

# Endnotes

## Overview

1. The latest world rural poverty figures are for 2002.
2. World Bank 1982.
3. For much of the developing world, smallholders are defined as operating a farm of 2 ha or less.
4. Hayami 2005.
5. Pardey and others 2006.
6. The best estimate of the contribution of emissions from land-use change (mainly from deforestation) is 20 percent, with a likely range from 10 to 30 percent (Watson and others 2000).
7. Staatz and Dembele 2007.
8. Vyas 2007.
9. Reardon and Berdegue 2006.

## Chapter 1

1. Defined as living on less than \$1.08 a day in 1993 purchasing power parity dollars (Ravallion, Chen, and Sangraula 2007). The latest year for which global rural poverty data are available is 2002.
2. Bairoch 1973.
3. Ravallion and Chen 2007; World Bank 2007c.
4. Excluding South Africa.
5. De Ferranti and others 2005.
6. Ravallion, Chen, and Sangraula 2007.
7. This decomposition abstracts from indirect effects of urbanization on rural poverty through remittances and rural wage changes through tighter rural labor markets (see focus A). Yet, it also conservatively assumes that all rural-urban migrants are poor, which is unlikely because migrants are usually the more educated and entrepreneurial (see chapter 9).
8. Schultz 1978; Hayami 2005; and de Gorter and Swinnen 2002 particularly emphasize the importance of the relative income hypothesis (as opposed to absolute poverty) in understanding agricultural policy making.
9. Delgado, Minot, and Tiongco 2005.
10. Based on data reported in social accounting matrices constructed for these countries by the International Food Policy Research Institute for the early 2000s.
11. This is called the “real wage good” effect (Hsieh and Sadoulet 2007).
12. Christiaensen and Demery 2007; Ravallion 1990.
13. Minten and Barrett forthcoming.
14. The consensus holds that the increase is largely from a genuine increase in Ghana’s cocoa production and not just from increased cross-border smuggling from Côte d’Ivoire because of price differences.

15. Fish is now the second largest export from Uganda (Kigundu 2006). Kenya has become the world’s third largest flower exporter.

16. Humphrey, McCulloch, and Ota 2004; Maertens and Swinnen 2006.

17. Dorosh and Haggblade 2003; Haggblade, Hazell, and Reardon forthcoming. Nonetheless, their quantification remains difficult because of simultaneity problems. Time-series evidence from countries with fast-growing agriculture traces the impact of many changes at once. Few panel data are available, and they produce ambiguous results. Most attempts at quantifying agricultural growth links thus rely on simulations done with models that inevitably resort to strong behavioral assumptions.

18. Diao and others 2003.

19. Several prominent analysts have argued that Korea is one clear example of a country that *did not* invest in raising its agricultural productivity before starting rapid industrialization (Amsden 1989; Ban, Moon, and Perkins 1980). This interpretation is based on Korea’s phenomenal growth after the Korean War, which was largely the result of rapid industrialization. However, careful analysis shows that this was preceded by heavy investments in rural infrastructure (mainly roads), irrigation, fertilizer, and higher-yielding seed varieties during the first half of the 20th century, generating important initial conditions that contributed to the industrial take-off thereafter (Kang and Ramachandran 1999).

20. Datt and Ravallion 1998b; Fan 1991; Rosegrant and Hazell 2001; Timmer 2002.

21. Diao and others 2003.

22. <http://iresearch.worldbank.org/PovcalNet/jsp/index.jsp>.

23. Based on poverty lines defined in each country (Warr 2001).

24. The *hukou* or household registration system has increasingly been relaxed over the past years.

25. Fields 2005; Karp 2007b.

26. McCulloch, Weisbrod, and Timmer 2007; Ravallion and Chen 2007.

27. Dong 2006; Mellor 1999.

28. Wang and others 2006.

29. Ravallion and Chen 2007.

30. Bonschab and Klump 2006; van de Walle and Cratty 2004.

31. Ravallion and Datt 1996; Suryahadi, Suryadarma, and Sumarto 2006; Warr 2001.

32. Ravallion and Datt 2002.

33. Haggblade, Hazell, and Reardon forthcoming.

34. Ravallion 2005.

35. Foster and Rosenzweig 2004.

36. Hayami 1998.
37. de Janvry, Sadoulet, and Nong 2007. See Amsden 1991, Hayami, Kikuchi, and Marciano 1996, and Kikuchi 1998 for case studies from Taiwan, China, and the Philippines.
38. Hossain 2004; Kijima and Lanjouw 2005.
39. Anríquez and López 2007.
40. De Ferranti and others 2005; Ferreira, Leite, and Litchfield 2006; Figueiredo, Helfand, and Levine 2007; Paes de Barros 2003.
41. Ellis 2005; Maxwell 2005.
42. Martin and Mitra 2001.
43. Krueger, Schiff, and Valdés 1991.
44. Deininger and Okidi 2003.
45. Fan, Zhang, and Zhang 2004.
46. Thorbecke and Wan Jr. 2004; Teranishi 1997. Optimal levels of taxation in contexts where agriculture (most often agricultural exports) forms the base of tax and foreign exchange earnings are discussed in World Bank 2000a.
47. Alston and others 2000.
48. Inocencio and others 2005.
49. Fan and Chan-Kang 2004.
50. In China, public spending on agriculture increased by 15 percent a year between 1995 and 2005, compared with a virtual stagnation in the first half of the 1990s (China's 11th Five Year Plan). Government of India: Planning Commission 2006; World Bank 2004d).
51. López and Galinato 2006.
52. The statistical code of the Organisation for Economic Co-operation and Development/Development Assistance Committee (OECD/DAC) for "agriculture" does not include "rural development" (which is classified as multisector aid) or "food aid" (a subcategory of general program assistance). The recent trend toward program-based approaches and multisectoral projects is not reflected here.
53. The OECD Creditor Reporting System (CRS) reports *commitments*, not the funds actually disbursed.
54. This includes both Sub-Saharan and North Africa.
55. Anderson, Feder, and Ganguly 2006.
56. de Gorter and Swinnen 2002.
57. The political consensus on food security in itself was not enough, however, to make the green revolution happen. The autobiography of C. Subramaniam, the minister of agriculture at that time, reveals how much leadership it took to persuade the skeptics, including parliamentarians, that modernizing India's agriculture on the basis of science and technology was feasible (Visvanathan 2003).
58. Bates 1981.
59. Djurfeldt, Jirstroml, and Larsson 2005 point out that two policy beliefs held by the ruling urban elites were important for this policy choice: (1) that smallholders are resistant to change, and (2) that large-scale production is superior. In India such beliefs were also common prior to the green revolution, but there were strong political incentives to include smallholders in the ongoing efforts to improve food production (Swaminathan 1993).
60. Suri 2006.
61. Anderson 2004.
62. Mercoiret 2005.
63. Bates 1981.

### Focus A

1. Byerlee, Diao, and Jackson 2005.
2. United Nations 2006.
3. Ravallion, Chen, and Sangraula 2007.
4. Ravallion, Chen, and Sangraula 2007.
5. Yang 1999; Ravallion and Chen 2007.
6. Migration's contribution to rural poverty reduction is computed here using the \$2.15 poverty line rather than the \$1.08 extreme poverty line, because it is unrealistic to think that all migrants are extremely poor.

7. The expressions for these decomposition are as follows:

Poverty-neutral migration:

$$H_t - H_{t-1} = \underbrace{S_t^r (H_t^r - H_{t-1}^r)}_{\text{Rural contribution}} + \underbrace{S_t^u (H_t^u - H_{t-1}^u)}_{\text{Urban contribution}} + \underbrace{(H_{t-1}^u - H_{t-1}^r)(S_t^u - S_{t-1}^u)}_{\text{Urban-rural migration}}$$

All migrants poor:

$$H_t - H_{t-1} = \underbrace{S_t^r H_t^r - S_{t-1}^r H_{t-1}^r}_{\text{Rural contribution}} + \underbrace{(S_{t-1}^r - S_t^r)}_{\text{Urban contribution (on urban population)}} + \underbrace{S_{t-1}^u H_{t-1}^u - S_{t-1}^r H_{t-1}^r}_{\text{Urban contribution (on migrants)}} + \underbrace{(S_t^u - S_{t-1}^u)}_{\text{Urban contribution (on migrants)}} (H_t^u - 1)$$

where  $H$ ,  $H^u$ , and  $H^r$  are respectively the total, urban, and rural poverty rates,  $S^u$  and  $S^r$  are respectively the urban and rural population shares, and the subscript  $t$  denotes time.

8. Renkow 2005.

9. Only in Ecuador are poverty rates lower in areas with higher agricultural potential. And in Cambodia and Kenya poverty rates are very high everywhere and do not appear to be lower in favorable areas. See Minot, Baulch, and Epprecht 2003 for Vietnam; Benson, Chamberlin, and Rhinehart 2005 for Malawi; Buys and others 2007 for the other countries.

10. In Thailand almost 50 percent of all poor live in areas with high agropotential and good access to large cities and thus markets. A recent study for Central America also found a high share of the poor living in areas of good accessibility in Guatemala and Nicaragua (World Bank 2004e).

