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AGRICULTURAL DEVELOPMENT AND ECONOMIC TRANSFORMATION

Promoting Growth with Poverty Reduction

JOHN W. MELLOR

Palgrave Studies in Agricultural Economics and Food Policy

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Agricultural and food policy lies at the heart of many pressing societal issues today and economic analysis occupies a privileged place in contemporary policy debates. The global food price crises of 2008 and 2010 underscored the mounting challenge of meeting rapidly increasing food demand in the face of increasingly scarce land and water resources. The twin scourges of poverty and hunger quickly resurfaced as high-level policy concerns, partly because of food price riots and mounting insurgencies fomented by contestation over rural resources. Meanwhile, agriculture's heavy footprint on natural resources motivates heated environmental debates about climate change, water and land use, biodiversity conservation and chemical pollution. Agricultural technological change, especially associated with the introduction of genetically modified organisms, also introduces unprecedented questions surrounding intellectual property rights and consumer preferences regarding credence (i.e., unobservable by consumers) characteristics. Similar new agricultural commodity consumer behavior issues have emerged around issues such as local foods, organic agriculture and fair trade, even motivating broader social movements. Public health issues related to obesity, food safety, and zoonotic diseases such as avian or swine flu also have roots deep in agricultural and food policy. And agriculture has become inextricably linked to energy policy through biofuels production. Meanwhile, the agricultural and food economy is changing rapidly throughout the world, marked by continued consolidation at both farm production and retail distribution levels, elongating value chains, expanding international trade, and growing reliance on immigrant labor and information and communications technologies. In summary, a vast range of topics of widespread popular and scholarly interest revolve around agricultural and food policy and economics. The extensive list of prospective authors, titles and topics offers a partial, illustrative listing. Thus a series of topical volumes, featuring cutting-edge economic analysis by leading scholars has considerable prospect for both attracting attention and garnering sales. This series will feature leading global experts writing accessible summaries of the best current economics and related research on topics of widespread interest to both scholarly and lay audiences.

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Foreword

After the heyday of the Green Revolution, a generation of scholars and policymakers took agriculture for granted. Then the global food price crises of 2007–2012 reawakened appreciation of the central role agriculture plays in the process of economic development locally and globally.

John Mellor was among the earliest and most influential champions of that fundamental truth. His landmark 1961 *American Economic Review* paper with Bruce Johnston, "The role of agriculture in economic development" was, along with the Nobel Laureate W. Arthur Lewis' classic 1954 paper, absolutely foundational to subsequent understanding of how agricultural development ignites economic growth and poverty reduction at larger scales. That 1961 paper drew on Mellor's own intensive field research in south Asia in the 1950s, which set the stage for a career of careful empirical investigation and deep engagement with the messy realities of agricultural and food policy around the world. A sequence of heavily cited studies—most notably his 1966 book *The Economics of Agricultural Development* and his 1976 work *The New Economics of Growth*—built up the evidence base that helped prompt Green Revolution investments by underscoring the crucial role of institutional and technological change in agriculture, and of public investment in agricultural research and extension, in spurring economic transformation. While public intellectuals feared that population growth would bring mass famine, Mellor and others charted a course that instead helped usher in a period of historically unprecedented reduction in poverty and hunger. A burgeoning academic literature today is now rediscovering the old truths first articulated by Mellor and his collaborators.

Mellor was unusual not only in the extraordinary intellectual impact of his scholarship on subsequent research, but equally in the practical impact he had on real world policymaking. As a Cornell University professor, he influenced a generation of talented students, several of whom went on to highly influential careers of their own, most notably his doctoral advisee Lee Teng-Hui, who served as President of the Republic of China (Taiwan) from 1988 to 2000. Serving as Chief Economist of the United States Agency for International

Development in the early 1970s, including during the world food crisis of 1973–74, Mellor exerted considerable influence over the United States government's response to unfolding events of immense humanitarian consequence, as well as those of other governments. Indeed, Mellor's sage influence helped prompt the creation in 1975 of the International Food Policy Research Institute (IFPRI). Mellor then served as IFPRI's Director General from 1977 to 1990. That period secured for IFPRI an enviable reputation as the global leader in policy-oriented research on food and agricultural policy to reduce hunger, malnutrition, and poverty and to stimulate economic growth, environmental sustainability, and human development. In the quarter century since he ran IFPRI, Mellor has served as a prized adviser to a range of senior government officials around the world, remaining remarkably active as a global thought leader to this day.

