

Sources

Chapter 1: The challenge

1. FAO. 2004. *The ethics of sustainable agricultural intensification*. FAO Ethics Series, No. 3. pp. 3-5. Rome.
2. Kassam, A. & Hodgkin, T. 2009. *Rethinking agriculture: Agrobiodiversity for sustainable production intensification*. Platform for Agrobiodiversity Research (<http://agrobiodiversityplatform.org/climatechange/2009/05/14/rethinking-agriculture-agrobiodiversity-for-sustainable-production-intensification/>).
3. Royal Society. 2009. *Reaping the benefits: Science and the sustainable intensification of global agriculture*. RS Policy document 11/09. London.
4. Hazell, P.B.R. 2008. *An assessment of the impact of agricultural research in South Asia since the green revolution*. Rome, Science Council Secretariat.
5. Gollin, D., Morris, M. & Byerlee, D. 2005. Technology adoption in intensive post-green revolution systems. *Amer. J. Agr. Econ.*, 87(5): 1310-1316.
6. Tilman, D. 1998. The greening of the green revolution. *Nature*, 396: 211-212. DOI: 10.1038/24254
7. World Bank. 2007. *World Development Report 2008*. Washington, DC, International Bank for Reconstruction and Development and World Bank.
8. FAO. 2011. FAOSTAT statistical database (<http://faostat.fao.org/>).
9. FAO. 2009. *The State of Food Insecurity in the World: Economic crises – impacts and lessons learned*. Rome.
10. Bruinsma, J. 2009. *The resource outlook to 2050: By how much do land, water and crop yields need to increase by 2050?* Paper presented at the FAO Expert Meeting on How to Feed the World in 2050, 24–26 June 2009. Rome, FAO.
11. Tilman, D., Cassman, K.G., Matson, P.A., Naylor, R. & Polasky, S. 2002. Agricultural sustainability and intensive production practices. *Nature*, 418: 671–677.
12. FAO. 2010. *The State of Food Insecurity in the World: Addressing food insecurity in protracted crises*. Rome.
13. FAO. 2009. *Food security and agricultural mitigation in developing countries: Options for capturing synergies*. Rome.
14. IFAD. 2010. *Rural Poverty Report 2011. New realities, new challenges: New opportunities for tomorrow's generation*. Rome.
15. United Nations. *World urbanization prospects, the 2009 revision population database* (<http://esa.un.org/wup2009/unup/>).
16. Rosegrant, M.W., Ringler, C. & Msangi, S. 2008. *International model for policy analysis of agricultural commodities and trade (IMPACT): Model description*. Washington, DC, IFPRI.
17. FAO. 2003. *World agriculture: Towards 2015/2030*, by J. Bruinsma, ed. UK, Earthscan Publications Ltd and Rome, FAO.
18. FAO. 2009. *Feeding the world, eradicating hunger*. Background document for World Summit on Food Security, Rome, November 2009. Rome.
19. Nellemann, C., MacDevette, M., Manders, T., Eickhout, B., Svihus, B., Prins, A.G. & Kaltenborn, B.P., eds. 2009. *The environmental food crisis – The environment's role in averting future food crises. A UNEP rapid response assessment*. Norway, United Nations Environment Programme and GRID-Arendal.
20. IPCC. 2001. *Climate Change 2001: Synthesis report. A contribution of working groups I, II, and III to the Third Assessment Report of the Intergovernmental Panel on Climate Change*, by R.T. Watson & the Core Writing Team, eds. UK, Cambridge and New York, NY, USA, Cambridge University Press.
21. IPCC. 2007. *Climate Change 2007: Synthesis Report. An assessment of the intergovernmental panel on climate change*. Geneva, Switzerland.
22. Rosenzweig, C. & Tubiello, F.N. 2006. Adaptation and mitigation strategies in agriculture: An analysis of potential synergies. *Mitigation and adaptation strategies for global change*, 12: 855-873.
23. Jones, P. & Thornton, P. 2008. Croppers to livestock keepers: Livelihood transitions to 2050 in Africa due to climate change. *Environmental Science & Policy*, 12(4): 427-437.
24. Burney, J.A., Davis, S.J. & Lobell, D.B. 2010. Greenhouse gas mitigation by agricultural intensification. *Proc. Natl. Acad. Sci.*, 107(26): 12052-12057.
25. FAO. 2010. *Price volatility in agricultural markets: Evidence, impact on food security and policy responses*. Economic and Social Perspectives Policy Brief No. 12. Rome.
26. Nelson, G.C., Rosegrant, M.W., Palazzo, A., Gray, I., Ingersoll, C., Robertson, R., Tokgoz, S., Zhu, T., Sulser, T.B., Ringler, C., Msangi, S. & You, L. 2010. *Food security, farming, and climate change to 2050: Scenarios, results, policy options*. Washington, DC, IFPRI.
27. FAO. 2006. *World agriculture: Towards 2030/2050. An FAO perspective*. Rome.
28. EC. 2007. *Food security thematic programme: Thematic strategy paper and multiannual indicative programme 2007-2010*. Brussels.