11. Jalan and Ravallion 2002.

### Chapter 2

1. Wik, Pingali, and Broca 2007.
2. This chapter presents data according to World Bank regions, which can be related to the typology introduced in chapter 1 in the following way: agriculture-based: Sub-Saharan Africa (SSA); transforming: South Asia (SA), East Asia and Pacific (EAP), and Middle East and North Africa (MENA); urbanized: Eastern Europe and Central Asia (ECA), and Latin America and the Caribbean (LAC) (see table 1.1).
3. Evenson and Gollin 2003; IIRI pers. comm. and CIMMYT pers. comm.
4. FAO 2006a.
5. Based on studies of decomposition of agricultural growth by Fan and Pardey 1997, Huang and Rozelle 1995, McKinsey and Evenson 2003, and Mundlak, Larson, and Butzer 2004.
6. Bruinsma 2003.
7. Ruttan 2002; Timmer 2002.
8. Mundlak, Larson, and Butzer 2004.
9. Based on studies of decomposition of agricultural growth by Fan and Pardey 1997, Huang and Rozelle 1995, McKinsey and Evenson 2003, and Mundlak, Larson, and Butzer 2004.

10. Fan, Zhang, and Zhang 2002; McKinsey and Evenson 2003; Rozelle and others 2003.
11. Huang and Rozelle 1996.
12. Lusigi and Thirtle 1997; Thirtle, Hadley, and Townsend 1995.
13. Binswanger, Khandker, and Rosenzweig 1993; Fan, Zhang, and Zhang 2002; Mundlak, Larson, and Butzer 2004.
14. Foster and Rosenzweig 1996.
15. Frisvold and Ingram 1995.
16. Fan, Zhang, and Zhang 2004.
17. Ali and Byerlee 2002; Huang and Rozelle 1995.
18. World Bank 2006r.
19. A reliable growing period is defined as greater than 150 days.
20. Binswanger and Pingali 1988.
21. Morris and others 2007.
22. Henaio and Baanante 2006.
23. Köhlin 2006.
24. Chamberlin, Pender, and Yu 2006.
25. Some of the differences between the country examples cited here might be a result of differences in the level of disaggregation of population density data, but the heterogeneity can be found across a wide variety of countries, independent of data quality.
26. Based on Ali 2006.
27. Joshi, Singh BIRTHAL, and Minot 2006.
28. Ali 2006.
29. World Bank 2007a.
30. Agricultural GDP in constant 2000 reais (Instituto de Pesquisa Economica Aplicada (IPEA) 2006.
31. World Bank 2005j.
32. Aldana 2006.
33. World Bank 2006f.
34. World Bank 2006e.
35. Ali 2006; Dinham 2003.
36. Delgado and others 1999.
37. De Haan and others 2001.
38. World Bank 2007b.
39. FAO 2004d.
40. FAO 2004d.
41. FAO 2004d.
42. Belasco 2006.
43. Bruinsma 2003; FAO 2006d; Rosegrant and others 2006b.
44. World Bank 2006d.
45. World Bank 2007i.
46. Barreto and others 2006.
47. Sauven 2006.
48. Description of IFPRI's reference case: The reference case in the IFPRI model is a no-new-policies scenario by design. It imagines a world developing over the next decades as it does today, without anticipating deliberate interventions requiring new or intensified policies in response to the projected developments. Population projections are taken from the medium variant projections of the United Nations (2004), with global population increasing from slightly more than 6.1 billion in 2000 to more than 8.2 billion in 2050. Economic growth follows loosely the assumptions of the TechnoGarden Scenario of the Millennium Ecosystem Assessment (2005) but with adjustments to align with World Bank medium-term projections. Agricultural productivity values are based on the Millennium Ecosystem Assessment (TechnoGarden Scenario) and the recent FAO interim report projections to 2030/2050 (FAO 2006d).
- Trade conditions seen today are presumed to continue out to 2050. Projections for water requirements, infrastructure capacity expansion, and water use efficiency improvement are conducted by IMPACT-WATER, an IFPRI model. Energy use and production are loosely coupled to the International Energy Agency (IEA) 2004 reference scenario—a scenario that lies central in the range of available energy projections. Climate change data were developed through collaborative work with the Integrated Model to Assess the Global Environment (IMAGE-2) of the Netherlands Environmental Assessment Agency based on downscaled data from the Climate Research Unit of the University of East Anglia. The climate change impacts of the reference scenario are comparable to medium scenarios such as the IPCC-B2 scenario. For the simulations of the reference world, the medium climate sensitivity value of the Third Assessment Report (2.5°C rise in global temperature over the next 50 years) is used, which has been adjusted slightly in the latest Intergovernmental Panel on Climate Change (IPCC) 2001 report to a level of 3.0°C (IPCC 2007a).
49. Numbers on past growth in meat and cereal demand are from the FAO.
50. Rosegrant and others 2006b.
51. Cassman and others 2003.
52. World Bank 2007i.
53. Scherr and Yadav 1996.
54. Sebastian 2007.
55. Comprehensive Assessment of Water Management in Agriculture 2007; International Assessment of Agricultural Science and Technology for Development IAASTD 2007; United Nations Development Program 2006.
56. Comprehensive Assessment of Water Management in Agriculture 2007.
57. United Nations Development Program 2006.
58. World Bank 2006t.
59. Comprehensive Assessment of Water Management in Agriculture 2007.
60. United Nations Development Program 2006.
61. Stern 2006.
62. African Development Bank and others 2007.
63. Parry, Rosenzweig, and Livermore 2007; Warren 2006.
64. Estimates prepared by Warren 2006 for Stern 2006, based on the integrated crop-climate and socioeconomic model developed by the International Institute for Applied Systems Analysis. These results assume a high degree of adaptation, international trade, and no CO<sub>2</sub> fertilization. Estimates vary by the assumed special-report-on-emission scenarios of greenhouse gas emissions, technological development, economic growth, and socioeconomic conditions, as developed by the IPCC.
65. Darwin and others 1995, as reported in Schmidhuber and Tubiello forthcoming; Fischer, Shah, and Velthuizen 2002; Reilly and others 1996.
66. Fischer, Shah, and Velthuizen 2002, as reported by Schmidhuber and Tubiello forthcoming.
67. The World Bank projects real crude oil prices to fall by about half between 2006 and 2015. Others, such as the International Energy Agency in Paris, expect real crude oil prices to remain near current levels for the next several decades.

68. Rosegrant and others 2006a.
69. Schmidhuber 2007.
70. FAO 2000.
71. U.S. Congressional Research Service 2004.
72. U.S. Department of Agriculture (USDA) 2006.
73. Baffes 2006.
74. U.S. Department of Agriculture: Economic Research Service 2004.
75. U.S. Congressional Research Service 2004.
76. Lucas, Jones, and Hines 2006.
77. Murray 2007.
78. Cassman and others 2003; Reynolds and Borlaug 2006.
79. Bruinsma 2003.
80. Cassman and others 2003.
81. Alexandratos 2005.
82. Alexandratos 2005.

### Focus B

1. Current technologies use agricultural feedstocks such as sugar and maize for ethanol and rapeseed, soybean, and palm oil for biodiesel.
2. U.S. Department of Agriculture (USDA) 2007.
3. Garten Rothkopf (international advisory firm) 2007.
4. International Energy Agency (IEA) 2004; Garten Rothkopf (international advisory firm) 2007.
5. Koplou 2006.
6. World Bank 2007d.
7. U.S. Department of Agriculture (USDA) 2007.
8. World Bank 2007d.
9. Schmidhuber 2007.
10. World Bank 2007d.
11. Cellulosic ethanol technologies may result in substantial social and environmental benefits; in most cases, however, they are probably 10 to 15 years away (if ever) from becoming commercially viable as they are currently used only on a pilot basis (International Energy Agency (IEA) 2004). Technologies are tested on a pilot-plant scale in individual process steps but are not integrated. Scaling up the integrated process could take at least a decade.
12. U.S. Department of Agriculture (USDA) 2007.
13. U.S. Department of Agriculture (USDA) 2007.
14. In the extreme, trucking ethanol from midwestern states in the United States to the coastal cities rather than transporting gasoline in pipelines would consume considerably more energy, in the form of diesel.
15. Farrell and others 2006; Hill and others 2006; Kartha 2006; review of studies reported in Worldwatch Institute 2006 and Kojima, Mitchell, and Ward 2006.
16. Koplou 2006.
17. Commission of the European Communities 2006.
18. Turner and others 2007.
19. FBOMS (Fórum Brasileiro de ONGs e Movimentos Sociais) 2006.
20. Worldwatch Institute 2006.
21. United Nations Conference on Trade and Development (UNCTAD) 2006b; Worldwatch Institute 2006.
22. Kojima, Mitchell, and Ward 2006.

