

AGRICULTURE AND RURAL DEVELOPMENT



Rising Global Interest in Farmland

CAN IT YIELD SUSTAINABLE AND EQUITABLE BENEFITS?

Klaus Deininger and Derek Byerlee
with Jonathan Lindsay, Andrew Norton,
Harris Selod, and Mercedes Stickler



THE WORLD BANK

RISING
GLOBAL INTEREST
IN FARMLAND

AGRICULTURE AND RURAL DEVELOPMENT

Seventy-five percent of the world's poor live in rural areas, and most are involved in agriculture. In the 21st century, agriculture remains fundamental to economic growth, poverty alleviation, and environmental sustainability. The World Bank's Agriculture and Rural Development publication series presents recent analyses of issues that affect the role of agriculture, including livestock, fisheries, and forestry, as a source of economic development, rural livelihoods, and environmental services. The series is intended for practical application, and we hope that it will serve to inform public discussion, policy formulation, and development planning.

Titles in this series:

Agribusiness and Innovation Systems in Africa

Agricultural Land Redistribution: Toward Greater Consensus

Agriculture Investment Sourcebook

Bioenergy Development: Issues and Impacts for Poverty and Natural Resource Management

Building Competitiveness in Africa's Agriculture: A Guide to Value Chain Concepts and Applications

Changing the Face of the Waters: The Promise and Challenge of Sustainable Aquaculture

Enhancing Agricultural Innovation: How to Go Beyond the Strengthening of Research Systems

Forests Sourcebook: Practical Guidance for Sustaining Forests in Development Cooperation

Gender and Governance in Rural Services: Insights from India, Ghana, and Ethiopia

Gender in Agriculture Sourcebook

Organization and Performance of Cotton Sectors in Africa: Learning from Reform Experience

Reforming Agricultural Trade for Developing Countries, Volume 1: Key Issues for a Pro-Development Outcome of the Doha Round

Reforming Agricultural Trade for Developing Countries, Volume 2: Quantifying the Impact of Multilateral Trade Reform

Rising Global Interest in Farmland: Can It Yield Sustainable and Equitable Benefits?

Shaping the Future of Water for Agriculture: A Sourcebook for Investment in Agricultural Water Management

The Sunken Billions: The Economic Justification for Fisheries Reform

Sustainable Land Management: Challenges, Opportunities, and Trade-Offs

Sustainable Land Management Sourcebook

Sustaining Forests: A Development Strategy

RISING GLOBAL INTEREST IN FARMLAND

Can It Yield Sustainable and Equitable Benefits?

Klaus Deininger and Derek Byerlee
with Jonathan Lindsay, Andrew Norton,
Harris Selod, and Mercedes Stickler



THE WORLD BANK
Washington, D.C.

© 2011 The International Bank for Reconstruction and Development/The World Bank
1818 H Street NW
Washington DC 20433
Telephone: 202-473-1000
Internet: www.worldbank.org

All rights reserved

1 2 3 4 13 13 12 11

This volume is a product of the staff of the International Bank for Reconstruction and Development/The World Bank. The findings, interpretations, and conclusions expressed in this volume do not necessarily reflect the views of the Executive Directors of The World Bank or the governments they represent.

The World Bank does not guarantee the accuracy of the data included in this work. The boundaries, colors, denominations, and other information shown on any map in this work do not imply any judgement on the part of The World Bank concerning the legal status of any territory or the endorsement or acceptance of such boundaries.

Rights and Permissions

The material in this publication is copyrighted. Copying and/or transmitting portions or all of this work without permission may be a violation of applicable law. The International Bank for Reconstruction and Development / The World Bank encourages dissemination of its work and will normally grant permission to reproduce portions of the work promptly.

For permission to photocopy or reprint any part of this work, please send a request with complete information to the Copyright Clearance Center Inc., 222 Rosewood Drive, Danvers, MA 01923, USA; telephone: 978-750-8400; fax: 978-750-4470; Internet: www.copyright.com.

