Myths Become Realities—Or Do They?

Luc Christiaensen and Lionel Demery

Motivation and Opportunity

Africa is changing. It is a continent on the move. Yet public awareness has not always kept pace. Major events such as war, famine, and drought might be well covered by the media. But little is generally known about the day-to-day lives of ordinary Africans, especially African farmers, let alone how they are changing. Information is often partial and piecemeal (Carletto, Jolliffe, and Banerjee 2015). And, given the remarkable changes taking place on the continent, even this knowledge base can quickly become out-of-date and misleading. Thus, much of what is commonly believed about African agriculture could be based on flimsy evidence, more akin to myth than fact.

But the data situation is also changing. Information has significantly improved about the social aspects of the lives of Africa’s farmers in the 21st century—their health, education, and fertility (Beegle et al. 2016). The World Bank’s Living Standards Measurement Study (LSMS) has for some time provided important information on income, economic activities, and well-being. More recently, these surveys have strengthened their coverage of household agricultural activities—the LSMS–Integrated Surveys on Agriculture (LSMS-ISA). These surveys have been conducted in eight African countries—Burkina Faso, Ethiopia, Malawi, Mali, Niger, Nigeria, Tanzania, and Uganda—which together make up more than 40 percent of the population of Sub-Saharan Africa (SSA). Information is gathered at the household and plot levels, covering every aspect of farming life, including the plots farmers cultivate, crops they grow, harvest that is achieved, and inputs they use. Data are also gathered on the time farmers spend on each (farm and off-farm) activity, the amount they earn working off the farm, and how they spend their income. This broad perspective on farming households is the strength of the data. Further details are provided in annex 1A.

The LSMS-ISA data thus extend an open invitation for a careful review of the perception of African agriculture and its farmers’ livelihoods. This opportunity is fully exploited by the contributing authors of this monograph. Together they
scrutinize much of the current common wisdom about African agriculture. The main themes emerging from this work, and the key messages they contain, are summarized in this chapter. The references to the longer papers underlying the chapters are listed in annex 1B.

Emerging Messages

Although they are not meant to be exhaustive in their coverage of farmers’ livelihoods, the subjects in the study are breathtaking in scope, ranging from the markets facing African farmers, to the decisions they make about planting trees and strategies to preserve the rewards of their efforts postharvest. Together, the studies provide a very real sense of what African agriculture and its farmers’ livelihoods are currently all about. The chapters also speak to many of the core prevailing stylized facts that have been driving research agendas and policy debates about Africa’s rural development over the past couple of decades. They are, however, deliberately descriptive in nature, largely shying away from causal statements, which would require panel data analysis.

To help synthesize and assimilate this work, and taking the smallholder farm household as the organizing framework, the studies are grouped under the following topics:

- Market Engagement: farmers’ engagement in factor and product markets
- The Smallholder Setting: the constraints and opportunities of smallholder farming
- Backward Technology: modern farming methods in the African setting
- A Risky Business: coping with shocks from the weather or market instability.

The chapters discuss 16 broad conventional views about African agriculture, and assess whether the views are well founded empirically. Are these myths or realities in Africa’s current farming context? Table 1.1 summarizes the findings. But farming is complex, and farmers’ behavior is unlikely to be as cooperative as it would seem from the table. Reality varies across farming systems, regions and countries, and over time. The studies reflect this complexity and explore the nuances that any answer to the question “myth versus fact?” must recognize.