### Chapter 3

1. In this chapter, rural households are defined as those in areas defined as "rural" according to country-specific definitions (see chapter 2).
2. Chapter 2 discussed many of the public goods that partly determine the rural context (roads, market access, agroecological environment) and affect the returns on assets.
3. De Weerd 2006; Krishna and others 2006; Larwanou, Abdoulaye, and Reij 2006.
4. Peters 2006; World Bank 2006n.
5. Du, Park, and Wang 2005; Foster and Rosenzweig 2004; Kijima and Lanjouw 2004; Lanjouw 2007; Lokshin, Bontch-Osmolovski, and Glinskaya 2007; McCulloch, Weisbrod, and Timmer 2007.
6. Beegle, De Weerd, and Dercon 2006; De Weerd 2006; Krishna 2006b; McCulloch, Weisbrod, and Timmer 2007; Nargis and Hossain 2006.
7. Davis and others 2007; Deichmann, Shilpi, and Vakis 2006; Haggblade, Hazell, and Reardon 2005.
8. Mansuri 2007b; Quisumbing, Estudillo, and Otsuka 2004.
9. Lucas 1987; Mansuri 2007b; McCarthy and others 2006; Rozelle, Taylor, and de Brauw 1999.
10. Knight and Song 2003 for China and World Bank 2006n for Malawi. Calculations for Mexico based on ENIGH (National Survey of Household Incomes & Expenditures 2004).
11. Large-scale commercial farmers are not considered, as the chapter focuses on pathways out of poverty.
12. These households are not necessarily autarkic, and within subsistence farmers, there can be both net buyers and net sellers of food (see chapter 4). Most of these households engage in markets for food, labor, or manufactured goods, but in a more limited way than others.
13. Note that this quantification does not accurately reflect all aspects of migration as a livelihood strategy, as those households that chose to exit are not captured by the surveys. The classification captures households that have remained but derive the majority of their income from public and private transfers. Many of these are older and female-headed households. In addition to such households, migration is a key household livelihood strategy for many young and educated people who exit rural areas.
14. The share of diversified households is, logically, higher when agricultural wage labor, nonagricultural wage labor, and nonagricultural self-employment are considered as separate income sources.
15. We use the term "dualism" to put emphasis on the sharp contrast that exists among activities, recognizing that there is a continuum in the implications (such as income levels) across dual types.
16. <http://faostat.fao.org>.
17. Yet in Ghana and Nigeria, where the vast majority of farmers are subsistence-oriented, these farmers sell a larger share of total marketed production from all types of households (54 percent and 32 percent, respectively).
18. Deere 2005; Dolan and Sorby 2003; Newman 2001; Zhang and others 2007. See also chapter 9.
19. Regional averages were calculated using available households and labor force surveys in each region. For each country, surveys from 2000 or the nearest year available were used, and

the population was adjusted to 2000 population (as reported by the UN). The calculations for East Asia and the Pacific (EAP) exclude China but include Cambodia, Fiji, Indonesia, Marshall Islands, Thailand, Timor-Leste, and Vietnam, which account for 66 percent of the population of East Asia outside of China. South Asia (SA) includes Bangladesh, Bhutan, India, and Pakistan, which accounts for 97 percent of the region's population. Sub-Saharan Africa (SSA) includes Angola, Benin, Burundi, Burkina Faso, Cameroon, Cape Verde, Chad, the Democratic Republic of Congo, Ethiopia, Ghana, Gambia, Kenya, Lesotho, Madagascar, Mozambique, Rwanda, Senegal, Sierra Leone, Sao Tome and Principe, South Africa, Uganda, and Zambia, which represents 55 percent of the population of the region. Latin America and the Caribbean (LAC) includes Bolivia, Brazil, Chile, Colombia, Costa Rica, the Dominican Republic, Ecuador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Peru, Panama, Paraguay, and El Salvador, representing 85 percent of the population of the region. Middle East and North Africa (MENA) includes Egypt, Jordan, Morocco, and Yemen, representing 47 percent of the population of the region. Europe and Central Asia (ECA) includes Albania, Bosnia & Herzegovina, Croatia, Kyrgyz Republic, Macedonia, Poland, Romania, Russia, Tajikistan, Turkey, and Ukraine, representing 74 percent of the region's population of the region. See World Development Report 2008 Team 2007.

20. Katz 2003; Lastarria-Cornhiel 2006; Ramachandran 2006. Note that female self-employment in agriculture might not be captured well by surveys. Deere 2005, for example, discusses several reasons for underreporting bias in Latin America.

21. Barrett and others 2005; Haggblade, Hazell, and Reardon forthcoming; Otsuka and Yamano 2006.

22. Based on analysis of household surveys from 66 countries (see footnote 33 and World Development Report 2008 Team 2007 on the sources). See also Davis and others 2007; Reardon and others forthcoming.

23. de Brauw and Harigaya forthcoming; Macours and Vakis 2006; Ratha and Shah 2006; Rogaly and Rafique 2003; World Bank 2005a.

24. Anríquez and Bonomi 2007; Anríquez 2003; Lohmar, Rozelle, and Zhao 2001; World Bank 2006s; World Bank 2005a.

25. Otsuka and Yamano 2006 show evidence from Bangladesh, the Philippines, and Thailand.

26. Despite selection, the overall effect of migration on education level might well be positive, because of a positive incentive effect (see Stark, Helmenstein, and Prskawetz 1997) for a theoretical model and Boucher, Stark, and Taylor 2005 for empirical evidence from rural Mexico) and because of the use of remittances to cover the schooling costs of other household members.

27. Anríquez and Bonomi 2007.

28. de Janvry and others 2006; Gertler, Martinez, and Rubio-Codina 2006; Mansuri 2007a; Taylor and Mora 2006; Yang 2006; Yang and Choi forthcoming.

29. Frankenberg, Smith, and Thomas 2003; Macours and Swinnen 2006; Owen 1966.

30. Jalan and Ravallion 2002.

31. de Janvry and Sadoulet 2006b; Singh, Squire, and Strauss 1986.

32. The labor market imperfections can be the result of wages that are higher than the competitive equilibrium to guarantee sufficient caloric intake (Leibenstein 1986).

33. de Janvry, Fafchamps, and Sadoulet 1991; Von Braun, Hotchkiss, and Innmink 1989.

34. Bandiera and Rasul 2006; Basu 2006b; Conley and Udry 2004; Duflo, Kremer, and Robinson 2006; Foster and Rosenzweig 1995.

35. Basu 2006a; Bourguignon and Chiappori 1994; Carter and Katz 1997; Goldstein and Udry 2006; McPeak and Doss 2006; Udry 1996; Udry and others 1995.

36. Baland and Platteau 1996; McCarthy 2004; Ostrom 1990.

37. Duflo and Udry 2004.

38. Men still work only three-fourths of the time women do, reflecting culturally assigned housework responsibilities (Newman 2001).

39. Katz 1995; Von Braun, Hotchkiss, and Innmink 1989; Von Braun and Webb 1989; Warner and Campbell 2000.

40. Hall and Patrinos 2006; World Bank 2003i; Zezza and others 2007.

41. World Bank 2003i.

42. Jayne and others 2006b. Yet in a study in rural Uganda, de Walque 2004 found that this pattern reversed because the more educated seemed to be more responsive to education campaigns and learn faster how to protect themselves. Even so, the loss of active adults, even if formally uneducated, can lead to loss of knowledge for production of high-value cash crops (Yamano and Jayne 2004).

43. Gillespie 2006; Thirumurthy, Graff-Zivin, and Goldstein 2005.

44. Reviewing evidence of 40 Sub-Saharan Africa countries, Monasch and Boerma 2004 found that AIDS orphans are more likely to be in rural areas in some countries, but not in others.

45. Anríquez and Bonomi 2007.

46. Andre and Platteau 1998; de Janvry, Sadoulet, and Finan 2005; Otsuka and Yamano 2006.

47. Benfica 2006.

48. When most of the farms are small, but most of the land is in big farms, the mode of the distribution of farm size is low, while the mode of the distribution of total farmland is much higher—hence the distributions are bimodal. This bimodality of land distributions was first discussed by Johnston and Kilby 1975, who indicated that for most countries the unimodal structure is more productive because it equalizes the marginal product of labor across farms. More recently, Vollrath 2007 has shown a robust negative relationship between land inequality and agricultural productivity.

49. Part of the apparent increase of small farms in Bangladesh is a result of a change in methodology in the agricultural census, as the 1977 census did not include plots below a minimum size threshold (Anríquez and Bonomi 2007).

50. Zezza and others 2007.

51. This can be inferred from the fact that the size of this age cohort declines both in rural and urban areas. So the decline in rural areas is not from rural-urban migration. In fact, if anything, evidence suggests reverse migration in later years.

52. Boucher, Barham, and Carter 2005; De Ferranti and others 2004; Macours, de Janvry, and Sadoulet 2004; Rao and Walton 2004.

53. Agarwal 1994; Deere and Doss 2006; Deere and León 2003; World Bank 2005k.

54. Jacobs 2002; Quisumbing and others 2001; World Bank 2006n.

55. Fafchamps, Udry, and Czukas 1998; Lybbert and others 2004; Rogg 2006; Seré 2006.

56. Davis and others 2007; Zezza and others 2007.

57. Fafchamps and Minten 2002; La Ferrara 2003; Munshi 2003; Putnam, Leonardi, and Nanetti 1993; World Bank 2006s.

58. Agoua, Mercoiret, and Ouikoun 2000; Bernard and others 2006; Kaburie and Ruvuga 2006.

59. de Janvry and Sadoulet 2004; Society for Elimination of Rural Poverty (SERP) 2006.

60. Carter and Barrett 2006; Dercon 2004; Hoddinott 2006; Lybbert and others 2004; McPeak 2004.

61. Christiaensen and Sarris 2007; Christiaensen and Subbarao 2005; Dercon, Hoddinott, and Woldehanna 2005; González and Lopez 2007; Krishna 2006a.

62. Alderman and Paxson 1992; Binswanger and Rosenzweig 1993; Fafchamps and Pender 1997.

63. Gaiha and Thapa forthcoming; Rasmussen 2004; Santos 2006.

64. Gaiha and Thapa forthcoming.

65. Cavendish 1999.

66. Alderman, Hoddinott, and Kinsey 2006; de Janvry and others 2006; Jensen 2000; Thomas and others 2004.

67. Barrett 2007; Behrman and Deolalikar 1990; Dercon and Krishnan 2000; Fafchamps 1998.

68. Anriquez and Bonomi 2007; Von Braun 2003.

69. Berry and Cline 1979; Carter 1984. While some have argued that land quality differences or unobserved plot characteristics can help explain the inverse relationship (Assuncao and Braidó forthcoming; Benjamin 1995, others have shown that the inverse relationship persists even after controlling for land quality and other plot characteristics (Heltberg 1998; Kimhi 2006).

70. Feder 1985; Kevane 1996; World Bank 2003g; Zimmerman and Carter 2003. Insurance and credit markets failures often coincide because of common underlying conditions such as spatial dispersion, heterogeneity, seasonality, and covariant risk (Binswanger and McIntire 1987; Binswanger and Rosenzweig 1993).