All other queries on rights and licenses, including subsidiary rights, should be addressed to the Office of the Publisher, The World Bank, 1818 H Street NW, Washington, DC 20433, USA; fax: 202-522-2422; e-mail: pubrights@worldbank.org.

ISBN: 978-0-8213-8591-3

eISBN: 978-0-8213-8592-0

DOI: 10.1596/978-0-8213-8591-3

Library of Congress Cataloging-in-Publication Data

Deininger, Klaus W., 1962-

Rising global interest in farmland : can it yield sustainable and equitable benefits? / Klaus Deininger and Derek Byerlee.

p. cm. — (Agriculture and rural development)

Includes bibliographical references and index.

ISBN 978-0-8213-8591-3 — ISBN 978-0-8213-8592-0 (electronic)

1. Land use. 2. Land tenure—Government policy. 3. Right of property. I. Byerlee, Derek. II. World Bank. III. Title.

HD111.D36 2011

333.76—dc22

2010044273

Cover photo: Klaus Deininger

Cover design: Critical Stages

CONTENTS

Preface	xiii
About the Authors	xvii
Acknowledgments	xxi
Abbreviations	xxiii
Overview	xxv
Introduction	I
Notes	7
References	7
I. Land Expansion: Drivers, Underlying Factors, and Key Effects	9
Past and Likely Future Patterns of Commodity Demand and Land Expansion	10
Future Demand for Agricultural Commodities and Land	13
Lessons from Past Processes of Land Expansion: Regional Perspectives	16
Factors Affecting the Organization of Agricultural Production	28
Can Large-Scale Investment Create Benefits for Local Populations?	34
Conclusion	41
Notes	43
References	44
2. Is the Recent “Land Rush” Different?	49
Evidence from Media Reports	50

Evidence from Country Inventories	56
Evidence from Project Case Studies	64
Conclusion	70
Notes	72
References	73

3. The Scope for and Desirability of Land Expansion 75

Methodology and Potential Availability of Land for Rainfed Crop Production	77
Adopting a Commodity Perspective	83
Toward a Country Typology	86
Conclusion	92
Notes	93
References	94

4. The Policy, Legal, and Institutional Framework 95

Respect for Existing Property Rights to Land and Associated Natural Resources	98
Voluntary and Welfare-Enhancing Nature of Land Transfers	104
Economic Viability and Food Security	109
Impartial, Open, and Cost-Effective Mechanisms to Implement Investments	114
Environmental and Social Sustainability	119
Conclusion	125
Notes	126
References	127

5. Moving from Challenge to Opportunity 129

Key Areas for Action by Governments	130
Investors	133
Civil Society	137
International Organizations	138
Conclusion: The Need for an Evidence-Based Multistakeholder Approach	141
Notes	143
References	144

Appendix I: Methodology of and Issues Encountered in Collecting Inventory Data 145

Cambodia	145
Democratic Republic of Congo	146
Ethiopia	146
Indonesia	147
Liberia	147

Lao People's Democratic Republic	148
Mozambique	148
Nigeria	149
Pakistan	149
Paraguay	150
Peru	150
Sudan	151
Ukraine	151
Zambia	152
Notes	152
References	153

Appendix 2: Tables	155
---------------------------	------------

Appendix 3: Figures	181
----------------------------	------------

Appendix 4: Maps	187
-------------------------	------------

Contributors	195
---------------------	------------

Index	199
--------------	------------

BOXES, FIGURES, AND TABLES

Boxes

1	Principles for Responsible Agro-Investment	xxvii
2	Using Auctions to Transfer Public Land in Peru's Coastal Region	xxix
1.1	Who Demands Land?	2
1.1	Are Crop Yields Stagnating?	14
1.2	Competitive Land Markets in Latin America	33
1.3	Can Smallholders and Large Farms Coexist?	35
1.4	Options for Engaging Small Farmers	36
1.5	What Is the Right Price for Land?	37
2.1	Management of Land Concessions in the Lao People's Democratic Republic	60
3.1	Assessing and Valuing Indirect Impacts of Land Cover Change	82
4.1	Implementation of the Policy, Legal, and Institutional Framework Assessment in Peru	97
4.2	Using Auctions to Transfer Public Land	111
5.1	The Extractive Industries Transparency Initiative	139