29. Godfray, C., Beddington, J.R., Crute, I.R., Haddad, L., Lawrence, D., Muir, J.F., Pretty, J., Robinson, S., Thomas, S.M. & Toulmin, C. 2010. Food security: The challenge of feeding 9 billion people. *Science*, 327: 812–818.
30. FAO. 2010. *Report of the twenty-second session of the Committee on Agriculture, Rome, 29 November – 3 December 2010*. Rome.
31. FAO. 2010. *Sustainable crop production intensification through an ecosystem approach and an enabling environment: Capturing efficiency through ecosystem services and management*. Rome.
32. Foresight. 2011. *The future of food and farming: Challenges and choices for global sustainability*. Final Project Report. London, the Government Office for Science.
33. IAASTD. 2009. *Agriculture at the crossroads*, by B.D. McIntyre, H.R. Herren, J. Wakhungu & R.T. Watson, eds. Washington, DC.
34. Pretty, J.N., Noble, A.D., Bossio, D., Dixon, J., Hine, R.E., de Vries, F. & Morison, J.I.L. 2006. Resource-conserving agriculture increases yields in developing countries. *Environ. Sci. Technol.*, 40: 1114–1119.
35. Badgley, C., Moghtader, J., Quintero, E., Zakem, E., Chappell, M., Aviles-Vazquez, K., Samulon, A. & Perfecto, I. 2007. Organic agriculture and the global food supply. *Renew. Agric. Food Syst.*, 22: 86–108.
36. Power, A.G. 2010. Ecosystem services and agriculture: Tradeoffs and synergies. *Phil. Trans. R. Soc. B.*, 365(1554): 2959–2971.
37. Warner, K.D. 2006. Extending agroecology: Grower participation in partnerships is key to social learning. *Renewable Food Agric. Syst.*, 21(2): 84–94.
38. Swanson, B.E. & Rajalahti, R. 2010. *Strengthening agricultural extension and advisory systems: Procedures for assessing, transforming, and evaluating extension systems*. Agriculture and Rural Development Discussion Paper 45. Washington, DC, The International Bank for Reconstruction and Development and World Bank.
39. FAO. 2011. *The State of Food and Agriculture: Women in agriculture – Closing the gender gap for development*. Rome.

Chapter 2: Farming systems

1. Doran, J.W. & Zeiss, M.R. 2000. Soil health and sustainability: Managing the biotic component of soil quality. *Applied Soil Ecology*, 15: 3–11.
2. Pretty, J. 2008. Agricultural sustainability: Concepts, principles and evidence. *Phil Trans Royal Society of London*, B 363(1491): 447–466.
3. Kassam, A.H., Friedrich, T., Shaxson, F. & Pretty, J. 2009. The spread of Conservation Agriculture: Justification, sustainability and uptake. *Int. Journal of Agric. Sust.*, 7(4): 292–320.
4. Godfray, C., Beddington, J.R., Crute, I.R., Haddad, L., Lawrence, D., Muir, J.F., Pretty, J., Robinson, S., Thomas, S.M. & Toulmin, C. 2010. Food security: The challenge of feeding 9 billion people. *Science*, 327: 812–818.
5. Pretty, J., Toulmin, C. & Williams, S. 2011. Sustainable intensification in African agriculture. *Int. Journal of Agric. Sust.*, 9.1. (in press)
6. Shaxson, F., Kassam, A., Friedrich, T., Boddey, R. & Adekunle, A. 2008. *Underpinning the benefits conservation agriculture: Sustaining the fundamental of soil health and function*. Main document for the Workshop on Investing in Sustainable Crop Intensification: The case of soil health, 24–27 July. Rome, FAO.
7. Uphoff, N., Ball, A.S., Fernandes, E., Herren, H., Husson, O., Laing, M., Palm, C., Pretty, J., Sanchez, P., Sanginga, N. & Thies, J., eds. 2006. *Biological approaches to sustainable soil systems*. Boca Raton, Florida, USA, CRC Press, Taylor & Francis Group.
8. Montgomery, D. 2007. *Dirt, the erosion of civilizations*. Berkeley and Los Angeles, USA, University California Press.
9. FAO. 2003. *World agriculture: Towards 2015/2030*, by J. Bruinsma, ed. UK, Earthscan Publications Ltd and Rome, FAO.

10. Mrema, G.C. 1996. *Agricultural development and the environment in Sub-Saharan Africa: An engineer's perspective*. Keynote paper presented at the First International Conference of SEASAE, Oct. 2–4, 1996, Arusha, Tanzania.
11. Legg, B.J., Sutton, D.H. & Field, E.M. 1993. *Feeding the world: Can engineering help?* Fourth Erasmus Darwin Memorial Lecture, 17 November 1993, Silsoe.
12. Baig, M.N. & Gamache, P.M. 2009. *The economic, agronomic and environmental impact of no-till on the Canadian prairies*. Canada, Alberta Reduced Tillage Linkages.
13. Lindwall, C.W. & Sonntag, B., eds. 2010. *Landscape transformed: The history of conservation tillage and direct seeding*. Saskatoon, Canada, Knowledge Impact in Society.
14. Friedrich, T. & Kienzle, J. 2007. *Conservation agriculture: Impact on farmers' livelihoods, labour, mechanization and equipment*. Rome, FAO.
15. Giller, K.E., Murmiwa, M.S., Dhlwayo, D.K.C., Mafongoya, P.L. & Mpepereki, S. 2011. Soyabean and sustainable agriculture in Southern Africa. *Int. Journal of Agric. Sust.*, 9(1). (in press)
16. Knuttila, O., Hautala, M., Palojarvi, A. & Alakukku, L. 2010. Instrumentation of automatic measurement and modelling of temperature in zero tilled soil during whole year. In: *Proceedings of the International Conference on Agricultural Engineering AgEng 2010, Towards Environmental Technologies, Clermont Ferrand, France, Sept. 6–8*. France, Cemagref.
17. Owenya, M.Z., Mariki, W.L., Kienzle, J., Friedrich, T. & Kassam, A. 2011. Conservation agriculture (CA) in Tanzania: The case of Mwangaza B CA farmer field school (FFS), Rhotia Village, Karatu District, Arusha. *Int. Journal of Agric. Sust.*, 9.1. (in press)
18. Bruce, S.E., Howden, S.M., Graham, S., Seis, C., Ash, J. & Nicholls, A.O. 2005. Pasture cropping: Effect on biomass, total cover, soil water & nitrogen. *Farming Ahead*.