Market Engagement

Views about African agriculture often concern how it fits into the economy at large. To what extent are farmers engaged in markets—factor markets (labor, credit, and land) and product markets (buying or selling surplus output)? How well served are they by these markets? A first set of issues concerns how well factor markets function in Africa, and how that affects farm enterprises. The findings are somewhat mixed. Factor markets overall are found to fail African farmers, but not all the news is bad. Exchanges do happen, and especially land markets are already starting to play a beneficial role. But not so much credit markets, and the sale of surplus remains still limited.
Factor markets in general do not function well. The conventional wisdom sees African agriculture trading in incomplete and imperfectly functioning factor markets. Dillon and Barrett (chapter 2) conclude that this is largely true. At the heart of their test is the observation that the number of working-age people in the household should not affect the amount of labor used on the farm if all factor markets function well. If the size of the household affects the amount of labor used on the farm, some factor markets (possibly labor markets, but not necessarily, or credit or land markets) are absent or functioning poorly. The authors find a significant link between labor input and household size, suggesting some market failures. These market failures are not limited to certain locations or gender, but are general and structural. Overall, most farmers engage in labor and land markets (so these markets are not absent in an absolute sense); but the markets nonetheless often fail farmers. In other words, market existence appears less of a problem than market function. There are profound messages for policy makers here. They should focus more on reducing barriers to market participation and improving the efficiency of markets than on wholesale creation of factor markets. But to do so requires further analysis, to identify which factor markets are failing and why. For analysts, this message serves as a reminder that findings based on complete factor market assumptions are bound to be off the mark.

But land markets already do perform a useful role. The empirical test employed by Dillon and Barrett examines just one (albeit important) relationship—between

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### Table 1.1 Conventional Wisdom about African Agriculture

<table>
<thead>
<tr>
<th>Chapter</th>
<th>The wisdom</th>
<th>The finding</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>I. Market Engagement</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Factor markets are largely incomplete in Africa.</td>
<td>True</td>
</tr>
<tr>
<td>3</td>
<td>Land markets play a minor role in African development.</td>
<td>Increasingly false</td>
</tr>
<tr>
<td>4</td>
<td>Modern inputs are not financed through formal credit.</td>
<td>True</td>
</tr>
<tr>
<td>5</td>
<td>Agricultural commercialization enhances nutrition.</td>
<td>False</td>
</tr>
<tr>
<td><strong>II. The Smallholder Setting</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Labor is much less productive in agriculture.</td>
<td>False</td>
</tr>
<tr>
<td>7</td>
<td>Women provide the bulk of labor on African farms.</td>
<td>False</td>
</tr>
<tr>
<td>8</td>
<td>Incomes among African farmers are underdiversified.</td>
<td>Largely false</td>
</tr>
<tr>
<td>9</td>
<td>Household nonfarm enterprises only exist for survival.</td>
<td>Largely true</td>
</tr>
<tr>
<td><strong>III. Backward Technology</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>African farmers use very low levels of modern inputs.</td>
<td>Not generally true</td>
</tr>
<tr>
<td>11</td>
<td>Population growth and market access determine intensification.</td>
<td>Not generally true</td>
</tr>
<tr>
<td>12</td>
<td>Given its profitability, fertilizer use is too low.</td>
<td>Not true in Nigeria</td>
</tr>
<tr>
<td>13</td>
<td>Trees on farms are not important for African livelihoods.</td>
<td>False</td>
</tr>
<tr>
<td><strong>IV. A Risky Business</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Droughts are the main hazard for African livelihoods.</td>
<td>Largely false</td>
</tr>
<tr>
<td>15</td>
<td>Price volatility in Africa arises from international markets.</td>
<td>False in Burkina Faso</td>
</tr>
<tr>
<td>16</td>
<td>Food markets are no longer seasonal.</td>
<td>Largely false</td>
</tr>
<tr>
<td>17</td>
<td>Postharvest losses are seriously large.</td>
<td>Plausibly false</td>
</tr>
</tbody>
</table>
labor use and household size. But this relationship does not identify which markets are poorly functioning, only that some must be. In chapter 3, Deininger, Savastano, and Xia explore in greater depth and more directly the extent to which farmers are engaged in land markets, and the nature of that engagement. Contrary to the conventional view, they find that farming households actively engage in land markets, especially land rental markets. The authors find that such access has beneficial effects for the equalization of land endowments and farm productivity. Engagement in land markets permits land-poor but labor-rich households to raise their resource base by renting land. It enables other farmers to diversify their activity by renting out their land and taking up nonfarm employment (without the risk of losing their land assets). These are profound gains in a process of structural change. But there remain important opportunities to improve the functioning of land markets. The authors suggest that institutional reforms (especially within the legal framework) are needed, and are effective in strengthening the role that land markets can play in enhancing farmers’ welfare.