Figures

1	Potential Land Availability vs. Potential for Increasing Yields	xxxvi
2	Yield Gap, Availability of Uncultivated Land, and Area Cultivated per Rural Inhabitant, Selected Countries in Sub-Saharan Africa	xxxviii
3	Yield Gap, Availability of Uncultivated Area, and Area Cultivated per Rural Inhabitant for Selected Countries in Latin America and the Caribbean	xxxix
1.1	Area Expansion and Yield Growth	11
1.2	Cropland Expansion, Deforestation in Mato Grosso, Brazil, 2001–04	18
1.3	Range of Returns to Oil Palm and Potential REDD Payments for Forest Conservation in Indonesia	21
1.4	Yields on Semi-Mechanized Farms, Sudan, 1970–2007	24
1.5	Maize Production Costs by Country	25
1.6	Evolution of United States' Farm Size and Nonfarm Manufacturing Wage	30
2.1	Key Commodity Prices and Number of Media Reports on Foreign Land Acquisition	51
2.2	Frequency Distribution of Projects and Total Land Area by Destination Region and Commodity Group	52
2.3	Share of Projects by Commodity and Production Status of Capital	53
3.1	Yield Gaps and Relative Land Availability for Different Countries	86
3.2	Yield Gaps and Relative Land Availability for South Asia, East Asia and Pacific, and the Middle East and North Africa	87
3.3	Yield Gaps and Relative Land Availability for Latin America and the Caribbean	88
3.4	Yield Gaps and Relative Land Availability for Eastern Europe and Central Asia	90
3.5	Yield Gaps and Relative Land Availability for Sub-Saharan Africa	91

Tables

1	Large Land Acquisitions in Select Countries	xxxiii
2	Potential Availability of Uncultivated Land in Different Regions	xxxiv
1.1	Changes in Arable Area Used for Farming	10

1.2	Key Commodities Driving Land Use Change, 1990–2007	12
1.3	Mean Farm Sizes and Operational Holding Sizes Worldwide	28
1.4	Publicly Listed Companies in Agribusiness Value Chains	29
1.5	Yields and Cost Structure for Major Rice Exporters	33
1.6	Key Factor Ratios in Case Studies of Large-Scale Investments	39
1.7	Land Expectation Values for Perennial Crops	41
2.1	Estimated Probability that a Country Is Targeted by Investments	54
2.2	Challenges Encountered in Collecting Inventory Data	58
2.3	Large Land Acquisitions in Selected Countries, 2004–09	62
2.4	Key Insights from Case Studies	65
3.1	Potential Supply of Land for Rainfed Cultivation in Different Regions	79
3.2	Potential Area of Nonforested, Nonprotected Land Close to Market Most Suitable for Different Crops under Rainfed Cultivation	80
3.3	Current Yield Relative to Estimated Potential Yield	82

Appendix Tables

A2.1	Land Sizes and Origin of Projects in Country Inventories	156
A2.2	Reasons for Country Selection and Key Insights from Case Studies	157
A2.3	Projections of Global Land Use for Food, Feed, Biofuels	163
A2.4	Estimated Costs of Sorghum Production in Sudan	163
A2.5	Summary of Analysis of Farm Incomes for Smallholders Relative to Wage Employment on Large-Scale Farms	164
A2.6	Potential Land Availability by Country	165
A2.7	Land Availability by Region for Different Crops	168
A2.8	Wheat—Potential for Land/Yield Expansion for Key Producers and Countries with Uncultivated Land	169
A2.9	Maize—Potential for Land/Yield Expansion for Key Producers and Countries with Uncultivated Land	172
A2.10	Soybeans—Potential for Land/Yield Expansion for Key Producers and Countries with Uncultivated Land	174

A2.11	Sugarcane—Potential for Land/Yield Expansion for Producers and Countries with Uncultivated Land	176
A2.12	Oil Palm—Potential for Land/Yield Expansion for Key Producers and Countries with Uncultivated Land	177