- 19• Landers, J. 2007. Tropical crop-livestock systems in Conservation Agriculture: The Brazilian experience. *Integrated Crop Management*, 5. Rome, FAO.
- 20• Joshi, P.K., Challa, J. & Virmani, S.M., eds. 2010. *Conservation agriculture: Innovations for improving efficiency, equity and environment*. New Delhi, New Delhi National Academy of Agricultural Sciences.
- 21• IFPRI. 2010. Zero tillage in the rice-wheat systems of the Indo-Gangetic Plains: A review of impacts and sustainability implications, by O. Erenstein. In D.J. Spielman & R. Pandya-Lorch, eds. *Proven successes in agricultural development: A technical compendium to millions fed*. Washington, DC.
- 22• Sims, B., Friedrich, T., Kassam, A.H. & Kienzie, J. 2009. *Agroforestry and conservation agriculture: Complementary practices for sustainable agriculture*. Paper presented at the 2nd World Congress on Agroforestry, Nairobi, August 2009. Rome.
- 23• Kassam, A., Stoop, W. & Uphoff, N. 2011. Review of SRI modifications in rice crop and water management and research issues for making further improvements in agricultural and water productivity. *Paddy and water environment*, 9.
- ### Chapter 3: Soil health
- 1• Hettelingh, J.P., Slootweg, J. & Posch, M., eds. 2008. *Critical load, dynamic modeling and impact assessment in Europe: CCE Status Report 2008*. The Netherlands, Netherlands Environmental Assessment Agency.
- 2• Cassman, K.G., Olk, D.C. & Dobermann, A., eds. 1997. Scientific evidence of yield and productivity declines in irrigated rice systems of tropical Asia. *International Rice Commission Newsletter*, 46. Rome, FAO.
- 3• de Ridder, N., Breman, H., van Keulen, H. & Stomph, T.J. 2004. Revisiting a "cure against land hunger": Soil fertility management and farming systems dynamics in the West Africa Sahel. *Agric. Syst.*, 80(2): 109–131.
- 4• Fermont, A.M., van Asten, P.J.A., Tittonell, P., van Wijk, M.T. & Giller, K.E. 2009. Closing the cassava yield gap: An analysis from smallholder farms in East Africa. *Field Crops Research*, 112: 24–36.
- 5• Howeler, R.H. 2002. Cassava mineral nutrition and fertilization. In R.J. Hillocks, M.J. Thresh & A.C. Bellotti, eds. *Cassava: Biology, production and utilization*, pp. 115–147. Wallingford, UK, CABI Publishing.
- 6• Allen, R.C. 2008. The nitrogen hypothesis and the English agricultural revolution: A biological analysis. *The Journal of Economic History*, 68: 182–210.
- 7• FAO. 2011. FAOSTAT statistical database (<http://faostat.fao.org/>).
- 8• Jenkinson, D.S. Department of Soil Science, Rothamsted Research. Interview with BBC World. 6 November 2010.
- 9• Miao, Y., Stewart, B.A. & Zhang, F.S. 2011. Long-term experiments for sustainable nutrient management in China. A review. *Agron. Sustain. Dev.* (in press)
- 10• Bot, A. & Benites, J. 2005. *The importance of soil organic matter: Key to drought-resistant soil and sustained food and production*. FAO Soil Bulletin No. 80. Rome.
- 11• Dudal, R. & Roy, R.N. 1995. *Integrated plant nutrition systems*. FAO Fertilizer and Plant Nutrition Bulletin No. 12. Rome.
- 12• Roy, R.N., Finck, A., Blair, G.J. & Tandon, H.L.S. 2006. *Plant nutrition for food security. A guide for integrated nutrient management*. FAO Fertilizer and Plant Nutrition Bulletin 16. Rome.
- 13• Karlen, D.L., Mausbach, M.J., Doran, J.W., Cline, R.G., Harris, R.F. & Schuman, G.E. 1997. Soil quality: A concept, definition and framework for evaluation. *Soil Sci. Soc. Am. J.*, 61: 4–10.
- 14• USDA-NRCS. 2010. *Soil quality - Improving how your soil works* (<http://soils.usda.gov/sqi/>).
- 15• EU-JRC. 2006. *Bio-Bio project: Biodiversity-Bioindication to evaluate soil health*, by R.M. Cenci & F. Sena, eds. Institute for Environment and Sustainability. EUR, 22245.
- 16• Kinyangi, J. 2007. *Soil health and soil quality: A review*. Ithaca, USA, Cornell University. (mimeo)
- 17• Vanlauwe, B., Bationo, A., Chianu, J., Giller, K.E., Merckx, R., Mokwunye, U., Ohiokepehai, O., Pypers, P., Tabo, R., Shepherd, K.D., Smaling, E.M.A., Woomer, P.L. & Sanginga, N. 2010. Integrated soil fertility management - Operational definition and consequences for implementation and dissemination. *Outlook on Agriculture*, 39:17–24.
- 18• Bationo, A. 2009. Soil fertility – Paradigm shift through collective action. *Knowledge for development – Observatory on science and technology* (<http://knowledge.cta.int/en/Dossiers/Demanding-Innovation/Soil-health/Articles/Soil-Fertility-Paradigm-shift-through-collective-action>).
- 19• IFDC. 2011. *Integrated soil fertility management* (www.ifdc.org/getdoc/1644daf2-5b36-4191-9a88-ca8a4aab93cb/ISFM).
- 20• Rodale Institute. *Soils* (<http://rodaleinstitute.org/course/M2/1>).
- 21• FAO. 2008. An international technical workshop Investing in sustainable crop intensification: The case for improving soil health, FAO, Rome: 22–24 July 2008. *Integrated Crop Management*, 6(2008). Rome.
- 22• Weber, G. 1996. Legume-based technologies for African savannas: Challenges for research and development. *Biological Agriculture and Horticulture*, 13: 309–333.
- 23• Chabi-Olaye, A., Nolte, C., Schulthess, F. & Borgemeister, C. 2006. Relationships of soil fertility and stem borers damage to yield in maize-based cropping system in Cameroon. *Ann. Soc. Entomol. (N.S.)*, 42 (3–4): 471–479.
- 24• Giller, K.E., Beare, M.H., Lavelle, P., Izac, A. & Swift, M.J. 1997. Agricultural intensification, soil biodiversity and agroecosystem function. *Applied Soil Ecology*, 6: 3–16.