Hence my great excitement that John Mellor has written this volume. Very rarely do we students get the opportunity to learn from the expert insights of an early giant of the field reflecting on more than half a century's research and practical experience in the field, much of it sparked by his own path-breaking work. The questions Mellor and his collaborators pursued decades ago remain highly topical today. We continue to struggle to understand how best to ignite inclusive economic growth that can rapidly and sustainably reduce the extreme poverty that still disfigures much of the world, especially in rural areas of Africa and Asia. The linkages between the farm and non-farm sectors, although indisputably substantial, remain underappreciated and only weakly understood. The appropriate role of government in these domains remains hotly disputed. On these and other key issues, Mellor has a vantage point like no other. By virtue of the extraordinary longevity and stature of his contributions, Mellor's insights merit careful study, perhaps especially where they buck current prevailing beliefs.

The central theses Mellor advances in this volume are powerful in their implications. Mellor argues that small commercial farmers, rather than large-scale farms or poorer, semi-subsistence producers, are the key engines of economic growth and poverty reduction. A significant portion of that impact comes through local general equilibrium effects through labor markets and those farmers' demand for non-tradable goods and services, both of which generate high multiplier effects that concentrate gains among the poor. Pervasive rural factor and product market imperfections and the significant public good elements of investments in, especially, agricultural research and extension, necessitate a central role for government. That requires more substantial public sector spending and activity than has been the case in most developing countries over the past generation. These claims challenge some conventional wisdom today and invite rigorous testing of many subsidiary hypotheses.

More than 50 years after his seminal work spawned a generation of scholars to pursue research agendas he advanced, John Mellor offers in this volume more than a powerful valedictory address from one of the field's giants. He again challenges the agricultural and development economics community to engage in research that makes a difference. It is a tremendous privilege to introduce a

volume that any serious student of agricultural development and economic transformation needs to read. The unsurpassed historical sweep of Mellor's observations, drawing on an extraordinary career of great scholarly and practical impact, make Mellor's insights as timely in the early twenty-first century as they were in the mid-twentieth century.

Cornell University Christopher B. Barrett

Preface

My intention is to explain how rapid agricultural growth accelerates the economic transformation to a modern economy and most important why it is the prime instrument for removing rural and much of overall poverty. From that I explain why modernization of agriculture is essential to filling that role and state what the initial conditions and requirements for that modernization are. The focus is on low- and middle-income countries—the ones striving to become high income and modern. Modernization of agriculture is of great importance to progress in those countries.

The reader should come away with a clear, integrated picture of why and how to develop agriculture. That picture is quite different to much of the academic analysis and practice of foreign assistance agencies and many low- and middle-income governments. It is consistent with the practice of several governments that have been highly successful in achieving rapid agricultural growth and poverty reduction. That consistency is in part because I closely observed and learned from them.

I take clear positons throughout the book, based on my own research and reading, and my lengthy and wide ranging experience drawn from living in rural areas, doing and administering research, senior government experience, and a recent 25-year period of interacting within low- and middle-income country governments.

The topic of this book is broad and so the relevant literature is vast. A comprehensive review is not possible. I cite research that draws different conclusions to mine as well as some in agreement and emphasize review papers. The citations lead to a further broadening of the literature for those who wish to pursue topics in depth. Quantification of key relationships between accelerated agricultural growth, the economic transformation and poverty reduction is either original to this book or an extension of my previous work with several colleagues. All that empirical work is reproducible from spreadsheets that are made available.

For the purposes of this book much of the survey data based research has two shortcomings: First, it fails to differentiate the non-poor commercial small

commercial farmers who produce the bulk of agricultural output from the comparably large number of farmers who are at subsistence or below subsistence levels and produce but a small fraction of agricultural output. Second, it fails to distinguish the geographic areas in which modernization is under way with accelerated agricultural output growth from those that remain predominantly in slow moving traditional agriculture. As a result, it understates the potential for growth and diverts attention from the means of that growth.