Appendix Figures

A3.1	Yield Gap vs. Relative Land Availability, Africa	182
A3.2	Yield Gap vs. Relative Land Availability, Europe and Central Asia	183
A3.3	Yield Gap vs. Relative Land Availability, Latin America and the Caribbean	184
A3.4	Yield Gap vs. Relative Land Availability, North America, Northern Europe, and Oceania	185
A3.5	Yield Gap vs. Relative Land Availability, Selected Countries	186

Appendix Maps

A4.2.1	Mozambique Concession Overlap with Community Claims	188
A4.3.1	Maximum Potential Value of Output for Africa	189
A4.3.2	Maximum Potential Value of Output for Latin America and the Caribbean	190
A4.3.3	Maximum Potential Value of Output for Europe	191
A4.3.4	Maximum Potential Value of Output for the Middle East and Asia	192
A4.3.5	Maximum Potential Value of Output for Oceania	193

PREFACE

Interest in farmland is rising. And, given commodity price volatility, growing human and environmental pressures, and worries about food security, this interest will increase, especially in the developing world.

Many countries have suitable land available that is either not cultivated or produces well below its potential. This was a development challenge even before the food price rise of 2008. Seventy-five percent of the world's poor are rural, and most are engaged in farming. The need for more and better investment in agriculture to reduce poverty, increase economic growth, and promote environmental sustainability was already clear when there were “only” 830 million hungry people before the food price rise. The case is even clearer today when, for the first time in human history, over a billion people go to bed hungry each night.

One of the highest development priorities in the world must be to improve smallholder agricultural productivity, especially in Africa. Smallholder productivity is essential for reducing poverty and hunger, and more and better investment in agricultural technology, infrastructure, and market access for poor farmers is urgently needed. When done right, larger-scale farming systems can also have a place as one of many tools to promote sustainable agricultural and rural development, and can directly support smallholder productivity, for example, through outgrower programs. However, recent press and other reports about actual or proposed large farmland acquisition by big investors have raised serious concerns about the danger of neglecting local rights and other problems. They have also raised questions about the extent to which such

transactions can provide long-term benefits to local populations and contribute to poverty reduction and sustainable development.

Although these reports are worrying, the lack of reliable information has made it difficult to understand what has been actually happening. Against this backdrop, the World Bank, under the leadership of Managing Director Ngozi Okonjo-Iweala, along with other development partners, has highlighted the need for good empirical evidence to inform decision makers, especially in developing countries. One result is this report, *Rising Global Interest in Farmland: Can It Yield Sustainable and Equitable Benefits?* To prepare the report, a multidisciplinary team was tasked with carrying out a multicountry study on large-scale agricultural land acquisition and investment. While this task proved to be less straightforward than originally anticipated, the effort has produced some striking results.

First, the demand for land has been enormous. Compared to an average annual expansion of global agricultural land of less than 4 million hectares before 2008, approximately 56 million hectares worth of large-scale farmland deals were announced even before the end of 2009. More than 70 percent of such demand has been in Africa; countries such as Ethiopia, Mozambique, and Sudan have transferred millions of hectares to investors in recent years.

At the same time, in many cases the announced deals have never been implemented. Risks are often large. Plans are scaled back due to a variety of reasons including unrealistic objectives, price changes, and inadequate infrastructure, technology, and institutions. For example, we found that actual farming has so far only started on 21 percent of the announced deals. Moreover, case studies demonstrate that even some of the profitable projects do not generate satisfactory local benefits, while, of course, none of the unprofitable or nonoperational ones do.

Institutional gaps at the country level can be immense. Too often, they have included a lack of documented rights claimed by local people and weak consultation processes that have led to uncompensated loss of land rights, especially by vulnerable groups; a limited capacity to assess a proposed project's technical and economic viability; and a limited capacity to assess or enforce environmental and social safeguards.