25. Sanchez, P.A., Shepherd, K.D., Soule, M.J., Place, F.M., Buresh, R.J., Izac, A.-M.N., Mokwunye, A.U., Kwasiga, F.R., Ndiritu, C.G. & Woome, P.L. 1997. Soil fertility replenishment in Africa: An investment. In R.J. Buresh, P.A. Sanchez & F. Calhoun, eds. *Replenishing soil fertility in Africa: Proceedings of an international symposium, 6 November 1996*, pp. 1-46. Madison and Indianapolis, USA, Soil Science Society of America Inc.
26. Sanginga, N. & Woome, P.L. 2009. *Integrated soil fertility management in Africa: Principles, practices, and developmental processes*. Nairobi, TSBF-CIAT.
27. Sanginga, N., Dashiell, K.E., Diels, J., Vanlauwe, B., Lyasse, O., Carsky, R.J., Tarawali, S., Asafa-Adjei, B., Menkir, A., Schulz, S., Singh, B.B., Chikoye, D., Keatinge, D. & Ortiz, R. 2003. Sustainable resource management coupled to resilient germplasm to provide new intensive cereal-grain-legume-livestock systems in the dry savanna. *Agriculture, Ecosystems and Environment*, 100: 305-314.
28. Sanchez, P.A. 2000. Linking climate change research with food security and poverty reduction in the tropics. *Agriculture, Ecosystems and Environment*, 82: 371-383.
29. Garrity, D.P., Akinnifesi, F.K., Ajayi, O.C., Weldesemayat, S.G., Mowo, J.G., Kalinganire, A., Larwanou, M. & Bayala, J. 2010. Evergreen agriculture: A robust approach to sustainable food security in Africa. *Food Security*, 2: 197-214.
30. Dobermann, A. 2000. Future intensification of irrigated rice systems. In J.E. Sheehy, P.L. Mitchel, & B. Hardy, eds. *Re-designing rice photosynthesis to increase yield*, pp. 229-247. Makati City, Philippines and Amsterdam, IRRI / Elsevier.
31. Byrnes, B.H., Vlek, P.L.C. & Craswell, E.T. 1979. The promise and problems of super granules for rice fertilization. In S. Ahmed, H.P.M. Gunasena & Y.H. Yang, eds. *Proceedings: Final inputs review meeting, Honolulu, Hawaii, 20-24 August 1979*. Hawaii, East-West Center.
32. Craswell, E.T., De Datta, S.K., Obcemea, W.N. & Hartantyo, M. 1981. Time and mode of nitrogen fertilizer application. *Fertilizer Research*, 2: 247-259.
33. Rong-Ye, C. & Zhu Zhao Liang. 1982. Characteristics of the fate and efficiency of nitrogen in supergranules of urea. *Fertilizer Research*, 3: 63-71.
34. Roy, R.N. & Misra, R.V. 2003. Economic and environmental impact of improved nitrogen management in Asian rice. In FAO. *Sustainable rice production for food security. Proceedings of the 20th Session of the International Rice Commission. Bangkok, 23-26 July 2002*. Rome.
35. Thomas, J. & Prasad, R. 1982. On the nature of mechanism responsible for the higher efficiency for urea super granules for rice. *Plant and Soil*, 69: 127-130.
36. Visocky, M. 2010. Fertilizer system revolutionizes rice farming in Bangladesh. *Frontlines*, 12(2010).
37. Peng, S., Buresh, R.J., Huang, J., Zhong, X., Zou, Y., Yang, J., Wang, G., Liu, Y., Hu, R., Tang, Q., Cui, K., Zhang, F.S. & Dobermann, A. 2010. Improving nitrogen fertilization in rice by site-specific N management. A review. *Agron. Sustain. Dev.*, 30(2010): 649-656.
38. Sachs, J., Remans, R., Smukler, S., Winowiecki, L., Sandy, J., Andelman, S.J., Cassman, K.G., Castle, L.D., DeFries, R., Denning, G., Fanzo, J., Jackson, L.E., Leemans, R., Lehmann, J., Milder, J.C., Naeem, S., Nziguheba, G., Palm, C.A., Pingali, P.L., Reganold, J.P., Richter, D.D., Scherr, S.J., Sircely, J., Sullivan, C., Tomich, T.P. & Sanchez, P.A. 2010. Monitoring the world's agriculture. *Nature*, 466: 558-560.
39. Steiner, K., Herweg, K. & Dumanski, J. 2000. Practical and cost-effective indicators and procedures for monitoring the impacts of rural development projects on land quality and sustainable land management. *Agriculture, Ecosystems and Environment*, 81: 147-154.
40. FAO. 2010. *Climate-smart agriculture: Policies, practices and financing for food security, adaptation and mitigation*. Rome.
41. Dumanski, J. & Pieri, C. 2000. Land quality indicators: Research plan. *Agriculture, Ecosystems & Environment*, 81: 93-102.
42. Mutsaers, H.J.W. 2007. *Peasants, farmers and scientists*. New York, USA, Springer Verlag.

Chapter 4: Crops and varieties

1. Fowler, C. & Hodgkin, T. 2004. Plant genetic resources for food and agriculture: Assessing global availability. *Annu. Rev. Environ. Resour.*, 29: 143-79.
2. FAO. 2010. *The Second Report on the State of the World's Plant Genetic Resources for Food and Agriculture*. Rome.
3. Alexandrova, N. & Atanassov, A. 2010. *Agricultural biotechnologies in developing countries: Options and opportunities in crops, forestry, livestock, fisheries and agro-industry to face the challenges of food insecurity and climate change (ABDC-10)*. Issue paper for the Regional session for Europe and Central Asia – Agricultural biotechnologies in Europe and Central Asia: New challenges and opportunities in a view of recent crises and climate change, Guadalajara, Mexico, 1-4 March 2010.
4. FAO. 2009. *Declaration of the World Summit on Food Security, 16-18 November 2009*. Rome.
5. FAO. 2009. *International Treaty on Plant Genetic Resources for Food and Agriculture: A global treaty for food security and sustainable agriculture*. Rome.
6. CBD. 2006. *Global Biodiversity Outlook 2*. Montreal, Canada.
7. Moore, G. & Tymowski, W. 2005. *Explanatory guide to the International Treaty for Plant Genetic Resources for Food and Agriculture*. Gland, Switzerland, Cambridge, UK and Bonn, Germany, IUCN.