71. Karp 2007a.

72. Similarly, important tradeoffs might exist related to land consolidation policies aimed at reducing the fragmentation of the farm of one household into multiple small plots. While consolidation might decrease transaction costs, it can increase risk (for example, plots that are geographically separated are less likely to be hit by the same plague). Moreover, consolidation policies leave room for elite capture, and fair and transparent mechanisms for reallocating land across different households can be hard to design and implement. Policies that force a minimum plot size can result in important distortions, coming with a potential efficiency and equity cost (Vranken and others 2007).

### Focus C

1. FAO 2002.

2. FAO 2006c.

3. Derived from the food balance sheet—food grown by a country, augmented by the food imported and food aid, and reduced by storage losses, amounts used as seed and animal feed, and food exported—the measure is adjusted by an inequality function to produce an estimate of the number of individuals undernourished. In this sense, it captures an access-adjusted availability of food.

4. Staple food is defined as cereals, pulses, roots, and tubers.

5. Sen 1981.

6. Sanchez and others 2005.

7. Katz 1994.

8. FAO 2006c; United Nations Children's Fund (UNICEF) 2007.

9. Alderman 2005.

10. This term reflects the fact that, except in severe cases, the impact of micronutrient malnutrition is invisible, unlike energy deficiency, which results in short-statured underweight people.

11. <http://www.gainhealth.org>.

12. Darnton-Hill and others 2005.

### Chapter 4

1. Hayami and Godo 2004.

2. OECD 2006b.

3. OECD 2006b.

4. Baffes and de Gorter 2005.

5. Schiff and Valdés 1992.

6. Derived from Easterly 2006.

7. Townsend 1999.

8. In contrast, currency overvaluation effects were included in the net taxation estimates for the agriculture-based and transforming countries, where the black market premiums for foreign currency were historically large.

9. The countries included in the analysis are Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Slovenia.

10. Anderson forthcoming.

11. Anderson and Martin 2005; Bouët 2006a; Polaski 2006. Including estimates of domestic agricultural taxation would likely add to the costs. Bouët 2006b reviewed 15 studies assessing the impact of full trade liberalization, which is indicative of the costs of current policies. While estimates of the implicit costs differ, the relative roles of sources of distortions and the distribution of costs across regions are similar across studies. The implicit welfare costs of current agricultural trade policies as a percent of the costs of all trade policies had a median of 66 percent across 10 studies; 38 percent of the costs were estimated to be borne by developing countries across 15 studies (median estimate); developing-country policies accounted for 55 percent of these costs across 8 studies; and on average tariffs accounted for more than 90 percent of the cost of agricultural trade policies across 4 studies.

12. The \$17 billion cost is a conversion to 2005 GDP and prices of the static share of the \$26 billion 2015 estimate in Anderson, Martin, and van der Mensbrugge 2006b. Other studies provide higher and lower estimates (see footnote 11).

13. Anderson, Martin, and Valenzuela 2006; Francois, Van Meijl, and Van Tongeren 2005; Hertel and Keeney 2005.
  14. Anderson and Valenzuela forthcoming.
  15. Anderson, Martin, and van der Mensbrugge 2006a.
  16. Baffes 2007.
  17. Anderson, Martin, and van der Mensbrugge 2006a; FAO 2005b.
  18. Aziz and others 2001.
  19. Baffes 2005.
  20. Anderson and Valenzuela forthcoming.
  21. Alston, Sumner, and Brunke 2007.
  22. Panagariya 2005; Tangerman 2005.
  23. Ashraf, McMillan, and Zwane 2005.
  24. Anderson, Martin, and van der Mensbrugge 2006a.
  25. Hertel and others 2007.
  26. Ravallion and Lokshin 2004.
  27. Baffes and Gardner 2003.
  28. Ivanic and Martin 2006.
  29. Hertel and Reimer 2005; Winters 2002.
  30. Minot and Goletti 2000.
  31. Ravallion 1990.
  32. Nicita 2004.
  33. Bussolo and others 2006; Isik-Dikmelik 2006; Klytchnikova and Diop 2006.
  34. Martin and Ng 2004.
  35. Anderson, Martin, and van der Mensbrugge 2006a Martin and Anderson 2006; Polaski 2006.
  36. Anderson, Martin, and Valenzuela 2006; Hertel and Keeney 2005.
  37. Anderson and Valenzuela forthcoming.
  38. Laborde and Martin 2006.
  39. Martin and Anderson 2006.
  40. Hertel and others 2007.
  41. Staatz and Dembele 2007; World Bank 2004c.
  42. World Bank 2004c.
  43. World Bank 2004c.
  44. Baffes and Gardner 2003.
  45. Winters 2006.
  46. FAO 2006b; Winters 2006.
  47. Foster and Valdés 2005.
  48. Baunsgaard and Keen 2005.
  49. World Bank 2000a.
  50. Consumption taxes are theoretically more efficient than trade taxes. A simplified example of a 1 percentage point reduction in the tariff rate on a final consumption good replaced with a 1 percentage point increase in the corresponding domestic tax on consumption of the same good can provide a useful illustration. The price faced by the consumer and tax revenues will be unchanged, but domestic producers will face prices closer to world market levels.
  51. International Monetary Fund 2005.
  52. World Bank 2004b.
  53. Ashraf, McMillan, and Zwane 2005.
  54. Coady, Dorosh, and Minten 2007.
  55. Binswanger 1989; Schiff and Montenegro 1997.
  56. López and Galinato 2006.
  57. Fan, Sukhadeo, and Rao 2004.
  58. Chand and Kumar 2004.
  59. Allcott, Lederman, and López 2006; Esteban and Ray 2006.
  60. See Bardhan 2002 for a discussion of the advantages and disadvantages of decentralization.
  61. Lederman, Loayza, and Soares 2006.
- Chapter 5**
1. Fafchamps, Minten, and Gabre-Madhin 2005.
  2. Kohls and Uhl 1985.
  3. Shepherd 1997.
  4. These are being implemented by the Kenyan and Malawi Agricultural Commodity Exchanges; the Mozambique Agricultural Marketing Information System (SIMA); and by Manobi, which is currently expanding these activities to Burkina Faso, Ghana, Mali, Tanzania, Uganda, and Zambia (see <http://www.manobi.sn/sites/?M=6&SM=20&IDPresse=22>).
  5. Fafchamps, Minten, and Gabre-Madhin 2005; Kleih, Oko-boi, and Janowski 2004; Temu and Msuya 2004.
  6. Gabre-Madhin and Goggin 2005; United Nations Conference on Trade and Development (UNCTAD) 2006a.
  7. Trading in forward and futures contracts in India was limited to a few commodities (such as oilseeds, sugar, and cotton) after broader futures trading was banned in 1952. In 2004 the ban on futures trading for 54 agricultural commodities was removed (World Bank 2005f), but it was reintroduced for wheat in 2006.
  8. Narender 2006; Sahadevan 2005.
  9. These included the fortnightly turnover of futures trading for guar seed, chick peas, black legumes, soybean oil, cane sugar, guar gum, and lentils (Narender 2006).
  10. Dana, Gilbert, and Shim 2006; Dana, Gravelet-Blondin, and Sturgess 2007; Dorward, Kydd, and Poulton 2006.
  11. Avalos-Sartorio 2006; Hazell, Shields, and Shields 2005; Mitchell and Le Vallee 2005.
  12. Cummings, Rashid, and Gulati 2006; Dorward, Kydd, and Poulton 2006; Umali-Deininger and Deininger 2001.
  13. Dawe 2001; Myers 2006; Timmer 2002.
  14. Dorward, Kydd, and Poulton 2006.
  15. Byerlee, Jayne, and Myers 2006.
  16. Malawi, despite having these reserves, disrupted domestic trade by imposing an export ban, which undercut the other price-stabilization measures.
  17. World Bank 2006p.
  18. The widespread adoption of genetically modified cotton varieties in major producing countries, such as Australia, China, and the United States, was a major contributor to significant increases in productivity and global output (Poulton 2007).
  19. Poulton 2007.
  20. Mayer and Fajarnes 2005.
  21. In Cameroon, this led to the “homogenization” of exported cocoa beans, with most cocoa being exported as “fair fermented” quality rather than the high-quality “good fermented” cocoa, and to a decline in the price premium paid on high-quality beans (Tollens and Gilbert 2003).