Such problems are not due to a lack of potential. For example, although deforestation associated with the expansion of the agricultural frontier has been a serious problem (and one of the world's largest contributors to greenhouse gas emissions), our analysis shows that the projected increase in the demand for agricultural commodities over the next decade could be met, without cutting down forests, by increasing productivity and farmland expansion in nonforested areas. In particular, none of the Sub-Saharan African countries of most interest to investors is now achieving more than 30 percent of the potential yield on currently cultivated areas. So, increasing productivity on existing farmland would have a much bigger impact than simply expanding the land area at current yields.

There is also considerable scope for a South-South exchange of good practice. Again, when done right, larger-scale farming can provide opportunities for poor countries with large agricultural sectors and ample endowments of land. To make the most of these opportunities, however, countries will need to better secure local land rights and improve land governance. Adopting an open and proactive approach to dealing with investors is also needed to ensure that investment contributes to broader development objectives. Experience in Asia and in Latin America and the Caribbean can provide lessons for Sub-Saharan African countries that have confronted these issues more recently.

A major conclusion of the report is that access to a basic set of good information is essential for all stakeholders. Good public information can help governments formulate policies, identify gaps in implementation, and perform essential regulatory functions. Good public information can help civil society educate local communities about their rights and the potential uses and value of their land, assist in specific negotiations, and monitor agreements so they are indeed adhered to. And good public information can help investors effectively design and implement projects that respect local rights, are profitable, and generate local benefits.

Helping countries reduce poverty and hunger by increasing agricultural productivity is at the core of the World Bank's agenda. In collaboration with partners, the World Bank is ready to contribute to this important agenda by providing information and analysis, helping countries build their institutional and regulatory capacity, and supporting more and better investment in agriculture, especially smallholder agriculture, so that the rising global interest in farmland contributes to results that are sustainable and equitable.

Juergen Voegele
Director
Agriculture and Rural Development Department
The World Bank

ABOUT THE AUTHORS

Derek Byerlee is a Member of the Science Council of the Consultative Group on International Agricultural Research (CGIAR) and a consultant and adviser to a number of international organizations. Formerly he was Rural Strategy Adviser of the World Bank and Co-Director of the 2008 *World Development Report: Agriculture for Development*. Before joining the World Bank, he was Director of Economics at the International Maize and Wheat Improvement Center, Mexico, and Associate Professor, Michigan State University. For most of his career, he worked in several postings in Africa, Asia, and Latin America, conducting field research on agricultural technological change and food policy. He has published widely in several fields of agricultural development.

Klaus Deininger is Lead Economist in the Development Research Group of the World Bank. His research focuses on income and asset inequality and its relationship to poverty reduction and growth; access to land, land markets, and land reform, and their impact on household welfare and agricultural productivity; land tenure and its impact on investment, including environmental sustainability; and capacity building for policy analysis and evaluation, in Africa, China, India, Latin America, and East Asia. He holds a Ph.D. in Applied Economics from the University of Minnesota and has published more than 50 articles and a number of books, including a 2003 Policy Research Report “Land Policies for Growth and Poverty Reduction.” For the past four years, he has also served as the World Bank’s adviser on land tenure and land policy.

Jonathan Lindsay is Senior Counsel in the Environmental and International Law practice group of the World Bank's Legal Department, where he specializes in legal aspects of land and natural resource management, and in tenure issues arising in the context of the World Bank's safeguard policies. Prior to joining the Bank, he worked in the Development Law Service at the Food and Agriculture Organization (FAO) for 13 years, providing legislative technical assistance on land, forestry, and common property management issues. His work at the World Bank and FAO has involved extensive involvement in land and natural resource management projects in most regions of the world.

Andrew Norton is Director of Research at the Overseas Development Institute in London. A social anthropologist by training, he carried out his doctoral fieldwork in a farming community in Mali and has since worked extensively on issues of poverty, vulnerability, social protection, citizen participation, political economy analysis, aid effectiveness, natural resource management, and social policy. From 2005 to 2010, he was a Lead Social Development Specialist at the World Bank, where he was responsible for oversight of strategy, social and political analysis, gender, and special initiatives within the Social Development Department, managing a major multidonor work program on Poverty and Social Impact Analysis and leading a number of studies, including on social dimensions of climate change and social guarantees. Before joining the World Bank, he was the Head of Profession for Social Development at the UK Department for International Development.