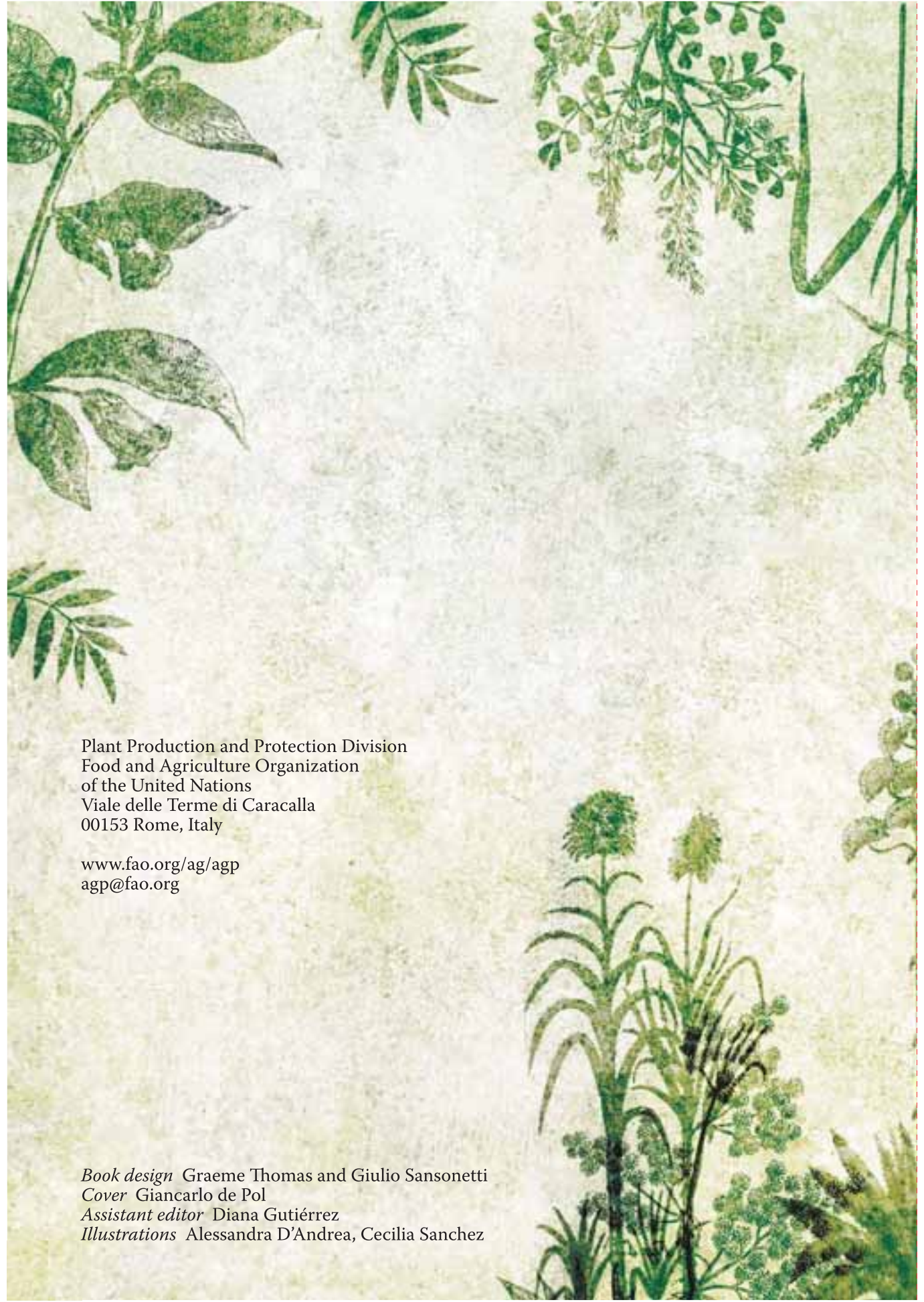
8. Jarvis, D., Hodgkin, T., Bhuwon, S., Fadda, C. & Lopez Noriega, I. 2011. *A heuristic framework for identifying multiple ways of supporting the conservation and use of traditional crop varieties within the agricultural production systems. Critical reviews in plant sciences.* (in press)
9. Hunter, D. & Heywood, V., eds. 2011. *Crop wild relatives. A manual of in situ conservation.* London, Bioversity International, Earthscan.
10. Street, K., Mackay, M., Zeuv, E., Kaul, N., El Bouhssine, M., Konopka, J. & Mitrofanova, O. 2008. *Swimming in the gene pool – A rational approach to exploiting large genetic resource collections. Proceedings 11th International Wheat Genetics Symposium, Brisbane.* Sydney, Sydney University Press.
11. Ceccarelli, S., Grando, S., Shevstov, V., Vivar, H., Yayaoui, A., El-Bhoussini, M. & Baum, M. 2001. *The ICARDA strategy for global barley improvement.* Aleppo, Syria, ICARDA.
12. Lipper, L., Anderson, C.L. & Dalton, T.J., eds. 2010. *Seed trade in rural markets: Implications for crop diversity and agricultural development.* Rome, FAO and London, Earthscan.
- Chapter 5: Water management**
1. IIASA/FAO. 2010. *Global agro-ecological zones (GAEZ v3.0).* Laxenburg, Austria, IIASA and Rome, FAO.
2. French, R.J. & Schultz, J.E. 1984. Water use efficiency of wheat in a Mediterranean type environment. I: The relation between yield, water use and climate. *Australian Journal of Agricultural Research*, 35(6): 743–764.
3. Sadras, V.O. & Angus, J.F. 2006. Benchmarking water use efficiency of rainfed wheat in dry environments. *Australian Journal of Agricultural Research*, 57: 847–856.
4. UNDP. 2006. *Human Development Report 2006.* New York, USA.
5. Wani, S.P., Rockstrom, J. & Oweis, T., eds. 2009. Rainfed agriculture: Unlocking the potential. *Comprehensive Assessment of Water Management in Agriculture* 7. Wallingford, UK, CABI Publishing.
6. FAO. 2011. AQUASTAT statistical database (www.fao.org/nr/water/aquastat/main/index.stm).
7. Perry, C., Steduto, P., Allen, R. & Burt, C. 2009. Increasing productivity in irrigated agriculture: Agronomic constraints and hydrological realities. *Agricultural Water Management*, 96(2009): 1517–1524.
8. Batchelor, C., Singh, A., Rama Rao, M.S. & Butterworth, J. 2005. *Mitigating the potential unintended impacts of water harvesting.* UK, Department for International Development.
9. Liniger, H.P., Mekdaschi Studer, R., Hauert, C. & Gurtner, M. 2011. *Sustainable land management in practice – Guidelines and best practices for Sub-Saharan Africa.* Rome, TerrAfrica, WOCAT and FAO.
10. FAO. 2002. *Deficit irrigation practices.* Water reports No. 32, 51: 87–92.
11. Oweis, T., Hachum, A. & Kijne, J. 1999. *Water harvesting and supplemental irrigation for improved water use efficiency in dry areas.* SWIM Paper 7. Colombo, Sri Lanka, ICARDA/IMWI.
12. ICARDA. 2010. *ICARDA Annual Report 2009.* Aleppo, Syria.
13. FAO. 2010. *Mapping systems and service for multiple uses in Fenhe irrigation district, Shanxi Province, China.* Rome.
- Chapter 6: Plant protection**
1. Rana, S. 2010. *Global agrochemical market back in growth mode in 2010.* Agrow (www.agrow.com).
2. Lewis, W.J., van Lenteren, J.C., Phatak, S.C. & Tumlinson, J.H. 1997. A total system approach to sustainable pest management. *Proc. Natl. Acad. Sci.*, 94(1997): 12243–12248.
3. Wood, B.J. 2002. Pest control in Malaysia's perennial crops: A half century perspective tracking the pathway to integrated pest management. *Integrated Pest Management Reviews*, 7: 173–190.
4. Pimentel, D. & Levitan, L. 1986. Pesticides: Amounts applied and amounts reaching pests. *BioScience*, 36(2): 86–91.
5. Stern, V.M., Smith, R.F., van den Bosch, R. & Hagen, K.S. 1959. The integrated control concept. *Hilgardia*, 29: 81–101.
6. FAO. 1966. *Proceedings of the FAO Symposium on Integrated Pest Control, Rome, 1965.* Rome, FAO.
7. Smith, R.F. & Doutt, R.L. 1971. The pesticide syndrome—diagnosis and suggested prophylaxis. In C.B. Huffaker, ed. *Biological Control. AAAS Symposium Proceedings on Biological Control, Boston, December 1969*, pp. 331–345. New York, Plenum Press.
8. IAASTD. 2009. *Agriculture at the crossroads*, by B.D. McIntyre, H.R. Herren, J. Wakhungu & R.T. Watson, eds. Washington, DC.
9. Way, M.J. & Heong, K.L. 1994. The role of biodiversity in the dynamics and management of insect pests of tropical irrigated rice: A review. *Bulletin of Entomological Research*, 84: 567–587.
10. Gallagher, K., Ooi, P., Mew T., Borromeo, E., Kenmore, P.E. & Ketelaar, J. 2005. Ecological basis for low-toxicity: Integrated pest management (IPM) in rice and vegetables. In J. Pretty, ed. *The Pesticide Detox*, pp. 116–134. London, Earthscan.
11. Catindig, J.L.A., Arida, G.S., Baehaki, S.E., Bentur, J.S., Cuong, L.Q., Norowi, M., Rattanakarn, W., Sriratanasak, W., Xia, J. & Lu, Z. 2009. In K.L. Heong & B. Hardy, eds. *Planthoppers: New threats to the sustainability of intensive rice production systems in Asia*, pp.191–220, 221–231. Los Baños, Philippines, IRRI.
12. Neuenschwander, P. 2001. Biological control of the cassava mealybug in Africa: A review. *Biological Control*, 21(3): 214–229.
13. Bellotti, A.C., Braun, A.R., Arias, B., Castillo, J.A. & Guerrero, J.M. 1994. Origin and management of neotropical cassava arthropod pests. *African Crop Science Journal*, 2(4): 407–417.