22. Baffes, Lewin, and Varangis 2005; Tollens and Gilbert 2003.
23. KILLICAFE, a farmer-owned company, facilitates marketing and provides technical assistance to members to improve productivity and quality. Its export sales of specialty coffee exceed \$500,000 annually. The quality improvement enabled farmers to receive a 70 percent price premium ([www.technoserve.org/news/TZCoffeeSectorBrief.pdf](http://www.technoserve.org/news/TZCoffeeSectorBrief.pdf)).
24. Akiyama, Baffes, and Varangis 2001.
25. Akiyama and others 2003; Bonjean, Combes, and Sturgess 2003.
26. Akiyama, Baffes, and Varangis 2001; Shepherd and Farolfi 1999.
27. Winter-Nelson and Temu 2002.
28. Bonjean, Combes, and Sturgess 2003; Poulton 2007; Tschirley, Zulu, and Shaffer 2004.
29. Poulton 2007.
30. Bonjean, Combes, and Sturgess 2003.
31. Regmi and Gehlar 2005.
32. CII-McKinsey & Co. 1997.
33. Marketing survey covering 78 wholesale markets handling mangoes, tomatoes, potatoes, tumeric, and maize in the Tamil Nadu, Maharashtra, Orissa, and Uttar Pradesh, India (World Bank 2007f).
34. Shilpi and Umali-Deininger 2006.
35. Reardon and Berdegué 2006.
36. Asociación Nacional de Tiendas de Autoservicios y Distribuidoras (ANTAD) 2005; Goldman and Vanhonacker 2006; Reardon, Pingali, and Stamoulis 2006.
37. See Reardon and Berdegué 2002 for Latin America, Berdegué and others 2005 for Central America, Dries, Reardon, and Swinnen 2004 for Central and Eastern Europe, Schwentesius and Gómez 2002 for Mexico, Reardon and Farina 2002 for Brazil, and Weatherspoon and Reardon 2003 for Africa.
38. Reardon and Berdegué 2006.
39. Berdegué and others 2005; Boselie, Henson, and Weatherspoon 2003; Dries, Reardon, and Swinnen 2004; Natawidjaja and others 2006.
40. Similar figures have been obtained in Costa Rica and Brazil (Reardon and Berdegué 2006).
41. Boselie, Henson, and Weatherspoon 2003; Dries and Reardon 2005; Manalili 2005.
42. Reardon and Berdegué 2006; Reardon and others 1999.
43. Modern retailers in Vietnam signaled to consumers their supply chain food-safety assurance procedures during and after the avian flu crisis, which won many consumers away from wet markets and into supermarkets in Ho Chi Minh City (Phan and Reardon 2006).
44. These studies looked at tomatoes in Guatemala (Hernández, Reardon, and Berdegué 2007), Indonesia (Natawidjaja and others 2006), and Nicaragua (Balsevich, Berdegué, and Reardon 2006); kale in Kenya (Neven, Odera, and Reardon 2006); lettuce in Guatemala (Flores, Reardon, and Hernandez 2006); guavas in Mexico (Berdegué and others 2006a); and produce in China (Wang and others 2006).
45. Berdegué and others 2003; Dries, Reardon, and Swinnen 2004.
46. Reardon and Timmer 2006.
47. Reardon and Berdegué 2002; Reardon and Timmer 2006.
48. Flores, Reardon, and Hernandez 2006.
49. For example, farmers growing peanuts in Senegal (Warning and Key 2002), poultry in India (Ramawami, Birthal, and Joshi 2006), and maize in Indonesia (Simmons, Winters, and Patrick 2005).
50. Balsevich, Berdegué, and Reardon 2006; Dries and Reardon 2005; Hu and others 2004.
51. Gutman 1997. Rodríguez and others 2002 note that while general-line small shops folded quickly, those in specialized niches, particularly bakeries and fresh fish, meat, and fruit and vegetable shops, were better able to compete.
52. Mukherjee and Patel 2005.
53. Some examples are Xincheng and SanLu in China (Hu and others 2004), Homegrown in Kenya (Boselie, Henson, and Weatherspoon 2003), Konzum in Croatia (Dries, Reardon, and Swinnen 2004), Hortifruit in Central America (Berdegué and others 2003), and ITC in India (DeMaagd and Moore 2006).
54. Minten, Randrianarison, and Swinnen 2006; Swinnen and Maertens 2005.
55. Reardon and Berdegué 2002.
56. World Bank 2005d.
57. Buzby, Frenzen, and Rasco 2001; Henson 2006.
58. Unnevehr 2003.
59. <http://www.eurepgap.org/Languages/English/about.html>.
60. Henson and Caswell 1999; Jha 2002; OECD 2003; Wilson and Abiola 2003.
61. Jaffee and Henson 2004; World Bank 2005d.
62. Otsuki, Wilson, and Sewadeh 2001 is widely referenced.
63. Calvin, Flores, and Foster 2003.
64. Compliance costs are the additional costs necessarily incurred by government and private players in meeting the requirements to comply with a given standard in a given external market. They may include upgrades to official surveillance or inspection systems, investments in laboratory testing capacities, changes in production or manufacturing processes or technologies, upgrades of farm or factory infrastructure, and certification and testing costs.
65. Umali-Deininger and Sur 2006; World Bank 2005c.
66. See Jaffee 2005 for Indian spices, Minten, Randrianarison, and Swinnen 2006 for Madagascar vegetables, Manarungsan, Naewbanij, and Rerngjakrabbhet 2005 for Thai vegetables, and Dries, Reardon, and Swinnen 2004 for various examples in Eastern Europe.
67. Maertens and Swinnen 2006.
68. World Bank 2005f.
69. World Bank 2005d.
70. The Standards and Trade Development Facility provides project preparation and project grants to developing countries seeking to comply with SPS standards and hence gain or maintain market access (Standards and Trade Development Facility, <http://www.standardsfacility.org>).
71. For animals, organic means they were reared without the routine use of antibiotics and without the use of growth hormones. At all levels, organic food is produced without the use of genetically modified organisms.
72. Farnworth and Goodman 2007.

73. Dimitri and Oberholtzer 2006; International Federation of Organic Agriculture Movements (IFOAM) 2006.

74. Farnworth and Goodman 2007; Henson 2006.

75. Becchetti and Costantino 2006; Murray, Reynolds, and Taylor 2006; Utting-Chamorro 2005.

76. Mendoza and Bastiaensen 2003; Zehner 2002.

77. Lernoud and Fonseca 2004.

78. Henson 2006.

79. Akiyama and Larson 1994; FAO 2004d.

80. China's high-value agricultural exports nearly doubled from \$4.2 billion in 1994 to \$8 billion in 2004, while its processed food exports more than tripled from \$2.6 billion to \$8 billion.

81. FAO 2004d.

82. Henson 2006.

#### Focus D

1. FAO 2007b.

2. World Bank 2003f

3. Freeman and Estrada-Valle 2003.

4. van der Meer 2007.

5. Reardon, Henson, and Berdegué forthcoming.

6. The major agrochemicals include herbicides, insecticides, fungicides, and other chemicals used in agriculture.

7. Mercier Querido Farina and dos Santos Viegas 2003.

8. da Silveira and Borges 2007.

9. ETC Group Communiqué 2005.

10. Tirole 1998.

11. Murphy 2006.

12. FAO 2004b; International Coffee Organization 2007; International Cocoa Organization (ICO) 2006; Vorley 2003.

13. Morisset 1998.

14. World Bank 2006v

15. van der Meer 2007.

16. <http://www.tetrapak.com>.

17. <http://www.danone.com>; <http://www.grameen-info.org>.

18. <http://www.cocoasustainability.mars.com/News/article5.htm>.

#### Chapter 6

1. Ayalew, Dercon, and Gautam 2005; Deininger and Jin 2006; Place and Otsuka 2002.

2. Alden-Wily 2003.

3. Deininger, Ayalew, and Yamano 2006.

4. Chauveau and others 2006.

5. Burns 2006.

6. Goldstein and Udry 2006.

7. In cases of polygamy, wives beyond the first receive their own individual certificate.

8. Deere and León 2001.

9. Deininger and Castagnini 2006.

10. Khadiagala 2001.

11. Raju, Akella, and Deininger 2006.

12. Transparency International India 2005.

13. Government of Kenya 2004.

14. Lobo and Balakrishnan 2002.

15. World Bank 2007e.

16. Swinnen and Vranken 2006.

17. Deininger and Jin 2003.

18. Deininger and Chamorro 2004; Deininger and Jin 2007; Macours, de Janvry, and Sadoulet 2004.

19. Deininger, Ayalew, and Alemu 2006.

20. Cain 1981; Kranton and Swamy 1999; World Bank 2003h.

21. Nagarajan, Deininger, and Jin forthcoming.

22. Bardhan and Mookherjee 2006.

23. Bird and Slack 2004.

24. Banerjee and Iyer 2005; Nugent and Robinson 2002.

25. Appu 1996; Deininger 1999; Lutz, Heath, and Binswanger 1996.

26. Banerjee, Gertler, and Ghatak 2002.

27. World Bank 2007f.

28. Zeller 2003.

29. Boucher, Carter, and Guirkinger 2006.

30. Sarris, Savastano, and Tritten 2004.

31. Boucher, Carter, and Guirkinger 2006.

32. Peck Christen and Pearce 2005.

33. Pearce and others 2005.

34. Consultative Group to Assist the Poor (CGAP) 2004.

35. Adams, Graham, and Von Pischke 1984.

36. The *World Development Report 1989: Financial Systems and Development* offered a sharp critique of these programs. By the end of the decade, most donors and governments were lifting financially repressive policies and sharply scaling back state-led agricultural credit programs (World Bank 1989).

37. Coffey 1998.

38. Cuevas and Fischer 2006; Nair and Kloppinger-Todd 2007; World Bank 2007g.

39. Aeshliman 2007.

40. Consultative Group to Assist the Poor (CGAP) 2006b.

41. Consultative Group to Assist the Poor (CGAP) 2006a.

42. Nair and Kloppinger-Todd 2006.

43. Conning 2005.

44. Fleisig and de la Peña 2003.

45. de Janvry, McIntosh, and Sadoulet 2006.