*Farmers rarely use credit when purchasing farm inputs.* The role of credit in rural transformation is well understood. But do African farmers make use of credit when purchasing modern farm inputs, such as inorganic fertilizer or improved seeds? In chapter 4, Adjognon, Liverpool-Tasie, and Reardon estimate that only 6 percent of farmers use any form of credit to buy modern inputs, at least in the four countries they cover (Malawi, Nigeria, Tanzania, and Uganda). Larger farms are more likely to use credit, but even the use of informal credit is found to be rare. Modern inputs are purchased mainly through savings from income, crop sales, and nonfarm activities. By far the most common purpose of credit for a farming family in Africa is to finance the start-up costs of nonfarm enterprises, or to finance consumption.

*Farmers’ engagement in product markets does not necessarily enhance nutritional outcomes.* African farmers are very much involved in product markets—the vast majority sell some of their produce. However, Carletto, Corral, and Guelfi show that, at 20–40 percent, African farmers’ marketed shares remain rather limited (chapter 5). Conventional wisdom further suggests that the more farmers commercialize their operations through increased product market orientation, the better off they can become. Greater market orientation of agriculture is expected to raise incomes, improve consumption and sanitary conditions, and enhance nutritional outcomes in rural households. In short, it should enhance well-being. But many other factors could intervene. For example, commercialization may affect the gender earnings balance within the household, which, given different spending patterns, may even worsen nutritional outcomes. Despite the somewhat positive view in general of the effect of agricultural commercialization on nutrition, the evidence is mixed and somewhat dated. In the three countries studied, there appear to be no systematic links between commercialization and nutrition. These results are obtained using better data and more sophisticated statistical techniques, and are consistent with the few recent studies on the topic. Agricultural commercialization alone does not suffice to improve food security and nutritional outcomes.
**The Smallholder Setting**

Agriculture in Africa is organized mainly around the family farm, with relatively small parcels of land. The household is the institution within which farming decisions are made. This situation has implications for the operation and performance of the farm. And it is a source of much of the conventional wisdom about African agriculture.

*Labor in agriculture is not much less productive.* One common view is that labor productivity is much lower in agriculture than elsewhere in the economy. Indeed, national accounts data suggest that in Africa labor outside agriculture is six times more productive than agricultural labor. But McCullough shows (in chapter 6) that this is not true when productivity is measured at the micro level. Taking a household perspective and using micro data, McCullough accounts for production for own consumption, and links output more closely to labor input. She also defines the labor input not so much as a stock of labor (which the macro data are obliged to do), but more accurately as a flow of labor services, that is, the number of hours worked per worker. Using these preferred measures of labor output and input, productivity gaps become minimal. The differences in output per worker per year reflect gaps in employment levels rather than gaps in the returns to each hour of work.

This finding implies that agriculture is not intrinsically less productive. Workers outside agriculture supply on average far more hours of labor per year than do agricultural workers. Seasonality in agricultural demand for labor may be one reason. Irrigation investments, enabling multiple cropping seasons in a year, and diversification into products with labor demand at different times or more constant labor demand throughout the year (for example, poultry or dairy) can reduce the seasonality effect. But McCullough is agnostic about why the number of hours in agriculture is less. Digging further into the difference in labor productivity across sectors, especially the reasons behind it, is an important area for further research. The topic of sectoral labor productivity measures is starting to attract attention (see, for example, Arthi et al. 2016; Gollin, Lagakos, and Waugh 2014; Hicks et al. 2017; Vollrath 2013).

*Women do not provide most of the labor on the family farm.* The conventional wisdom has been that women contribute as much as 80 percent of the labor used on the African farm. But the source of this estimate is unknown. With the availability of reliable and more recent micro data, Palacios-Lopez, Christiaensen, and Kilic (chapter 7) put the record straight. They find that women in Africa contribute 40 percent of the total labor input in crop production (at least in the six countries they cover). This finding means that a disproportionate focus on women in strategies to raise African agricultural output might be misplaced, although it may be justified for other reasons (such as female empowerment). But this case should be made separately, by comparing it with the costs and benefits of other interventions.