The Economics of Agricultural Development, the predecessor to this book, was published 50 years ago. Ten years after publication it won the American Agricultural Economics Association award for research of lasting value. It is of course dated. It refers to Japan as a developing country and it was before the birth control pill. However, the errors are largely of omission rather than commission. (See the annex on intellectual history at the end of this book.) What has changed in the intervening 50 years is copious research on every facet of the subject and an extraordinary diversity of experience.

I had the good fortune to have an extraordinary set of people open the way to the diverse experiences that led to this book. Those experiences fall into four classes: The discipline of years of field research, teaching and learning from students, and leading the staff of a large research institute; the derived wisdom from close interaction with farmers, intensively in India, Ethiopia, Pakistan, and the United States, and more fleeting in many other African, Asian, and Latin-American countries; the healthy cynicism from a stint as Chief Economist of the US foreign assistance program and years of interaction at the field level with foreign aid missions; and a sense of reality from the most recent 25 years meshing research results and country experience in interacting with caring officials at all levels of low- and middle-income country governments.

Bruce Johnston my co-author in a much quoted *American Economic Review* article and two review articles in *The Journal of Economic Literature* was an early leader for many of the ideas in this book. He brought experience with the post war land reforms in Japan and introduced me to the seminal Japanese thinkers about agricultural development, Professors Ohkawa and Ishikawa.

F. F. Hill, Cornell University and later the Ford Foundation, guided my efforts to understand development problems of the then backward southern United States and had the faith to entrust me with starting a major academic program on agricultural development long before it became fashionable. I owe a lot to my Cornell colleagues. I also learned from Hill how he and his associates built the government instituted Farm Credit Administration and saw it become farmer managed and farmer owned—such a grand lesson about agricultural finance. The early US agricultural institutional history is valuable to understanding current needs and I was tied to that through my senior associates at Cornell.

Hla Myint, Oxford, taught me how important it was to leaven academic research with knowledge of how governments operate and their limitations. J. R. Hicks and Roy Harrod (Oxford) taught me the value of rigorous theory and Tommy Baloch (also Oxford) taught me that being an American is not always so good, an unpleasant experience that later became very helpful.

My greatest debt is to Arthur Mosher who said that having done a thesis on agricultural development in the then backward southern United States was not enough and arranged for my family to spend a year and a half in rural India, where I worked closely, interviewing each of them every week, with a sample of 30 Indian farmers. I owe those farmers and their families a lot and I am disappointed that I have had so little impact on improving their lot. I was once accused in public of generalizing from India—no, I generalized from 30 farm families in India—of course a bit leavened by meeting farmers in many other countries.

Ralph Cummings (Rockefeller Foundation) brought me back to India to work at the Indian Agricultural Research Institute, and I learned immensely from him how to run a technical assistance program so it actually builds national capacity instead of stunting it. Dan Parker, Administrator, USAID, took me as a young academic, into government, reporting directly to him and with a large staff to research pressing issues of foreign aid. Those were the days when US foreign aid officials were writing respectable and influential academic journal articles.

Then Sir John Crawford, took a flyer on me to build The International Food Policy Research Institute right at its start, which brought intimate contact with a large group of outstanding researchers and government officials. That period included for several years chairing the CGIAR center directors, enlarging my view of the hard sciences that are at the core of dynamic agricultural growth. Reading all the IFPRI research reports and commenting on them and interacting with government aid agencies and recipients gave me a sense of knowledge and knowledge gaps. During those years I benefitted immensely from Uma Lele's (World Bank) long and intensive work on all aspects of agricultural development in Africa.

Finally, another huge debt to Prime Minister Meles, Ethiopia who showed me that a government can indeed achieve rapid growth in agriculture—it is not just some academic figment of the imagination—and through his staff an appreciation of why some of what I recommended was not possible. In that context, I interacted at all levels with practical participants in effective cooperatives and learned first-hand the problems of these important institutions. Throughout I interacted with traders, learning of their problems and contributions.

It is obvious that following from each of these I was privileged to learn from a legion of their associates. It has been a long journey, that I hope is not yet over.

Chris Barrett (Cornell) took time from his extraordinarily demanding pressures to read the drafts carefully and to give comments that made a major difference to this book. Liz Bageant his associate, gave the blunt (but tactfully put) commentary that forced major changes from the early draft. Similarly, for the publisher's anonymous reviewers.