14. Luttrell, R.G., Fitt, G.P., Ramalho, F.S. & Sugonyaev, E.S. 1994. Cotton pest management: Part 1. A worldwide perspective. *Annual Review of Entomology*, 39: 517-526.
15. Bove, J.M. 2006. Huanglongbing: A destructive, newly-emerging, century-old disease of citrus. *Journal of Plant Pathology*, 88(1): 7-37.
16. Gottwald, T.R. 2010. Current epidemiological understanding of Citrus Huanglongbing. *Annual Review of Phytopathology*, 48: 119-139.
17. Gilbertson, R.L. 2006. *Integrated pest management of tomato virus diseases in West Africa* (www.intpdn.org/files/IPM_Tomato_Bob_Gilbertson_UC_Davis.pdf).
18. Guillon, M. 2004. *Current world situation on acceptance and marketing of biological control agents (BCAS)*. Pau, France, International Biocontrol Manufacturer's Association.
- Chapter 7: Policies and institutions**
1. Pingali, P. & Raney, T. 2005. *From the green revolution to the gene revolution: How will the poor fare?* ESA Working Paper No. 05-09. Rome, FAO.
2. Pingali, P. & Traxler, G. 2002. *Changing locus of agricultural research: Will the poor benefit from biotechnology and privatization trends*. Food Policy, 27: 223-238.
3. Beintema, N.M. & Stads, G.J. 2010. *Public agricultural R&D investments and capacities in developing countries: Recent evidence for 2000 and beyond*. Note prepared for GCARD 2010.
4. Crawford, E., Kelley, V., Jayne, T. & Howard, J. 2003. *Input use and market development in Sub-Saharan Africa: An overview*. Food Policy, 28(4): 277-292.
5. World Bank. 2007. *World Development Report 2008*. Washington, DC, International Bank for Reconstruction and Development and World Bank.
6. De Schutter, O. 2010. *Addressing concentration in food supply chains: The role of competition law in tackling the abuse of buyer power*. UN Special Rapporteur on the right to food, Briefing note 03. New York, USA.
7. Humphrey, J. & Memedovic, O. 2006. *Global value chains in the agrifood sector*. Vienna, UNIDO.
8. IAASTD. 2009. *Agriculture at the crossroads*, by B.D. McIntyre, H.R. Herren, J. Wakhungu & R.T. Watson, eds. Washington, DC.
9. Alexandratos, N. 2010. *Expert meeting on "Feeding the World in 2050". Critical evaluation of selected projections*. Rome, FAO. (mimeo)
10. IFPRI. 2010. *Proven successes in agricultural development: A technical compendium to Millions Fed*, by D.J. Spielman & R. Pandya-Lorch, eds. Washington, DC.
11. Fischer, R.A., Byerlee, D. & Edmeades, G.O. 2009. *Can technology deliver on the yield challenge to 2050?* Paper presented at the FAO Expert Meeting: How to Feed the World in 2050, 24-26 June 2009. Rome, FAO.
12. FAO. 2010. *Climate smart agriculture: Policies, practices and financing for food security, adaptation and mitigation*. Rome.
13. FAO. 2009. *Food security and agricultural mitigation in developing countries: Options for capturing synergies*. Rome.
14. Hazell, P. & Fan, S. 2003. *Agricultural growth, poverty reduction and agro-ecological zones in India: An ecological fallacy?* Food Policy, 28(5-6): 433-436.
15. CBD. 2010. *Perverse incentives and their removal or mitigation* (www.cbd.int/incentives/perverse.shtml).
16. UNEP/IISD. 2000. *Environment and trade: A handbook*. Canada, IISD.
17. OECD. 2003. *Perverse incentives in biodiversity loss*. Paper prepared for the Ninth Meeting of the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA 9). Paris.
18. Rhodes, D. & Novis, J. 2002. *The impact of incentives on the development of plantation forest resources in New Zealand*. Information Paper No. 45. New Zealand Ministry of Agriculture and Forestry.
19. DNR. 2008. *Environmental harmful subsidies - A threat to biodiversity*. Munich, Germany.
20. FAO. 2010. *Price volatility in agricultural markets: Evidence, impact on food security and policy responses*. Economic and Social Perspectives Policy Brief No. 12. Rome.
21. FAO. 2009. *Feeding the world, eradicating hunger*. Background document for World Summit on Food Security, Rome, November 2009. Rome.
22. Ceccarelli, S. 1989. Wide adaptation. How wide? *Euphytica*, 40: 197-205.
23. Lipper, L., Anderson, C.L. & Dalton, T.J. 2009. *Seed trade in rural markets: Implications for crop diversity and agricultural development*. Rome, FAO and London, Earthscan.
24. TEEB. 2010. *The economics of ecosystems and biodiversity: Mainstreaming the economics of nature: A synthesis of the approach, conclusions and recommendations of TEEB*. Malta, Progress Press.
25. Wunder, S., Engel, S.Y. & Pagiola, S. 2008. Payments for environmental services in developing and developed countries. *Ecological economics*, 65(4): 663-852.
26. FAO. 2007. *The State of Food and Agriculture 2007: Paying farmers for environmental services*. Rome.
27. FAO. 2010. *The State of Food Insecurity in the World: Addressing food insecurity in protracted crises*. Rome.
28. GNHC. 2009. *10th five year plan 2008-2013*. Main document, vol. I. Royal Government of Bhutan.
29. Wilkes, A., Tan, J. & Mandula. 2010. The myth of community and sustainable grassland management in China. *Frontiers of Earth Science in China*, 4(1): 59-66.
30. Lipper, L. & Neves, B. 2011. Pagos por servicios ambientales: ¿qué papel ocupan en el desarrollo agrícola sostenible? *Revista Española de Estudios Agrosociales y Pesqueros*, 228(7-8): 55-86.
31. Donnelly, T. 2010. *A literature review on the relationship between property rights and investment incentives*. Rome, FAO. (mimeo)