*African households are not unduly tied to agriculture.* The common view is that families in rural Africa rely more on agriculture compared with other parts of the developing world. But Davis, Di Giuseppe, and Zezza find otherwise.
It is true that rural African households derive about two-thirds of their income from on-farm agriculture, compared with one-third (on average) in other developing countries. But if the analysis takes into account differences in the level of development in Africa compared with elsewhere (as reflected in gross domestic product per capita), Africa is not really on a different structural trajectory from the other developing regions. But there are some important differences. Most off-farm income in Africa is derived from informal self-employment. Rural households are more involved in nonfarm household enterprises (often closely related to agriculture—see chapter 6) than in wage employment (agricultural and nonagricultural), which is more important in other developing regions. Of course, there are differences across and within African countries. Chapter 8 provides details about Africa’s income diversification patterns and reviews these variations.

*Households in rural Africa diversify into nonfarm activities mainly for survival.*

Chapter 8 shows that structural change in rural Africa is on a similar trajectory as in other developing regions. The chapter also highlights peculiar features of the African case—especially that nonagricultural incomes come mainly from nonfarm household enterprises in Africa, rather than wage income outside agriculture. Why is this? Might this be because nonfarm activities in rural Africa serve a different purpose, the survival of the household? Nagler and Naudé pose this question in chapter 9. They find that nonfarm activities in the African household are indeed mostly oriented around survival. The evidence lies in the nature of the activities: most are small, unproductive, informal household enterprises, only operating for a portion of the year. But obviously not all are just there for survival. The authors show that when the conditions are right, households can seize the opportunities for enhancing family income. When households are better educated and have access to credit, they engage in agribusiness and trade throughout the year—not just in survival mode. The policy challenge is to create the demand and a business climate to foster such activities. This is not an easy task, and it is aggravated further by emerging concerns about premature de-industrialization (Rodrik 2016).

**Backward Technology**

The prevailing view of African agriculture is that technology is backward and changing only slowly. Africa is decades behind Asia from this perspective. Farmers are slow to respond to modern methods of farming, such as using new seed varieties, applying modern inputs and mechanization, improving land, and irrigating crops. The studies included here confront this conventional wisdom with the data.

*African farmers do in fact use modern inputs.* According to common wisdom, farmers in Africa are reluctant to use modern farming methods. They hardly use modern inputs such as nonorganic fertilizer and other agrochemicals. But Sheahan and Barrett (chapter 10) put the record straight with more recent household survey data. They find that the use of fertilizer and agrochemicals is greater than is often thought, but varies by country. It appears favorable in Malawi, Ethiopia, and Nigeria, and not so good in Niger, Tanzania, and Uganda.
Maize (corn) is on the move—maize farmers are using higher levels of fertilizer and improved seed varieties. But it is not all good news. The authors also find that farmers fail to use these inputs in the most productive combinations at the plot level. Perhaps the biggest message of chapter 10 is that the country setting is the main factor behind farmers’ input use—the policy and market environments really do matter. From this perspective, the higher rates observed in Malawi, Ethiopia, and Nigeria do not surprise.

But agriculture is not intensifying as much as expected, given population pressure and better market access. Sheahan and Barrett are fairly positive about the use of modern inputs in Africa. In this sense, they find the glass half full, especially for maize. But Binswanger-Mkhize and Savastano (chapter 11) are less sanguine about the processes influencing modern input use among African farmers. Although they use the same data, they find the glass half empty. The Boserup-Ruthenberg framework (Boserup 1965; Ruthenberg 1980) suggests that a virtuous cycle can emerge, involving increased fertilizer use, mechanization, and land development in response to population pressure and increased market access. But the authors find only partial support for the existence of such a cycle in Africa. They establish that fallow areas have virtually disappeared, and observe some response of modern input use (fertilizer, agrochemicals, and improved seeds), but not other measures of intensification, such as irrigation or increased number of crop cycles per year. The authors conclude that the use of fertilizer and other agrochemical inputs is insufficient to maintain soil fertility when fallow practices cease. The weak response of land improvement and irrigation is also not consistent with the virtuous cycle of the Boserup-Ruthenberg framework. The authors call for further research when panel data become available.