In writing this book, I received excellent research assistance, covering a wide range of careful and thoughtful statistical and library search, from Akbar Naqvi. In the modern computer age perhaps the most important debt is to Zarmina Said and her sister Homa who patiently saw me through hundreds (two per day on

average!) of book ending computer crises and endured my hysterics while they were doing it. And then my books are well written because I do what my editor says to do and Linda Dhondy was especially helpful on this book.

Thank you all, thank you, I hope I have done justice to the opportunities you have given me.

Washington, DC, USA John W. Mellor
May 2, 2017

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CHAPTER 1

Introduction

This chapter first summarizes the two "big ideas" that are the subject of this book. These ideas differ from current central tendencies in thinking about the agriculture of low- and middle-income countries and poverty reduction. That is followed by definition of the concepts that are central to the analysis in this book—geographic area and national income level, four types of households (small commercial farm, large-scale/feudal farm, rural non-farm, and urban), economic transformation, agricultural modernization, and rapid agricultural growth.

The Big Ideas

The rapid growth of small commercial farmer dominated agriculture accelerates the economic transformation and is essential to the rapid decline in dominantly rural poverty.

Small commercial farmers dominate agricultural production in most low- and middle-income countries. They are not poor and spend a substantial portion of their incremental income from farming on labor-intensive non-tradable goods and services from the large, rural, non-farm sector. That is central to poverty reduction. Those farmers are central to the exposition throughout this book.

Much of the academic literature (e.g., Collier and Dercon 2014; Dercon and Christiaensen 2011), foreign aid policy, and even government officials of low- and middle-income countries presume and act as though farmers are poor with a consequent inability to finance change or take risks. They are implicitly depicted as an average of what we define as small commercial farmers and the rural non-farm population. This book is a major departure from that conventional wisdom with profound implications for all aspects of agricultural growth and its role in economic transformation and poverty reduction.

The rural poor are concentrated in the rural non-farm sector and their employment and income increase comes from increased local demand for non-farming activities. That demand comes from the small commercial farmer

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and is the dominant means of reducing poverty in both low- and middle-income countries. Many households in the rural non-farm sector also do some farming, earning a portion of their income from that source.

Because small commercial farmers dominate agricultural growth and foster rapid growth in the rural non-farm sector this plays an important role in economic transformation. That not only speeds up economic transformation but disburses urbanization from the major central city to a geographically dispersed set of smaller towns and cities. That in turn influences the path of growth as upper-middle-income and high-income status is achieved.

Open trading regimes are favorable to agricultural growth. However, because of the rapid growth of the non-tradable rural non-farm sector the trade component will be lower in this strategy than in those that have been most favored over the past few decades.

The impact of expenditure by small commercial farmers on the rural non-farm sector is measured under fast and slow agricultural growth regimes and is found to be dominant in poverty reduction in both low- and middle-income countries, and also dominant in gross domestic product (GDP) growth in low-income countries, while being important but not dominant in middle-income countries. The impact of expenditure by high growth rate small commercial farmers is compared to that from large-scale farmers and the urban sector and is found to be the dominant source of increased employment and rural poverty decline.

For the past few decades, much of the thinking and practice of rural poverty reduction, especially among influential foreign aid donors, has focused directly on the poorer geographic regions and subsistence and below subsistence farmers. That has provided a welcome palliative to the recipients but fails to achieve a long-term reduction in poverty.

Since poverty is most dramatically illuminated by hunger, and severe malnutrition, the conditions for food security are analysed throughout. The findings are consistent with the view of Noble Laureate Amartya Sen that famine, hunger, and poverty are due to lack of income on the part of the poor, not lack of food in the economy. However, the relationship is more complex. It is only through a rapid increase in agricultural production by small commercial farmers that the income can be generated that reduces dominantly rural poverty. There has been an unfortunate tendency of Sen's followers to conclude, incorrectly, that growth in agricultural production is not important to food security and poverty reduction. That wrong conclusion strengthened the shift of foreign aid away from agricultural growth. Barrett (2010) in a science paper places this discussion in the current hierarchy of food security discussions.

Government has a prominent role if small commercial farmer dominated agriculture is to grow rapidly.