32. Fitzpatrick, D. 2005. Best practice: Options for the legal recognition of customary tenure. *Development and Change*, 36(3): 449–475. DOI: 10.1111/j.0012-155X.2005.00419.x
33. FAO. 2010. *The Second Report on the State of the World's Plant Genetic Resources for Food and Agriculture*. Rome.
34. Piesse, J. & Thirtle, C. 2010. Agricultural R&D, technology and productivity. *Phil. Trans. R. Soc. B.*, 365(1554): 3035–3047.
35. Pardey, P.G., Beintema, N., Dehmer, S. & Wood, S. 2006. *Agricultural research: A growing global divide?* IFPRI Food Policy Report. Washington, DC, IFPRI.
36. United Nations. 2009. *Promotion and protection of human rights: Human rights questions, including alternative approaches for improving the effective enjoyment of human rights and fundamental freedoms* (UN GA Doc A/64/170). New York, USA.
37. Wright, B.D., Pardey, P.G., Nottenberg, C. & Koo, B. 2007. Agricultural innovation: Investments and incentives. In R.E. Evenson & P. Pingali, eds. *Handbook of agricultural economics*, vol. 3. Amsterdam, Elsevier Science.
38. Helfer, L.H. 2004. *Intellectual property rights in plant varieties*. Rome, FAO.
39. GAT. 2010. *Transforming agricultural research for development*. Paper commissioned by the Global Forum on International Agricultural Research (GFAR) as an input into the Global Conference on Agricultural Research for Development (GCARD), Montpellier, 28–31 March 2010.
40. Hazell, P., Poulton, C., Wiggins, S. & Dorward, A. 2007. *The future of small farms for poverty reduction and growth*. 2020 Discussion Paper No. 42. Washington, DC, International Food Policy Research Institute.
41. IFAD. 2010. *Rural Poverty Report 2011. New realities, new challenges: New opportunities for tomorrow's generation*. Rome.
42. Scoones, I. & Thompson, J. 2009. *Farmer first revisited: Innovation for agricultural research and development*. Oxford, ITDG Publishing.
43. Shepherd, A.W. 2000. *Understanding and using market information*. Marketing Extension Guide, No. 2. Rome, FAO.
44. IFAD/WFP. 2010. *The potential for scale and sustainability in weather index insurance for agriculture and rural livelihoods*, by P. Hazell, J. Anderson, N. Balzer, A. Hastrup Clemmensen, U. Hess & F. Rispoli. Rome.
45. Devereux, S. 2002. Can social safety nets reduce chronic poverty? *Development Policy Review*, 20(5): 657–675.
46. Ravallion, M. 2009. *Do poorer countries have less capacity for redistribution?* Policy Research Working Paper No. 5046. Washington, DC, World Bank.
47. FAO. 2006. *The right to food guidelines: Information papers and case studies*. Rome.
48. Shepherd, A.W. 2007. *Approaches to linking producers to markets*. Agricultural Management, Marketing and Finance Occasional Paper, No. 13. Rome, FAO.
49. Winters, P., Simmons, P. & Patrick, I. 2005. Evaluation of a hybrid seed contract between smallholders and a multinational company in East Java, Indonesia. *The Journal of Development Studies*, 41(1): 62–89.
50. Little, P.D. & Watts, M.J., eds. 1994. *Living under contract: Contract farming and agrarian transformation in Sub-Saharan Africa*. Madison, USA, University of Wisconsin Press.
51. Berdegue, J., Balsevich, F., Flores, L. & Reardon, T. 2003. *Supermarkets and private standards for produce quality and safety in Central America: Development implications*. Report to USAID under the RAISE/SPS project, Michigan State University and RIMISP.
52. Reardon, T., Timmer, C.P., Barrett, C.B. & Berdegue, J. 2003. The rise of supermarkets in Africa, Asia, and Latin America. *American Journal of Agricultural Economics*, 85(5): 1140–1146.
53. Johnson, N. & Berdegue, J.A. 2004. *Collective action and property rights for sustainable development: Property rights, collective action, and agribusiness*. IFPRI Policy Brief, 2004. Washington, DC.
54. Cavatassi, R., Gonzalez, M., Winters, P.C., Andrade-Piedra, J., Thiele, G. & Espinosa, P. 2010. *Linking smallholders to the new agricultural economy: The case of the Plataformas de Concertación in Ecuador*. ESA Working Paper, No. 09-06. Rome, FAO.
55. McCullough, E.B., Pingali, P.L. & Stamoulis, K.G., eds. 2008. *The transformation of agri-food systems: Globalization, supply chains and smallholder farmers*. Rome, FAO and London, Earthscan.
56. Singh, S. 2002. Multi-national corporations and agricultural development: A study of contract farming in the Indian Punjab. *Journal of International Development*, 14: 181–194.
57. Dietrich, M. 1994. *Transaction cost economics and beyond: Towards a new economics of the firm*. London, Routledge.