Returns to fertilizer use are not always favorable—at least not in Nigeria. Is the glass half full or half empty? One reason why conventional wisdom considers it half empty—that fertilizer use really is too low—is because its profitability would suggest greater use. According to this commonly held view, fertilizers are profitable but farmers are not convinced. The analysis in chapter 12—by Liverpool-Tasie, Omonona, Sanou, and Ogunleye—focuses on fertilizer profitability in maize production in Nigeria. The authors conclude that fertilizer use is not particularly profitable for maize. The reasons are the poor yield response to the application of fertilizers, but also the high (last mile) transport costs involved in procuring fertilizers. Thus, the application of fertilizers for maize by Nigerian farmers is consistent with its profitability—application rates are for the most part not “too low.” This finding sheds important new light on Africa’s agricultural technology debate, in that input use may not always be profitable, because of poor soil, poor-quality fertilizer, high transport costs, limited market access, and so forth. The implicit profitability assumption of modern input use deserves further scrutiny with good plot-level data.

On-farm trees are important to African farmers. Chapter 13 changes gear, and takes our attention away from fertilizers and other modern inputs. Rather, it focuses on something very traditional and part of the rural landscape over centuries—trees. Miller, Muñoz-Mora, and Christiaensen raise this issue because
conventional wisdom has viewed trees as unimportant for African farms; they think otherwise. They find that trees are widespread on farmland and serve useful economic functions. Trees provide cash crops, timber for firewood, and fruits for consumption. Overall, trees are grown on about one-third of the farms, providing 17 percent of total gross income among tree-growing households. This income is in addition to the indirect contributions of trees (such as soil and water conservation and biodiversity), which the authors do not measure directly. So the reality is quite different from the myth.

**A Risky Business**

If there is one commonly held view about Africa—and African agriculture in particular—it is that the economic environment is very volatile and uncertain. Fluctuating markets and massive weather shocks combine to make for an uncertain agricultural livelihood, and a risky life for farmers. The following paragraphs summarize the chapters that deal with the empirical reality of these risks and their associated coping mechanisms.

*The risks affecting African farmers go well beyond droughts.* A commonly held view is that drought is the dominant risk faced by households in Africa, and because droughts can affect all households at once in an area, the risk is difficult to manage (as all neighbors and relatives are affected in the same way). Another common view is that asset sales and informal transfers are the main coping strategies available to households in the absence of well-developed financial markets and effective public safety nets. Nikoloski, Christiaensen, and Hill (in chapter 14) show that price risk is just as prevalent as climate risk, and that price risk affects more people at once than droughts do. Health shocks are also widely reported by rich and poor households alike. The use of savings was the most commonly reported coping mechanism. That many households simply have no means to cope with climate and price shocks underscores how important this issue is for policy intervention.

*Maize price volatility does not arise from international markets.* Food price volatility has been a long-standing concern in food policy making, with world market price fluctuations often seen as an important cause. The 2008 world food price crisis gave additional impetus to this concern and viewpoint. Ndiaye, Maître d’Hôtel, and Le Cotty (in chapter 15) explore this issue in the context of Burkina Faso, and conclude that maize prices in the country are not closely linked to world prices. Seasonality (predictable, regular price swings) only explains about a fifth of the observed volatility. The authors’ big message is that price volatility in Burkina Faso comes mainly from the physical constraints facing farmers. Remoteness from markets has a massive effect on price volatility. Therefore, infrastructure and enhanced regional integration are the featured policy responses.

*African food markets continue to display substantial seasonality.* Although seasonality in African livelihoods is well known, what exactly is known is less clear. Systematic analysis of seasonality in markets and consumption has been absent, and the topic has largely disappeared from the rural development policy debate. Since the 2008 world food price crisis, the focus has also been more on
food price volatility. Christiaensen, Gilbert, and Kaminski challenge this in chapter 16, starting with a focus on seasonality in food prices. Unlike most of the studies reported here, their main data source is not rural household surveys, but rather price data obtained in rural markets across the seven countries covered. With ingenuity, the authors demonstrate that seasonality is still a fact of life in Africa. Seasonality proves to be a feature of prices for most commodities (especially maize and perishable foods such as tomatoes). And it is two and a half to three times greater in the countries covered than that experienced in international markets (at least for maize and rice). But seasonality does not explain much of the overall price volatility over the year. Using the LSMS-ISA data from Tanzania, the authors further show that seasonality in food prices can translate into seasonality in caloric intake, which is especially detrimental when it occurs during the first 1,000 days of life. The chapter concludes that the neglect of seasonality in the policy debate has been premature.