If government is not explicit about the importance of agriculture and does not make large expenditure and rapidly build key government institutions to foster agricultural growth the sector will not grow rapidly and rural poverty levels will decline slightly or not at all. Failure by government is the story in much of Sub-Saharan Africa, in a few low-income Asian countries, and increasingly so in

middle-income countries of Asia. That is why poverty reduction has slowed. Recent decades have seen foreign aid and much academic effort focused on “privatization” and neglect of the central role of government in modernization of agriculture and hence on poverty reduction.

Of course agriculture is preeminently private sector—farmers are private sector as is the bulk of input and output marketing firms. However, they become more motivated in the context of clear government emphasis on their role in reaching national objectives and they require essential, constantly improving, complementary government services including rural roads, electrification, education and major government institutions always including research and extension, and many modest services such as statistics provision and market analysis.

There are four big problems: obtaining an explicit emphasis on agriculture; appropriating adequate funds; developing the government’s institutional capacity; and knowing when and how to withdraw from some activities as the private sector grows and modernizes.

A large, widespread, extension service and the field efforts of research can bring substantial rural political support to governments. Indeed, it is surprising that more low-income country governments have not sought popular support in rural areas by large-scale, nationwide, government research/extension systems contributing to a large increase in income of the politically influential, small commercial farmer. Perhaps that is because so many low-income country governments do not rely significantly on popular democratic processes.

It is apparent that the explicit role of government with respect to agriculture is very different and far greater than its explicit role in the industrial or service sectors. Of course that means that over reach with all its negative effects is also possible. The exposition in Part 3 will monitor that role carefully.

There has been a tendency in recent decades for foreign aid to focus on encouraging the private sector, without recognizing that the greatest need of the agricultural private sector is rapid growth in agricultural production that requires specific government actions and institutions. A six percent growth rate as a minimum doubles the size of the private sector in 12 years. The reality has been neglect of key government functions, particularly compared to the golden age of foreign assistance to agriculture in the 1960s–1980s. That is particularly important given the tendency of contemporary low- and middle-income country political systems to be far more urban oriented than was true of most contemporary high-income countries when they were in low- and middle-income status.

Share of Government Expenditure on Agriculture

How large should the government effort to forward accelerated agricultural growth be? The African Union’s major effort to provide a strategy for agricultural development, the Comprehensive Africa Agriculture Development Programme (CAADP) (2010), has a carefully analysed and researched numerical recommendation: governments should spend a minimum of ten percent of their total expenditure on agriculture. The International Food Policy Research

Institute (IFPRI) (2016) reports that for Africa that share declined from 3.5 percent in 2003–2008 to 3.0 percent for 2008–2014!

The CAADP recommendation is important to the exposition in succeeding chapters. Those chapters will emphasize critical areas that must receive priority in planning and implementation. But there are many essential functions of government with respect to a modern agriculture that are too mundane and detailed for attention in a grand strategy and in this exposition. A review of all the departments in a well-functioning Ministry of Agriculture would show area after area essential to a well-functioning modern agriculture. Those include detailed regulatory functions essential to a healthy agriculture, special planning functions, statistical systems, and data collection. If budget is provided for the priorities but insufficient for these many essential functions of government then the priorities will not be met.

Definitions

The following definitions are central to the analysis in this book and are stated and quantified in the following sections.

Defining Countries by National Income Level and Geographic Location

This book analyses low- and middle-income countries. As defined by the United Nations, low-income countries average $648 per capita income, middle-income $4729, and high-income $37,793. Low-income countries are almost entirely in Sub-Saharan Africa and South Asia (Table 1.1). Sub- Saharan Africa is divided nearly equally between low-income and middle-income countries, while South Asia is one-quarter low-income and three-quarters middle-income. East Asia and the Pacific is two-thirds middle-income and one-third high-income. Analysis in this book is heavily on Asia, which has been emphasized in foreign aid since the end of World War II, and Sub-Saharan Africa which started later than Asian countries but is now heavily favored by foreign aid donors.