Abbreviations

CA conservation agriculture	ITPGRFA International Treaty on Plant Genetic Resources for Food and Agriculture
CBD Convention on Biological Diversity	N nitrogen
CGIAR Consultative Group on International Agricultural Research	N₂O nitrous oxide
DNR Deutscher Naturschutzring	NGOs non-governmental organizations
EC European Commission	OECD Organisation for Economic Co-operation and Development
EU-JRC European Commission - Joint Research Centre	P phosphorus
FAO Food and Agriculture Organization of the United Nations	PES payments for environmental services
FFS farmer field school	PGR plant genetic resources
GAT Global Authors' Team	PGRFA plant genetic resources for food and agriculture
GNHC Gross National Happiness Commission	RDI regulated deficit irrigation
ha hectares	R&D research and development
HLB Huanglongbing disease	SCPI sustainable crop production intensification
IAASTD International Assessment of Agricultural Knowledge, Science and Technology for Development	SI supplemental irrigation
ICARDA International Centre for Agricultural Research in the Dry Areas	SMS short message service
ICRAF World Agroforestry Centre	SSNM site-specific nutrient management
IFAD International Fund for Agricultural Development	t tonnes
IFDC International Fertilizer Development Center	TEEB The Economics of Ecosystems and Biodiversity
IFPRI International Food Policy Research Institute	UDP urea deep placement
IIASA International Institute for Applied Systems Analysis	UN United Nations
IISD International Institute for Sustainable Development	UNDP United Nations Development Programme
IITA International Institute of Tropical Agriculture	UNEP United Nations Environment Programme
IPCC Intergovernmental Panel on Climate Change	UNFCCC United Nations Framework Convention on Climate Change
IPM integrated pest management	UPOV International Union for the Protection of New Varieties of Plants
IPR intellectual property right	USDA-NRCS United States Department of Agriculture - Natural Resources Conservation Service
IRRI International Rice Research Institute	USG urea super granules
	WFP World Food Programme
	WTO World Trade Organization



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