46. Hess 2003; Skees and Barnett 2006.

47. Just 2006.

48. McPeak 2006.

49. McCord, Botero, and McCord 2005.

50. Hazell 1992.

51. Sarris, Karfakis, and Christiaensen 2006.

52. Gine, Townsend, and Vickery 2006.

53. Factors affecting demand for fertilizer are discussed in Kelly 2006.

54. Yanggen and others 1998.

55. For a discussion of how risk affects fertilizer use decisions, see Anderson and Hardaker 2003.

56. Morris 1998.

57. For a discussion of the logistical challenges facing fertilizer distributors, see Gregory and Bumb 2006.

58. Jayne and others 2003; Kherallah and others 2002.

59. For initiatives in Sub-Saharan Africa, see Minot and others 2006 and Morris and others 2007.

60. FAO 2005a; International Center for Soil Fertility and Agricultural Development 2003.

61. Crawford, Jayne, and Kelly 2006.

62. Borlaug and Dowsell 2007.
  63. Kelly, Adesina, and Gordon 2003.
  64. Duflo, Kremer, and Robinson 2006.
  65. Van der Meer and Noordam 2004.
  66. Other initiatives to support entrepreneurial input distributors in Africa include Seeds of Development (<http://www.sodp.org/>) and African Agricultural Capital (<http://www.aac.co.ke/>).
  67. Bramel and Remington 2005.
  68. An association is a nonprofit organization that enables members to collaborate for services, information exchanges, and representation. In some countries, professional organizations refer to themselves as “societies” rather than associations. A cooperative engages in collective commercial activities such as buying inputs or selling members’ products. Benefits are distributed to each member proportionately to the volume of transactions with the cooperative, rather than to the member’s capital contribution; capital contribution is remunerated at a fixed interest rate, with a limit on the amount. Cooperatives benefit from a specific fiscal regime, distinct from that of enterprises, and are often tax exempt.
  69. Overseas Cooperative Development Council 2007. Well-known cooperative brand names include Land O’Lakes, Welch’s, Sunkist, Blue Diamond, and Ocean Spray.
  70. Mauget and Koulytchizky 2003.
  71. Banerjee and others 2001.
  72. <http://www.agro-info.net>.
  73. Mercoiret, Pesche, and Bosc 2006.
  74. National Dairy Development Board Web site (<http://www.nddb.org>).
  75. <http://www.juanvaldez.com/>.
  76. Chen and others forthcoming; Mercoiret, Pesche, and Bosc 2006; Stockbridge 2003.
  77. Bernard, de Janvry, and Sadoulet 2005.
  78. Berdegú 2001.
  79. Berdegú 2001.
  80. Brock and McGee 2004.
  81. Hussi and others 1993.
  82. By 1995, 20 percent of the village cooperatives and unions were not free to set consumer prices, and 13 percent were not free to set producer prices. Twenty-four percent of the unions and 7 percent of the village cooperatives were experiencing interference in staff recruitment or removing redundant staff, and 24 percent of the unions still had political appointees on their boards (World Bank Operations Evaluation Department 1998).
  83. Collion and Rondot 2001; Mercoiret, Pesche, and Bosc 2006.
  84. World Bank 2006c.
- Chapter 7**
1. Conway 1999.
  2. Evenson and Gollin 2003.
  3. Evenson and Rosegrant 2003.
  4. See Web site at <http://www.indiastat.com>.
  5. Reynolds and Borlaug 2006.
  6. “Slow magic” refers to the long-term but high payoff of investment in R&D (Pardey and Beintema 2001).
  7. Adoption is high for wheat, which is an important crop only in Ethiopia.
  8. InterAcademy Council 2004; Quisumbing 1996.
  9. Byerlee and Eicher 1997.
  10. CIMMYT, personal communication.
  11. Falusi and Afolami 2000; Nweke, Spencer, and Lynman 2002.
  12. Africa Rice Center, personal communication, 2007; Kijima, Sserunkuuma, and Otsuka 2006.
  13. International Center for Tropical Agriculture (CIAT) 2006.
  14. Joshi and others 1996.
  15. Walker 2007.
  16. Joshi and others 1996; Walker 2007.
  17. Sperling, Loevinsohn, and Ntabomvura 1993; Walker 2007.
  18. Gollin 2006.
  19. Blackeslee 1987.
  20. Maintenance research is also essential for the productivity of livestock. In South Africa, cattle disease losses are closely related to expenditures on livestock health. Previous studies that ignored this maintenance found low returns on livestock improvement in South Africa. But when maintenance effects are accounted for, the returns on livestock research are about 40 percent (Townsend and Thirtle 2001).
  21. Stokstad 2007.
  22. Long and Hughes 2001.
  23. See <http://www.promusa.org>.
  24. Kamuze 2004.
  25. Karamura and others 2006.
  26. CIMMYT 2006.
  27. Lantican, Pingali, and Rajaram 2003.
  28. Xu and others 2006.
  29. Smale and Drucker forthcoming.
  30. Narrod and Pray 2001.
  31. Steinfeld and others 2006.
  32. Thibier and Wagner 2002.
  33. Leksmono and others 2006.
  34. Asian Development Bank 2005; Dey and others 2000.
  35. Fuglie and others 2002.
  36. McGaw, Witcombe, and Hash 1997; Gibson 2002; Publico 2006.
  37. World Bank 2004h.
  38. Pretty 2006.
  39. See <http://www.rolf-derpsch.com/siembradirecta.htm>.
  40. Consultative Group on International Agricultural Research Science Council (CGIAR) 2006b.
  41. French Agricultural Research Centre for International Development 2006.
  42. Angus 2001.
  43. Consultative Group on International Agricultural Research Science Council (CGIAR) 2006a.
  44. Waibel and Pemsil 1999.
  45. Zeddies and others 2001.
  46. InterAcademy Council 2004.
  47. CIRAD 2006.
  48. See Web site at <http://www.icipe.org>.
  49. World Bank 2006u.
  50. Tripp 2006.

51. Barrett 2003.
52. This section is based largely on Pardey and others 2007.
53. Alston and others 2000.
54. Many of these studies do not consider technological spillovers from other countries (Maredia and Byerlee 2000). But econometric studies and metastudies that include costs of all programs, successful or not, and spillovers show high returns (Alston and others 2000; Raitzer 2003).
55. Pardey and others 2007.
56. Pardey and others 2007.
57. Beintema and Stads 2006.
58. Alston and Pardey 1993; Hayami, Kikuchi, and Morooka 1989.
59. Byerlee and Traxler 2001; Maredia and Byerlee 2000.
60. Alston 2002.
61. Pardey and others 2007.
62. Gardner and Lesser 2003; Pardey and others 2007.
63. Gisselquist, Nash, and Pray 2002.
64. Kremer and Zwane 2005.
65. Sobel 1996.
66. Masters 2005.
67. Eicher 2006.
68. World Bank 2005g.
69. Byerlee and Traxler 2001.
70. See Web site at <http://www.fontagro.org>.
71. Spielman, Hartwich, and von Grebmer 2006.
72. Pardey and others 2007.
73. In Spanish, Produce means “farm, go farm!”
74. Kangasniemi 2002. When used, there has often been little accountability of the funded scientists to farmers.
75. Uruguay, with commercialized agriculture, has by law implemented a levy for all agricultural research, matched by public funding to the level of 0.4 percent (see Allegri 2002).
76. Levies are feasible for products that pass through a narrow processing or marketing chain or where the producers are concentrated and well organized. They are not applicable to traditional staples, such as cassava.
77. Christiaensen and Demery 2007.
78. Anderson, Feder, and Ganguly 2006.
79. Anderson 2007; Qamar 2002.
80. Singh 2007.
81. Blackden and others 2006; Doss and Morris 2001; Moore and others 2001.
82. Ekwamu and Brown 2005; Ellis and others 2006.
83. Sulaiman V. and Hall 2002.
84. Cuéllar and Kandel 2006; Uliwa and Fischer 2004.
85. van den Berg and Jiggins 2007.
86. Feder, Murgai, and Quizon 2004; Godtland and others 2004; Tripp, Wijeratne, and Piyadasa 2005.
87. International Telecommunication Union (ITU) 2006.
88. Muto 2006.
89. Sullivan 2005.
90. Lio and Liu 2006.
3. Huang and others 2002; Qaim 2005.
4. Fok, Liang, and Wu 2005; Pemsil, Waibel, and Gutierrez 2005; Yang and others 2005.
5. Pray and others 2002; Sakiko 2007; Smale and others 2006.
6. Gandhi and Namboodiri 2006.
7. There was an observed reduction in the coefficient of variation of yields in on-farm field trials in India from 0.69 for conventional cotton to 0.57 for transgenics (Qaim 2003).
8. Bennett, Morse, and Ismael 2006; Gandhi and Namboodiri 2006; Herring 2007; Qaim and others 2006; Stone 2007.
9. James 2006.
10. In an International Food Policy Research Institute study of 15 developing countries, the public research pipeline for transgenic food crops included 201 genetic transformation events in 45 different crops (Cohen 2005). In addition, the Grand Challenges in Global Health Initiative, a public-private partnership, has ongoing research projects on staple crops such as banana, rice, sorghum, and cassava for increased levels of key micronutrients.
11. Huang and others 2005.
12. Life-years are computed as the number of beneficiaries multiplied by the average expected number of years of extra life per beneficiary.
13. Stein, Sachdev, and Qaim 2006.
14. Byerlee 1996.
15. Eicher, Maredia, and Sithole-Niang 2006.
16. Edmeades and Smale 2006
17. Pingali 2007; Spielman, Cohen, and Zambrano 2006.
18. Byerlee and Fischer 2002; Pingali 2007.
19. Spielman, Cohen, and Zambrano 2006.
20. Brookes and Barfoot 2006; International Council for Science 2003; Task Force of the International Life Science Institute (ILSI) International Food Biotechnology Committee 2001; The Royal Society 2002.
21. FAO 2004e; Sanvido and others 2006.
22. Pray and others 2006.
23. Cross-boundary movement of transgenics is regulated by the Cartagena Protocol under the Convention on Biodiversity, but the focus is on living modified organisms, such as seed intended for testing and commercial production.
24. Gruere and Bouët 2006; Nielson and Anderson 2001.
25. Bernauer 2003.
26. Barrett and Brunk 2007.
27. New Partnership for Africa's Development Secretariat 2006.