Table 1.2 provides a sense of the wide variation among low- and middle-income countries. The table arranges selected countries within geographic areas

Table 1.1 Proportion of population in low-, middle-, and high-income countries, by region

Region	*Low income (%)*	*Middle income (%)*	*High income (%)*
East Asia & Pacific	5.4	64.9	29.7
South Asia	25.0	75.0	0
Europe & Central Asia	0	33.3	66.7
Latin America & Caribbean	2.4	53.7	43.9
Middle East & North Africa	0	61.9	38.1
North America	0	0	100
Sub-Saharan Africa	54.1	41.7	4.2

Source: Regions are from World Bank; percentages calculated from country and lending groups World Bank Data

Table 1.2 Economic indicators for selected countries

Country	*GDP per capita (US$)*	*% of rural population*	*GDP per capita growth rate (%)*	*Agricultural growth rate (3-year average) %*	*Manufacturing as % of GDP*	*Wheat yield (3-yr. avg.)*[a]	*Rice yield (3-yr. avg.)*[b]	*Maize yield (3-yr. avg.)*[c]
Bangladesh[d]	1086.8	66	4.8	3.3	17	29,897	44,050	66,223
Pakistan	1316.6	62	2.6	3.0	14	27,750	24,193	41,231
India	1581.5	68	6.0	2.2	17	31,203	36,452	25,926
Indonesia	3491.9	47	3.7	4.2	21	N/A	51,409	48,989
China	7590.0	46	6.7	4.3	30	50,390	67,315	59,658
Ethiopia	573.6	81	7.5	5.8	4	23,660	28,136	32,448
Rwanda	695.7	72	4.5	5.0	5	21,153	55,602	21,544
Tanzania	955.1	69	3.6	3.2	6	9786	24,835	13,812
Ghana	1441.6	47	1.6	4.2	5	N/A	26,243	17,748
Nigeria	3203.3	53	3.5	4.6	10	10,566	19,059	16,060
Bolivia	3124.1	32	3.8	4.2	13	11,693	25,604	26,509
Guatemala	3673.1	49	2.1	4.4	20	21,768	29,384	20,790
Egypt	3365.7	57	0.0	3.0	16	65,875	95,487	77,426
Japan	36,194.4	7	0.1	1.8	19	39,905	67,215	26,857
France	42,725.7	21	−0.3	−0.7	11	74,034	49,950	60,862
USA	54,629.5	19	1.6	1.4	12	30,771	84,866	94,820

[a]Food and Agriculture Organization of the United Nations *Statistics Division* (FAOstat) dataset: 2012–2014 average for wheat yields for all countries, units are Hg/Ha
[b]FAOstat: 2012–2014 avg. for rice/paddy yields for all countries
[c]FAOstat: 2014–2014 avg. for maize yields for all countries
[d]Bangladesh qualifies as a low-income country according to the World Bank, despite having a GDP per capita above the maximum number for low-income countries, assumingly because of the fact that its growth in GDP per capita in 2014 was an anomaly in comparison to other years where it was comfortably below the number

by per capita income. It is striking that over a wide range of incomes the proportion of the population that is rural remains at a very high 46 percent up to 81 percent. This suggests that even middle-income countries as a group still have a large population of rural poor, in turn suggesting failure in agricultural growth of the small commercial farmer.

Across these sets of countries as incomes rise the share of the rural population and the share of agriculture in GDP trends down and the share in services trends up. The share in industry increases substantially from low to middle income and then drops. On growth rates, that for GDP is the same for the two low- and middle-income sets and then drops substantially for high-income countries.

Agriculture is at the lower end of the range for rapid growth in the low-income countries. It drops substantially below that for the middle-income countries and even lower for the high-income countries. The moderately high level for low-income countries is the product of a small number with substantially higher growth rates than the average and the bulk significantly lower. There is at most modest evidence of catch-up growth in agriculture.

Poverty

In this book, the World Bank's extreme poverty line is used to define the poor. Conceptually that requires income to provide a basic diet of sufficient calories for a moderately active life plus the other essentials met by families at that level of calorie consumption. In 1996 that was defined as a dollar a day and is increased with inflation. The World Bank at the same time also defined moderate poverty as less than two dollars a day.

Extreme poverty is of course a very low-level definition. It is used here because it is clearly defined and is the ultimate in abject poverty, associated with high death rates with a likely unfavorable impact on the physical and mental development of children. Although concentrated in South Asia and Sub-Saharan Africa, extreme poverty is widespread with well over one billion people so classified. The number in moderate poverty is in the order of twice the number in extreme poverty. The proportionate incidence of poverty has been increasing in Sub-Saharan Africa, while it has been declining elsewhere, albeit at a diminishing rate.