Harris Selod is a senior economist with the Development Research Group of the World Bank, on secondment from the French Ministry of Foreign and European Affairs. His current research focuses on land governance, land markets, and the spatial organization of rural, urban, and peri-urban areas in developing countries, with a specific interest in West Africa. He has published on a number of topics in regional and public economics, including theories of squatting and residential informality, the political economy of investments in transport infrastructure, the effects of residential segregation on schooling and unemployment, and the impact of land reforms and place-based policies. Prior to joining the World Bank in 2007 as an invited scholar, he was a researcher at the French National Institute for Agricultural Research (INRA) and an associate professor at the Paris School of Economics. He holds a Ph.D. in economics from the University of Paris Panthéon-Sorbonne, graduated in statistics from the Ecole Nationale de la Statistique et de l'Administration Economique (ENSAE) and in business administration from the Ecole Supérieure de Commerce de Paris (now ESPC Europe). He serves as an adviser for the French Ministry of Sustainable Development and has consulted for several governmental agencies in France, including the Conseil d'Analyse Economique (Council of Economic Advisers to the Prime Minister).

M. Mercedes Stickler is an Associate in Ecosystem Services for Development at the World Resources Institute (WRI). Her work focuses on mapping and valuing ecosystem services provided by Kenya's arid and semi-arid lands and includes coordinating the dissemination of these spatial data to secondary and tertiary schools in Kenya. Previously, she was a Junior Professional Associate in the Agriculture and Rural Development Department at the World Bank. Ms. Stickler has spent several years working and studying in South Africa, where she investigated agricultural development issues across Sub-Saharan Africa for the Howard G. Buffett Foundation and also earned her M.Sc. in Environmental Sciences from Rhodes University with the support of a U.S. Fulbright Grant.

ACKNOWLEDGMENTS

This report arose out of an initiative by Managing Director Ngozi Okonjo-Iweala in close interaction with a working group on this topic with broad representation from the World Bank Group. It was prepared by a team led by Klaus Deininger (DECAR) under the overall guidance of Juergen Voegelé, ARD Sector Director; Mark Cackler, ARD Sector Manager; with support from Martin Ravallion, DEC Sector Director; and Will Martin, DEC Sector Manager. The core team included Derek Byerlee (consultant), Guenther Fischer (IIASA), Jonathan Lindsay (LEGEN), Andrew Norton (Overseas Development Institute, formerly World Bank, SDV), Harris Selod (ARD), Mahendra Shah (formerly IIASA, new Qatar national food security agency), and M. Mercedes Stickler (World Resource Institute, formerly World Bank, ARD), as well as Diji Chandrasekharan Behr (ARD), Nuria de Oca (SDV), Gerhard Dieterle (ARD), Clemens Gros (SDV), Daniel Monchuk (DEC), and Michelle Rebosio (SDV). Brian Blankespoor, Gloria Kessler, Deepthi Kolady, Katie Lancos, Siobhan Murray, Libei Tian, and Jeremy Weber also contributed to the report. Guenther Fischer and Mahendra Shah applied the global agro-ecological zoning (AEZ) methodology and models for the yield gap analysis, quantification of crop production potentials, tabulations and maps, and analysis of the results.

We gratefully acknowledge the cooperation and valuable inputs for country case studies contributed by the following individuals: **Argentina:** Martín Piñero (Economics and Organization Consultants Group, Grupo CEO); **Benin:** José Tonato (independent consultant); **Brazil:** Túlio Barbosa and