### Chapter 8

1. Rosegrant and Hazell 2001.
2. Estimates suggest that the germplasm improvement, largely through the green revolution, saved around 80 million hectares of land in developing countries through the 1990s (Nelson and Maredia 2007).
3. Millennium Ecosystem Assessment 2005.
4. Tiffen, Mortimore, and Gichuki 1994 and Pagiola 1994 show in Kitui/Machakos in Kenya that even expensive conservation measures such as terraces have been widely adopted by poor farmers with no access to formal credit markets.
5. Ruben and Pender 2004.

### Focus E

1. James 2006.
2. FAO 2004e; Smale and others 2006.

6. Jackson 1993.
  7. Boserup 1965; Tiffen, Mortimore, and Gichuki 1994.
  8. Cleaver and Schreiber 1994; Place, Pender, and Ehui 2006.
  9. Messer, Cohen, and Marchione 2001.
  10. Comprehensive Assessment of Water Management in Agriculture 2007; Hazell and Wood forthcoming; Sebastian 2007.
  11. Millennium Ecosystem Assessment 2005.
  12. United Nations Development Program 2006.
  13. Shah and others 2003.
  14. Comprehensive Assessment of Water Management in Agriculture 2007.
  15. Howe 2002.
  16. Millennium Ecosystem Assessment 2005.
  17. Comprehensive Assessment of Water Management in Agriculture 2007; International Assessment of Agricultural Science and Technology for Development (IAASTD) 2007; Rockström and Barron 2007.
  18. Feuillette 2001; García-Mollá 2000; Moench and others 2003.
  19. Comprehensive Assessment of Water Management in Agriculture 2007; World Bank 2006t.
  20. World Bank 2005h.
  21. de Wit and Stankiewicz 2006.
  22. World Bank 2006l.
  23. Aw and Diemer 2005.
  24. World Bank 2006o.
  25. Gulati, Meinzen-Dick, and Raju 2005.
  26. Dinar 2007.
  27. World Bank 2006x.
  28. An example of a canal automation system is Total Channel Control technology, which includes gates and other regulating structures, remotely controlled by a host computing site. A feature of this innovative technology is the ability to accurately control and measure water flow.
  29. Nayar and Aughton 2007.
  30. Pongkijvorasin and Roumasset 2007.
  31. Bastiaanssen and Hellegers 2007.
  32. Molle and Berkoff 2006.
  33. Backeberg 2005; Kuriakose and others 2005; United Nations Development Program 2006; World Bank 2006x; Zwart-veen 1997.
  34. World Bank 2006x.
  35. Aw and Diemer 2005; Saleth and Dinar 2005.
  36. World Bank 2005h.
  37. World Bank 2003b.
  38. World Bank 2006l.
  39. International Fund for Agricultural Development (IFAD) 2001.
  40. Millennium Ecosystem Assessment 2005.
  41. Fowler and Hodgkin 2004; McNeely and Scherr 2003.
  42. Heisey and others 1997.
  43. World Bank 2003d.
  44. Pingali and Rosengrant 1994; Susmita, Meisner, and Wheeler 2007.
  45. Pretty 2006.
  46. Pingali, Hossaim, and Gerpacio 1997.
  47. Forss and Lundström 2004; Forss and Sterky 2000.
  48. Steinfeld and others 2006.
  49. World Bank 2005i.
  50. Gilbert and others 2006.
  51. FAO 2007c.
  52. Gilbert and others 2006.
  53. Dixon, Gibbon, Gulliver 2001.
  54. Scherr and Yadav 1996.
  55. Bojo 1996.
  56. Cohen, Shepherd, and Walsh 2005.
  57. Cohen, Brown, and Shepherd 2006.
  58. World Bank 2007h.
  59. Palmieri and others 2003.
  60. Area of forests in mosaic lands is about 16 percent of total forest cover in tropical areas, as calculated from World Bank 2007i.
  61. World Bank 2007i.
  62. Scherr and McNeely 2006.
  63. Fan and Hazell 2001.
  64. World Bank 2007i.
  65. Shively and Pagiola 2004.
  66. Rudel 2005.
  67. World Bank 2007h.
  68. Rockström and Barron 2007.
  69. Nkonya and others 2007.
  70. McIntire, Bouzart, and Pingali 1992.
  71. ICRAF, personal communication, 2007.
  72. de Graaff 1996; Helben 2006; Reij and Steeds 2003.
  73. Erenstein 1999.
  74. See Tripp 2006 and Ruben and Pender 2004 for useful reviews.
  75. Pender, Place, and Ehui 2006.
  76. Tripp 2006.
  77. Gebremedhin, Pender, and Tesfaye 2006.
  78. International Fund for Agricultural Development (IFAD) 2005b.
  79. Uphoff 2001.
  80. Jackson 1993.
  81. Westermann, Ashby, and Pretty 2005.
  82. Knox, Meinzen-Dick, and Hazell 2002.
  83. As shown in a recent Consultative Group on International Agricultural Research Science Council (CGIAR) 2006a study, more powerful win-win options are elusive.
  84. Pagiola and Platais forthcoming.
  85. Pagiola and Platais forthcoming.
  86. Pagiola and others forthcoming.
  87. Tipper 2004.
- Focus F**
1. Long and others 2007.
  2. Stern 2006; Parry, Rosenzweig, and Livermore 2007.
  3. Estimates by Warren 2006 based on data prepared by Parry and others 2004. Scenario without the CO<sub>2</sub> fertilization effect.
  4. Long and others 2007.
  5. Crop yields are particularly sensitive to heat stress during flowering, so a small temperature increase, if it occurs during this critical stage, can have a far greater impact on yields, and this is not included in crop-climate model predictions (Challinor and others 2006; Schlenker and Roberts 2006).
  6. Dasgupta and others 2007.

7. Intergovernmental Panel on Climate Change (IPCC) 2007a.
8. Survey of 9,500 farmers in 11 African countries, conducted under the "Climate Change Impacts on and Adaptation of Agro-ecological Systems in Africa" project funded by the Global Environment Facility (GEF).
9. Maddison 2006.
10. Very similar evidence emergence from another recent Center for Environmental Economics and Policy in Africa survey of 727 farmers in the Limpopo River Basin in South Africa (Gbetibouo 2006).
11. Kurukulasuriya and others 2006; African Development Bank and others 2007.
12. Vergara and others forthcoming; Vergara 2005.
13. Arndt, Hazell, and Robinson 2000.
14. International Research Institute for Climate and Society (IRI) and others 2007.
15. This initiative was funded by the Least Developed Countries Fund, implemented by the GEF.
16. Stern 2006.
17. Stern 2006.
18. Stern 2006.
19. Intergovernmental Panel on Climate Change 2007b.
20. World Bank 2007i using data from Tomich and others 2005. These estimates consider only the landowners' forgone profits from conversion and assume that displaced labor can find alternate employment at the going wage.
21. Sathaye and others forthcoming cited after World Bank 2007i.
22. Steinfeld and others 2006; Stern 2006.
23. World Bank 2007i.
11. Jayachandran 2006.
12. Foster and Rosenzweig 1994.
13. Sundaram and Tendulkar 2007.
14. Dev 2002.
15. Hurst, Termine, and Karl 2005, citing Olney and others 2002.
16. Hurst, Termine, and Karl 2005.
17. Valdés and Foster 2006.
18. Hurst, Termine, and Karl 2005.
19. For Brazil, Mexico and Nicaragua, see Valdés and Foster 2006. For Poland, see World Bank 2001. For Poland this tax also applies to urban incomes.
20. Ureta 2002.
21. Jayaraman and Lanjouw 1999; Otsuka and David 1994.
22. Escobal, Reardon, and Agreda 2000; Jarvis and Vera-Toscano 2004.
23. Valdés and Foster 2006.
24. Valdés and Foster 2006.
25. Haggblade, Hazell, and Reardon forthcoming.
26. Hurst, Termine, and Karl 2005.
27. Rural Investment Climate Assessment surveys for Bangladesh, Indonesia, Nicaragua, Pakistan, Sri Lanka, and Tanzania; and 2004 VLSS for Tanzania, available online at <http://iresearch.worldbank.org/InvestmentClimate/>.
28. The World Bank's Rural Investment Climate Assessment Program has so far expanded to Bangladesh, Indonesia, Nicaragua, Pakistan, Sri Lanka, and Tanzania. Designed to be the counterpart of the Bank's *Investment Climate Surveys*, Rural Investment Climate surveys collect information on rural nonagricultural enterprises and perceptions of the main hurdles to their operation and development.
29. Damiani 2007.
30. Sundaram and Tendulkar 2007.
31. World Bank 2004g.
32. Araujo, de Janvry, and Sadoulet 2002.
33. Hanson 2005.
34. Hanson 2005.
35. Estimates are computed assuming that, in the absence of migration, natural population rates for urban and rural areas would be equal, thus providing a conservative measure of migration. Reclassification of rural areas into urban has not been taken into account, although it may account for some of the urbanization, independent of migration.
36. See, for example, Hoddinott 1994, Lanzona 1998, Li and Zahniser 2002, Matsumoto, Kijima, and Yamano 2006, and Zhao 1999.
37. Quisumbing and McNiven 2005.
38. McCulloch, Weisbrod, and Timmer 2007.
39. Otsuka and Yamano 2006; Satterthwaite and Tacoli 2003.
40. Banerjee and Newman 1993.
41. World Bank 2007c.
42. Otsuka and Yamano 2006.
43. Foster and Rosenzweig 1993.
44. Gurgand 2003.
45. Duflo 2001.
46. de Brauw and others 2002; Du, Park, and Wang 2005; Kashisa and Palanichamy 2006.
47. Fafchamps and Quisumbing 1999; Jolliffe 2004; Laszlo 2004.