Non-monetary measures of poverty such as life expectancy, childhood mortality, literacy, the gap between female and male literacy, and other measures are also used as indicators of progress and various composites of several measures calculated. Most of these measures have been improving somewhat more rapidly than the monetary measure. However, in a broad sense the various measures of poverty are moderately correlated.

Small Commercial Farmers

Agricultural production in most low- and middle-income countries is dominated by small commercial farmers (e.g., Mellor and Malik 2017; Jayne et al. 2006). They produce the bulk of agricultural output and are the source of the income

growth the expenditure of which lifts the rural poor out of poverty. They are central to the exposition throughout this book.

For low- and middle-income countries the small commercial farmer is defined at the lower end as having enough land to produce sufficient food to lift the family's consumption above the World Bank defined poverty line. At the upper end, they have insufficient land (income) to support an urban import and capital-intensive lifestyle. They live in the rural areas along with other rural people and have a rural-based consumption pattern. They are generally thought of as the backbone of rural society. These farmers are not poor by the standards of their community, are commercial, selling a minimum one-third of their production, to derive the non-food items in the above poverty line level of living. The class as a whole markets well over half of its output and that rises over time. They are able to bear risk, to invest capital from their own income, and are interested in raising their farm income. Almost all their income comes from farming (Table 1.5).

Tenant farms are treated in principle like owner-operated farms. If they have enough land to generate an above poverty line income they are counted as small commercial farmers. Those that qualify as small commercial farmers are not common and will not be discussed separately. If they have enough income to support an urban lifestyle they are counted as large commercial farmers. They too are a rarity as a percentage of farming. If they generate farming income at the poverty level or lower, after subtracting the rent payment, then they are rural non-farmers. In a feudal system, as in much of Sindh Province, Pakistan, essentially all fall into the rural non-farm class.

This definition is not stated in terms of farm area. That is because the area encompassing the small commercial farm category varies according to a wide range of factors including land productivity. For any specific situation the definition can be converted to an area definition, as is done in the tables in this chapter and the next. Data for the rural household classes are presented for Ethiopia, Punjab, Pakistan, and Sindh, Pakistan to illustrate three quite different circumstances.

Ethiopia is broadly representative of low-income countries with respect to these household classes (see Jayne et al. 2006). Small commercial farmers dominate agricultural production (Table 1.3). They represent a little over half of the rural households but farm 77 percent of the land. The bulk of the farms are between 0.75 and 5.0 hectares. Large-scale farms occupy ten percent of the land. The rural non-farm population represents somewhat less than half of the rural households but only farms 13 percent of the land.

Punjab, Pakistan represents a situation in which the small commercial farmer also dominates production, comparable to Ethiopia, but with a substantially larger large-scale farm component. Note that the rural non-farm sector is far larger than in Ethiopia, at 80 percent of the rural households, but farms the same percentage of the land: 12 percent. There is current literature (e.g., Collier and Dercon 2014) arguing for agricultural growth in low-income countries to be centered on large-scale commercial farms; hence the representation, here and in Chap. 2, of a province that has a prominent place for such farms.

Table 1.3 Relative importance of major rural household types, Ethiopia, Punjab, Sindh

Region	*Small commercial farmer households (%)*	*Small commercial farmer land (%)*	*Rural non-farm households (%)*	*Rural non-farm land (%)*	*Large-scale/ feudal households (%)*	*Large-scale/ feudal land (%)*
Ethiopia	54	77	46	13	Less than 1	10
Punjab	20	70	80	12	Less than 1	18
Sindh	11	42	89	2	Less than 1	56

Source: Mellor and Malik (2017)

Sindh, Pakistan represents a vastly different situation with 56 percent of the land in feudal holdings and only 42 percent in small commercial holdings. Chapter 7 will quantify the implications of that for growth and poverty reduction. The rural non-farm sector is even larger than in Punjab at 89 percent of the rural population but farms only two percent of the land. Later chapters will show the deleterious effect of these circumstances on poverty reduction. Although feudal agricultures are now uncommon, they once played an important role and hence the focus on such an example.