Alberto Coelho Gomes Costa (independent consultants); **Cambodia:** Chan Sophal (Leopard Capital); **the Democratic Republic of Congo:** Angélique Mbelu, Augustin Mpoyi, Patrick Mutombo, Serges Ngwato, and Olivier Nzuzi (Council for Environmental Defense by Legality, CODELT); **Ethiopia:** Imeru Tamrat (Multi-Talent Consultancy); **Indonesia:** Bambang Setiono (Institute for Environmental and Natural Resource Economics, ELSDA); **the Lao People's Democratic Republic:** M. Srinivas Shivakumar (consultant); **Liberia:** Sam Gotomo (Making Enterprises) and Augustine Johnson, Peter Lowe, and J. Christopher Toe (independent consultants); **Mexico:** Gustavo Gordillo de Anda and Brando Flores Pérez (Workshop in Political Theory and Policy Analysis); **Mozambique:** Anna Locke (HTSPE), Simon Norfolk (Terra Firma), and Gil Lauriciano and Rachel Waterhouse (independent consultants); **Nigeria:** Adeolu Ayanwale (Obafemi Awolowo University); **Pakistan:** Gulbaz Ali Khan, Adnan Rasool, and Abid Suleri (Sustainable Development Policy Institute, SDPI); **Paraguay:** Thomas Otter (independent consultant); **Peru:** Victor Endo (Administración del Territorio Consultantes) and Mercedes Callenes, Alvaro Espinoza, and Eduardo Zegarra (Grupo de análisis para el desarrollo, GRADE); **Sudan:** Musa Adam Abdul Jalil and Omer Egemi (University of Khartoum), Atta El-Hassan El-Battahani (International Institute for Democracy and Electoral Assistance, IDEA), and Abdelmoneim Taha (Agricultural Research Corporation); **Tanzania:** Thomas Blomley (Acacia Natural Resource Consultants), Razack Lokina and George Senyoni (University of Dar es Salaam), and Daudi Danda, Gabriel Joshua, Lembulung M. Ole Kosyando, Devis Mlowe, and William Ole Nasha (Pastoralists' Survival Options, NAADUTARO); **Ukraine:** Ildar Gazizullin (International Centre for Policy Studies, ICPS) and Alex Lissitsa (Ukrainian Agribusiness Club); **Zambia:** Davison Gumbo (Center for International Forestry Research, CIFOR), Henry Machina (Zambia Land Alliance), Augustine Mulolwa (University of Zambia), and Choolwe Mudenda, K. Ng'omba, and Frighton Sichone (independent consultants).

This report was produced with the collaboration of many partners, including the African Union, the Food and Agriculture Organization of the United Nations (FAO), the International Fund for Agricultural Development (IFAD), the United Nations Conference on Trade and Development (UNCTAD), the International Institute for Environment and Development (IIED), the International Land Coalition (ILC), and a number of development partners, including numerous bilateral organizations, the Working Group on Land of the European Union, and the Global Donor Platform for Rural Development. Many colleagues from inside and outside the World Bank, too numerous to list here individually, contributed to this report through insightful discussions. A selective listing of key contributors to this report is provided on page 195.

We also wish to acknowledge the contribution of the Office of the Publisher, World Bank, in particular, Mary Fisk, who managed the publishing process.

ABBREVIATIONS

AEZ	agro-ecological zoning
CGE	computable general equilibrium
DUAT	direito de uso e aproveitamento da terra (land use right)
EIA	environmental impact assessment
EITI	Extractive Industries Transparency Initiative
FAO	Food and Agriculture Organization (of the United Nations)
FSC	Forest Stewardship Council
GALDC	Government Agricultural Land Disposition Committee
GPS	global positioning system
IFC	International Finance Corporation
IIASA	International Institute for Applied Systems Analysis
LEV	land expectation value
NGO	nongovernmental organization
NPV	net present value
OECD	Organisation for Economic Co-operation and Development
PACRO	Patents and Companies Registration Office
PLIAF	policy, legal, and institutional framework
PROFEPA	Procuraduría Federal para la Protección al Ambiente
REDD	Reducing Emissions from Deforestation and Forest Degradation in Developing Countries
RSB	Roundtable on Sustainable Biofuels

R&D	research and development
RSPO	Roundtable on Sustainable Palm Oil
SNNPR	Southern Nations, Nationalities, and People's Region
UNEP	United Nations Environment Programme
ZDA	Zambia Development Agency