## Chapter 9

1. Measuring labor force participation and assigning workers to a specific sector of activity are difficult for reasons inherent to the rural household pattern of activity. Many women will declare themselves as not in the labor force if they consider their main activity as being responsible for household care, even if they are active on the farm or in the household business. In addition, to avoid double counting, statistics report only the main activity of workers. The overall participation in any sector of activity or type of employment is thus underestimated. Asymmetric under-reporting of wage workers may occur if farming their own land is considered the main activity, even when it is not the main source of income. Following common terminology, nonfarm refers to employment in the nonagricultural sectors, be it self-employment or wage employment. Off-farm employment includes agricultural wage employment and nonfarm employment.
2. Cramer and Sender 1999; Erlebach 2006; Sender, Oya, and Cramer forthcoming.
3. Basu 2006a
4. Cramer and Sender 1999; Erlebach 2006; Johnston 1997; Sender, Oya, and Cramer forthcoming.
5. Deshingkar and Farrington 2006.
6. Hurst, Termine, and Karl 2005.
7. Glinkskaya and Jalan 2005.
8. World Bank 2003g.
9. Jarvis and Vera-Toscano 2004.
10. Kochar 1997.

48. Orazem and King forthcoming.
49. Cherdchuchai 2006; Quisumbing, Estudillo, and Otsuka 2004; Takahashi 2006.
50. Kochar 2000.
51. Hanushek and Woessmann 2007; OECD 2004; World Bank 2006z.
52. World Bank 2005e.
53. Nishimura, Yamano, and Sasaoka forthcoming.
54. Rawlings and Rubio 2005.
55. de Janvry and Sadoulet 2006a; Rugh and Bossert 1998.
56. Ravallion and Wodon 2000; Schady and Araujo 2006; Schultz 2001.
57. The noncontributory pensions applied in Bolivia (BONO-SOL) cover both urban and rural areas.
58. Levy 2007.
59. Edmonds forthcoming, using data from UNICEF's Multiple Indicator Cluster Surveys; <http://www.childinfo.org/MICS2/MICSDataSet.htm>.
60. Ratha 2005.
61. Alderman and Haque 2006.
62. Clay, Riley, and Urey 2004.
63. Galasso, Ravallion, and Salvia 2004; Ravallion and others 2005.
64. Morton and others 2006.

#### **Focus G**

1. Edmonds and Pavcnink 2005.
2. De and Dreze 1999.
3. Chaudhury and others 2006.
4. World Bank 2006z.
5. De and Dreze 1999.
6. United Nations Educational Scientific and Cultural Organization 2006.
7. FAO and UNESCO 2003.
8. Johanson and Adams 2004.
9. Johanson and Adams 2004.
10. Johanson and Adams 2004.
11. <http://www.opportunidades.gob.mx>.
12. FAO and UNESCO 2003.
13. Muir-Leresche 2003.
14. EARTH (Escuela de Agricultura de la Región Tropical Húmeda) University, located in Costa Rica—a private, nonprofit university dedicated to education in the agricultural sciences and natural resources.
15. Juma 2006.
16. Barrera 2007.
17. Section based on Saint 2007.
18. International Food Policy Research Institute (IFPRI) 2004.
19. Stads and Beintema 2006.
20. [www.saa-tokyo.org/english](http://www.saa-tokyo.org/english).
21. Eicher 2006.
22. Eicher 2006.
23. United Nations Educational Scientific and Cultural Organization 2006.

#### **Focus H**

1. Hawkes and Ruel 2006; Perry and others 2002.
2. Lipton and de Kadt 1988.
3. World Health Organization (Regional Office for Africa) 2006.
4. Mutero and others 2005; Snowden 2006; Keiser and others 2005.
5. Amarcher and others 2004.
6. Mutero, McCartney, and Boelee 2006.
7. Snowden 2006.
8. The study compared farmers who complained of malaria-like symptoms for two or more days in a month to those with symptoms for one or no days (Girardin and others 2004).
9. Keiser, Singer, and Utzinger 2005.
10. van der Hoek 2003; Mutero and others 2005.
11. World Health Organization (WHO) 2003.
12. Goldman and Tran 2002.
13. Yanggen and others 2003; Cole, Carpio, and León 2000.
14. The health effects of herbicide use were not significant in the estimation results. This could be due to the much higher number of insecticide poisonings compared with herbicide poisonings (Pingali, Marquez, and Palis 1994).
15. Pingali, Marquez, and Palis 1994; Rola and Pingali 1993.
16. Hruska and Corriols 2002.
17. United Nations Joint Programme on HIV/AIDS (UNAIDS) 2006.
18. Binswanger 2006.
19. Gillespie and Kadiyala 2005
20. Staatz and Dembele 2007.
21. Gillespie and Kadiyala 2005.
22. Jayne and others 2006b.
23. Abbot and others 2005.
24. Gillespie 2006.
25. Taylor, Latham, and Woolhouse 2001.
26. United Nations Systemwide Influenza Coordinator and World Bank 2007.
27. Zinsstag and others 2007.
28. World Bank and others 2006.

#### **Chapter 10**

1. Gabre-Madhin and Haggblade 2004.
2. FAO 2006a.
3. Collier 2006; Staatz and Dembele 2007.
4. Limao and Venables 2001.
5. International Institute of Strategic Studies (IISS) 2000.
6. Ndulu 2007.
7. Staatz and Dembele 2007.
8. Hayami and Platteau 1997.
9. Diao and others 2003; Staatz and Dembele 2007.
10. Pender and Nkonya 2007.
11. Staatz and Dembele 2007.
12. Algeria, the Arab Republic of Egypt, the Islamic Republic of Iran, Iraq, Jordan, Lebanon, Libya, Morocco, the Syrian Arab Republic, Tunisia, West Bank and Gaza, and the Republic of Yemen.
13. FAO 2006a.

14. Vyas 2007.
15. Vyas 2007.
16. World Bank 2006m.
17. Eighty percent of the population according to country definitions of urban, but only 56 percent using the OECD definition based on population density (De Ferranti and others 2005).
18. Wilkinson and Rocha 2006.
19. Comisión Económica de las Naciones Unidas para America Latina y el Caribe (CEPAL) 2006; FAO 2004c.
20. Farnworth and Goodman 2007; Henson 2006; Lyon 2006.
21. Ravallion, Chen, and Sangraula 2007.
22. Berdegúe and others 2006b.
23. De Ferranti and others 2004.
24. Martínez Nogueira 2007.
25. Helfand and Levine 2005.
26. Pichon 2007.
27. Inter-American Development Bank 2005.
28. World Bank 2005o.
29. Martínez Nogueira 2007.

### Chapter 11

1. See Binswanger, Deininger, and Feder 1995 for a historical review of the governance challenges arising from land relations.
2. Goldstone and others 2005.
3. Herzog and Wright 2006.
4. Julio Berdegúe, personal communication, 2007.
5. Riikka Rajalahti and Willem Janssen, personal communication, 2007.
6. Sabatier and Jenkins-Smith 1993.
7. Ryan 1999.
8. López and Galinato 2006.
9. C. de Haan, personal communication, 2007.
10. World Bank 2003i.
11. Sharma 2007.
12. Huppert and Wolff 2002; Rinaudo 2002; Wade 1982, Wade 1984.
13. BBC News 2005; Fredriksson and Svensson 2003.
14. Ackerman 2004.
15. Olken 2007.
16. Finan and Ferraz 2005.
17. Work 2002.
18. Bahiigwa, Rigby, and Woodhouse 2005.

19. Brosio 2000.
20. Bahiigwa, Mdoe, and Ellis 2005.
21. Lin, Tao, and Liu 2007.
22. Chattopadhyay and Duflo 2004.
23. Asian Development Bank 2004.
24. Faguet 2004.
25. Hayward 2006.
26. Zyl, Sonn, and Costa 2000.
27. Binswanger forthcoming; Binswanger and Nguyen 2006.
28. Wassenich and Whiteside 2004; World Bank 2005m.
29. OECD 2006a.
30. The percentage would be lower, if disbursement data rather than commitment data are used. However, available disbursement databases are incomplete or are not disaggregated by sector.
31. Blackie and others 2006; Chinsinga 2007; Evans, Cabral, and Vadnjal 2006; Harrigan 2003.
32. See <http://www.donorplatform.org>, <http://www.ruta.org>, and <http://www.neuchatelinitiative.net>.
33. SWAPs aim to subsume all significant funding in a single policy and expenditure program under government leadership and to adopt common approaches across the sector, while relying on government procedures to disburse and account for all funds (Foster, Brown, and Naschold 2000).
34. Mosley and Suleiman 2007.
35. World Bank 2005b.
36. World Bank 2005b.
37. Alex McCalla, personal communication, 2007.
38. Forum on China-Africa Cooperation at <http://www.fmprc.gov.cn/eng/>; People's Republic of China 2006.
39. Raitzer 2003.
40. Louwaars 2007.
41. Oberthür 2002.
42. Lele and Gerrard 2003.
43. World Bank 2004a.
44. Winter-Nelson and Rich 2006.
45. Lele and Gerrard 2003; Raitzer and Kelley forthcoming.
46. Stern 2006.
47. [http://www.g-8.de/nn\\_92452/Content/EN/Artikel/\\_\\_\\_g8-summit/2007-06-07-g8-klimaschutz\\_\\_en.html](http://www.g-8.de/nn_92452/Content/EN/Artikel/___g8-summit/2007-06-07-g8-klimaschutz__en.html).
48. Unnevehr 2004.
49. Stern 2006.