Small commercial farmers spend half of their incremental income on the local rural non-farm sector. That sector provides labor-intensive goods and services that are non-tradable—that is they do not have a market outside of the local community. Examples are house improvements, local furniture, traveling by bus with local drivers and conductors, local school tutoring, and a wide range of services.

Table 1.4, with data from Pakistan, shows that the market for all non-farm production is almost entirely local. The tehsil (administrative division) is the lowest administrative level. This is an important feature of the rural non-farm sector in low- and middle-income countries. The table for Pakistan frames the issue very clearly and is particularly convincing since Pakistan is a country in which urban areas are widespread with maximum opportunity to provide a market for the rural non-farm sector.

There is a large literature corroborating that it is rural households and farmers specifically who provide the market for the large rural non-farm sector. Gavian et al. (2002) provide a detailed study specifically for Egypt, which like Pakistan has a widespread urban system. Mead and Liedholm (1998) generalize broadly from a large number of studies specifically noting that farmers are the prime market. Mellor and Malik (2017) discuss the issue at length.

Rural Non-Farm Households

Rural non-farm households are defined as those with insufficient land to reach the poverty level from farming—that is less land than the bottom of the range for small commercial farmers. Relatively few well-to-do rural households own plots smaller than the bottom of the small commercial farm range. The bulk of the

Table 1.4 Sources of demand for rural non-farm enterprises, Pakistan (%)

Location of demand	*Production*	*Services*	*Trade*
Same tehsil	74	98	100
Different tehsil in the same district	15	1	0
Different district in the same province	7	0	0
Other province	2	0	0
Other country	1	0	0

Source: Malik (2008)

rural non-farm households are poor and the bulk of the poor are rural non-farm. Long-term poverty reduction in low- and middle-income countries must focus on how growth can raise incomes in these households.

The rural non-farm households (top two rows) rely on a diverse set of income sources, largely as wage earners (Table 1.5). On average, those with land derive half of their income from crop and livestock production. Essentially all in the rural non-farm class are net purchasers of food. Landless rural non-farm households derive essentially all of their income from non-farming activities. The small commercial farmers derive essentially all of their income from farming. As stated above and in Table 1.4 the demand for what they provide comes almost entirely from the same tehsil, the lowest level administrative unit. The local small commercial farmers are the prime source of demand for their goods and services and hence determine their prosperity.

In Ethiopia this group represents 46 percent of rural households and farms 13 percent of the land. In Pakistan, they constitute those with under three acres of land (Table 1.2). They comprise 79 percent of rural households, 83 percent of impoverished households, and 61 percent of these households fall under the poverty line. Two-thirds of these households are landless. This class farms only eight percent of acreage available in Pakistan.

Large Commercial/Feudal Farmers

Large commercial and feudal landholders have sufficient agricultural income to take on urban-oriented consumption patterns (widespread focus groups participated in by the author and colleagues in Pakistan and East Africa provided this description). They commonly live in urban areas. For Pakistan they are defined as those with more than 75 acres of farmed land. Such farms comprise 18 percent of the area in Punjab, thus they are an important but not dominant category (Table 1.2). They are more important in a few East African countries, but never dominant, except in the Union of South Africa. Both large commercial farmers and feudal landowners spend their income in urban areas substantially on capital- and import-intensive goods and services that create little employment, and of course none in rural areas (focus groups and individual informants in Ethiopia and Pakistan, including the chairman of the large farmers' association in Pakistan).

Table 1.5 Percentage share of each source of income in total income, by size of farm, Pakistan, 2010–2011

Size of farm (acres)	*Crop income*	*Livestock income*	*Wages and salaries*	*Business income*	*Rental and pension income*	*Other transfer income*	*Remittances*	*Total income*
Landless	0	3	56	19	4	2	15	100
More than zero but less than 3 acres	27	20	24	13	3	2	12	100
3 to less than 5 acres	51	22	13	5	1	1	7	100
5 to under 12.5	65	17	8	4	1	1	4	100
12.5 to under 25	73	16	5	2	1	1	2	100
25 to under 50	70	17	4	3	1	0.2	5	100
50 to under 75	85	10	1	2	2	0.1	0.2	100
75 and above	80	8	5	5	1	0	1	100
Total	28	11	34	13	3	2	10	100

Source: Pakistan Bureau of Statistics HIES 2010–2011