AWEA, op. cit. note 1, p. 5; South Dakota from Jim Dehlsen, Clipper Wind, discussion with author, 30 May 2001.


12. AWEA, op. cit. note 1.

13. Ibid.

**Bicycle Production Breaks 100 Million** (pages 129–32)


3. Ibid.


7. White, op. cit. note 4, p. 29.


**Solar Cell Sales Booming** (pages 133–37)


3. EPIA and Greenpeace, op. cit. note 2, pp. 18–21; Schmela, op. cit. note 2, p. 43.


5. Calculations from ibid., and from Schmela, op. cit. note 2.

7. EPIA and Greenpeace, op. cit. note 2, p. 7; Williams, op. cit. note 6, p. 22.


9. EPIA and Greenpeace, op. cit. note 2, p. 27, gives the figure of up to 350 kilograms of annual carbon dioxide emissions. Calculation was made of carbon's share using the atomic weights of carbon and oxygen.


PART 3. ECO-ECONOMY UPDATES

U.S. Farmers Double Cropping Corn and Wind Energy (pages 143–47)


3. According to American Wind Energy Association (AWEA), Kansas, North Dakota, and Texas would be able to produce 3,470 billion kilowatt-hours (kWh), exceeding the 3,087 billion kWh used by the United States in 2000, as reported by U.S. Department of Energy (DOE), Energy Information Administration (EIA); AWEA, AWEA Wind Energy Projects Database, at <www.awea.org/projects/index.html> and EIA Country Analysis Brief, DOE, at <www.eia.doc.gov/emeu/cabs/usa.html>.

4. Beef from author’s personal experience with ranches in southern Wyoming and northern Colorado; wheat from Dittrich, op. cit. note 1.

5. Calculation from Tom Gray, AWEA, e-mail to author, 12 June 2002.


10. DOE, “Energy Secretary Richardson Directs Department to


12. Author’s observations in traveling through countries.

The Rise and Fall of the Global Climate Coalition
(pages 148–52)


10. DuPont will cut emissions by 65 percent by 2010, according to their position statement, “Global Climate Change” (Wilming-ton, DE: 5 June 2001).


15. PR Watch, op. cit. note 2.


Climate Change Has World Skating on Thin Ice (pages 153–57)


6. Ibid.


8. Ibid.

9. Ibid.


OPEC Has World Over a Barrel Again (pages 158–63)


5. Ibid.


12. According to AWEA, Kansas, North Dakota, and Texas would be able to produce 3,470 billion kilowatt-hours (kWh), exceeding the 3,087 billion kWh used by the United States in 2000, as reported by U.S. Department of Energy (DOE), Energy Information Administration (EIA).


8. According to AWEA, Kansas, North Dakota, and Texas would be able to produce 3,470 billion kilowatt-hours (kWh), exceeding the 3,087 billion kWh used by the United States in 2000, as reported by U.S. Department of Energy (DOE), Energy Information Administration (EIA); AWEA, AWEA Wind Energy Projects Database, at <www.awea.org/projects/index.html> and EIA Country Analysis Brief, DOE, at <www.eia.doe.gov/emeu/cabs/usa.html>. According to Debra Lew and Jeffrey Logan, “Energizing China’s Wind Power Sector,” Pacific Northwest Laboratory, 2001, at <www.pnl.gov/china/ChinaWind.htm>, China has at least 230 gigawatts of exploitable wind potential, roughly equal to the current installed electrical capacity in China as reported by EIA.


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8. FAO, op. cit. note 3.
9. USDA, op. cit. note 3.
10. Ibid.; this shows grain imports alone into the region of over 63 million tons, equivalent to 63 billion tons (63 billion cubic meters) of water, nearly the usable flow of the Nile River reported in Postel, op. cit. note 3, p. 146.
11. Total harvest from USDA, op. cit. note 3.

Africa Is Dying—It Needs Help (pages 174–79)

2. Ibid.
3. Ibid.
4. Ibid.
7. UNAIDS, op. cit. note 1, pp. 32–33.
8. Ibid.
9. Ibid.
10. Ibid.
11. Ibid.

HIV Epidemic Restructuring Africa’s Population (pages 180–84)

Obesity Threatens Health in Exercise-Deprived Societies
(pages 185–89)


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8. Eighty percent from Roudi, op. cit. note 5; Dungus, op. cit. note 1.
10. Roudi, op. cit. note 5; Schwartz, op. cit. note 3.
15. PRB, op. cit. note 7.

Paving the Planet: Cars and Crops Competing for Land (pages 195–99)

2. Calculations for paved area by Janet Larsen, Earth Policy Institute, using U.S. Department of Transportation, Federal Highway Administration (FHWA), Highway Statistics 1999 (Washington, DC: 2001); Mark Delucchi, “Motor Vehicle Infrastructure and Services Provided by the Public Sector,” cited in Todd Litman, Transportation Land Valuation (Victoria, B.C., Canada: Victoria Transport Policy Institute, November 2000), p. 4; Ward’s World Motor Vehicle Data (Southfield,


10. Ibid.


15. Calculation from Tom Gray, American Wind Energy Association, e-mail to author, 12 June 2002.
Worsening Water Shortages Threaten China’s Food Security
(pages 205–09)


3. Ibid.

4. Ibid.


6. Hong and Zehnder, op. cit. note 1, p. 85.


13. Ibid.


15. Ibid.

16. Ibid.


18. FAO, op. cit. note 11.

World’s Rangelands Deteriorating Under Mounting Pressure
(pages 210–14)


5. Africa’s 3 million buffalo are included in the estimate for cattle, found in FAO, op. cit. note 2; Southern African Development Coordination Conference, SADCC Agriculture: Toward 2000 (Rome: FAO, 1984).


7. FAO, op. cit. note 2.


15. See <www.icarda.cgiar.org>.

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Fish Farming May Overtake Cattle Ranching As a Food Source (pages 215–220)


5. Ibid.


7. FAO, op. cit. note 4.


15. Ibid.


**Our Closest Relatives Are Disappearing** (pages 221–25)


3. Ibid.


10. SSC, op. cit. note 2.


13. Bushmeat consumption from BCTF, op. cit. note 11; African ape extinction from Jane Goodall, speech at Bushmeat Crisis Task Force Capitol Hill Event, op. cit. note 12.

Illegal Logging Threatens Ecological and Economic Stability (pages 226–30)


3. Ibid., pp. xi, 36.


8. Pomfret, op. cit. note 5.


13. Currey et al., op. cit. note 9, p. 4.


Green Power Purchases Growing (pages 231–35)


peopleandplanet.org/climatechange/switch.asp#no7>, viewed 14 February 2002.


New York: Garbage Capital of the World (pages 236–40)


3. Calculations by author; Lhota quoted in Lipton, op. cit. note 2.


Tax Shifting on the Rise (pages 241–45)

1. David Roodman, “Environmental Tax Shifts Multiplying,” in


3. Figure of 2 percent from Kai Schlegelmilch, German Ministry of the Environment, e-mail to author, 2 June 2002; fuel sales, gas consumption, and carpool growth from German Ministry of the Environment, “Environmental Effects of the Ecological Tax Reform,” at <www.bmu.de/english/topics/oekosteuer/oekosteuer_environment.php>, viewed 20 May 2002.


8. EEA, op. cit. note 5, p. 65.


12. Harmonization from EEA, op. cit. note 5, p. 11; border tax adjustments from OECD, op. cit. note 10, p. 28.

13. Tax refunds from OECD, op. cit. note 10, p. 11.


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