**Food losses may not be as large as is often portrayed.** The commonly held view that farmers experience significant postharvest losses is based mainly on flimsy and outdated information. Kaminski and Christiaensen, in chapter 17, ask the farmers instead, and find that self-reported postharvest losses are only a fraction of what is commonly reported. Only about a fifth of maize farmers report experiencing a loss of their maize after the harvest. Those who do have losses lose on average 20–25 percent of their harvest—at least in the three countries studied (Malawi, Tanzania, and Uganda). For Tanzania, the authors delve deeper by exploring the factors behind the reported losses. That makes for interesting reading in chapter 17 and adds an important cautionary note to the ongoing conversations about the gains from better postharvest handling techniques. Irrespective of whether the authors are right or wrong, if farmers do not believe postharvest loss to be important, they are less likely to adopt storage silos or other improved postharvest handling techniques.

**Annex 1A: LSMS-ISA Data**

The Living Standards Measurement Study–Integrated Surveys on Agriculture (LSMS-ISA) initiative supports national statistical offices in the collection of at least four rounds of nationally representative household panel survey data in eight African countries during 2008–20. The studies in this monograph mainly draw on the first rounds collected during 2009–12 in six of the countries (Ethiopia, Malawi, Niger, Nigeria, Tanzania, and Uganda), which together cover more than 40 percent of the population in SSA and most of its agroecological zones. Although this does not make them representative of SSA as such, together they provide a broad picture of the emerging new reality, and allow for elucidating differences across settings. In these countries, a total of 31,848 households were interviewed, with sample sizes per country varying between 2,716 (Uganda) and 12,271 (Malawi) households. Of the surveyed households, on average 76 percent were rural. Burkina Faso and Mali joined the initiative more recently. Their survey findings are not included here.
The LSMS-ISA initiative presents several notable innovations for the World Bank's LSMS surveys. First, most important, the initiative strengthens the coverage of household agricultural activities—the ISA part of LSMS-ISA. The surveys are based on household samples and designed from the perspective of the household, not the farm. As a result, it is difficult to draw statistically sound inferences about the practices of medium- and large-scale farms, because there are not many of these in the sample (Jayne et al. 2016). Second, in addition to the integrated approach to data collection, data gathering took place at highly disaggregated levels, at the plot level, but also at the individual level, such as for time allocation and plot management. This type of data gathering enabled a more refined, gendered perspective on agriculture and rural livelihoods. Third, the surveys made wide use of information and communications technology (ICT) tools (tablets and Global Positioning System devices) for data collection and plot measurement, improving the quality of data. Finally, individuals (not just households) are tracked across survey waves, opening a host of new research areas, such as the study of migration.

These four innovative features of the data—integration, individualization, ICT use, and intertemporal tracking—not only helped obtain more refined insights into African agriculture and its rural livelihoods, but also helped researchers scrutinize several conventional views that have so far lacked an adequate information base to do so, such as the gender patterns in agricultural labor allocation or the application of joint input packages in practice, that is, at the plot level. The nationally representative scope of the data and the great degree of standardization across countries in questionnaire design and survey implementation further facilitated cross-country comparison as well as comparisons across settings within countries.

Annex 1B: Companion Papers

The chapters in this volume draw upon companion papers that are published elsewhere. We hope that they have awakened your interest, and encourage you to read these fuller versions.

Chapter 2

Chapter 3

Chapter 4
Chapter 5

Chapter 6

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Chapter 8

Chapter 9

Chapter 10

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Chapter 16

**Chapter 17**


**Notes**

1. This was organized under the umbrella of an ambitious research program initiated by the Chief Economist’s Office of the World Bank Africa Region, in partnership with the African Development Bank, the Alliance for a Green Revolution in Africa, Cornell University, the Food and Agriculture Organization, the London School of Economics, the Maastricht School of Management, the University of Pretoria, the University of Rome Tor Vergata, the University of Trento, and Yale University.

2. For a detailed description and access to the data and their documentation, see http://www.worldbank.org/lsms.

**Additional Reading**

This chapter draws on:


Other key references:


